Midwives Knowledge and Attitude Regarding Newborn Hearing Screening at Kamuzu Central Hospital

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ABSTRACT

Early detection of hearing loss in newborns is critical for timely intervention to allow for speech, language, and cognitive development. Newborn Hearing Screening (NHS) is a standard practice in many high-income countries. However, its implementation remains limited in many low- and middle-income settings, including Malawi. As frontline maternal and child health providers, midwives play a vital role in identifying at-risk newborns and facilitating early referrals. Their knowledge and attitude towards hearing screening is paramount to successfully implement and integrate NHS into routine newborn care. The aim of this study was to assess the knowledge and attitudes of midwives regarding newborn hearing screening at Kamuzu Central Hospital. A questionnaire comprising of 26 questions relating to the significance of NHS was administered to 17 nurses working at Ethel Mutharika Maternity wing. Most participants (70.5%) showed limited knowledge regarding NHS but demonstrated positive attitude with a mean score of 3.8. The positive attitude offers a strong foundation for successful implementation but there is need to address existing knowledge gaps through targeted trainings and strengthening health system support to enhance early detection and timely intervention for childhood hearing loss.

Keywords: *Newborn hearing screening (NHS), Kamuzu Central Hospital, permanent hearing loss, midwives' knowledge and attitude, early intervention, midwives' nurses.*

INTRODUCTION

It is estimated that 34 million children worldwide have moderate or greater degree of hearing loss, with a higher percentage residing in low- and middle-income countries (WHO, 2024). The prevalence of disabling (≥ 30dB HL) childhood hearing loss in sub-Saharan African is over three times that of high-income countries (Brough, 2017).

Malawi is a low-income country in the southern Africa with a population of 21 million with a projected increase of 77% to 37 million by 2050 (WHO, 2024). Most of the population resides in rural areas. Due to extreme levels of poverty, its health system faces numerous challenges. Most people have no access to health services, and there are inadequate health care providers (Goudge *et al*., 2023).

A community-based study conducted on pediatric population revealed that the prevalence of childhood hearing impairment was as high as 11.5% in children aged 4-6 years, these children were found to have hearing loss of greater than 25 decibels (dB) hearing level bilaterally (Mulwafu *et al*.,2019). Malawi has 2 otolaryngologists and less than 40 audiologists (Mulwafu *et al.*, 2019). Access to ear and hearing services is a challenge. There are only 2 hospitals offering routine newborn hearing screenings. Accesses to newborn hearing screening and intervention can help reduce the negative impact of permanent hearing loss on speech and language development (Moeller *et al*, 2006).

Children with untreated hearing loss may have delays in the development of receptive and expressive communication skills (ASHA, 2023). Delayed speech and language development may result in communication difficulties which may lead to reduced academic achievement, poor self-image and ultimately reduce employment opportunities. These consequences could be minimized if hearing loss can be detected early through newborn hearing screening followed by appropriate and timely intervention. Hearing loss is a hidden disability, it commonly remains undetected in both children and adults; and it is important to put in place hearing screening measures at different stages across the course of life (WHO, 2021).

Annually, about 6 per 1000 babies are born with sensorineural hearing loss in the first month of life in low and middle-income countries compared with 2 per 1000 live births in high income countries (Olusanya, 2015). As early hearing detection is crucial for speech and language development, Centre for Disease Control and prevention (CDC) recommends 1-3-6 benchmarks which says that a child should be screened for hearing loss before one month of age, followed by diagnostic evaluation before three months of age and should be enrolled in early intervention before six months of age (CDC, 2024). This gives a child who is born deaf an opportunity to develop language almost at the same level as a hearing child. According to World Health Organization, a child who is born deaf or lost their hearing at an early age and had an opportunity to receive appropriate intervention (before 6 months of age), may be able to develop language at the same level as a child born with normal hearing by the time, they reach five years old if they do not have other learning disabilities (WHO, 2016).

In high-income countries, newborn hearing screening is offered routinely as a measure for early detection of infants with permanent congenital hearing loss or early onset hearing loss (Olusanya, 2015). With only two hospitals being able to offer newborn hearing screenings, detection of hearing is a challenge and there is lack of public awareness about hearing health (Kapalamula, 2023). In 2017, an effort was made by one of the private hearing clinics in Lilongwe together with *Hear The World Foundation* to extend neonatal hearing screenings services to Kamuzu Central Hospital. According to Nasimba, the program was not established due to shortages of human resource and issues with the screening equipment (D. Nasimba, personal communication, February 28, 2025).

Midwife nurses are in key position when it comes to newborn care; having direct communication with guardians and families, they are in best position to encourage and counsel families regarding further assessments (Goedert et al., 2011). Research has revealed gaps in midwives' knowledge of newborn hearing screening protocols, referral systems, follow up practices as well as attitude relating to the importance of screening and their professional role (Ravi et al., 2018). These gaps can hinder early detection efforts and contribute to delays in diagnosis and intervention. It is essential to understand the extend of midwives' knowledge and attitude toward newborn hearing screening for proper designing of educational and policy interventions that would strengthen early identification and follow-up systems.

Need of the study

Newborn hearing screening is a critical component of early child health care, it enables prompt identification of permanent hearing loss and timely intervention to improve speech and language development. In Malawi, NHS in not routinely implemented, resulting in late diagnosis which leads to poor developmental outcomes in the affected individuals. Midwives, as frontline providers in maternal and newborn care, are strategically positioned to support hearing screening initiatives. The success of screening programs depends largely on their knowledge, skills, and attitudes. This study is necessary to identify knowledge gap and barriers to its implementation. The findings will provide evidence to guide targeted trainings, policy development and strengthen neonatal care services in Malawi. This research aligns with Malawi's effort to enhance child development and reduce disability-related inequalities

METHOD

Aim of the study

The aim of this study was to a assess midwives' level of knowledge regarding newborn hearing screening and to assess their general attitude towards neonatal hearing screening

Inclusion criteria

The study only involved midwives practicing or have worked at Ethel Mutharika (Postnatal ward, Labour ward and OPD) and who were on duty. Midwives are the gatekeepers when it comes to newborn care; they are the first point of contact for caregivers and their infants, influencing

screenings and referrals (Goedert et al.,2011).

Exclusion criteria

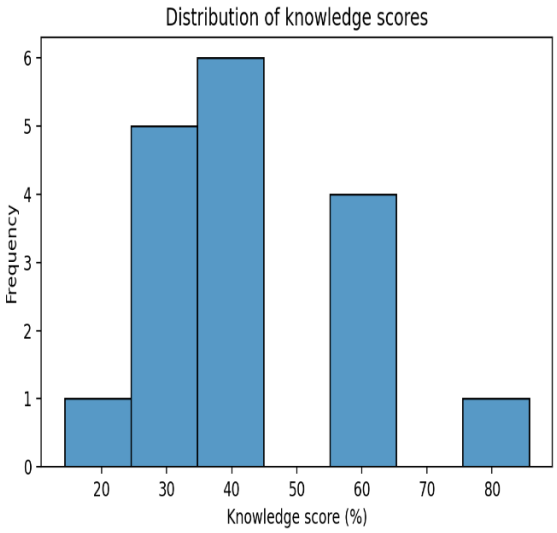
Approximately there are more than 20 midwife nurses working at Kamuzu Central Hospital Ethel Mutharika maternity wing. The study excluded nurses that are not in close contact with newborns and mothers.

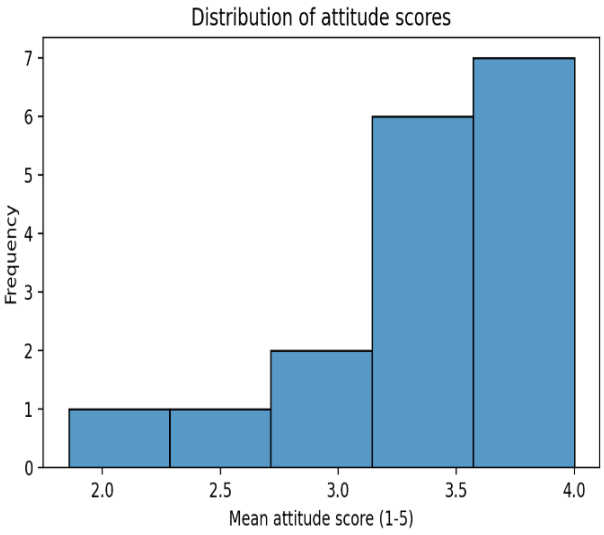
Procedure

The researcher used a multiple choice and a true or false questionnaire to collect data. The questionnaire consisting of 26 questions was sent out to 17 midwives to find out their level of knowledge and their attitude towards newborn hearing screening.

Figure 1.

Distribution of Attitude Scores and Attitude scores





Analysis

The collected data was transferred into a Microsoft Excel and analyzed using descriptive statistical methods. The analysis was categorized into three sections: demographic, knowledge regarding NHS and attitude. Knowledge data were analyzed using descriptive statics (frequencies and percentages) to determine the number of respondents who answered each question correctly. The attitude section was measured using a 5-point Likert Scale ranging from 1 (strongly disagree) to 5 (strongly agree). Demographic variables were analyzed using frequencies and percentages. The results were used to describe the background of participants.

RESULTS

Knowledge Regarding Newborn Hearing Screening

The knowledge section consisted of multiple-choice and true or false questions.

Each correct response was coded as 1, while incorrect or not sure responses were coded as 0. Knowledge data were analyzed based on frequency and percentages to determine the number of respondents who answered each question correctly. Individual knowledge scores were calculated by adding correct responses for each participant. The scores were converted into percentages: Good knowledge- ≥75%, Moderate knowledge-50-74%, Poor knowledge- < 50%. This categorization allowed for an interpretation of the general level of knowledge among nurses regarding NHS.

Table 1.

Knowledge Category

Knowledge level	n	Percent
Poor	12	70.58824
Moderate	4	23.52941
Good	1	5.882353

Poor (12): < 50% Moderate (4): 50–74% Good (1): ≥ 75%

The nurses were asked about risk factors for congenital or early onset hearing loss, medication considered ototoxic, professional involved in diagnostic assessment when a child fails screening, whether early identification improves language outcomes and the ideal age for screening. Table 1 shows that, out of the 17 participants, 12 nurses (70%) scored below 50%, 4 nurses (23.5%) had knowledge score ranging from 50-74% and only one nurse representing 5.8% scored 86%. Knowledge scores ranged from about 14% to 86%, with most midwives classified as having poor knowledge, and only a small proportion achieving good knowledge. This revealed that nurses are unaware of newborn hearing screening. A large proportion did not know the ideal age for screening. Most participants did not know risk factors for congenital or late onset childhood hearing loss, screening methods and medication that are considered ototoxic despite indicating that early identification improves language development outcomes.

Attitude Regarding Newborn Hearing Screening

This section was measured using a 5-point Likert scale ranging from 1(strongly disagree) to 5 (strongly agree). Responses were analyzed using frequencies, percentages, and mean scores. Higher mean score indicated a more positive attitude towards NHS. They were classified as follows: Positive attitude: Mean ≥ 4.0, Neutral attitude: Mean 3.0-3.9, Negative attitude: Mean < 3.0.

Table 2.

Attitude Mean of Respondents

Index	Attitude Mean
Unique	11.0
Mean	3.85
Common	4.0

The attitude Mean is above 3.8 often closer to the "Agree" range. This pattern indicates that even with moderate knowledge, midwives' attitude is overall positive toward newborn hearing screening:

Nurses were asked if NHS is an essential part of newborn care if they would attend an NHS training and whether they would support implementation initiatives. 11 midwives agreed that NHS is an essential component of newborn care, 16 agreed to supporting

initiatives and 17 agreed that they would attend training if offered. In Table 2, the mean score is 3.85. The mean attitude scores suggested generally positive attitudes towards newborn hearing screening, with most respondents indicating agreement or strong agreement to supporting newborn hearing screening initiatives.

The findings revealed a positive attitude towards NHS. Most respondents agreed that NHS is an essential component of newborn care and supported its routine implementation at Kamuzu Central Hospital. A large proportion of participants expressed interest in attending training if it were offered. However, some respondents expressed that its implementation might increase workload and were unsure if there is a proper referral system.

Demographic Analysis

Demographic variables (age, sex, professional qualification, years of experience and department) were analyzed using frequencies and percentages. The majority (58.8%) of respondents were female, 82% holding a diploma in nursing and midwifery. A total of 52% of responded had at least 1-3 years' experience in newborn care with large proportion working in postnatal ward. A total of 88% of respondents reported that their training did not cover neonatal/childhood hearing loss.

DISCUSSION

The aim of the study was to assess the level of knowledge and attitude midwives have towards Newborn Hearing Screening. The findings revealed that most of the nurses demonstrated poor knowledge on essential aspects of NHS despite having a generally positive attitude.

Knowledge Regarding Newborn Hearing Screening

The findings revealed that most midwives had poor knowledge of NHS especially in relation to screening methods, risk factors for hearing loss and ideal timing for screening. This is suggestive that while midwives are involved in newborn care, they may lack formal education or in-service training on hearing screening. And these findings could be due to the unavailability of structured training programs in their curriculum. In the study, a small proportion of responded reported to have received formal training in NHS hence the low knowledge score. Study findings by Goedert revealed that midwives expressed the need to be equipped with information relating to hearing loss causes, risk factors and screening protocols (Goedert et al., 2011). This suggests that midwives often lack formal training in audiology-related topics during their training. The limited knowledge could be due to limited emphasis in the midwives training curriculum, inadequate professional development opportunities and lack of public awareness.

Limited knowledge could have an impact on early identification of hearing loss which could lead to delayed or late diagnosis and intervention. Early detection of hearing loss (within the first month of life) is crucial for

speech and language development. Inadequate knowledge among frontline healthcare providers represents a threat to effective implementation of NHS programs.

Hospital. They recognized the importance and expressed their interest in getting the training. This positive attitude is a good starting point as it shows their readiness to

Table 3.

Demographic Characteristics of Respondents (N = 17)

Variable	Category	Percentage (%)
Gender	Female	58.8
	Male	41.2
Qualification	Diploma in Midwifery	82.4
	Degree in Midwifery	11.8
	Certificate	5.8
Position	Midwife	95.0
	Senior Midwife	5.0
Experience in Newborn Care	< 1 year	5.9
	1–3 years	52.9
	4–7 years	11.8
	8–12 years	11.8
	13+ years	5.9
Formal Training in NHS	Yes	11.8
	No	88.2
Department	Postnatal ward	47.1
	Antenatal	17.6
	ENT	11.8
	Labour ward	23.5

Attitude Towards Newborn Hearing Screening

Most midwives demonstrated positive attitude towards newborn hearing screening despite poor levels of knowledge. Most respondents agreed that NHS is essential component of newborn care and supported its implementation at Kamuzu Central

support NHS initiatives. Positive attitude among health workers is paramount for successful implementation and sustainability of interventions. These findings also indicate that although nurses lack knowledge, they can recognize the importance of early detection of hearing loss as well as their role in educating and counseling parents and their families.

Limitation of the Study

The study relied on self-administered questionnaire which may be subject to response bias. In addition, this study had limited resources. This greatly influenced the researcher choice to go with a smaller sample size which may limit the generalization of the findings.

Future Line of Research

There should be studies to evaluate the impact of targeted training programs on midwives' knowledge and skills regarding neonatal hearing screening, exploring feasibility and cost of integrating NHS into existing maternal and child health services and more studies on childhood hearing loss as there is limited data nationwide.

Recommendations

1. Further studies may help in identifying barriers to effective implementation of newborn hearing screening programs.
2. Training and public awareness campaign. Basic ear and hearing subjects to be emphasized in the curriculums to improve nurses' knowledge on the subject matter. There is need for public awareness campaign on ear and hearing health among health workers.
3. Strengthening referral pathways. Establishing clear referral pathways with a collaboration between maternity units, audiology/ENT department to ensure timely diagnosis and intervention.
4. Further studies may help in identifying barriers to effective implementation of newborn hearing screening programs.
5. Training and public awareness campaign. Basic ear and hearing subjects to be emphasized in the curriculums to improve nurses' knowledge on the subject matter. There is need for public awareness campaign on ear and hearing health among health workers.
6. Strengthening referral pathways. Establishing clear referral pathways with a collaboration between maternity units, audiology/ENT department to ensure timely diagnosis and intervention.

CONCLUSION

In conclusion, the study found that midwives at Kamuzu Central Hospital demonstrated poor knowledge but positive attitude towards NHS. Their positive attitude provides a strong foundation for implementation, but there is a need to address the knowledge gaps through trainings and strengthening systems to improve early detection and intervention for childhood hearing loss.

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APPENDIX

APPENDIX A: QUESTIONNAIRE

Midwives' Knowledge and Attitude Regarding Newborn Hearing Screenings at Kamuzu Central Hospital, Malawi

You are invited to participate in the study title "Midwives Knowledge and Attitude Regarding Newborn Hearing Screening". The purpose of this survey is to assess the level of knowledge and attitude of midwives towards neonatal hearing screening. Please note that your responses will be confidential and used for research only. Your honest response will be highly valued. You may choose to withdraw at any point without any consequences.

Please answer all questions. Tick or fill in the appropriate response.

Section A: Demographic Information

1. Age: __ years
2. Sex: ☐ Female ☐ Male ☐ Other
3. Highest professional qualification: ☐ Diploma in Midwifery ☐ Bachelor of Science (Midwifery/Nursing) ☐ Degree with postgraduate training ☐ Other: _____
4. Current position / role: ☐ Staff nurse/midwife ☐ Senior nurse/midwife ☐ In-Charge Nurse ☐ Unit Matron☐ Other: _____
5. Years of experience in maternity/newborn care: ☐ <1 ☐ 1–3 ☐ 4–7 ☐ 8–12 ☐ 13+
6. Have you received any formal training on newborn hearing

screening (NHS) or neonatal hearing loss? ☐ Yes ☐ No
If yes, specify type & year:

_____

7. Work area (tick all that apply): ☐ Labour ward ☐ Postnatal ward ☐ Neonatal unit ☐ Outpatient ☐ Other: _____

Section B: Knowledge Regarding Newborn Hearing Screening

8. What is the ideal age for newborn hearing screening? (Tick all that apply)

- ☐ Within the first 24 hours after birth
- ☐ Within the first month of life
- ☐ Before hospital discharge
- ☐ At 6 months of age
- ☐ unsure

9. Which of the following is the most common method used in screening newborn hearing? (choose one)

- ☐ Otoacoustic emissions (OAE)
- ☐ Tympanometry
- ☐ Pure tone audiometry

10. Early detection of hearing loss improves language development outcomes. True or False:

- ☐ True
- ☐ False

11. Which of these is a risk factor for congenital or early childhood hearing loss? (tick all that apply)

- ☐ Family history of childhood hearing loss.
- ☐ Neonatal intensive care unit (NICU) stay >5 days / ototoxic drugs.
- ☐ Severe jaundice requiring exchange transfusion.
- ☐ All of the above

12. If a newborn fails the initial screening, the best immediate action is:

- ☐ Discharge without follow-up
- ☐ Refer to ENT/Audiologist
- ☐ Wait until 6–12 months to reassess
- ☐ Not sure

14. Which professional(s) are usually involved in diagnostic assessment after a failed newborn hearing screen? (tick all that apply)

- ☐ Audiologist.
- ☐ ENT/otolaryngologist.
- ☐ Speech and language therapist.
- ☐ Dentist

15. Ototoxic medications (can) increase the risk of hearing loss. Which medication class is known for ototoxicity? (choose one)

- ☐ Aminoglycoside antibiotics (e.g., gentamicin).
- ☐ Penicillins

- ☐ Antipyretics
- ☐ Laxatives

17. Which of the following statements is TRUE about newborn hearing loss?

- ☐ It always presents with visible signs at birth.
- ☐ It can be congenital or acquired
- ☐ It cannot be detected until speech delay occurs.
- ☐ It is always temporary.

18. True or False: Midwives play an important role in counselling parents about newborn hearing screening.

- ☐ True
- ☐ False

Section C: Attitude Towards Newborn Hearing Screening

Scale: 1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree

For each statement circle 1–5.

19. Newborn hearing screening is an essential part of newborn care. 1 2 3 4 5
20. I feel it is primarily the midwife's responsibility to inform parents about newborn hearing screening. 1 2 3 4 5
21. I would be comfortable explaining screening results and next steps to parents. 1 2 3 4 5
22. I believe early detection of hearing loss improves language outcomes. 1 2 3 4 5
23. Performing newborn hearing screening will significantly increase workload for midwives. 1 2 3 4 5
24. I would support implementing routine newborn hearing screening at Kamuzu Central Hospital. 1 2 3 4 5
25. I trust that referral pathways for babies who fail screening are available and functional. 1 2 3 4 5
26. I would attend training on newborn hearing screening if offered. 1 2 3 4 5

APPENDIX B: CERTIFICATE OF APPORVAL FROM MALAWI NATIONAL HEALTH SCIENCES RESEARCH COMMITTEE (NHSRC)

Telephone: a + 265 789 400
Facsimile: + 265 789 431

All Communications should be addressed to:

The Secretary for Health

In reply please quote No. MED 4/36c
MINISTRY OF HEALTH
P.O. BOX 30377
LILONGWE 3
MALAWI

9th July, 2025

Masozi Nyirenda
Kamuzu Central Hospital

Dear Sir/Madam
Protocol# 25/07/4706: Midwives "Knowledge and Attitude Regarding Newborn Hearing Screening at Kamuzu Central Hospital

Thank you for the above titled proposal that you submitted to the National Health Sciences Research Committee (NHSRC) for review. Please be advised that the NHSRC has **reviewed** and **approved** your application to conduct the above titled study.

- **APPROVAL NUMBER : 4706**
- The above details should be used on all correspondences, consent forms and documents as appropriate.
- **APPROVAL DATE : 09/07/2025**
- **EXPIRATION DATE : 08/07/2026**
  This approval expires on **08/07/2026**. After this date, this project may only continue upon renewal. For purposes of renewal, a progress report on a standard form obtainable from the NHSRC Secretariat should be submitted one month before the expiration date for continuing review.
- **SERIOUS ADVERSE EVENT REPORTING:** All serious problems having to do with subject safety must be reported to the NHSRC within 10 working days using standard forms obtainable from the NHSRC Secretariat.
- **MODIFICATIONS**: Prior NHSRC approval using forms obtainable from the NHSRC Secretariat is required before implementing any changes in the protocol (including changes in the consent documents). You may not use any other consent documents besides those approved by the NHSRC.
- **TERMINATION OF STUDY**: On termination of a study, a report has to be submitted to the NHSRC using standard forms obtainable from the NHSRC Secretariat.
- **QUESTIONS**: Please contact the NHSRC on phone number *+265 999936937* or by email on mohdoccentre@gmail.com.
- **OTHER**: Please be reminded to send in copies of your final research results for our records (Health Research Database).

Kind regards from the NHSRC Secretariat.

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For: CHAIRPERSON, NATIONAL HEALTH SCIENCES RESEARCH COMMITTEE
Promoting Ethical Conduct of Research[1]

Executive Committee: *Dr. M. Joshua (Chairperson), Dr. F. Sinyiza (Vice-Chairperson)*
Registered with the USA Office for Human Research Protections (OHRP) as an International IRBIRB Number IRB00003905 FWA0000597