Malaysian Journal of Public Health Medicine 2018, Special Volume (1): 62-68

ORIGINAL ARTICLE

KNOWLEDGE AND ATTITUDE OF MALAYSIAN HEALTHCARE PROFESSIONALS TOWARDS NEWBORN HEARING SCREENING PROGRAM

Rafidah Mazlan and Wong Say Min

Audiology Programme, Center for Rehabilitation Special Needs, Faculty of Health Sciences, Universiti Kebangsaan Malaysia, Kuala Lumpur, Wilayah Persekutuan Kuala Lumpur, Malaysia

Corresponding Author:
Rafidah Mazlan,
Email: rafidahmazlan@ukm.edu.my

ABSTRACT

Newborn hearing screening program (NHSP) is a standard of care in many countries around the world. Its success to a great extent depends on professionals understanding of the program's goals and the screening procedures. Hence, this study aimed to investigate the knowledge and attitudes of Malaysian healthcare professionals involved in NHSP. A cross-sectional survey study using a 25 items questionnaire was conducted on a purposive sample of healthcare professionals who worked in 30 Malaysian government hospitals that run NHSP. Four hundred and three questionnaires were distributed, only 138 completed questionnaires were analysed, yielding a response rate of 34.2%. Of the 138 healthcare professionals, 35 (25.4%) were paediatricians, 43 (31.2%) were ear, nose and throat (ENT) specialists, and 60 (43.5%) were nurses. In general, the study revealed that the ENT specialists scored significantly higher that the paediatricians and nurses on both knowledge and attitude. Although the majority of all three healthcare professionals (>75%) viewed NHSP as very important, yet many nurses and paediatricians (>70%) reported received limited information during their training in this area and felt uncomfortable in explaining about the whole hearing screening process to the parents. Despite the positive attitude towards NHSP, 22.5% of the healthcare professionals were not aware of the existence of the program. In conclusion, this study has demonstrated knowledge gap in NHSP among the healthcare professionals, but their positive attitudes could be an indication of a strong interest to learn more about NHSP. Therefore, there is a need to take urgent efforts to improve the knowledge of healthcare professionals on NHSP.

Keywords: *knowledge, attitude, healthcare professionals, newborn hearing screening*

INTRODUCTION

Hearing loss is one of the most common disorders present at birth with a prevalence of one to six per 1000 live births[1,2]. Studies have shown that undetected hearing loss can adversely affect a child's speech, language, and social development as well as educational achievement[3,4]. However, these negative effects can be prevented through newborn hearing screening program (NHSP) which aim to identify infants with hearing loss by three months of age and provide appropriate early intervention no later than six months of age[5]. To date, NHSP has been widely implemented in developed countries such as the United States of America, the United Kingdom, and Australia.

In Malaysia, NHSP have been implemented in 30 hospitals within the Ministry of Health since 2001. Consequently, guidelines that outline the principles of hearing screening, evaluation, and intervention were developed for use by professionals involved in NHSP[6]. These guidelines also emphasize the roles and responsibilities of each professionals involved in the program, including but not limited to paediatricians, otolaryngologist (ENTs), and nurses. These professionals are vital team members to the success of NHSP as they play a key role to educate, advocate and promote the best practices in NHSP to the families. It is therefore vital that these three healthcare professionals have sufficient knowledge and hold positive attitude towards the program to ensure that every infant receive appropriate and timely service.

Unfortunately, there is limited published literature that focuses on the extent to which paediatricians, ENTs, and nurses participate, specifically as to their knowledge and attitude with regard to NHSP. For instance, studies by Danhauer et al.[7] and Moeller et al.[8] indicated that most paediatricians and ENTs in their study supported the programs. However, lack of knowledge that centered on issues such as referral and follow-up process for infants identified with hearing loss, cochlea implants, and communication approaches were reported. In another study by Goedert et al.[9], positive attitudes towards the program were also observed among 61% of midwives who were not involved in NHSP. Consequently, their overall knowledge of NHSP were limited. It can be concluded from these studies that knowledge has still been a major

concern even in countries where NHS has been practiced for years. Insufficient knowledge about NHSP among healthcare professionals has been linked to loss to follow-up or delays in follow-up among infants identified with hearing loss[10]. Gaps in knowledge, if it is not addressed, could potentially hinder the successful implementation of NHSP. Since NHSP are relatively new practice in Malaysia, it is essential to understand the knowledge and attitude among healthcare professionals, because these two factors may influence NHSP in achieving its desired goals of early identification and intervention of childhood hearing impairment. Moreover, assessing the knowledge and attitude of the healthcare professionals serve as a mean of identification for barriers and achievements of the existing program. Therefore, the purpose of this study was to measure the knowledge and attitude of Malaysians paediatricians, ENTs, and NICU nurses regarding NHSP.

METHODOLOGY

Participants

A descriptive, cross-scetional study was employed in this study where paediatricians, ENTs and neonatal intensive care unit (NICU) nurses who worked at 30 Malaysian government hospitals that implement NHSP were invited to take part in the study. A total of 138 participants responded to the questionnaire. Of the 138 participants, 35 were peadiatricians, 43 were ENTs, and 60 were NICU nurses. Participants' demographic characteristics are summarised in Table 1. The majority of the participants were female (68.8%), Malay (52.2%) and had working experience of between one to 10 years (84.3%).

Table 1: ***Demographic data of participants***

Characteristics	Data (n=138)	
	N	%
Gender		
Male	43	24.2
Female	95	68.8
Race		
Malay	72	52.2
Chinese	33	18.6
Indian	16	9.0
Others	17	9.7
Age (Year)		
20-29	47	26.6
30-39	43	31.2
40-49	38	21.5
50-59	9	5.1
>60	1	0.5
Year of Practice (Year)		
1 - 10	79	57.2
11-20	48	27.1
21-30	11	6.2

Study Instrument

A structured questionnaire with 25 items that were adapted from Danhauer et al.[7] and Moeller et al.[8] were used in the study. There were 10 items assessing knowledge about NHSP and 15 items evaluating attitude towards the programs. Demographic characteristics of the participants including age, race and years of practice were also included in the questionnaire. Within the domain of knowledge, items were measured in the form of dichotomous and multiple-choice questions, while a five-point Likert scale format ranging from 1 (strongly disagree) to 5 (strongly agree) was used for measuring attitude. Before the study commenced, the questionnaire was piloted among 5 ENTs and 5 NICU nurses in one of the hospitals to establish clarity of the items and the time required to complete the questionnaire. All participants reported that the questions were understandable and there were no ambiguities. Thus, no modifications to the questionnaire was necessary. The questionnaire required 20-25 minutes to complete.

Procedure

This study was approved by the Universiti Kebangsaan Malaysia Ethical Reviewer Committee (NN-2013-093) and the Medical Research and Ethics Committee of the Ministry of Health Malaysia (NMRR-11-052-10050). Following ethical approval, the researchers contacted the head of each department of the 30 hospitals via emailed to obtain a list of potential participants. The self-administered questionnaire was directly mailed to each participant along with a copy of information sheet, a consent form and a stamped returned envelope. Upon completing the survey, the questionnaires were returned to the researchers using the pre-addressed stamped envelope provided. If no questionnaire was returned to the researchers within two weeks after the dispatch of the study packages, a reminder email was sent to the non-respondents. Reliability testing was conducted for the attitude responses from the pilot testing. The results showed a Cronbach's alpha value of 0.88, indicating a high level of internal consistency.

Data Analysis

Only fully completed questionnaires were included in the analysis. Data were analysed using the Statistical Package for the Social Sciences Software version 17.0. Descriptive statistics such as frequency, percentage, mean, mode and standard deviation were used to describe the data. A scoring system recommended by Bloom[11] was used to assess the level of knowledge based on the answers provided. Each correct answer scored 1 mark, while 0 was given for each wrong or unsure response, so the maximum obtainable correct score was 10. The scores were then summed and multiplied by 100 to give a percentage of a total knowledge score. The total knowledge score was categorised into two levels by poor (<80%) and good (≥80%). For attitude, a mean score for each profession was calculated. These values were used to obtain the overall mean score for attitude. The overall mean score was used to divide the professions into two groups: positive and negative. Participants who scored within the overall mean was considered as having positive attitude and those with less than the mean score were treated as having negative attitude. A Kruskal Wallis test was used to analyse the difference between knowledge and attitude among the three groups and any *p* value of less than 0.05 was considered statistically significant.

RESULTS

During the 9-month data collection period (i.e. February – October 2013), a total of 403 questionnaires were distributed, and 178 (44.2%) were returned. These returned questionnaires were from paediatricians, ENTs and NICU nurses who were working at 23/30 hospitals (76.7%) with NHSP during the study period.

Knowledge of NHSP

Forty participants (22.5%) were unaware of the program. Hence, only responses from 138 participants who knew about NHSP were further analysed. Of the 138 participants, 98.5% of the participants support the implementation of NHSP. However, only 84 (60.9%) of the participants who were familiar with the JCIH guidelines agreed with it. Their accuracy of knowledge about these guidelines were further measured, and 76.5% of them knew that hearing loss should be diagnosed by thee months of age. Regarding age of intervention, about half of the participants (55.8%) correctly answered that intervention for children with hearing impairment should begin by six months of age. Nearly 21% (29/138) incorrectly stated that an intervention program should be in placed by one year of age or later. Nevertheless, 76.8% of the participants knew that hearing loss can also occur in babies born without risk factors. Although about two thirds of the participants (65.5%) were aware that hearing aids and cochlea implants are the intervention options for children with hearing loss, 53/138 (38.4%) of them believed inappropriately that hearing aids/cochlear implants correct hearing loss like glasses ameliorate visual problems. When asked about risk factors, the majority of participants did not know that cleft palate (n = 103) [74.6%]) and staying in NICU for more than 2 days (n = 108 [78.3%]) were associated with increased risk of late-onset hearing loss.

The overall mean score of knowledge for all participants was 67.7 ± 11.7. As depicted in Table 2, 20.3% and 79.7% of the participants were categorised as having good and poor knowledge, respectively. Among the professions, knowledge was highest for the ENTs and Kruskal Wallis test proved that the difference was significant (p <0.001). Within groups, a huge difference was observed between those with good and poor knowledge among the pediatricians and NICU nurses.

Table 2: ***Mean and percentage distribution of knowledge for each professional***

Professional Category	Knowledge Score % Mean (SD)	Knowledge Category Good (n)	Poor (n)
Paediatricians (n = 35)	67.5 (13.0)	20.0 (7)	80.0 (28)
ENTs (n = 43)	74.9 (10.3)	44.2 (19)	55.8 (24)
NICU nurses (n = 60)	60.7 (11.7)	3.3 (2)	96.7 (58)

Attitude towards NHSP

The overall mean score for all participants was 3.5 ± 0.5, indicating positive attitude towards NHSP. Consistently, the individual group means were within the overall mean ranging from 3.3 to 3.9. As shown in Table 3, the mean score for ENTs was higher than the paediatricians and NICU nurses (3.9±0.4 versus 3.5±0.4 and 3.3±0.4, respectively). The higher mean score observed in ENTs was proven to be significant (p <0.001), indicating the ENTs' attitude towards NHSP were more postive than the other two professionals. Looking at the items individually, items which ask on 'the importance of screening for permanent hearing loss' and 'NHSP is worth what is costs' scored the highest among all items across professionals, with more than 80% of the participants either agreed or strongly agreed to these two items. Among the healthcare professionals, only NICU nurses showed negative attitude on three statements: hearing screening causes anxiety to parents (mean score = 2.6), confidence in explaining results to parents (mean score = 2.7) and difficulty understanding the results (mean score = 2.9). The pediatricians and ENTs showed positive attitudes on all items in the domain.

Table 3: ***Descriptive statistics for each item in the attitude domain according to profession.***

Item Description \ Profession	Paediatrician (n = 35) Mean (SD)	ENT (n = 43) Mean (SD)	NICU Nurses (n = 60) Mean (SD)
I am not very familiar with the NHSP in the hospital I work*	3.2 (1.2)	4.0 (0.9)	3.6 (1.0)
It is very important to screen all newborns for permanent hearing loss	4.3 (1.1)	4.5 (0.9)	3.9 (1.0)
A NHSP is worth what it costs	4.3 (0.8)	4.5 (0.7)	3.9 (0.8)
Hearing screening in babies causes unnecessary parental anxiety*	3.8 1.0	3.5 (1.0)	2.6 (1.0)
Current screening tool used for screening babies' hearing provides accurate results	3.1 (0.8)	3.1 (1.0)	3.5 (0.7)
The number of babies who do not pass the initial hearing screening of the NHSP is very high*	3.5 (0.8)	3.6 (0.8)	3.3 (0.9)
Each profession in my hospital that I am working are very committed and dedicated in NHSP	3.4 (0.8)	3.7 (0.9)	3.8 (0.7)
I play an important role in the NHSP	3.8 (0.7)	3.5 (0.9)	3.2 (0.9)
My training prepared me adequately to meet the needs of infants with hearing loss	3.4 (0.9)	3.8 (1.0)	3.0 (1.0)
I am confident in explaining the hearing screening results to parents	3.5 (0.9)	4.1 (0.6)	2.7 (0.9)
I am not confident in explaining the consequences of hearing loss to parents*	3.5 (1.0)	3.9 (1.1)	3.0 (0.8)
I am very well informed with the incidence of hearing loss among newborns who are at risk to have hearing impairment	3.0 (1.0)	3.8 (1.0)	3.0 (0.7)
I do not know the protocols steps for follow-up screening in the NHSP*	3.1 (1.1)	3.9 (1.1)	3.3 (0.8)
I face difficulty understanding the screening results as jargon are always used in the results*	3.4 (0.9)	4.0 (1.0)	2.9 (0.7)
The results of screening are easily accessible	3.4 (1.0)	3.8 (0.8)	3.2 (0.6)
TOTAL	**3.5 (0.4)**	**3.9 (0.4)**	**3.3 (0.4)**

n= total number of participants answered each item; SD = standard deviation; *negatively worded item

DISCUSSION

To our knowledge, this was the first study in Malaysia to document the knowledge and attitude of pediatricians, ENTS and NICU nurse on NHSP. Although all healthcare professionals in this study worked in hospitals where NHSP were implemented, it is disturbing that 22.5% of them did not know about the programs. The lack of awareness may be attributed to newly implemented program and their working experience where most participants (84.7%) in the present study were novice and early career healthcare professionals with years of working experience between one and 10 years. Another possible explanation for their lack of awareness on NHSP is the low incidence of infant with hearing loss in comparison to other health care conditions seen by the healthcare professionals on a daily basis. For instance, Moller et al.[8] reported that the average number of children with hearing loss encountered by pediatricians in their study was 3.3 in the past three years.

The survey results also suggest the overall knowledge of NHSP was poor in all healthcare professionals involved in the NHSP. It can be concluded from this study that many healthcare professionals did not have basic knowledge about NHSP, particularly the ages at which infants should be referred for diagnostic testing and received intervention. Similar findings were also demonstrated by pediatricians[8], ENTs[7] and nurses[9]. For example, more than a fourth of ENTs in Danahaeur et al.'s[7] study incorrectly thought that hearing loss should be identified by 6 months of age and Dorros[12] reported that 55% of the participating pediatricians demonstrated inadequacies in knowledge about appropriate follow-up procedures. The deficiencies in healthcare professionals' knowledge about follow-up procedures are of concern because it could directly result in parents' reluctance or non-compliance towards the NHSP program. These knowledge gaps may also create many opportunities for loss to follow-up in NHSP.

Another area in which healthcare professionals showed knowledge deficits was on specific risk factors for late-on-set hearing loss. In this study, more than 70% of participants were ill-informed about cleft palate and staying in NICU >48 hours are associated with late-onset hearing loss. These results suggest that infants presented with these two factors (either single or combined) were often not being monitored by the healthcare professionals. Hence, it is important that all healthcare professionals are aware of all the risk factors of delayed-onset hearing loss, including those with cleft palate and staying in NICU >48 hours, and the need for close follow-up and monitoring for hearing loss of such conditions. It was demonstrated in this study that the knowledge level of the ENTs was significantly higher than the paediatricians and NICU nurses. This probably is because the ENTs had been exposed to audiology curriculum, particularly on the diagnosis and management of children with hearing loss during their residency training.

Regarding healthcare professionals' general attitude towards NHSP, an overall positive attitude was indicated by all groups of participants. Most of the participants (>80%) in the present study acknowledged the importance and benefits of NSHPs. These findings are consistent with a study carried out on 1968 physicians working in the United States of America, where 81.6 % of the participants believed on the importance of screening all newborns for hearing loss[8]. In another study conducted among Minnesota physicians, 89% of them responded that they were aware about the presence of newborn hearing screening and its importance[13]. In this study, NICU nurses showed the least positive attitude towards NHSP in comparison to paediatricians and ENTs. This finding is due to their inaccurate beliefs that NHSP cause anxiety among parents of infants who failed the hearing screening. A large proportion (47.2%) of the NICU nurses in the present study hold such beliefs, suggesting that the NHSP in the hospitals where they work in may yield a high rate of false positive results. The finding from the current study also showed that most of the NICU nurses do not feel confident in explaining and understanding the hearing screening results. This result suggests the lack of training received by the nurses in these aspects of the NHSP. Similar findings were obtained in a study by Goedert et al.[9] where the study showed that 47.1% of midwives did not know what to say parents.

This research, of course, is not without limitations. First and foremost is the potential for socially desirable responding. Participants in the present study may have expressed attitudes that were more positive than their actual views to appear more accepting. It is also possible that the sample was not fully representative of the national population of healthcare professionals involved in NHSP. For example, the hospitals that agreed to participate in our research may have had a greater interest in or more accepting ideas about NHSP than others that did not participate. Similarly, the healthcare professionals who agreed to participate in this study may have had more favorable attitudes than those who declined. Nevertheless, the results obtained contribute valuable information for planning transformations to improve the quality of care for NHSP.

CONCLUSIONS

The Malaysian healthcare professionals had positive attitude but poor knowledge towards NHSP. The majority of the healthcare professionals felt NHSP to be important, but only a few showed good understandings about the basic knowledge of NHSP. They also had deficiencies in critical information needed for serving as the medical home for infants with hearing loss and their families. The findings of the study suggest that there is a need for continuous educational initiatives for the paediatricians, ENTS and the NICU nurses on NHSP.

ACKNOWLEDGEMENTS

The authors are grateful to the healthcare professionals who kindly participated in this survey. The authors would also like to thank the directors and the heads of each hospital for their time and assistance during the study.

REFERENCES

1. Watkin PM, Baldwin M, McEnery G. Neonatal at risk screening and the identification of deafness. *Arch Dis Child* 1991; **66**(10):1030-1035.

2. White KR, Behrens TR. The Rhode Island hearing assessment project: Implications for universal newborn hearing screening. *Semin Hear* 1993; 14:1-119.

3. Helfand M, Thompson DC, Davis RL, McPhillips H, Homer CJ, Lieu TL. Newborn hearing screening: Systematic evidence review. Rockville, MD: Agency for Healthcare Research and Quality; 2001. www.ahrq.gov/clinic/serfiles.htm (accessed 20 October 2017)

4. Pimperton H, Kennedy CR. The impact of early identification of permanent childhood hearing impairment on speech and language outcomes. Arch Dis Child 2012; **97**(7);648-653.

5. Joint Committee on Infant Hearing. Year 2007 position statement: Principles and guidelines for early hearing detection and interventions programs. *Pediatrics* 2007;**120**(4);898-921.

6. Ministry of Health Malaysia. Guidelines for neonatal hearing screening. Surgical and Emergency Medicine Services Unit. Medical Services Development Section of Medical Development Division, August 2009.http://www.moh.gov.my/images/gallery/Garispanduan/Buku_NHS_Edition_internet.pdf. (accessed 20 October 2017).

7. Danhauer JL, Johnson CE. A case study of an emerging community-based early hearing detection and intervention program: Part II. Team building with otolaryngologists and pediatricians using a survey approach. *Am J Audiol* 2006;**15**(1);33-45.

8. Moeller MP, White KR, Shisler L. Primary care physicians' knowledge, attitudes, and practices related to newborn hearing screening. *Pediatrics* 2006;**118**(4);1357-1370.

9. Goedert MH, Moeller MP, White KR. Midwives' knowledge, attitude, and practice related to newborn hearing screening. *J Midwifery Womens Health* 2011;**56**(2);147-153.

10. Shulman S, Besculides M, Saltzman A, Ireys H, White KR, Forsman I. Evaluation of the Universal Newborn Hearing Screening and Intervention Program. *Pediatrics* 2010;**126** (Suppl1): S19–27.

11. Bloom B, Englehart M, Furst E, Hill W, Krathwohl D. Taxonomy of Educational Objectives:The Classification of Educational Goals. Handbook I: Cognitive Domain. New York: Longmans 1956: 25-31.

12. Dorros C, Kurtzer-White E, Ahlerem M, Simon P, Vohr B. Medical home for children with hearing loss: Physician perspectives and practices. *Pediatrics* 2007; **120**(2);288-294.

13. Brown NC, James K, Liu J, Hatcher PA, Li Y. Newborn hearing screening. An assessmentof knowledge, attitudes, and practice among Minnesota physicians. Minn Med 2006;**89**(12):50- 54.