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PROFICIENCY OF CURRENT PRACTICE IN NEONATAL HEARING SCREENING AMONG NURSES IN KERALA

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INTRODUCTION

Hearing loss is the result of impaired auditory sensitivity and or diminished speech intelligibility of the physiological auditory system. Individuals with hearing loss are sometimes described as deaf or hard of hearing based on the type, degree and configuration of hearing impairment. (American Speech-Language Hearing Association (ASHA), 2011)

There are three basic types of hearing loss; sensorineural, conductive and mixed hearing loss. Congenital hearing loss means hearing loss that is present at birth. A congenital disorder may be caused by a genetic problem or other factors that interfere with normal embryological development or occur during the birth process. Causes of hearing loss can be rubella, herpes simplex. (Gelfand, 2001)

Prevalence of hearing increases dramatically with age. National survey results show that hearing impairment, only 2% were born with a hearing impairment; 4% to 6% developed a hearing loss after birth and before 6years. (ASHA, 2011)

Newborn hearing screening is the standard of care in hospitals nationwide. The primary purpose of newborn hearing screening is to identify newborns who are likely to have hearing loss and who require further evaluation. A secondary objective is to identify newborns with medical conditions that can cause late-onset hearing loss and to establish a plan for continued monitoring of their hearing status.(Joint committee on infant hearing (JCIH), 2007).The Early Hearing Detection And Intervention (EHDI) also known as Universal Neonatal Hearing Screening (UNHS) guidelines include hearing screening completion by 1month of age, diagnosis of any hearing loss by 3months of age, hearing aid selection and fitting within 1 month of confirmation of hearing loss if parents choose that option, and entry into early intervention services by 6 months of age. Screening programs target Permanent Childhood Hearing Loss (PCHL) irrespective of type. In 2006, India launched the National Programme for Prevention and control of Deafness (NPPCD).

This program is currently running in over 60 districts of the country and its aim is to identify babies with bilateral severe-profound hearing losses by 6months of age and initiate rehabilitation by 9 months of age. Neonatal hearing screening aims screening all babies in

the programme within the first month of life. Babies who fail the initial screening should undergo diagnostic tests to establish or rule out hearing loss before the age of three months. When a child is identified with hearing loss, audiological, medical and educational habilitation should be initiated as soon as possible and no later than by six months of age. The main tool used for neonatal hearing screening is physiological measures such as Otoacoustic Emission (OAE) and Auditory Brainstem Response (ABR).

Newborn hearing screening can be performed by nurses, audiologist and other trained personnel. It is a quick painless evaluation. Undiagnosed or late-diagnosed hearing loss in young children can have substantial negative consequences; not only in terms of its impact on a child's language and communication development, but also on social and emotional development and mental health, family relationships, educational opportunity and achievement and later economic contribution to society. Nurses are one of the medical professionals who plays a key important role in the Intensive care unit (ICU) as they can identify high risk babies who need audiological intervention, provided they should have adequate knowledge available in relation to different facts about neonatal hearing loss. The success of neonatal hearing screening programs lies in the timely identification, diagnosis, and management of children with hearing loss. Newborn hearing is a quick painless evaluation. Undiagnosed or late-diagnosed hearing loss in young children can have substantial negative consequences; not only in terms of its impact on a child's language and communication development, but also on social and emotional development and mental health, family relationships, educational opportunity and achievement and later economic contribution to society.

Barbosa, Aires, Farias, Linhares and Gris (2013) checked the knowledge of nursing professional after the educational actions on pediatric hearing. A quasi-experimental design with time series outline having 82 nursing professional was done in University Hospital, Brazil. Results showed a significant change in the knowledge of the nursing

professional after the educational activity in most of the variables such as ideal age to perform the newborn hearing screening, ideal age to diagnose hearing loss, ideal age to start intervention against hearing loss ad risk indicators for hearing loss.

Nurses plays a vital role in hospitals. They communicate with patients, understand them and take exceptional care of them along with administering. Screening is a multidisciplinary approach which usually involves audiological or audiometric technicians, neonatal intensive care nurse, maternity room nurse, obstetric nurse, health workers, doctors and pediatricians. But midwives have more and equal important role in neonatal screening of infants as they are the closest people during birth time. The successful partnership between and nurse and doctor will bring the best outcomes for their patients. Nurses are the backbone of the healthcare sectors because they are more involved in the foundation of health of the people.

Ravi, Gunjawate, Yerraguntla, Lewis and Rajashekhar (2017) assessed knowledge, attitude and practices towards universal newborn hearing screening across India. A cross sectional survey of 112 pediatricians working in India by using Questionnaires. Results showed that success of the universal newborn hearing screening program lies in the support and cooperation of pediatrician. This study draws attention to the positive attitude and practices exhibited by them.

Sanju, Aggarwal, Choudhary and Yadav (2018) assessed the knowledge and attitude related pediatric hearing loss among nurses across various range of hospital in Northern India. A questionnaire based online study (22) online survey questions was designed to assess the nurses. The questions were closed set task having 3-point rating scale. A total of 115 nurses from primary nursing care, corporate and government hospitals participated in the study. Poor knowledge among nurses regarding hearing impairment in neonatal screening can be observed in the present study.

Thus newborn hearing screening plays an important role in a child's life. A successful newborn hearing screening requires the active participation of several health care professionals includes nurses. Multidisciplinary team approach which includes

pediatrician, physician, co-health workers, audiologist and nurses act as the major facilitator for the successful implementation of newborn hearing screening. Therefore, it is important to analyze their knowledge and attitude towards newborn hearing screening.

The present research is being conducted to assess the knowledge and attitude of issues in neonatal hearing loss among nurses across various range such as primary nursing care, corporate and government hospitals in Kerala. A questionnaire-based study (online survey) of 22 questions was designed and adopted from similar studies to assess the knowledge and attitude among nurses regarding hearing impairment and issues related to hearing loss in newborns. A total of 115 nurses working in hospitals has been participated on this study.

REVIEW OF LITERATURE

Hearing loss in the first two years of life is accepted as congenital hearing loss. The problem of identification and evaluation of hearing loss at this age, due to difficulty in

ascribing the etiology of hearing loss in individual cases, has resulted in a lack of exact prevalence data of congenital hearing loss. It is estimated that an average 40% of cases with childhood sensorineural hearing loss are undiagnosed with respect to etiology, most of those with unknown etiology are congenital. (Sandford, 1996*)*

Hearing loss will affect child's ability to normal develop speech and language skills and in which later produce several consequences. In such scenario once the baby is born we need to do a neonatal hearing screening for the future better life of the child. Newborn screening (NBS) is a system of identifying genetic and other health problems in newborn that leads to overall improvement in the public health. NBS tests look for serious developmental, genetic and metabolic disorders so that important action can be taken during the critical time before symptoms develop. The main purpose of newborn screening is to detect potentially fatal or disabling conditions in newborns as early as possible, often before the infant displays any signs or symptoms of a disease or conditions. Such early detection allows treatment to begin immediately, which reduces or even eliminates the effects of the condition. Many of the conditions detectable in newborn screening, if left untreated, have serious symptoms and effects, such as lifelong nervous system damage, intellectual, developmental, physical disabilities, profound hearing loss and even death.

Newborn screening (NBS) is a universally accepted and one of the first population-based genetic screening programs that aims to identify and detect congenital conditions. Early identification of these congenital conditions is crucial as timely interventions could mean saving newborns from severe and irreversible complications, usually intellectual disability and or death (Pourfarzam & Zadhoush, 2013).

Newborn screening has evolved through the years from the simple bacterial assay developed by Guthrie in the 1960's to detect increased phenylalanine levels in newborns (Guthrie & Susi,1963) to a comprehensive and complex screening program that now includes detection of over 50 different conditions. (Therrell, Puryear, Eckman & Mann, 2015)

David and Jager (2018) aimed at exploring and describing the experiences of hearing parents regarding their child's hearing loss. The study was conducted in Cape Town, South Africa also it applied a qualitative methodology with a phenomenological design. The findings of the study showed that hearing parents experience a myriad of emotions when their child is diagnosed with a hearing loss. Also this study advocates for various stakeholders in the helping profession to collaborate in the best interest of hearing parents and a child with hearing loss.

The American Academy of Pediatrics (AAP, 2007) recommends hearing screenings for all newborns. The goal is for all babies to have a newborn hearing screening by one month of age, ideally before they go home from the hospital, identified by 3 months of age and enrolled in early intervention or treatment, if identified as deaf or hard of hearing, by the age of 6 months.

Universal Neonatal Hearing Screening (UNHS,1992) also known as early hearing detection and intervention (EHDI) programs in several countries, refers to those services aimed at the early identification, intervention, and follow –up of infants and young children who are deaf or hard-of-hearing. It is a strategy for early detection of permanent congenital hearing loss. It describes the use of objective testing methods (usually Oto acoustic Emission (OAE) or Automated Auditory Brainstem Response (AABR)) to screen the hearing of well newborns in a particular target region.

Declau, Boudewyns, Ende, Peters and Heyning (2007) clarified the audiologic aspects and causes of congenital hearing loss in children who failed universal neonatal hearing screening. An analysis of 170 consecutive records of neonates referred to a tertiary center after universal neonatal hearing screening failure, between 1998 and 2006, was performed 87000 neonatal were screened. The screening results were validated with a clinical ear, nose and throat examination and electrophysiological testing including diagnostic auditory brainstem response, automated steady state response and or behavioral testing. Finding showed that permanent hearing loss was confirmed in 116 children (68.2%). Bilateral hearing loss was diagnosed in 68 infants (58.6%) and unilateral hearing loss in 48 infants (41.4%). An etiologic factor could be identified, a genetic mechanism was present in

60.4% of the cases, periparta problems in 20.8% and congenital cytomegalovirus infection in 18.8%. An etiologic factor could be identified for nearly one half of the children with confirmed congenital hearing loss referred through a universal hearing screening program.

Early diagnosis and proper treatment can make the difference between long-term impairment and healthy development. Without proper screening and treatment, children can suffer developmental disability, physical disability or even death.

Newborn screening has seven components which includes education: Parents/Public and the professionals, screening: collection, submission, testing and storage, diagnosis: interpretation of results and reporting, conveying: to doctor and parents, counseling follow up: Repeat test if positive and confirm, management: treatment and monitor long term outcome, evaluation: program quality assurance, outcome and cost effectiveness.

The hearing screening is a first and important step in helping understand if the baby may be deaf or hard of hearing. Without newborn hearing screening, it is hard to know when there are hearing changes in the first months and years of your baby's life. For e.g. babies may respond to noise by startling or turning their heads toward the sound. But this doesn't necessarily mean they can hear all the sounds around them and everything we say. Babies who are deaf or hard of hearing may hear some sounds but still now hear enough to understand spoken language. Infants who are deaf or hard of hearing need the right support, care and early intervention services to promote health development. If the hearing status is not identified, it may have negative effects on the baby's communication and language skills. Longer term, a missed hearing loss can also impact the child's academic achievement and social-emotional development.

A hearing screening is a quick test to see how well you hear different sounds. You either pass or fail the screening. If you pass you do not need to do anything else. If you fail, you may need more testing to see if you have a hearing loss. (UNHS, 1993)

Thus screening is an integral part of child's life. It helps the child to have normal life. Early intervention will give the children the opportunity to develop normal language skills compared with those children who are diagnosed later.

The Joint Committee on Infant Hearing (JCIH, 1994) recommends early detection and intervention of infants with hearing loss through integrated, interdisciplinary state where the screening of the infant should be done before 1 month. A multidisciplinary team approach can act as the major facilitator for the successful implementation of newborn hearing screening. A successful hearing screening program requires nurses, pediatricians, physicians, audiologist and other several health care professionals. This active multidisciplinary team forms the backbone for the successful implementation of newborn hearing screening program.

Moellar, White and Shisler (2006) did a survey to examine the attitude, practices and knowledge of primary care physicians in relation to newborn hearing screening and follow up. A survey was created on the basis of input from focus groups with primary care physicians included n=12,121. The response rate was 16.1%. Results showed that pediatricians and other primary care providers recognize the benefits of early detection and intervention for permanent hearing loss in infants. Physicians reported a high level of support for universal newborn hearing screening.81% judged it to be very important to screen all newborns for hearing loss at birth. Physician's roles will be supported through the provision of action-oriented resources that educate parents about the importance of follow-up and that prepare professionals to incorporate appropriate surveillance procedures in daily practice.

Midwives or nurses plays an important role in the newborn screening as there are the closest people soon after the birth of the infant. Nurses play a key role in the ICU as they can identify high risk babies who needs audiological intervention. Considered as frontliners, nurses are usually the first contacted with the infants so it's necessary to give them knowledge regarding the screening. With increased awareness nurses can ensure that infants are screened accurately and that affected families receive prompt referrals for the service they require.

Goedert and Moeller (2011) evaluated knowledge, attitudes and practices of midwives related to newborn hearing screening and intervention across 5255 American nursing colleges. Results showed that midwives had lack of knowledge regarding various

screening procedures, steps for referral and also the availability of resources when an infant doesn't pass a test.

Hendershot, Pakulski, Thompson, Dowling and Price (2011) did a survey regarding the services and practices being delivered by the elementary and middle school nurses concerning NIHL screening and prevention. Results indicated that 48% of the nurses were not aware of many educational programs being addressed for screening NIHL in students. They concluded that school nurses need to become advocates and trained regarding the various hearing screening policies and educational programs in order to help reduce hearing loss.

Nurses should be trained and guided regarding the knowledge and importance of newborn hearing screening as it is vital part in infant's life. Also nurses can educate and counsel expectant mother regarding the various hearing screening policies and educational programs in order to help reduce hearing loss.

Roberts and Jones (2017) investigated the knowledge and understanding of universal newborn hearing screening (UNHS). A group of 15 adults, licensed nurses with varied professional experience participated in the study. Participants completed both objective and subjective measurements to evaluate their current knowledge to training procedures. Participants completed pre and post surveys as the subjective measure of their UNHS training. Results of this study suggested nursing professionals are not confident in their current level of training concerning UNHS.

Mazlan and Min (2018) examined the knowledge and attitudes of Malaysian healthcare professionals involved in newborn hearing screening program (NHSP). A cross sectional survey study using a 25items questionnaire was conducted on 30 Malaysian government health care workers that run (NHSP). 403 questionnaire were distributed. Findings showed that majority of the healthcare professionals viewed NHSP as very important. But nurses and pediatrician received limited responses the awareness of hearing screening.

Advanced Practice Registered Nurse (APRNs) and Registered Nurse (RNs) who are responsible for maternal-newborn care should have knowledge of the NBS tests required

by the states in which they practice. Within her or his scope of practice and responsibility, the APRN or RN involved in the newborn screening should be able to do the following below mentioned things: -

- Counsel and educate families about NBS tests
- Explain the importance and implications of testing
- Assure completion of the required information from the OAE and AABR testing. (Newborn Screening Technical Assistance and Evaluation Program (NSTAE), 2011)

Nurses are considered to be the crucial in increasing newborn screening coverage. Considered as front liners, nurses are usually the first contact of parents in a primary care setting or in health facility and this gives the man opportunity to advocate and educate parents on newborn screening. The inherited nature of the conditions detected in newborn screening, mostly inborn errors of metabolism, implies that nurses should be knowledgeable about basic genetics concepts necessary to explain these conditions to parents. Nurses should also be ready to address parent's questions on newborn screening mechanism, discuss what the results could be potentially mean for the newborn and the family.

Barbosa, Aires, Farias, Linhares and Gris (2013) checked the knowledge of nursing professional after the educational actions on pediatric hearing. A quasi-experimental design with time series outline having 82 nursing professional working in University hospital, Brazil. Results showed a significant change in the knowledge of the nursing professional after the educational activity in most of the variables such as ideal age to perform the newborn hearing screening, ideal age to diagnose hearing loss, ideal age to start intervention against hearing loss and risk indicators for hearing loss.

Khan, Joseph and Adhikari (2018) determined primary health care nurses experiences, practices and beliefs regarding hearing loss in infants. A descriptive survey was used with quantitative methods of analysis. Fourteen primary health care clinics from the eThekwini district were selected, from which 75 nurses participated by completing a self-administered

questionnaire. Results suggested that atleast one-third of primary health care nurses had never screened a child for hearing loss and most clinics did have access to basic hearing screening equipment or materials. Nurses reported that they would refer to audiology services for some of the risk factors, as indicated on the JCIH, they were less likely to refer if the child was in a neonatal intensive care unit longer than five days had neurodegenerative disease, meningitis etc. Less than a third of nurses always referred if the child displayed additional non-JCIH risk factors. Approximately 38% reported that communities believed that hearing loss could be because of some form of spiritual or supernatural causes.

Rozul and Chiong (2020) described the current knowledge, attitudes and practices of healthcare practitioners in Rizal province regarding the implementation of the Universal Hearing screening Program (UNHSP). A descriptive phenomenological research design through focus group discussions with pediatrics and Obstetrics and Gynecology (OBGYN) consultants in a government hospital, nurses, from private primary and secondary hospitals, midwives from private birthing homes and rural health workers. Results showed that most participants were able to determine the advantages and disadvantages of implementing UNHSP. However, less than half of the participants admitted to have an established protocol to give access to newborn hearing screening services.

Nurses not only care for their sick patients but they also promote wellness strategies too. They may either have one-on-one discussion with patient. Nurses treat patients and give them positive suggestions regarding their lifestyle and healthy choices to build an overall healthy community. Nurses are the crucial factor in the healthcare industry. They take upon different roles and responsibilities. Not only that they lend an empathetic ear to the patients and understand them. They take care of the patients along with educating them on all important aspects of their health.

INDIAN STUDIES

Ravi, Gunjawate, Yerraguntla, Lewis and Rajashekhar (2017) assessed knowledge, attitude and practices towards universal newborn hearing screening across India. A cross sectional survey of 112 pediatricians working in India by using Questionnaires. Results showed that success of the universal newborn hearing screening program lies in the support and cooperation of pediatricians. This study draws attention to the positive attitude and practices exhibited by them.

Ravi and Rajashekhar (2017) conducted a systemic review on newborn hearing screening team members from different countries. This search was carried out using various keywords such as practitioners, newborn hearing screening, knowledge, attitudes and practices in different combinations. Results showed that newborn hearing screening team members from different countries, healthcare systems and early hearing detection and intervention programs shows difference in critical knowledge warranting outreach and educational programs.

NEED OF THE STUDY

A questionnaire was developed in Malayalam language to assess knowledge and attitude among Malayalam speaking nurses regarding hearing impairment in neonatal hearing screening which is important for early intervention because it helps in understanding if the baby has hearing loss which can lead to language delay and other issues as well. In this scenario nurses play an important role for neonatal screening also they should have adequate knowledge about it. Soon after the birth nurses fulfils specialty duties carried out within intensive care unit (ICU) also helps in taking decision-making in technology wise that is available to care for the neonates. Several studies were done in

other Indian languages to evaluate the knowledge and attitude of medical professionals like pediatricians, nurses etc. Sanju, Aggarwal, Choudhary and Yadav (2018) developed a questionnaire based study in English to assess the knowledge and attitude related pediatrics hearing loss among nurses across various range of hospital in Northern India. But limited or few studies were attempted in Malayalam language. To fill this lacunae, it is essential to develop a questionnaire in Malayalam language to assess nurse's knowledge on prenatal history, birth history, medical history, importance of early identification of hearing loos, need of amplification devices, and mode of rehabilitation services needed for babies with hearing loss and their attitudes regarding the cause and management of hearing loss. The present study attempts to evaluate the knowledge and attitude of nurses in the area of issues related to pediatric hearing loss in different hospital setups in Kerala.

METHOD

AIM:

The aim of the current study was to adapt a questionnaire from English developed by Sanju, Aggarwal, Choudhary and Yadav (2018) consisting of 22 questions related to hearing loss in neonates and it was translated to Malayalam language which was given to nurses via online survey to evaluate their knowledge and attitude regarding hearing loss in

neonates. The translated study was validated by 4 audiologists who were fluent in both English and Malayalam.

PARTICIPANTS:

115 nurses in the age group of 21-25years who used Malayalam as their native language were selected who were working at primary nursing care, corporate and government hospitals and had a minimum education up to graduation level (B.Sc. Nursing).

INCLUSION CRITERIA:

Nurses who had a qualification of B.Sc. nursing with minimum 2-3 years of experience was included for the study.

TOOLS USED:

A questionnaire based study of 22 question was developed in Malayalam language by translating English questionnaire developed by Sanju, Aggarwal, Chaudhary, Yadav (2018) which was validated by 4 audiologists who were fluent in both English and Malayalam language.

PROCEDURE:

Data required was collected by distributing questionnaire developed in Malayalam language to all subjects chosen as sample. The questionnaire consisted of 22 questions based on knowledge and attitude level of questions.

SCORING:

Questionnaire was based on a 3-point rating scale which includes Yes, No or Not sure. 20 questions had a scoring of 3-point rating scale, 1 question had a scoring of only YES or No and remaining 1 question had a scoring of ENT or Audiologist.

STATISTICAL ANALYSIS:

Collected data was analyzed by frequency, mean and Standard Deviation.

RESULTS AND DISCUSSION

The aim of the study is to develop a questionnaire in Malayalam language to assess the awareness/knowledge and attitude of current practice in neonatal hearing screening among nurses in Kerala. The percentage of scores obtained for 22 questions as follows: -

A. Knowledge/awareness of the nurses towards neonatal hearing screening

Table: 4.1

Showing the knowledge/awareness of the nurses towards neonatal hearing screening

	No(No+Not sure)		Yes		Total	
	Count	Row N %	Count	Row N %	Count	Row N %
	Knowledge					
Can babies born with hearing loss?	30	26.1%	85	73.9%	115	100.0%
Can high fever cause hearing loss?	35	30.4%	80	69.6%	115	100.0%
Can measles cause hearing loss?	33	28.7%	82	71.3%	115	100.0%
Can ear discharge cause hearing loss?	40	34.8%	75	65.2%	115	100.0%
Can convulsion cause hearing loss?	35	30.4%	80	69.6%	115	100.0%
Can some type of medication cause hearing loss?	36	31.3%	79	68.7%	115	100.0%
Can jaundice cause hearing loss?	29	25.2%	86	74.8%	115	100.0%
Can prolonged noise cause hearing loss?	17	14.8%	98	85.2%	115	100.0%
Can delayed cry at birth cause hearing loss?	19	16.5%	96	83.5%	115	100.0%
Can consanguinity cause hearing loss?	31	27.0%	84	73.0%	115	100.0%
Is treatment for hearing loss available?	7	6.1%	108	93.9%	115	100.0%
Do you consider early treatment of hearing loss will prevent further complication?	15	13.0%	100	87.0%	115	100.0%
If you find child has problem of hearing which professional you will refer?	115	100.0%	0	0.0%	115	100.0%
Do you think children with hearing impairment can still hear and speak?	97	84.3%	18	15.7%	115	100.0%
Do you think child with speech and language problem due to hearing loss should receive speech therapy?	0	0.0%	115	100%	115	100.0%

B. Attitude of nurses towards neonatal hearing screening.

Table 4.2

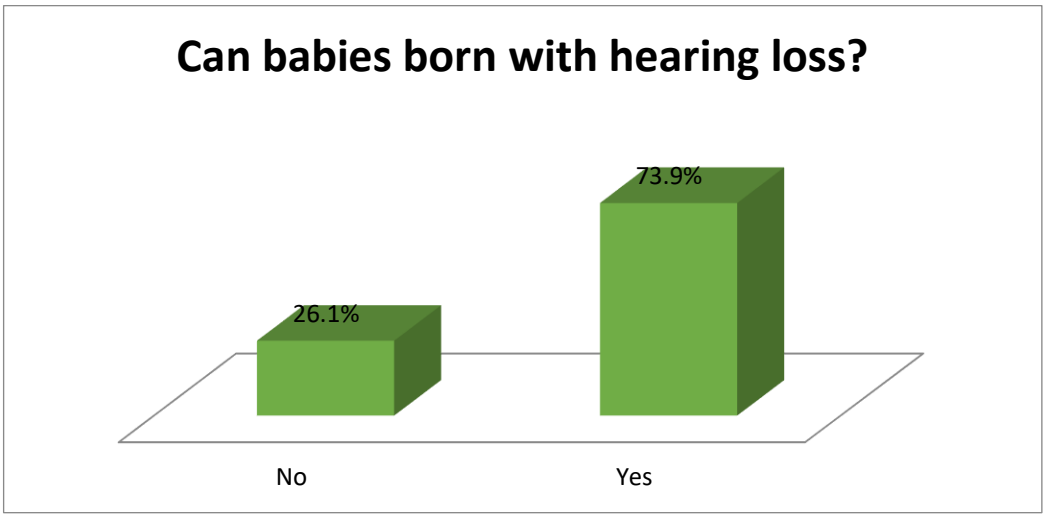
Showing the attitude of neonatal newborn hearing screening

	No (No+Not sure)		Yes		Total	
	Count	Row N %	Count	Row N %	Count	Row N %
	Knowledge					
Attitude						
Can hearing loss be identified soon after birth?	29	25.2%	86	74.8%	115	100.0%
Can children with hearing loss able to attend normal school?	25	21.7%	90	78.3%	115	100.0%
Would you like babies hearing tested soon after birth?	28	24.3%	87	75.7%	115	100.0%
Would you let baby use hearing aids if she/he has hearing loss?	18	15.7%	97	84.3%	115	100.0%
Can bewitchment cause hearing loss in infants?	115	100.0%	0	0.0%	115	100.0%
Do you think hearing loss in newborn cause anxiety in parents?	4	3.5%	111	96.5%	115	100.0%
Do you think children with hearing loss feel isolated from other child of their age group?	60	52.2%	55	47.8%	115	100.0%

C. Awareness regarding babies born with hearing loss

Fig 4.1

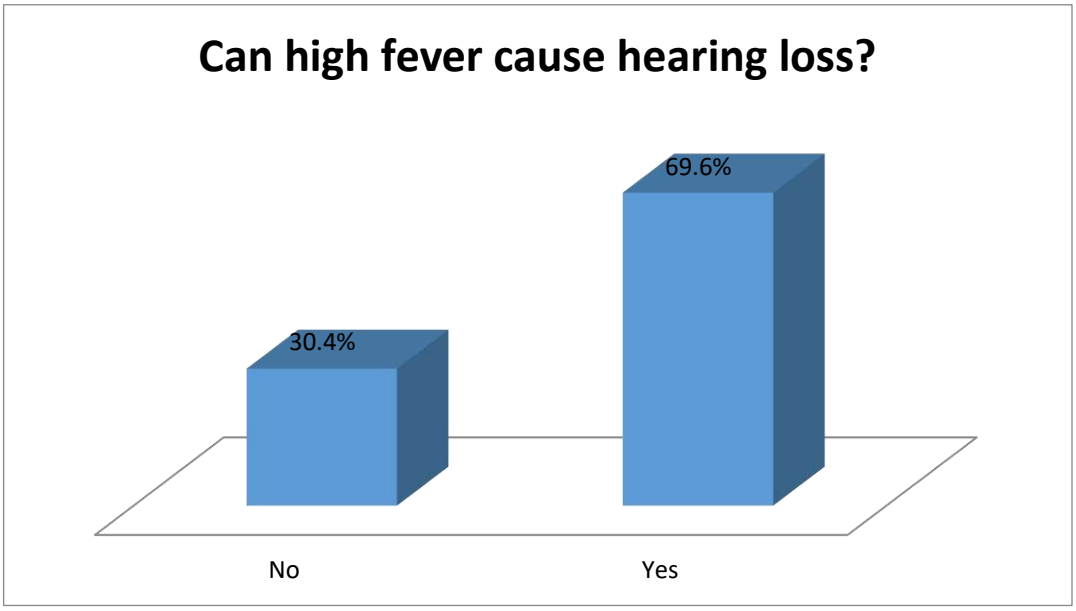
Showing *awareness regarding babies born with hearing loss*



D. Harmful effect of high fever on infants hearing.

Fig 4.2:

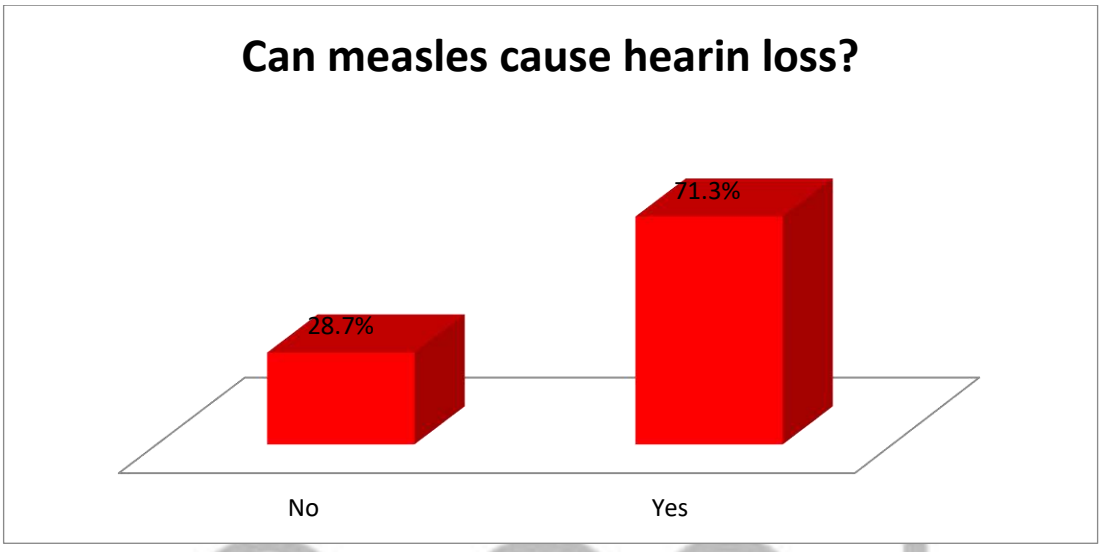
Showing awareness regarding harmful effect of high fever on infants hearing.



E. Harmful effect of measles on infants hearing.

Fig 4.3:

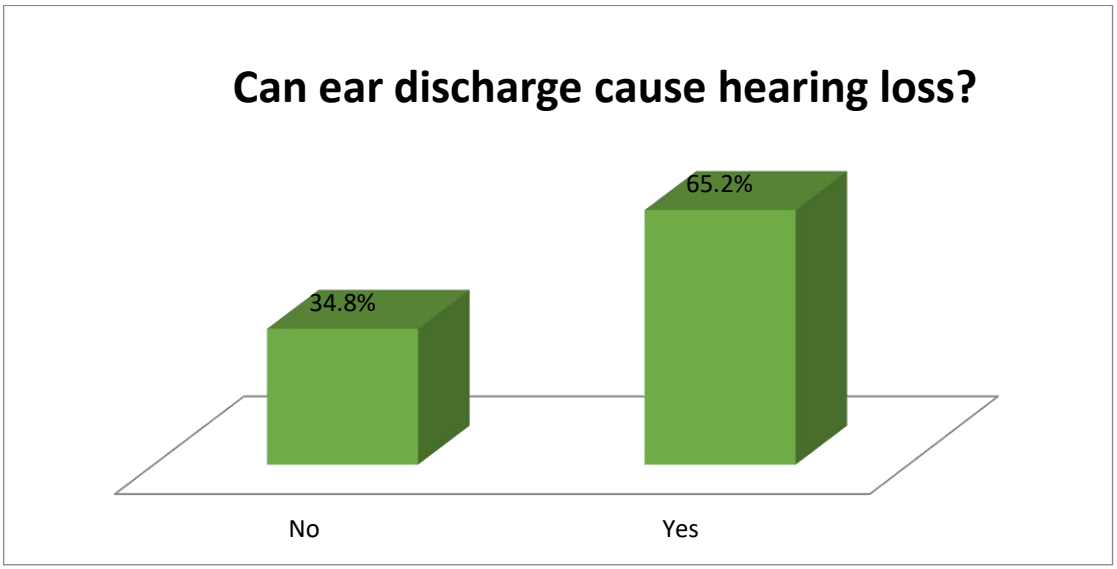
Showing awareness regarding harmful effect of measles on infants hearing.



F. Harmful effect of ear discharge on infants hearing

Fig 4.4:

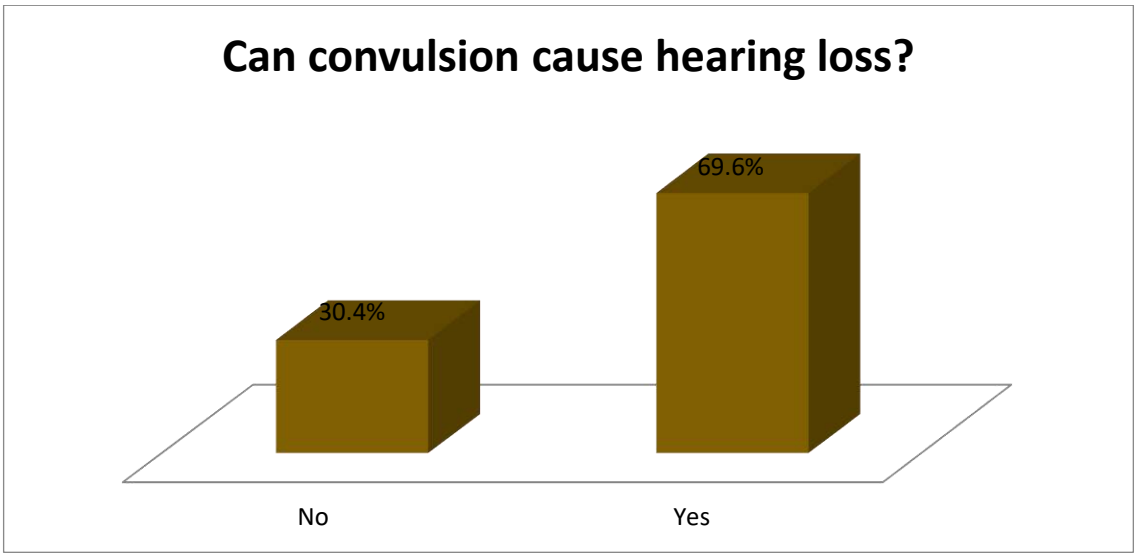
Showing awareness regarding harmful effect of ear discharge on infants hearing



G. Harmful effect of convulsion on infants hearing

Fig 4.5:

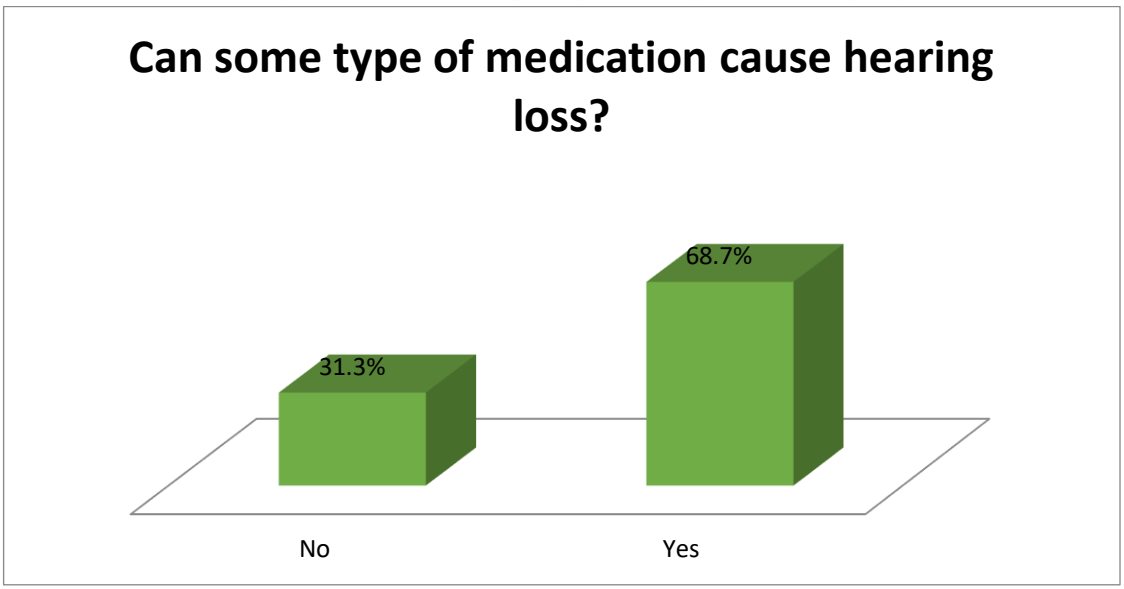
Showing awareness regarding the harmful effect of convulsion on infants hearing



H. Harmful effect of medication on infants hearing

Fig 4.6:

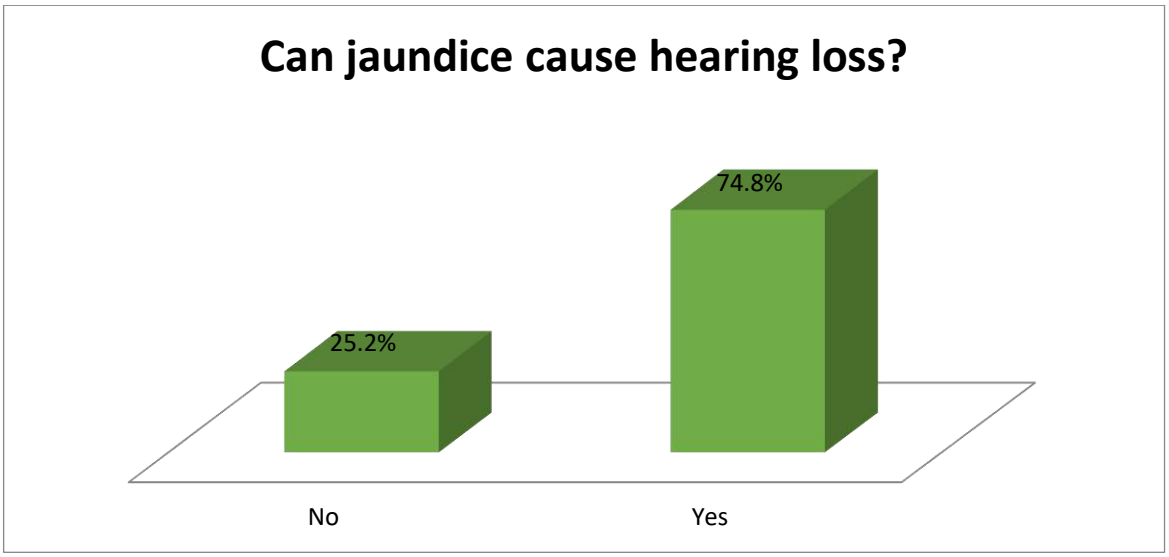
Showing *awareness regarding the harmful effect of medication on infants hearing.*



I. Harmful effects of jaundice on infants hearing loss.

Fig 4.7:

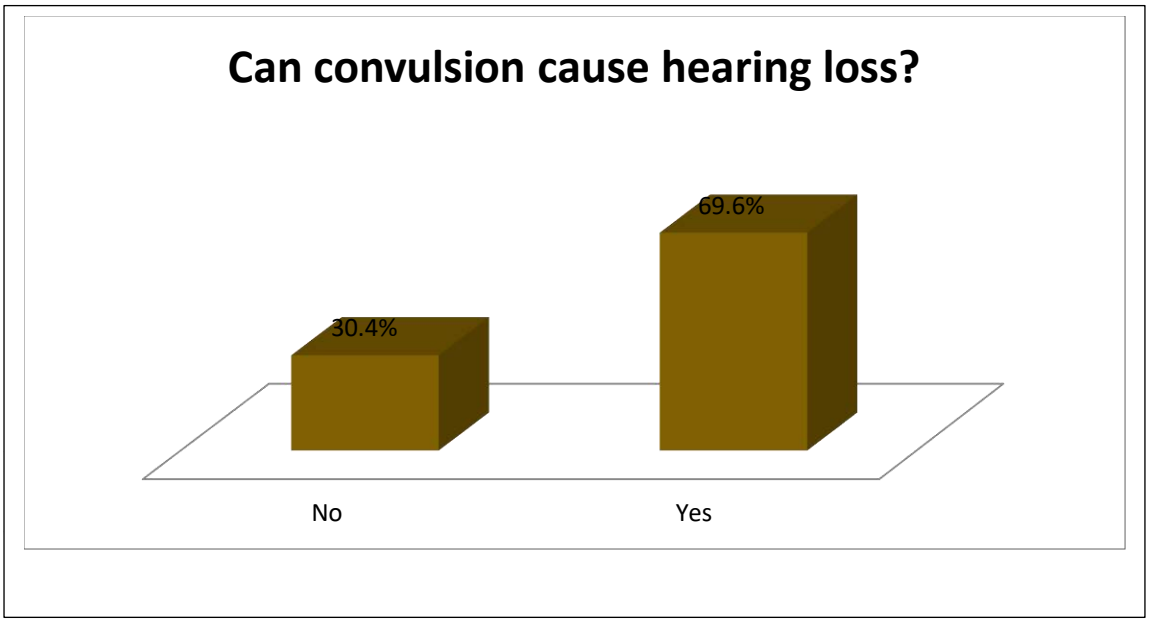
Showing awareness regarding harmful effects of jaundice on infants hearing loss.



J. Harmful effect on Noise induced hearing loss on infants hearing

Fig 4.9:

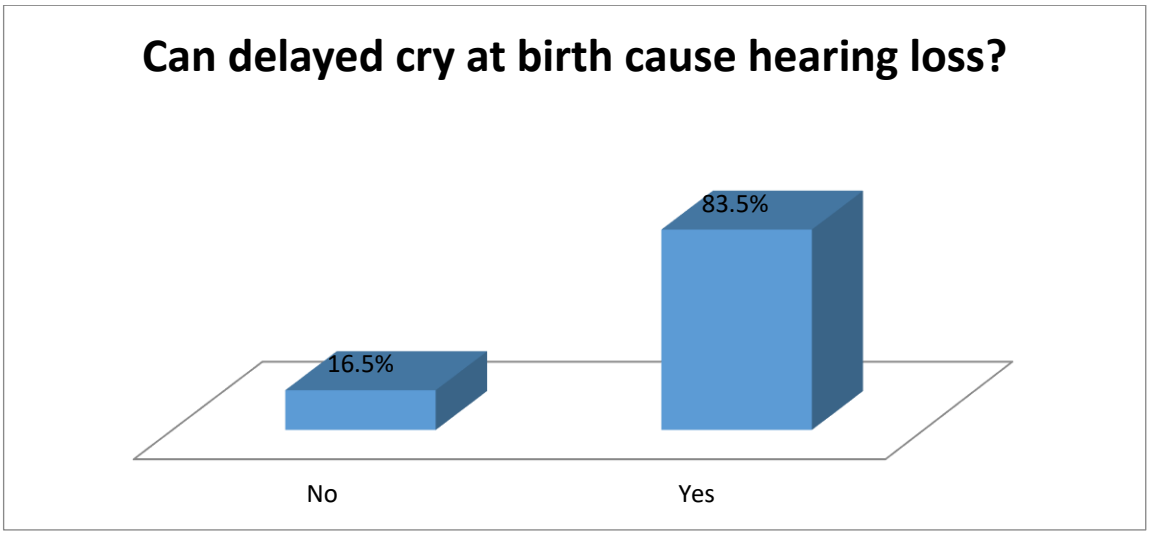
Showing *awareness regarding the harmful effect on Noise induced hearing loss on infants hearing.*



K. Effect of delayed cry on infants hearing

Fig 4.9:

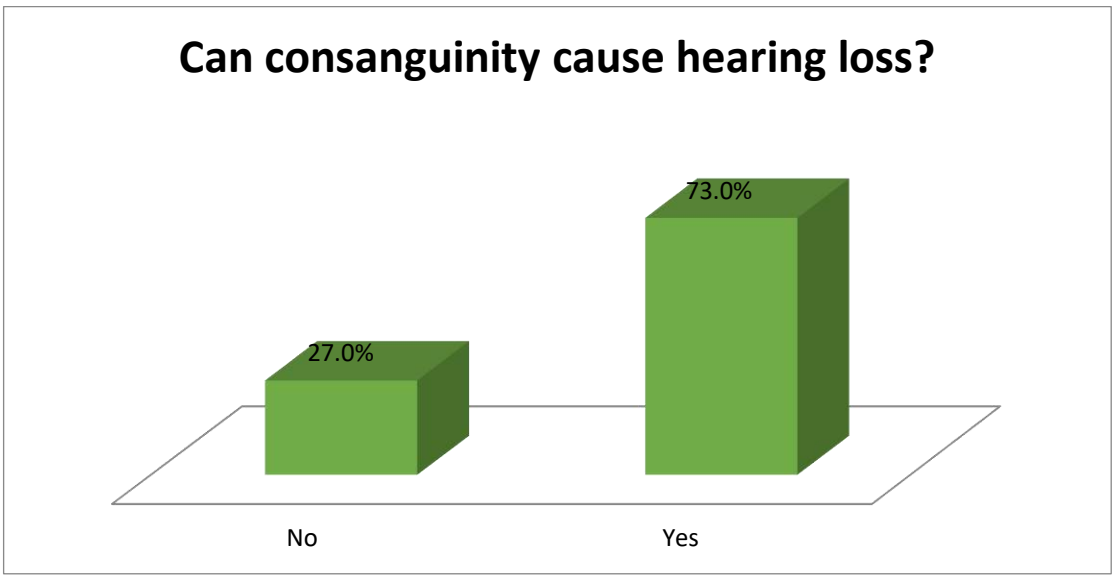
Showing awareness regarding the harmful effects of delayed crying on infants hearing



L. Consanguinity on infants hearing.

Fig 4.10:

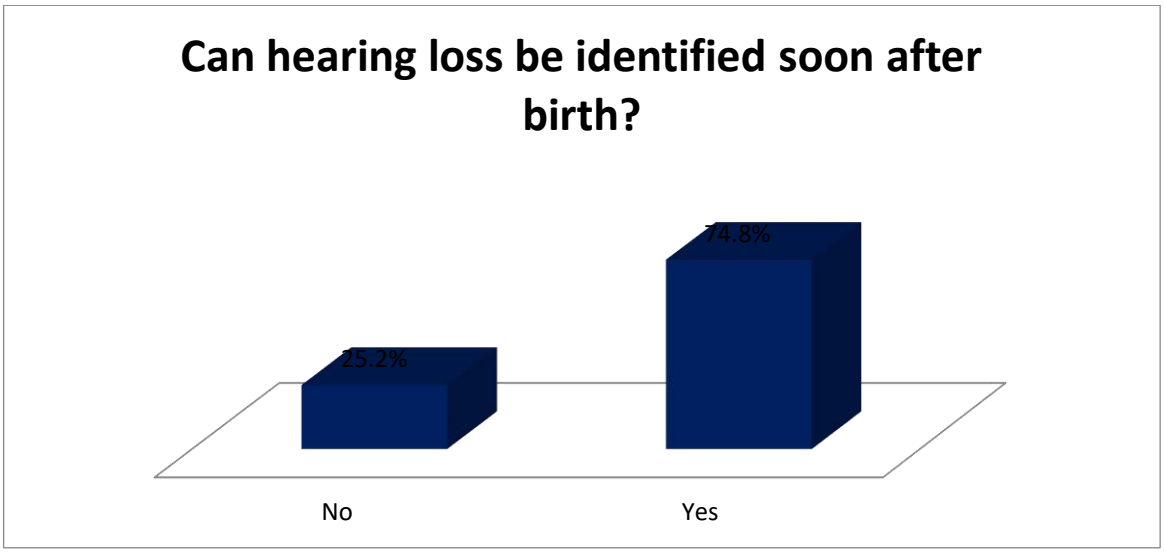
Showing awareness regarding consanguinity on infants hearing



M. Identifying the hearing loss soon after infant's birth.

Fig 4.11:

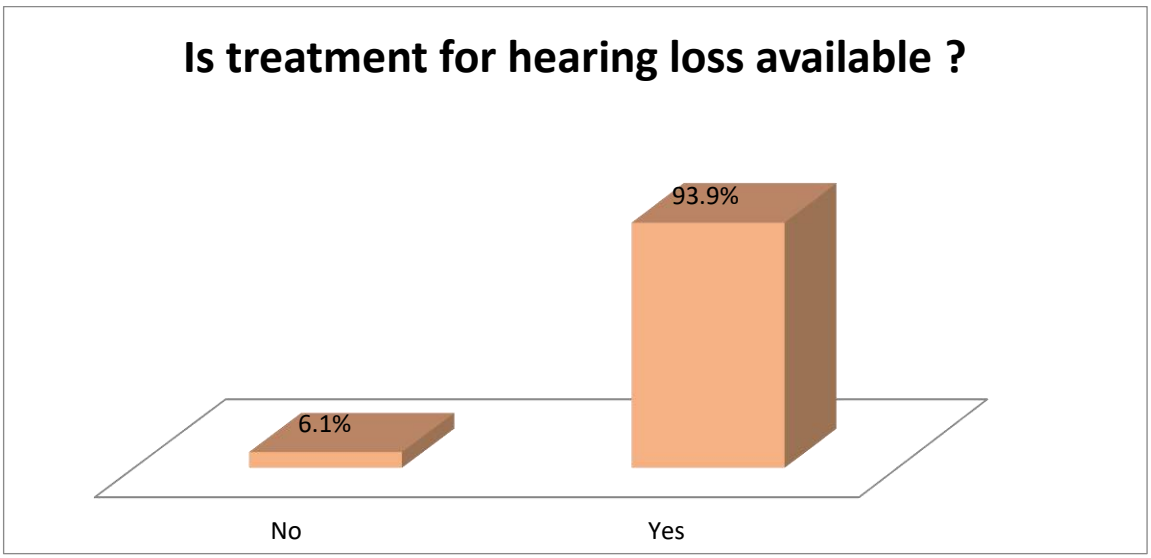
Showing awareness regarding identifying the hearing loss soon after infant's birth.



N. Treatment for hearing loss is available

Fig 4.12:

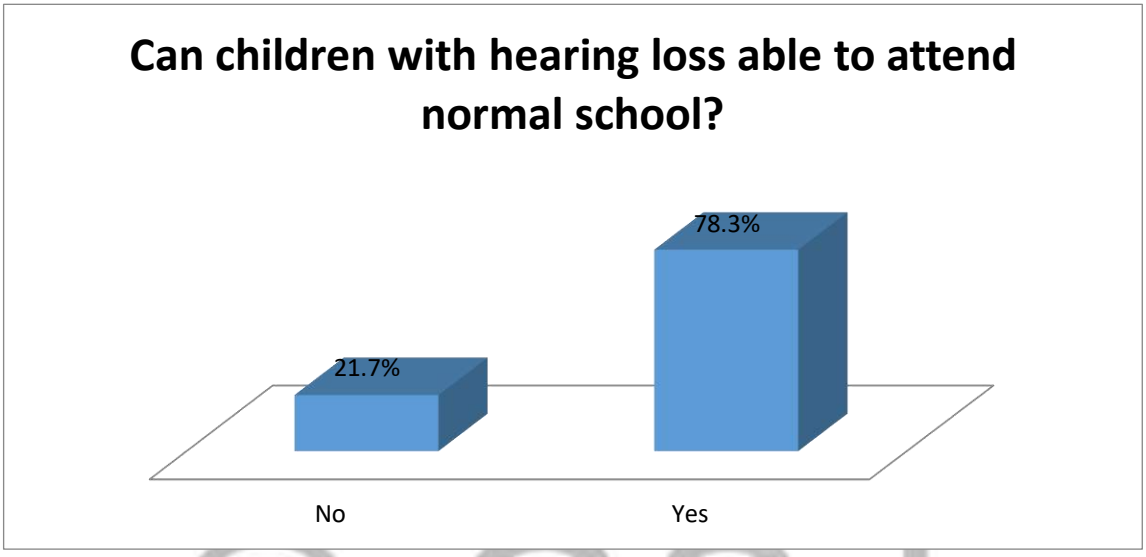
Showing *awareness regarding if the hearing treatment is available*



O. Effect of children with hearing loss able to attend normal school

Fig 4.13:

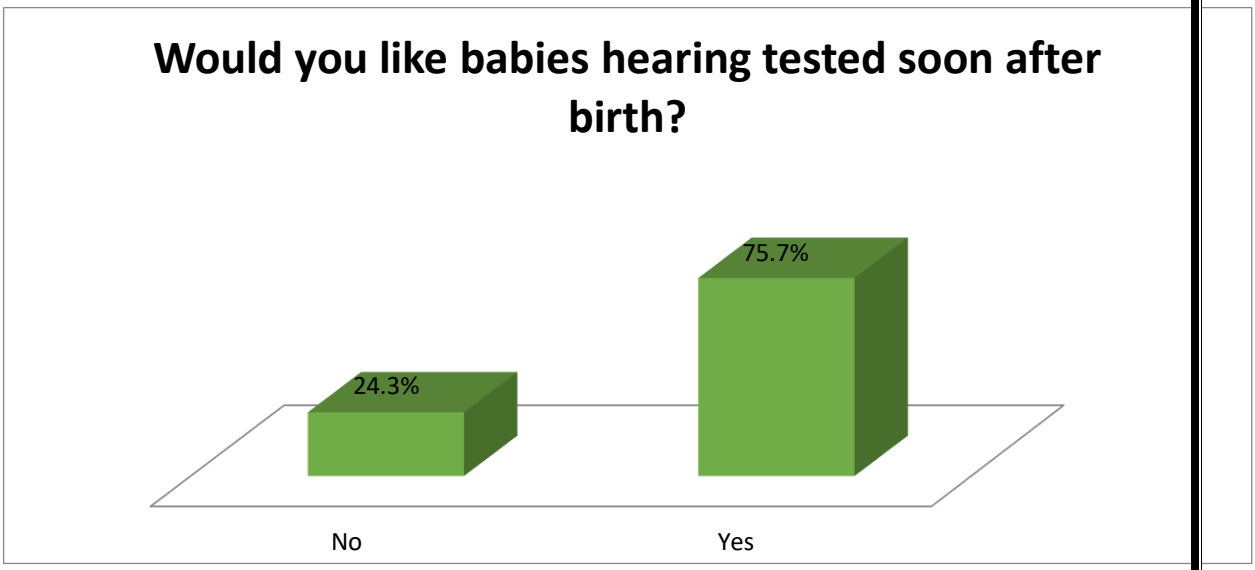
Showing attitude regarding the effect of children with hearing loss able to attend normal school



P. Attitude regarding babies hearing should be tested soon after birth

Fig 4.14:

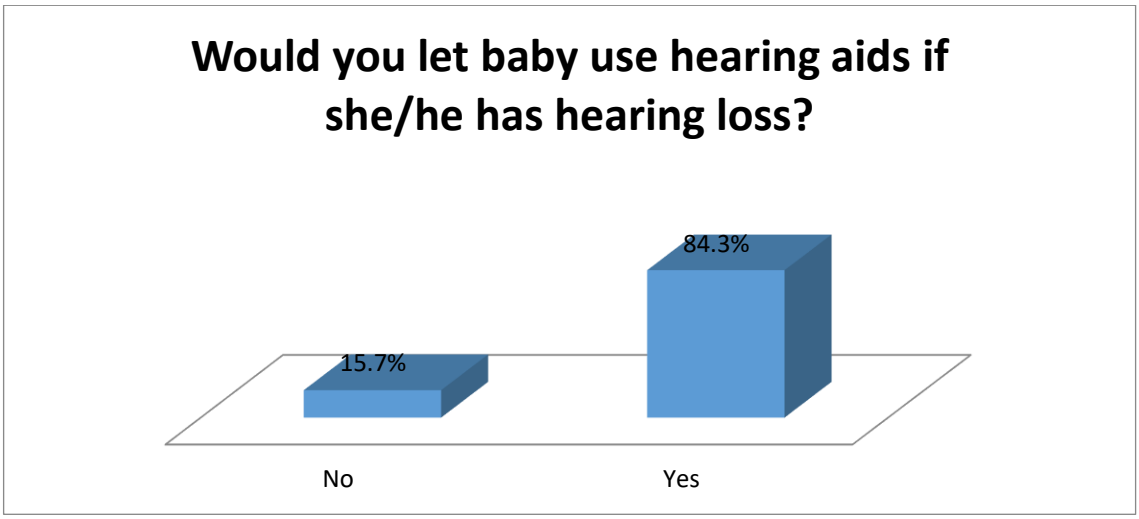
Showing attitude regarding babies hearing should be tested soon after birth



Q. Babies using hearing aid if they have hearing loss.

Fig 4.15:

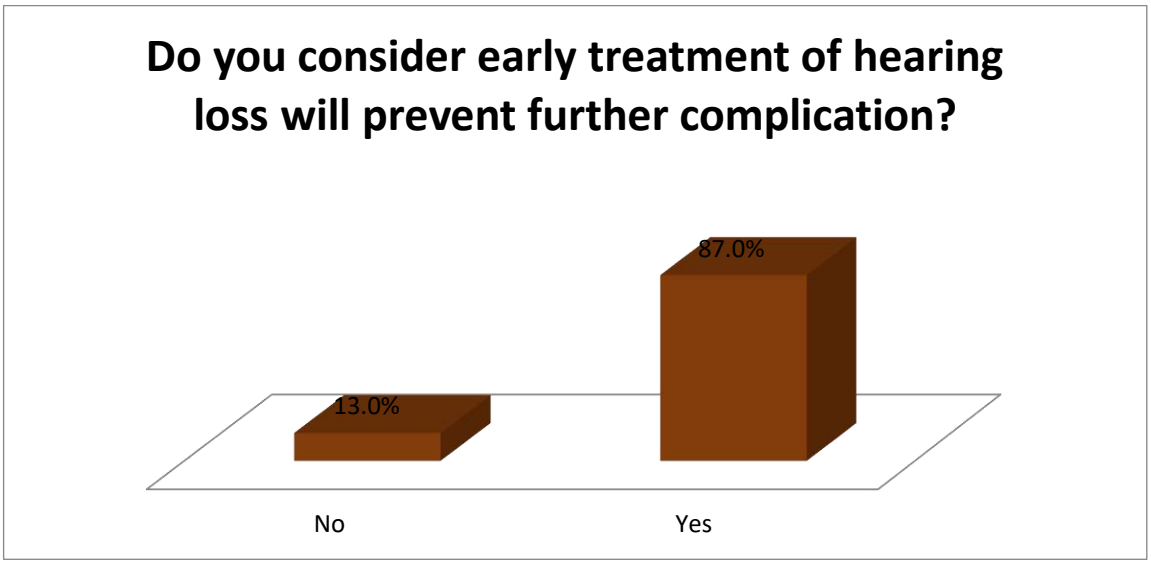
Showing *attitude regarding babies using hearing aid if they have hearing loss.*



R. Importance of early identification and intervention

Fig 4.16:

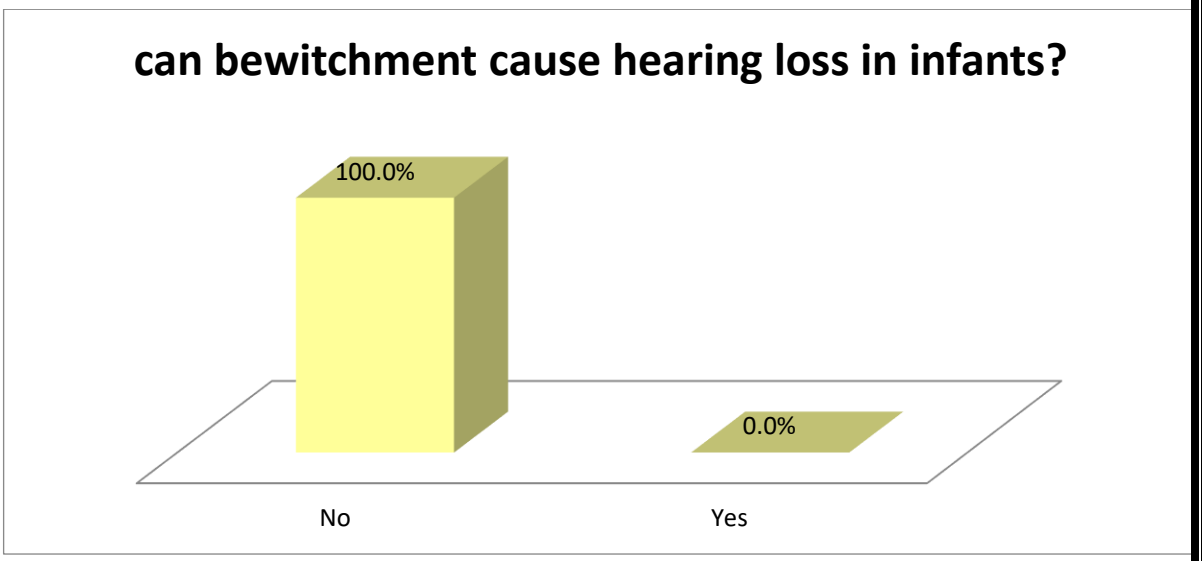
Showing *awareness regarding the importance of early identification and intervention*



S. Bewitchment on infants hearing

Fig 4.17:

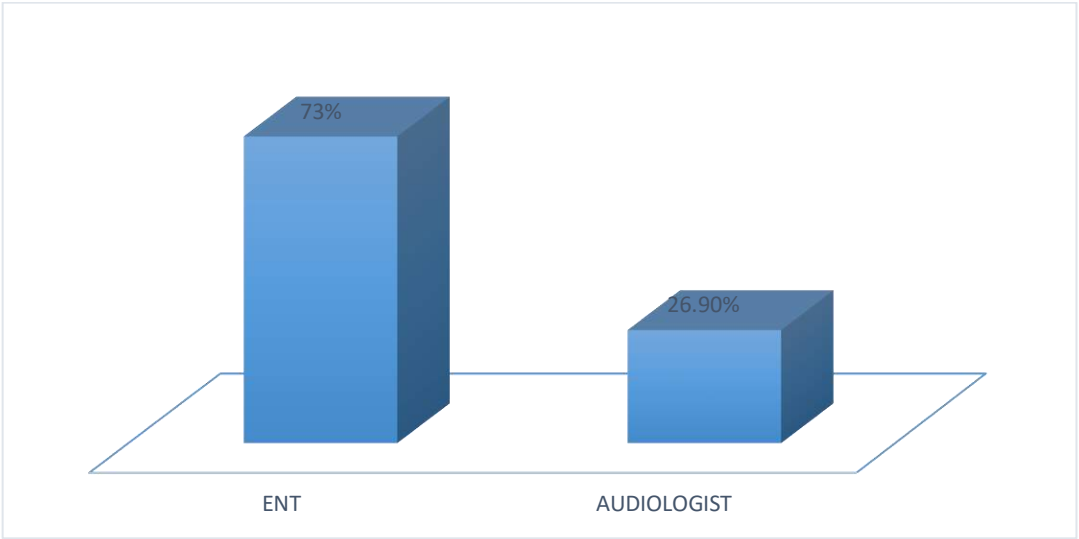
Showing *attitude about bewitchment on infants hearing.*



T. Professional deals with hearing assessment and management.

Fig 4.18:

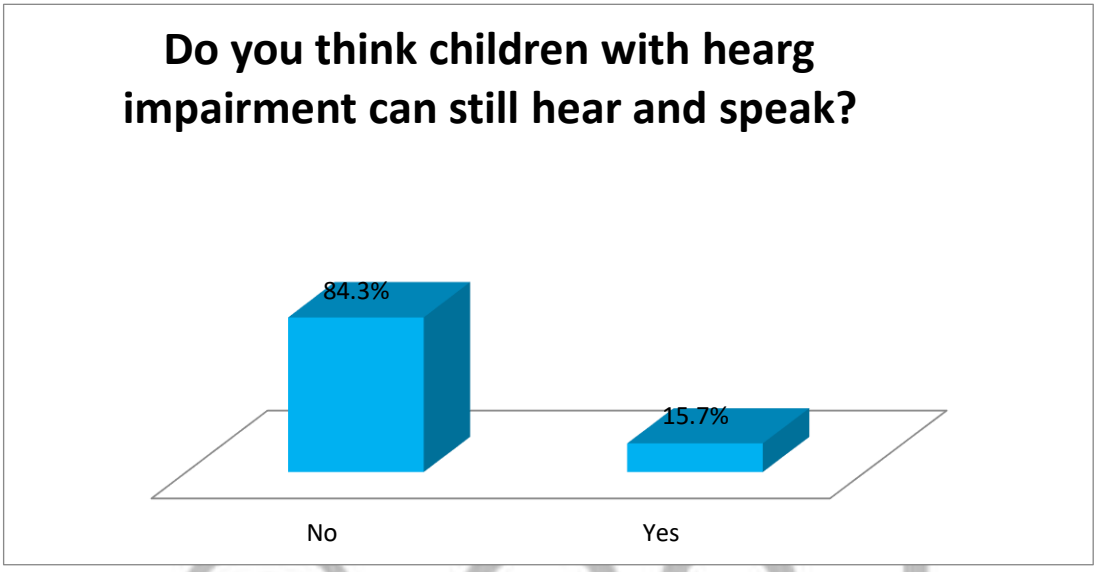
Showing awareness regarding professional deals with hearing assessment and management.



U. Children with hearing impairment can still hear and speak.

Fig 4.19:

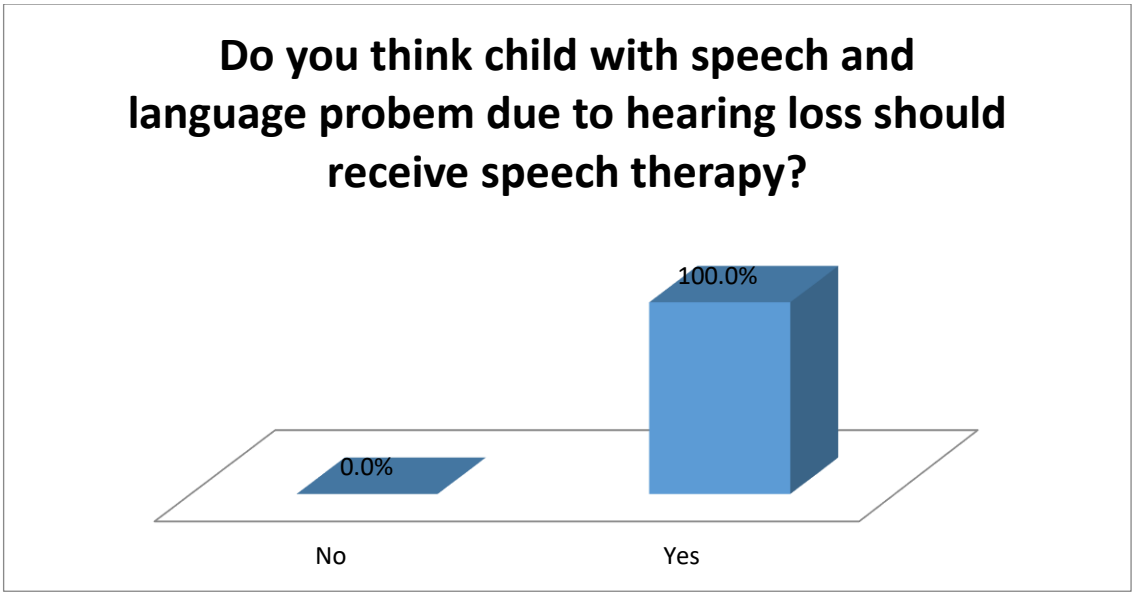
Showing attitude towards children with hearing impairment can still hear and speak.



V. Child with speech and hearing problems due to hearing loss should receive speech therapy.

Fig 4.20:

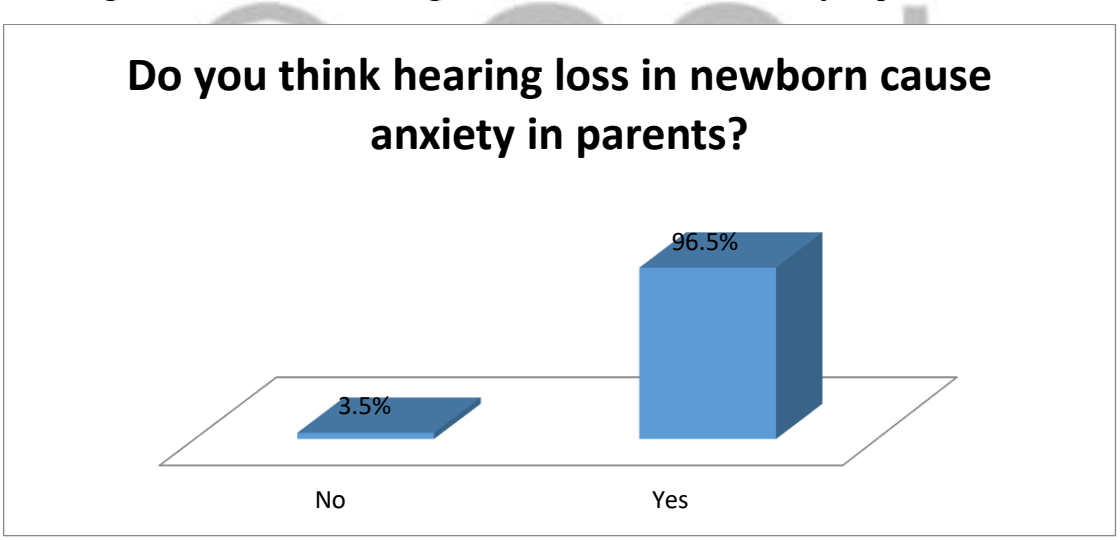
Showing attitude towards child with speech and hearing problems due to hearing loss should receive speech therapy.



W. Hearing loss in newborn cause anxiety in parents.

Fig 4.21:

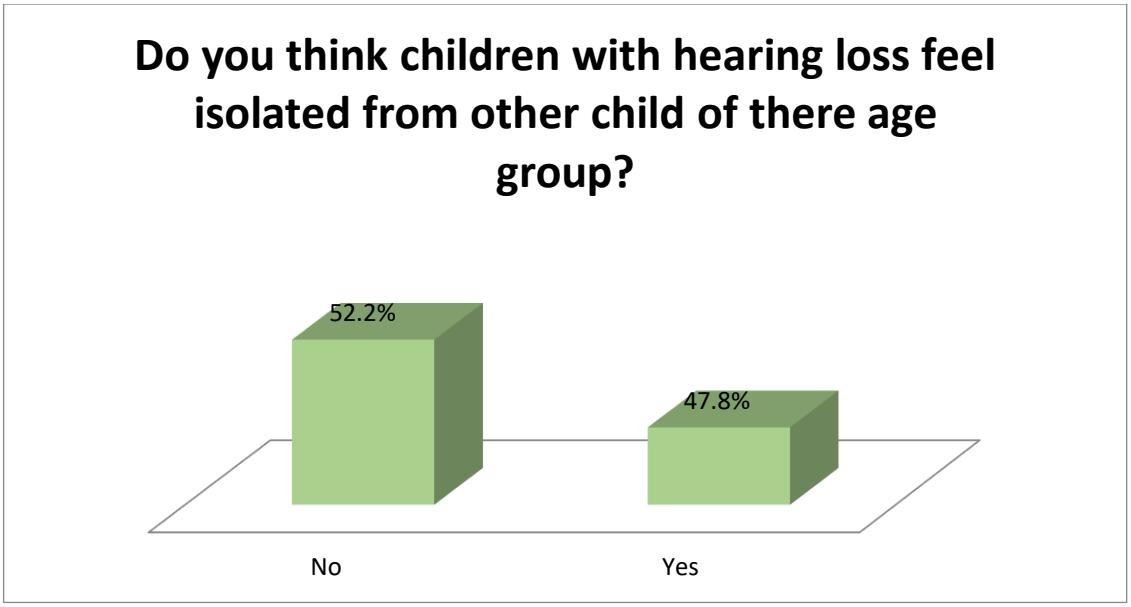
Showing attitude towards hearing loss in newborn cause anxiety in parents.



X. Children with hearing loss feel isolated, from other child of their age group.

Fig 4.22:

Showing attitude towards children hearing loss feel isolated, from other child of their age group.



On examining the table 4.1 and the figures, majority of the nurses (100%) are aware or have knowledge about the question no. 20 followed by question no.12, question no.16, question no.8, question no. 9, question no.7&11, question no.1,question no. 10 &18, question no.3, question no.9, question no.10, question no 6 and question 4 respectively.

The table 4.2 and figures reveal that 96.5% of nurses show positive attitude towards the question number 21 followed by question no.14, question no.13, question no.22 and question no.17 respectively.

DISCUSSION

A questionnaire comprising of 22 questions related to hearing loss was developed to assess knowledge and attitude about newborn hearing screening and the issues related to it in different hospital set up in Kerala. The data was evaluated and response percentages were generated. Questions related to knowledge towards hearing impairment in infants were asked to nurses. The percentage of responses given by 115 nurses was calculated for all 22 questions. As shown in the table 4.1, 73.9% of the nurses were aware about hearing impairment in infants. 69.6%% of the nurses was aware of high fever can cause hearing loss. Only 28.7% of the nurses were not aware regarding measles can cause hearing loss and 34.5 % of the nurses were unaware about ear discharge as one of the causes of hearing loss. 68.7% of the nurses were aware of the medication can cause hearing loss. 74.8%of the nurses know harmful consequences of hyperbilirubinemia on infants hearing.

In contradiction to the study done by Barbosa, Aries, Farias, Linhares and Gris (2013) almost 73% of the nurses were aware about ENT and only 26.9% of them aware of audiologist as a professional.

On contradiction to study done by Hendershot, Pakulski, Thampson, Dowling and Price (2011) 58.2% of the nurses were aware that prolonged noise can cause hearing loss.

78.3% of the nurses were aware hearing loss can be identified soon after birth and result was 40% of the nurses were aware of early identification intervention which was not correlating to the study by Goedert and Moeller (2011).73.5% of the nurses were aware of consanguinity can cause hearing loss.69.6% of the nurses were aware of convulsion can cause hearing loss. Questions related to attitude towards hearing impairment in infants were asked to nurses.

100% of the nurses were aware that bewitchment can cause hearing loss.78.3% of the nurses were aware of children with hearing loss can attend normal school. 84.3% of the nurses were aware that children with hearing impairment can still hear and speak.

On contradiction to study done by David and Jager (2018) majority of the parents experience a myriad of emotions when newborn is diagnosed with hearing loss.47.8% of the nurses were aware that children with hearing loss feel isolated from other child of their age group.84.3% of the nurses were aware of using hearing aids if the baby is having hearing loss.

The results of the present study is in accordance with similar study by Sanju, Aggarwal, Chaudhary and Yadav (2018) on 115 nurses in North India except for 6 questions related to knowledge and attitude related to newborn hearing screening it may be due to appropriate educational programs provided for the nurses in Kerala related to knowledge, attitude and practices towards newborn hearing loss, the need of hearing loss screening ,the early identification of hearing loss and the impact of hearing loss in children.

The findings of the current study showed appropriate knowledge and attitude among nurses towards newborn hearing screening.

SUMMARY AND CONCLUSION

Hearing loss is characterized by a reduction in the sensitivity of the auditory mechanism so that sounds need to be of higher intensity than normal before they are perceived by the listener. The major cause of hearing disorder is a loss of hearing sensitivity. A loss of hearing sensitivity means that the ear is not as sensitive as normal in detecting sound. There are 3 types of hearing loss sensorineural hearing loss, conductive hearing loss and mixed hearing loss.

Hearing disorder can be caused congenitally and acquired. Congenital hearing loss is present at birth and acquired hearing loss is a hearing loss which appears after birth, at any time in one's life (ASHA, 2011).

Newborn screening and diagnosis helps ensure all babies who are deaf or hard of hearing are identified soon as possible. The hearing screening is a first and important step in helping understand if the baby is deaf or hard of hearing. The American Academy of Pediatrics (AAP, 2007) recommends hearing screenings for all newborns. The goal is for all babies to have a newborn hearing screening by one month of age, ideally before they go home from the hospital.

Universal Neonatal Hearing Screening (UNHS) also known as early hearing detection and intervention (EHDI) programs in several countries mainly aims at early identification,

intervention and follow up of infants and young children who are deaf or hard-of-hearing. It is a strategy for early detection of permanent congenital hearing loss. Hearing screening in newborns is performed via Otoacoustic Emission (OAE) and Automated Auditory Brainstem Response (AABR) testing. Early diagnosis and management of children who have all degrees and types of hearing impairment can be attained through heightened awareness of physicians and other health professionals to the indicators for hearing loss and the need to develop a strong coalition with a licensed audiologist. Newborn hearing screening can be performed by nurses, audiologist and other trained personnel.

Nurses are one of the medical professionals who plays a key important role in the Intensive care unit (ICU) as they can identify high risk babies who need audiological intervention, provided they should have adequate knowledge available in relation to different facts about neonatal hearing loss. The success of neonatal hearing screening programs lies in the timely identification, diagnosis, and management of children with hearing loss. Nurses plays a vital role in hospitals. They communicate with patients, understand them and take exceptional care of them along with administering. Screening is a multidisciplinary approach which usually involves audiological or audiometric technicians, neonatal intensive care nurse, maternity room nurse, obstetric nurse, health workers, doctors and pediatricians. But midwives has more and equal important role in neonatal screening of infants as they are the closest people during birth time.

The current study was aimed to adapt a questionnaire from English developed by Sanju, Aggarwal, Chaudhary and Yadav (2018) consisting of 22 questions related to hearing loss in neonates and it was translated to Malayalam language which was given to nurses via online survey to evaluate their knowledge and attitude regarding hearing loss in neonates. The translated study was validated by 4 audiologists who were fluent in both English and Malayalam. 115 nurses in the age group of 21-25years who used Malayalam as their native language were selected who were working at primary nursing care, corporate and government hospitals and had a minimum education up to graduation level (B.Sc. Nursing). A questionnaire based study of 22 question was developed in Malayalam language by translating English questionnaire developed by Sanju, Aggarwal, Chaudhary,

Yadav (2018) which was validated by 4 audiologists who were fluent in both English and Malayalam language. Data required was collected by distributing questionnaire developed in Malayalam language to all subjects chosen as sample. The questionnaire consisted of 22 questions based on knowledge and attitude level of questions. Questionnaire was based on a 3-point rating scale.

The results revealed that question no.20 had the highest percentage of awareness (100%) followed by question no. 20 followed by question no.12, question no.16, question no.8, question no. 9, question no.7&11, question no.1, question no. 10 &18, question no.3, question no.9, question no .10, question no 6 and question 4 respectively. And 96.5% of the nurses shows positive attitude towards the question number 21 followed by question no.14, question no.13, question no.22 and question no.17 respectively.

Hence the results of the present study revealed that only few nurses in Kerala showed poor attitude and knowledge towards newborn hearing screening and the issues related to it. Hence educational program for nursing professionals should be continued to improve clinical skill related to newborn hearing screening. These educational programs also enhance their professional self-perception.

Limitations of the study:

- Limited sample size
- Age range above 25year old was not focused in this present study.
- Only 7 questions where there to assess the attitude of nurses towards newborn hearing screening and the issues related to it.

Future directions:

- Sample size can be increased

- More question can be included to assess the attitude, knowledge and practices towards newborn hearing screening
- Comparative study can be done on primary nursing care, corporate and government hospitals.

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APPENDIX

PROFICIENCY OF CURRENT PRACTICE IN NEWBORN HEARING SCREENING AMONG NURSE IN KERALA

പേര് :
വയസ്സ് :

താഴെ കാണുന്ന ചോദ്യങ്ങൾക്ക് ഏതെങ്കിലും ഒരു ഉത്തരം തിരഞ്ഞടുക്കുക.

ചോദ്യങ്ങൾ	പ്രതികരണം		
1.കേൾവിക്കുറവോടെ കുഞ്ഞുങ്ങൾ ജനിക്കുമോ?	ശരി	തെറ്റ്	ഉറപ്പില്ല
2.കടുത്ത പനി കേൾവിക്കുറവിന് കാരണമാകുമോ?	ശരി	തെറ്റ്	ഉറപ്പില്ല
3. അഞ്ചാംപനി കേൾവിക്കുറവിന് കാരണമാകുമോ?	ശരി	തെറ്റ്	ഉറപ്പില്ല
4. ചെവിയിലെ പഴുപ്പ് കേൾവിക്കുറവിന് കാരണമാകുമോ?	ശരി	തെറ്റ്	ഉറപ്പില്ല
5. അപസ്മാരം കേൾവിക്കുറവിന് കാരണമാകുമോ?	ശരി	തെറ്റ്	ഉറപ്പില്ല
6. മരുന്നുകളുടെ ഉപയോഗം കേൾവിക്കുറവിന് കാരണമാകുമോ?	ശരി	തെറ്റ്	ഉറപ്പില്ല
7. മഞ്ഞപ്പിത്തം കേൾവിക്കുറവിന് കാരണമാകുമോ?	ശരി	തെറ്റ്	ഉറപ്പില്ല
8. ഉച്ചത്തിലുള്ള ശബ്ദം കേൾവിക്കുറവിന് കാരണമാകുമോ?	ശരി	തെറ്റ്	ഉറപ്പില്ല
9. ജനനസമയത്ത് കുഞ്ഞുങ്ങൾ കരയാൻ താമസിക്കുന്നത് കേൾവിക്കുറവിന് കാരണമാകുമോ?	ശരി	തെറ്റ്	ഉറപ്പില്ല
10. രക്തബന്ധത്തിൽ ഉള്ളവർ വിവാഹം ചെയ്താൽ അവർക്ക് ജനിക്കാൻ പോകുന്ന കുട്ടികൾക്ക് കേൾകിക്കുറവിന് കാരണമാകുമോ?	ശരി	തെറ്റ്	ഉറപ്പില്ല

11. ജനനസമയത്ത് തന്നെ കേൾവിക്കുറവ് തിരിച്ചറിയാൻ സാധിക്കുമോ?	ശരി	തെറ്റ്	ഉറപ്പില്ല
12. കേൾവിക്കുറവിന് ചികിത്സ ലഭ്യമാണോ?	ശരി	തെറ്റ്	ഉറപ്പില്ല
13. കേൾവിക്കുറവുള്ള കുട്ടികൾക്ക് സാധാരണ വിദ്യാലയങ്ങളിൽ പഠിക്കാൻ കഴിയുമോ?	ശരി	തെറ്റ്	ഉറപ്പില്ല
14. ജനിച്ചയുടനേ കേൾവി പരിശോധന നടത്താൻ കഴിയുമോ?	ശരി	തെറ്റ്	ഉറപ്പില്ല
15. അവൾക്ക് / അവന് കേൾവിക്കുറവുണ്ടെങ്കിൽ ശ്രവണസഹായികൾ ഉപയോഗിക്കാൻ കുഞ്ഞിനെ അനുവദിക്കുമോ?	ശരി	തെറ്റ്	ഉറപ്പില്ല
16. ആദ്യഘട്ട ശ്രവണ ചികിത്സ പിന്നീടുള്ള പ്രശ്നങ്ങൾ പരിഹരിക്കുമോ?	ശരി	തെറ്റ്	ഉറപ്പില്ല
17. ദുർമന്ത്രവാദം ചെയ്യുന്നത് കുട്ടികളിൽ കേൾവികുറവിന് കാരണം ആകുമെന്ന് നിങ്ങൾക്ക് തോന്നുന്നുണ്ടോ?	ശരി	തെറ്റ്	ഉറപ്പില്ല
18 കുഞ്ഞിന് കേൾവിക്കുറവ് ഉണ്ടെങ്കിൽ ആരെയാണ് ചികിത്സയ്ക്കായി സമീപിക്കുക?	ശരി	തെറ്റ്	ഉറപ്പില്ല
19. ശ്രവണ വൈകല്യമുള്ള കുട്ടികൾക്ക് കേൾക്കാനും സംസാരിക്കാനും കഴിയുമെന്ന് നിങ്ങൾക്ക് തോന്നുന്നുണ്ടോ?	ശരി	തെറ്റ്	ഉറപ്പില്ല
20. കേൾവിക്കുറവുള്ള കുട്ടികൾക്ക് ഭാഷാ വൈകല്യ ചികിത്സ നടത്തിയാൽ കൃത്യമായ ആശയ വിനിമയം സാധ്യമാകുമെന്ന് നിങ്ങൾ തോന്നുന്നുണ്ടോ ?	ശരി	തെറ്റ്	ഉറപ്പില്ല
21. നവജാതശിശുക്കളിലെ കേൾവിക്കുറവ് മാതാപിതാക്കളിൽ ആശങ്ക വർദ്ധിപ്പിക്കുമോ?	ശരി	തെറ്റ്	ഉറപ്പില്ല
22. കേൾവിക്കുറവുള്ള കുട്ടികൾ മറ്റു കുട്ടികളിൽ നിന്ന് ഒറ്റപ്പെടുമെന്ന് തോന്നുന്നുണ്ടോ ?	ശരി	തെറ്റ്	ഉറപ്പില്ല

PROFICIENCY OF CURRENT PRACTICES IN NEWBORN HEARING SCREENING AMONG NURSES IN KERALA

NAME:

AGE/GENDER:

	YES	NO	NOT SURE
1. Can babies born with hearing loss?			
2. Can high fever cause hearing loss?			
3. Can measles cause hearing loss?			
4. Can ear discharge cause hearing loss?			
5. Can convulsion cause hearing loss?			
6. Can some type of medication cause hearing loss?			
7. Can jaundice cause hearing loss?			
8. Can prolonged noise cause hearing loss?			
9. Can delayed crying at birth cause hearing loss?			
10. Can consanguinity cause hearing loss?			
11. Can hearing loss can be identified soon after birth?			
12. Is treatment of hearing loss available?			
13. Can children with hearing loss able to attend normal school?			

14. Would you like babies hearing tested soon after birth?			
15. Would you let baby use hearing aids if she/he has hearing loss?			
16. Do you consider early treatment of hearing loss will prevent further complication?			
17. Can bewitchment cause hearing loss?			
18. If you find child has problem of hearing to which professional you will refer?			
19. Do you think children with hearing impairment can still hear and speak?			
20. Do you think child with speech and language problem due to hearing loss should receive speech therapy?			
21. Do you think hearing loss in newborn cause anxiety in parents?			
22. Do you think children with hearing loss feel isolated from other child of their age group?			