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INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI: 10.21474/IJAR01/19767
DOI URL: http://dx.doi.org/10.21474/IJAR01/19767

RESEARCH ARTICLE

AWARENESS LEVEL ABOUT NEWBORN HEARING SCREENING AMONG THE GENERAL POPULATION

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Manuscript Info

Manuscript History
Received: 28 August 2024
Final Accepted: 30 September 2024
Published: October 2024

Abstract

Hearing loss has become the most prevalent birth defect affecting one in 1000 newborn babies. The JCIH National Institute on deafness has told that newborn hearing screening within the hours of birth is the only way to eradicate it and paves way for early diagnosis intervention. Diagnosing congenital hearing loss at birth becomes a very crucial part of every newborn baby as the hearing loss has a deteriorating effect on the speech and language development as well and the academic performance of the individual. Even children with minimal sensorineural hearing loss and unilateral hearing loss have had challenges in educational performance and faced psychosocial difficulties. (Bess et al, 1998). Also, it was proved that when children were identified and intervened as early as 6 months of age, they had better developed language skills. (Mehl et al, 1998).

Introduction:-

Hearing loss has become the most prevalent birth defect affecting one in 1000 newborn babies. The JCIH National Institute on deafness has told that newborn hearing screening within the hours of birth is the only way to eradicate it and paves way for early diagnosis intervention. Diagnosing congenital hearing loss at birth becomes a very crucial part of every newborn baby as the hearing loss has a deteriorating effect on the speech and language development as well and the academic performance of the individual. Even children with minimal sensorineural hearing loss and unilateral hearing loss have had challenges in educational performance and faced psychosocial difficulties. (Bess et al, 1998). Also, it was proved that when children were identified and intervened as early as 6 months of age, they had better developed language skills. (Mehl et al, 1998).

Universal newborn hearing Screening is the idea of testing all babies born rather than limiting it to babies who are at the high-risk register. It focuses on identifying hearing loss in one month, diagnosis in 3 months, and intervention in 6 months. (JCIH,2007). This is viewed as the goal throughout the USA. The National Institute of Health multidisciplinary panel, 1993 had given a statement regarding the universal Newborn Hearing Screening stating that all neonates should be screened irrespective of high risk or low risk for hearing impairment before discharge from the hospital within 3 months of birth. Also, it is stated that they must beunder surveillance for hearing impairment throughout the development period and should have a universal screening before they enter school.Even though newborn hearing Screening has a lot of positive advantage factors, the usage and practices of it are very limited. Thus, it becomes very important to know about the awareness level among the public about Newborn Hearing Screening.

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This study aims in finding out the knowledge and awareness level about Newborn Hearing Screening among the general population. The study was also conducted with two-way benefits. The participants were also enlightened about the significance and importance of Newborn Hearing Screening at the end of the study.

Literature Review:-

With the previous studies that were conducted in the region of West Bengal and Gujarat in India, the average age of suspicion of hearing loss was usually from one to two years of age. And it was very shocking to see that the age of intervention of the child exceeded seven years of age in both studies. India being a developing country it is even more challenging to implement universal newborn hearing screening all over the country. These aspects can be accounted to the scarcity of audiologists, lack of infrastructure, and a huge gap of the ratio between the population in demand and the audiologist.The study conducted by Yathiraj, Sameer and Jayaram in 2002 revealed that high-risk register-based screening was found to be effective when conducted by the grassroot workers. They screened 1000 babies from the high-risk register and the children were assessed with behavioural observation audiometry using calibrated noise makers and along with otoacoustic emission screeners.

Yet another study conducted in the year 2010 by Suman Kumar, Bijoyaa and Mohapatra, aimed to evaluate newborn Hearing screening in India by comparing the implementation in medical colleges and speech and hearing centres. The study revealed that compared to medical colleges and hospitals speech and hearing clinics used objective measures of evaluation like auditory brainstem response and otoacoustic emissions whereas medical colleges and hospitals used subjective measures of evaluation like behaviour observation audiometry.

In the year of 2006 Ministry of Health and Welfare Government of India implemented institution-based screening and community-based screening in an overall spread of more than 200 districts. The community-based screening was majorly targeted in the rural area for infants during the immunization. They were administered with questionnaires and behavioural testing. If the child failed the screening procedure, they were asked to follow up with their nearby District Hospital for otoacoustic emission and auditory brainstem response testing. Even though this was a wonderful opportunity for implementing the newborn hearing screening, the major issues in the implementation of the program were lack of human resources, inadequate infrastructure and less priority for preventing and identifying hearing impairment among public.

Furthermore, astonishing initiative by the Government of India in the year 2013 was Rashtriya Bal Swasthya Karyakram. This was carried out by mobile health care practitioners like Paediatrician Paramedical Professionals and Nurses who screened the children in the Anganwadi and the government-run preschool centres. When any child was identified with illness they were asked to receive follow up from the nearby hospital.There are three programs that have had a long run for about 5 to 13 years in the Christian Medical College Vellore, Shri Ramachandra Hospital, Chennai and a centralized newborn hearing screening program in Cochin, Kerala.It is also a great initiative by the Kerala government to add hearing screening as the mandatory health check-up before discharge from the hospital.

In the study conducted by Nagapoornima et al in the year 2007 they reported that if only high-risk register babies were screened then we were missing 70% of the newborn who were born with congenital hearing loss in India.

The summary of the above studies reported that the incidence of hearing loss was around one to six per thousand among the high-risk babies and between 7 to 10 per thousand among the well babies. In the year 2012 Ramesh et al in Karnataka reported that a trained health worker with their supervision will be able to screen a satisfactory number of 425 new units using the mechanically calibrated noisemakers.

Aim for the Study:-

Considering the importance of newborn hearing screening, indulging it in the protocol for screening children becomes essential. But to achieve that stage, the public must become aware of it and know its importance. But in the present situation and with the evidence of past studies it is known that the awareness level of the public about newborn hearing screening is very limited. Thus, this study was aimed to be conducted to measure the awareness level about newborn hearing screening and with the motive of spreading awareness about the same through the study.

Objectives of the Study:-

1.To check the awareness level about newborn hearing screening among the general population
2.To check whether there lies any significant difference in the awareness level between gender.

Hypothesis Of The Study

1.There exists different level of awareness about newborn hearing screening among general population
2.There exists no significant difference in the awareness level about newborn hearing screening between gender.

Methodology:-

A descriptive survey method was followed. Sample from the general population were selected through snowball sampling technique. The tool on awareness of newborn hearing screening was prepared and content validity was obtained using experts' opinions. The reliability value was also found to be good. The developed questionnaire was prepared and circulated through google forms. The questionnaire contained three sections. They were the demographic data of the participants followed by a section that interrogated the awareness level of newborn hearing screening. The last section was exclusively added to the study which described Universal newborn hearing screening, its importance of it, and the test procedures that will be carried out during the screening. Also, the questionnaire included a picture of the child undergoing the Otoacoustic Emission testing to support the description of newborn hearing screening being non-invasive.

Analysis & Interpretation:-

Descriptive Statistics

A total of 140 individuals participated in the study. All the questions that were interrogated about the awareness level of newborn hearing screening were Yes/No type. The answers to these were then converted into raw scores. All the positive questions were scored 1 for yes, 0 for no, and vice versa for negative questions. The total score that an individual can obtain was cumulative of 10. The average of all the individual scores was calculated followed by thestandard deviation. The average of the sample was 4.4 and the standard deviated calculated was 1.84. With the calculated values, the low cut-off and the high cut-off were then denominated. The low cut-off was attributed to 2.56 and high cut-off was 6.24. Based on these scores the level of awareness was divided into three categories namely low, moderate and high. The data set is very mildly negatively skewed with platykurtic bell curve.

Mean	4.4
Standarddeviation	1.82
Lowcut-offvalue	2.56
Highcut-offvalue	6.24
Skewness	-0.06
Kurtosis	-0.32

Table 1:- Defining the descriptive statistics of the data set.

Inferential Analysis

LevelofAwareness	NumberofParticipants	Percentage
Low	24	17.14%
Moderate	100	71.42%
High	16	11.42%

Table 2:- Containing the Number of Participants and their Respective Awareness Levels.

Out of 140 samples, 24 individuals fell under the category of low awareness level. They were 17.14% of the total participants included in the study. It was seen that there were 100 participants in the range of moderate level of awareness which comprised 71.42% of the total participants in the study. Then it was seen that 16 persons fell under the category of high awareness level and comprised 11.42% of the total sample of the study. Thus, from the above study, it is evinced that there is a significant number of people who have a moderate level of awareness about newborn hearing screening. Thus, the stated hypothesis "there exists different level of awareness about newborn hearing screening among general population" is accepted.

Effect of Gender on the Level of Awareness about Newborn Hearing Screening

The t-test was used in the study to compare the mean differences of the two groups male and female respectively. The mean and standard deviation was calculated and subjected to t- test calculation and the results are provided in the table below.

Group	Mean	StandardDeviation	t-value
Male	4.25	1.98	$0.73^{@}$
Female	4.48	1.76	

Table 3:- Table showing the calculated t- Value for the two groups.

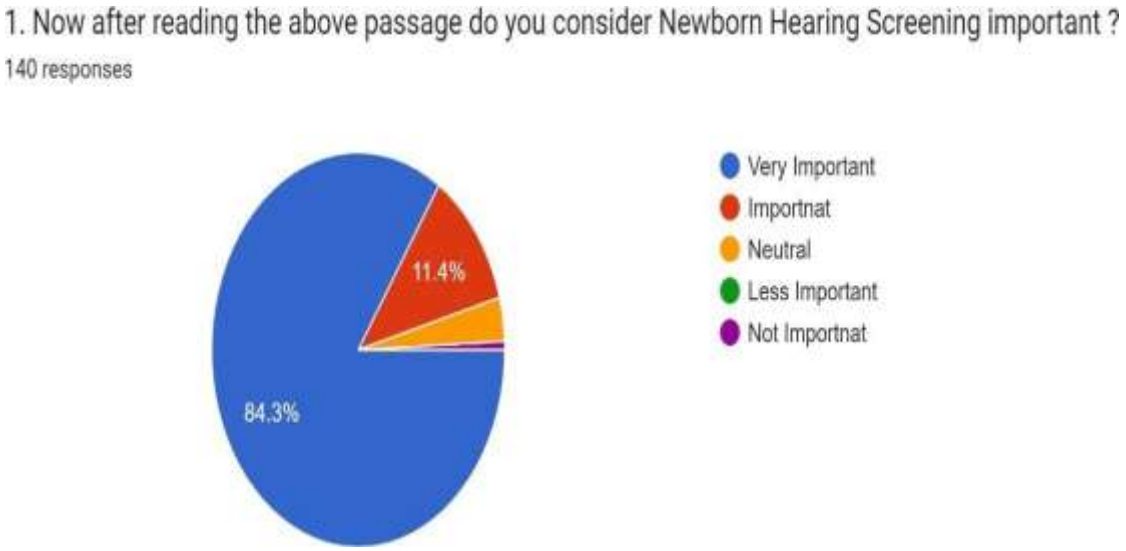
From the above table, the obtained t- value of 0.73 is less than the table value at the 0.05 level. This shows that there is no significant difference in the level of awareness about newborn hearing screening with respect to gender. Thus, the stated hypothesis "There is no significant difference in the awareness level about newborn hearing screening between gender" is accepted. The level of awareness among the male and female populations is the same about newborn hearing screening.

To create awareness about newborn hearing screening among the public the following paragraph was added to google forms in a separate section.

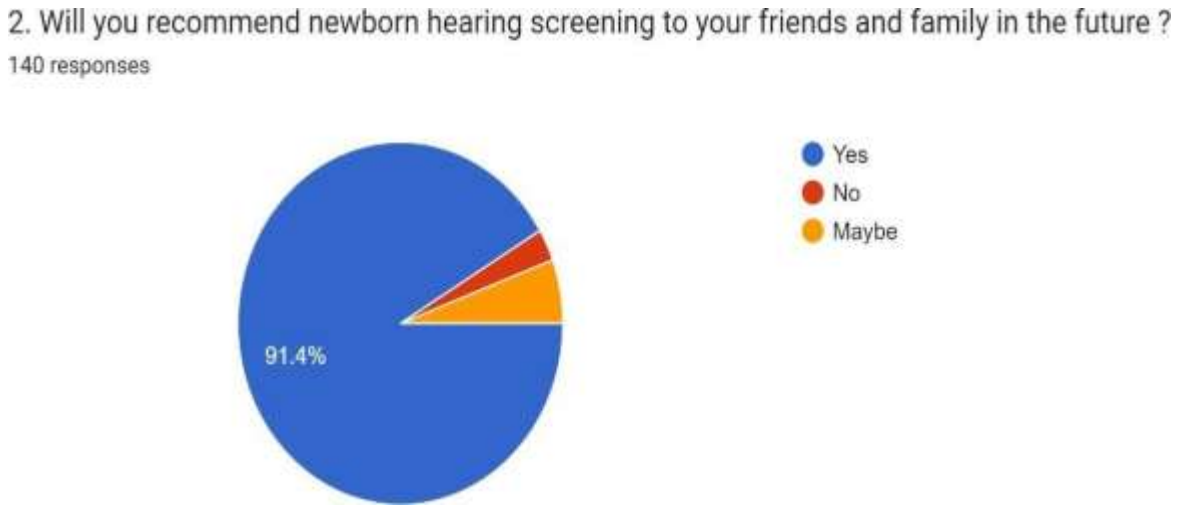
"Hearing Loss is a hidden disability that cannot be identified until the child does not respond to even loud sounds or starts to learn a language in his 2 to 3 years of age.

Universal New-born Hearing Screening is **a two-tier testing procedure** that is **painless & lesstime-consuming** to identify hearing loss in **all babies** at a very early stage.It must be done for all the babies. These testing can be done as early as 2 days after birth before discharge from the hospital. It becomes our responsibility to know spread awareness about it among the public. These tests will be**available** in certain **government and privatehospitals**."

Following this, there were two questions that followed the section. It enquired whether after reading the above passage the readers felt hearing screening was important or not. And also, they were interrogated about whether will they recommend hearing screening in the future to their relatives or friends. The responses to these are recorded as a pie chart and is illustrated below.



Picture 1:- Pie chart representing responses on whether the participants considered newborn hearing important after reading the paragraph.



Picture 2:- Pie chart representing whether the participants will recommend newborn hearing screening in the future.

It is evident from the above responses that there were 118 participants (84.3%) considered newborn hearing screening very important. Also, there were 16 participants (11.4%) who told that it is important to screen the child for hearing loss. There were also 5 participants (3.6%) who did not have any comments and recorded neutral responses. And there was one participant who recorded that hearing screening was not important.

Also, it was very good to see that 128 participants (91.4%) would recommend newborn hearing screening in the future. There were only 12 participants who recorded responses of NO or Maybe for the question that was asked.

Discussion:-

From the above descriptive and inferential statistics, it is evident that even though there is a moderate level of awareness about newborn hearing screening among public, the practice of the same is not well established. Study conducted by Shwetadesh Pande et al in the year 2019, revealed that the awareness level about newborn hearing screening is very limited. But as of now after three years the awareness level has been increased to a moderate level. But the real problem lies in motivating the parents to have their baby screened before discharge from hospital. Also, from the study it is revealed that there is no significant difference between the awareness level among the gender. As newborn hearing screening is the only way to decrease the impact of hearing impairment in the society, this study has paved way for increasing the awareness among public about the importance of it and describing about it to the same for the individuals who have participated in the study.

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