



Knowledge and Acceptability of Newborn Hearing Screening among Caregivers Attending Immunization Clinic at Aminu Kano Teaching Hospital, Kano, Nigeria.

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Abstract

Background: Childhood hearing loss is a common and worrisome condition. Early detection of hearing loss and intervention has made easier the burden of hearing loss. **Aim:** This study aimed to assess the knowledge and acceptability of newborn hearing screening among caregivers attending immunization clinic at Aminu Kano Teaching Hospital (AKTH), Kano-Nigeria. **Methods:** This was a cross-sectional study conducted among caregivers attending the immunization clinic of AKTH. A total of four hundred and fifteen participants were selected using a systematic random sampling technique. Data were analysed using SPSS version 20.0 with P-value set at ≤ 0.05 . **Results:** The mean age of the caregivers was 27.5 ± 6.9 years. Only a few (13.5%) of them had good knowledge of newborn hearing screening. A majority (81.6%) were willing to accept newborn hearing screening and early intervention programme. **Conclusion:** There was poor knowledge of newborn hearing screening among caregivers but with high acceptability rate and the occupation of the spouse was found to be an independent predictor of acceptability of newborn hearing screening. Hence, there is a need for health education regarding newborn hearing screening among caregivers.

Keywords: *Knowledge, Acceptability, Newborn, Screening*

Introduction

Hearing loss often referred to as the silent epidemic, is the most frequently occurring birth defect and is the most prevalent sensory disorder with more than 90% of these babies residing in the developing world (Störbeck, 2012). The world health organization (WHO) defined a disabling hearing loss in children as a loss ≥ 30 dB in the better hearing ear, affecting about 32 million children globally although the prevalence is unequally distributed across the world with prevalence of 1.7 % to 1.9% in Sub-Saharan Africa, 2.4%

in South Asia, 1.6% in both Central/ Eastern Europe and Latin America/Caribbean (WHO, 2012). The number of children with hearing loss is increasing worldwide, and this is worse in the developing world (Swanepoel & Störbeck, 2008), with a reported prevalence of 6 per 1000 live births in developing countries unlike 2 per 1000 live births in developed countries (Störbeck, 2012). In Nigeria, about 6000 – 27, 000 babies will be born yearly with permanent congenital and early-onset hearing loss, and about 5000 – 22, 000 of these will live beyond 5 years of age (Adedayo *et al.*

2013). The burden of childhood hearing loss includes social, economic, psychological, and physical effects on the child, the parent and their community. With the delay in early identification and intervention, children with hearing loss are relegated to a life of deprived language and cognitive development, restricted literacy, poor academic and vocational outcomes, as well as emotional difficulties (Adedayo *et al.* 2013).

Early diagnosis with effective management can improve the outcome for language development among children with congenital hearing loss (Stevens & Parker, 2009). The Joint Committee on Infant Hearing (JCIH) recommends identifying infants at risk of hearing loss and endorsed universal detection of infants with hearing loss as early as 3 months of age and intervention by 6 months of age (JCIH, 1995).

Universal newborn hearing screening is currently promoted in developed countries as an early detection strategy for permanent congenital and early-onset hearing loss (Olusanya *et al.* 2005), and has become a standard practice in medical care (Low *et al.* 2005). The degree of implementation and coverage of Early Hearing Detection and Intervention (EHDI) programs varies greatly from country to country and may differ from one region to another within the same country (WHO, 2016). The benefits and challenges of introducing newborn hearing screening in developing countries have been recently articulated, and pilot programs are already being implemented in Brazil, Mexico, South Africa, India, and the Middle East (Olusanya *et al.* 2005).

Despite the availability of Oto-Acoustic Emission (OAE) and Auditory Brain Response (ABR) machines in some hospitals in Nigeria, routine or systematic screening for childhood hearing loss is still rare. There is no evidence that screening with OAE or ABR will be unacceptable among Nigerian parents (Olusanya *et al.* 2005). However, the absence of universal newborn hearing screening

programmes in our settings may as well affect caregiver's view and acceptance of such a program due to a lack of genuine information. This study assessed the Knowledge and acceptability of newborn hearing screening among caregivers attending immunization clinic at Aminu Kano Teaching Hospital, Kano (AKTH).

Materials and Methods

This was a descriptive, cross-sectional study conducted among caregivers attending the immunization clinic of Aminu Kano Teaching Hospital (AKTH), a tertiary health institution in Kano between July to September 2018. The sample size was determined using Fisher's formula (Charan & Biswas, 2013); $n = \frac{Z^2 pq}{d^2}$. The calculated sample size was 415.

Participants were recruited into the study using a systematic random sampling technique. The monthly average of the total number of attendees at the daily immunization clinic over a period of 6 months was retrieved from the clinic register and this was used as the sample frame (sample frame = 1681. The sample interval

(n^{th} selection = $\frac{\text{sample frame}}{\text{sample size}}$) was

calculated to be 4 and a random start used as the first participant was selected between number 1 and sampling interval by simple random sampling (using ballot method) and subsequent participants were selected by repeatedly adding the sampling interval. An adapted version of a pretested, interviewer (researchers) administered a questionnaire by Olusanya *et al* (2006) was used.

Statistical Package for Social Sciences [SPSS] for Windows, Version 20.0 software [Armonk, NY: IBM Corp] was used for statistical analysis and results were summarized using frequencies, percentages, and graphic representations. Cross-tabulations were produced while the test for statistical association was done using Chi-square

method with statistical significance set at $p \leq 0.05$, at 95% confidence interval (CI).

Ethical clearance was obtained from the Institutional Ethical Review Committee of AKTH(NHREC/21/08/2008/AKTH/EC/1968).

The study protocol was explained to the participants. Subsequently, informed consent was obtained and respondents appended their signatures/thumb-prints on the consent form. Confidentiality of the respondents was strictly ensured. The study was carried out according to the Declaration of Helsinki (WMA, 2013).

Results

Out of the 415 questionnaires administered, 414 were appropriately filled and returned, giving an overall response rate of 99.8%.

Table 1: Distribution of Respondents According to Socio-Demographic Characteristics

Variables	Frequency	Percentage (%)
Age (years)		
15 – 24	139	33.6
25 – 34	197	47.6
35 – 44	72	17.4
45 - 54	6	1.4
Mean \pm SD	27.75 \pm 6.86	
Ethnic group		
Hausa-Fulani	314	75.8
Yoruba	40	9.7
Igbo	11	2.7
Others	49	11.8
Educational qualification		
Primary	41	9.9
Secondary	152	36.7
Tertiary	194	46.9
Qur'anic education	19	4.6
None	8	1.9
Marital status		
Single	4	1.0
Married	400	96.6
Divorced	10	2.4
Widowed	0	0
Occupational status		
Civil servant	129	31.2
Trader/Self-employed	67	16.2
Unemployed	218	52.7
Number of children		
1 – 4	334	80.9
≥ 5	79	19.1
Relationship with the child		
Mother	405	97.8
Other	9	2.2
Age of the child (Months)		
≤ 12	395	95.4
13 – 24	8	1.9

25 – 36	6	1.4
37 – 48	4	1.0
49 – 60	1	0.2
Mean ± SD	6.38 ± 7.58	
Educational qualification of the spouse		
Primary	10	2.4
Secondary	87	21.0
Tertiary	71.7	297
Quránic education	14	3.4
None	6	1.4
Occupational status of spouse		
Civil servant	246	59.4
Trader/Self-employed	120	29.0
Unemployed	48	11.6

Knowledge of Newborn Hearing Screening

To ascertain the respondents' knowledge of newborn hearing screening, responses to each of the 8 questions on knowledge in the adopted questionnaire by Olusanya *et al* (2006) were asked; (1) Can babies be born with hearing loss? (2) Can delay in crying at birth cause hearing loss? (3) Can neonatal jaundice cause hearing loss? (4) Can a febrile illness in the newborn cause hearing loss? (5) Can convulsions in the newborn cause hearing loss? (6) Can Drugs cause newborn hearing loss? (7) Can hearing loss in a newborn be detected

soon after birth? (8) Do you know that there are remedies for newborn hearing loss? These questions were assigned a scale of 0 -1: no = 0, not sure = 0, yes = 1 and total aggregate score of 0 – 8 was obtained. A score of 0 – 3 was graded as poor knowledge, 4 – 6 graded as fair knowledge and a score of 7 – 8 was graded as good knowledge. Only a few (13.5%) of the respondents have good knowledge of newborn hearing screening. About half of them (47.8%) have poor knowledge while the rest (38.6%) have a fair knowledge as shown in Figure 1.

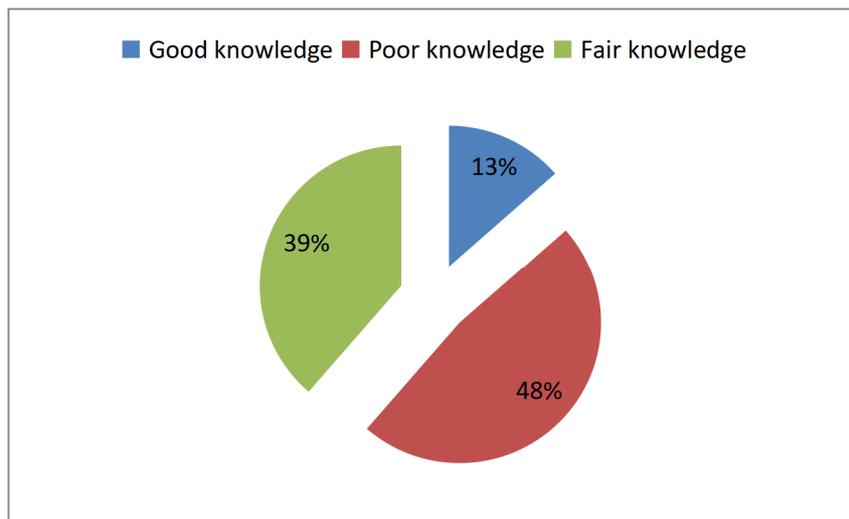


Figure 1: Knowledge of Newborn Hearing Screening

Acceptability of Newborn Hearing Screening

A majority (81.6%) of the respondents claimed they will accept newborn hearing screening, a few (11.4%) of them will not accept the procedure, while the rest (7.0%)

said they are not sure if they will accept newborn hearing screening as shown in Figure 2.

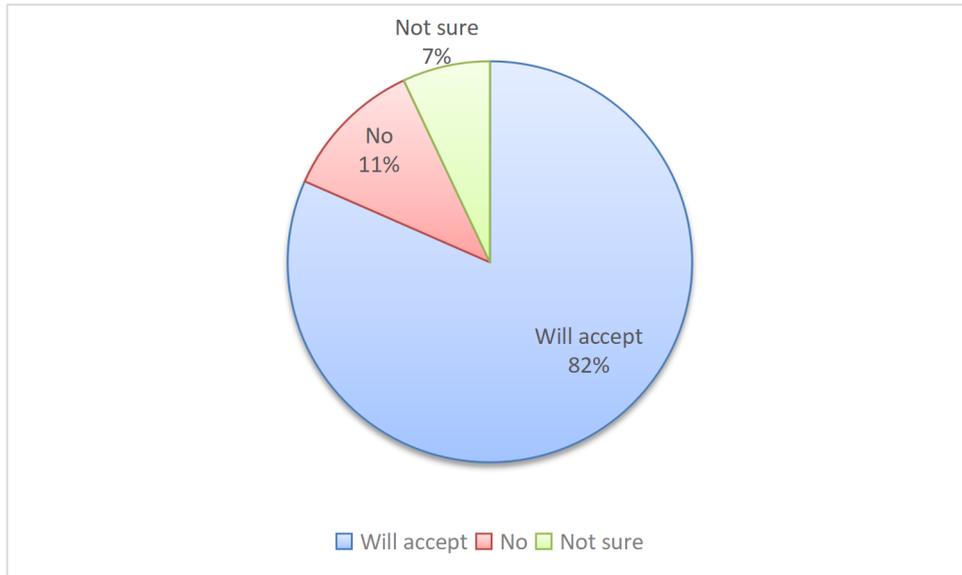


Figure 2: Acceptability of Newborn Hearing Screening

Acceptability of Early Intervention

A majority (80.2%) of the respondents will accept early intervention (Hearing aid or Cochlear implant) if their child was found to have hearing loss. The remaining said they

were either not sure (8.9%) or they will not (10.9%) accept early intervention for newborn hearing loss as shown in Figure 3.

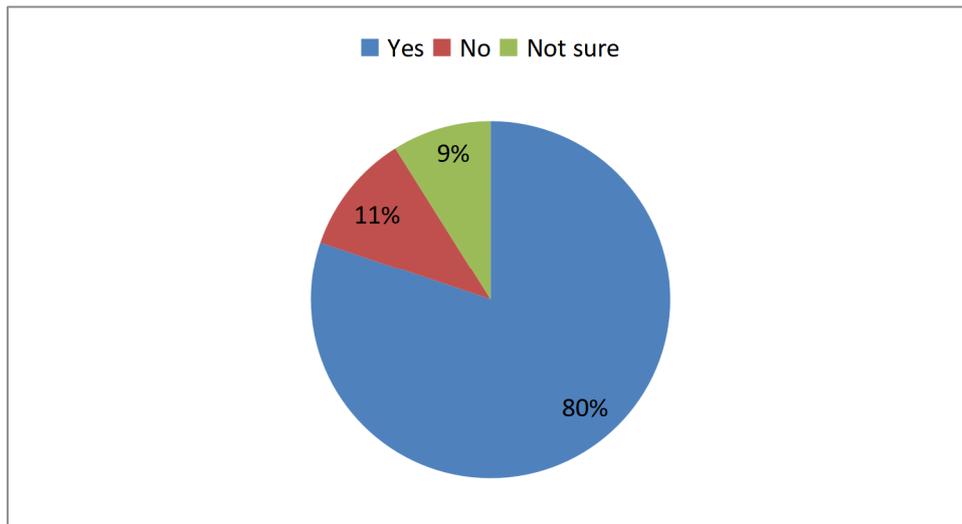


Figure 3: Acceptability of Early Intervention for Newborn Hearing Loss

Table 2: Associations between Socio-Demographic Variables of Respondents and Knowledge of Newborn Hearing Screening

Associations	χ^2	Df	P-value
Age of caregiver and knowledge of newborn hearing screening	2.419	2	0.298
Number of children (Parity) and Knowledge of newborn hearing screening	2.217	2	0.330
Educational status of caregivers and Knowledge of newborn hearing screening	97.514	8	0.000*
Occupation of caregivers and Knowledge of newborn hearing screening	27.337	4	0.000*

* - Statistically significant

Table 3: Associations between Socio-Demographic Variables of Respondents and Acceptability of Newborn Hearing Screening

Associations	χ^2	Df	P-value
Age of caregivers and acceptability of newborn hearing screening	13.753	2	0.001*
Number of children (parity) of caregivers and acceptability of newborn hearing screening	5.020	2	0.081
Educational status of caregivers and acceptability of newborn hearing screening	13.169	8	0.106
Occupation of caregivers and acceptability of newborn hearing screening	3.945	4	0.413
Occupation of spouse and acceptability of newborn hearing screening	23.585	4	0.0001*

* - Statistically significant

Table 4: Associations between Socio-Demographic Variables of Respondents and Acceptability of Early Intervention for Newborn Hearing Loss

Associations	χ^2	Df	P-value
Age of caregivers and acceptability of early intervention for newborn hearing loss	9.016	2	0.011*
Number of children (parity) of caregivers and acceptability of early intervention for newborn hearing loss	0.599	2	0.741
Occupation of caregivers and acceptability of early intervention for newborn hearing loss	13.711	4	0.008*
Occupation of spouse and acceptability of early intervention for newborn hearing loss	7.554	4	0.109
Educational status of caregivers and acceptability of early intervention for newborn hearing loss	7.653	8	0.468

* - Statistically significant

Independent Predictors

Variables found to be significantly associated with acceptability of newborn hearing screening at bivariate level of analysis were put into a logistic regression model and the results showed that spousal occupation was found to be a significant predictor, with those respondents whose spouses were civil

servants found to be 24 times more likely to accept newborn hearing screening ($P = 0.037$, $AOR = 0.244$, $95\% CI = 0.065 - 0.917$) while age was not a significant predictor for accepting newborn hearing screening ($P = 0.086$, $AOR = 0.511$, $95\% CI = 0.237 - 1.099$).

Discussion

Knowledge of Newborn Hearing Screening

Only a few (13.5%) of the respondents had good knowledge of newborn hearing screening. About half of them (47.8%) had poor knowledge while the remaining had a fair knowledge of newborn hearing screening. This value was lower than that obtained in other studies conducted in Benin City by Okhakhu *et al* (2014), Olusanya and Luxon (2006) in Lagos, Nigeria, Swanepoel & Almec (2008) in Gauteng, South Africa and Rajagopalan *et al.* (2014) in Chennai, India. This low level of knowledge of newborn hearing screening demonstrated by the respondents could be as a result of the absence of established newborn hearing screening protocol in our hospitals.

Acceptability of Newborn Hearing Screening

Despite the poor knowledge of newborn hearing screening demonstrated by the respondents, there seems to be an overall positive attitude as the majority (81.6%) of the respondents will accept newborn hearing screening and about the same number were willing to accept early intervention if their child was found to have hearing loss. This result was similar to what was found in previous studies conducted by Olusanya and Luxon (2006) in Lagos, Okhakhu *et al.* (2014) in Benin City, Nigeria, Swanepoel & Almec (2008) in Gauteng Province, South Africa, Rajagopalan *et al* (2014) in Chennai, India and Ng *et al.* (2004) in Hong Kong.

Factors that Affect the Respondent's Knowledge and Acceptability of Newborn Hearing Screening

To determine the factors that affect the respondents' knowledge of newborn hearing screening, socio-demographic variables were tested for associations. It was found out that there was a statistically significant association between educational qualification and occupation of the caregivers with knowledge of newborn hearing screening ($P < 0.05$). This was not surprising as educational status tend to shape the thinking of an individual as well

as influence health and information-seeking behaviour among people.

When socio-demographic variables such as age, parity, highest educational qualification and occupation of the caregivers and spousal occupation were considered to determine their relationship with acceptability of newborn hearing screening, only the age of the caregivers ($P = 0.001$) and spousal occupation ($P = 0.001$) were found to be statistically significant. This finding indicates that older caregivers are likely to be more experienced especially when it comes to issues related to newborn care. The significant association with spousal occupation may be explained by the fact that it is expected that husbands should provide food, shelter and health care for the family in most communities in northern Nigeria. Hence those husbands who are civil servants were more likely to support their families than those who are unemployed.

To control for confounding variables, logistic regression analysis was done and only spousal occupation was found to be an independent predictor of acceptability of newborn hearing screening, with those respondents whose spouses were civil servants found to be about 24 times more likely to accept newborn hearing screening ($P = 0.037$, AOR = 0.244, 95% CI = 0.065 – 0.917). Age of the caregiver was not a significant predictor for accepting newborn hearing screening ($P = 0.086$, AOR = 0.511, 95% CI = 0.237 – 1.099).

Conclusion

This study revealed that there was poor knowledge of newborn hearing screening among caregivers attending immunization clinic at AKTH. However, the majorities were ready to accept newborn hearing screening and the occupation of the spouse was found to be an independent predictor of acceptability of newborn hearing screening. It is recommended that there is a need for regular health education about newborn hearing loss and screening aimed at improving the knowledge about newborn hearing screening.

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