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**ORIGINAL ARTICLE**

# ASSESSMENT OF KNOWLEDGE AND PRACTICE OF GYNECOLOGY/OBSTETRICS RESIDENTS AND MIDWIVES TOWARDS ESSENTIAL NEWBORN CARE AT TIKUR ANBESSA SPECIALIZED HOSPITAL, ADDIS ABABA UNIVERSITY, ETHIOPIA

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**Abstract**

***Background:*** *A time-bound and chronologically ordered series of medical interventions that a baby receives at birth are referred to as the "essential newborn protocol." This period of immediate care is critical for the babies' subsequent well-being and adaptation. However, there are still reports of health workers lacking good knowledge and practice with newborn care, which was not investigated in our hospital.*

***Methods:*** *A hospital-based cross-sectional study was conducted in TASH with 114 selected gynecology and obstetrics residents and midwives. Using the SPSS version 25 software package, continuous data were described using the mean and standard deviation, while categorical data were described using frequency and percentage. To identify factors related to knowledge and practice, multivariable binary logistic regression analyses were used .*

***Result****: Eighty-eight residents and 26 midwives were included. Nearly a quarter (24.6%) of participants had good knowledge about essential newborn care. Regarding knowledge level by profession, 31.8% of the residents had good knowledge of essential newborn care, and all the midwives had poor knowledge. The odds of having good knowledge of ENC were 96.3% lower for first-year residents and 90.5% lower for second-year residents as compared to year four. Untrained participants had an 84 percent lower chance of having good knowledge of essential newborn care than trained participants. Regarding practice level by profession, more than two-thirds of 68 (77.3%) residents and 21 (80.8%) midwives had sufficient skill in essential newborn care.*

***Conclusion:*** *A substantial number of healthcare providers lacked essential newborn care knowledge and practice. The availability of service or on-the-job training, as well as the year of*

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*residency, were factors influencing newborn care knowledge. In-service training, encouraging supervision, and provisions should be reinforced to improve newborn care activities.*

**Keywords:** Knowledge, Practice, Newborn, Essential newborn care

## Introduction

Mortality in the neonatal period continues to be high despite a decreasing proportion of deaths in the under-five population. World Health Organization 2020 estimated neonatal mortality to be around 47% of all death under under-five mortality (1,2). The labor and delivery period are a significant challenge to newborns as it entails negotiating to shift from intrauterine to extrauterine life successfully (3). The early neonatal care period is vital to the newborn for subsequent health and adaptation. Expert care throughout labor and delivery with swift management of complications can avoid around 50% of neonatal mortality. Satisfactory newborn care in the post-delivery period can preclude 75% of current neonatal deaths (2–4).

Essential newborn procedure is a time-bound and chronologically performed series of care that a newborn obtains at birth, with standardized effective procedural steps such as drying and stimulating, evaluating breathing, clean delivery, cord care, keeping the newborn warm (thermoregulation), initiating breastfeeding in the first hour, give eye drops or ointment to prevent eye infection, give vitamin K intramuscularly, put the newborn's identification bands on, weigh the newborn when it is stable and warm, and keep a record of all observations and treatment given, including eye care, immunization, danger signs identification, preterm or low birth weight infant care, and managing newborn illnesses (5).

The United Nations' third sustainable development goal (SDG3) aims to eliminate avoidable neonatal deaths and under five children, with targets for under-five mortality (25 deaths per 1,000 live births, down from 33 deaths per 1,000 live births) and neonatal mortality (12 deaths per 1,000 live births, down from 22 deaths per 1,000 live births) (6,7). In order to achieve this reduction, it is essential for countries to apply efficient intervention policy to save the lives of newborns and avoid deaths more swiftly. The essential newborn protocol is an illustration of how concise and simple interventions can accomplish both immediate and long-term advantages. These interventions are bundled in very cost-effective way and it has the greatest effect on neonatal deaths (2,8–10).

The information health care providers have on essential newborn care has a great impact on the outcome of the neonates. A study done in Uganda showed that the reason of neonatal death in was the low levels of knowledge among health workers regarding newborn care (19). The prevalence of poor knowledge in essential newborn care is consistent in other Afriacan countries as well with a level as high as 56.2% in Ekiti, Nigeria(17) and 65.1% in Rwanda(18).

In Ethiopia studies have shown good knowledge to be found in less than 60% of the health care professionals participating in studies. Good knowledge was seen in only 38.2 % in Bench Sheko (11), 57.9% in Woliyta, (12), 47.8% in Jima zone and 53.8% in Afar (14),

This study aimed to evaluate knowledge, practice and factors associated with knowledge and practice among midwives and Gynecology/ obstetrics residents in Department of Gynecology/obstetrics, Tikur Anbessa Specialized Hospital (TASH), AAU. Although the two groups have different training background, the sequence of essential newborn care are thought (both practically and theoretically) in similar capacity. Furthermore, the training is largely given both groups by pediatricians and neonatologists (where available). This makes the study of the two groups feasible.

The results of the study will be used to produce evidence important in crafting management alternatives and targeted interventions for improving Essential Newborn Care (ENC).

## Methods

### Study area

The study was conducted in TASH, which is the major referral and teaching hospital in the nation, located in the capital Addis Ababa providing comprehensive healthcare services for over 800,000 patients per year via specialty clinics and inpatient departments. The department of Gynecology/Obstetrics is one of the units in the institute with 99 residents from first to fourth year in training and 26 Midwives currently working in the department.

### Study design and period

An institution-based cross-sectional study was carried out from May 1, 2022, to September 30, 2022.

### Eligibility criteria

All midwives in labor ward and Gyn/ Obstetrics residents who were working in Tikur Anbessa Specialized Hospital, Gyn/ Obstetrics Department, and who were willing to participate included in the study. Knowledge and practice were the dependent variable, and the independent variables were Sociodemographic factors (age, profession, level of education), training about essential newborn care, total medical work experience, Work experience at NICU/Delivery ward.

### Sample size and sampling technique

The sample size was estimated using an average knowledge level of 47.8% from previous studies done in Jima zone (15). A single population proportion formula was used with 95% certainty level and a maximum discrepancy of 5% then population correction formula since the study population is below ten thousand. For possible incompleteness, a 10% non-response rate was considered, and the final sample size estimated at 118.

### Data collection and quality assurance

The data was collected from Gynecology/ obstetrics residents and midwives using self-administered questionnaire adopted from previous literature done in our setting (Bench Sheko, Wolaita, Tigray and Afar (11-14)) that encompasses socio demographic

characteristics, knowledge assessing questions and practice assessing questions Using ODK application.

To ensure the quality of data, the structured checklists were tested on 5% of the sample. This group was not included in the study. Problems identified during pre-test were fixed before the initiation of data collection. Every question was coded; nonstop supervision was made throughout the pre-test and data collection period by the principal investigator. Collected data was tested for completeness and dependability on day of data collection.

**Data analysis techniques**

The data was collected using ODK version 1.25.2, after which every completed form was assessed for completeness. Data was then exported to SPSS version 25 to perform analysis. Incomplete and/or inconsistent data was substituted by another questioner for analysis. Mean and standard deviations were used to explain continuous data. Frequency and percentage were used to explain categorical data. To isolate factors related to knowledge and practice, Bivariable analysis followed by multivariable binary logistic regression analyses was performed. Statistical significance was taken as a level of significance of 5%, while an adjusted odds ratio (AOR) of 95% confidence interval (CI) was taken for the estimates of the association.

**Operational Definitions**

**Neonate**: the baby after delivery up to 28 days (3).

**Essential newborn care:** a sequence of time bound and chronologically assigned care that a newborn obtains at birth (5).

**Neonatal resuscitation:** a series of care given at the time of delivery to assist the initiation of breathing and circulation.

**Good knowledge:** for those who replied right at least 21 questions of 25 (score ≥ 80%) (16)

**Poor knowledge:** for those who correctly replied < 80% (according to 2015 Federal Ministry of Health Essential Baby Training Facilitators Manual accreditation criteria) (16).

**Sufficient Skill** – if the participants perform ≥ 80% (16).

**Insufficient skill** – if the participants perform < 80% (16).

**Results**

**Socio-Demographic Characteristics**

In this study, a total of 114 respondents participated, making a response rate 96.6%. Among these, 81 (71.1%) were male and 33 (28.9%) were female. 88(77.2 %) were residents; the rest 26(22.8 %) were midwives. Of residents, more than one third 30 (34.1 %) were year I residents. 33.3% had a working experience for 3 to 4 years at NICU. More than half of the residents 64(56.1%) took additional refresher on-job training regarding essential newborn care (Table 1).

Table 1: Socio-demographic characteristics of residents and midwife in Tikur Anbessa specialized hospital October 2022.

| Variables | | Frequency | Percent |
|---|---|---|---|
| Age | 20 to 25 years | 6 | 5.3 |
| | 25 to 30 years | 77 | 67.5 |
| | 30 to 40 years | 30 | 26.3 |
| | Above 40 years | 1 | 0.9 |
| Gender | Male | 81 | 71.1 |
| | Female | 33 | 28.9 |
| Qualification | Degree and above | 114 | 100.0 |
| Profession | gyn/obs resident | 88 | 77.2 |
| | Midwife | 26 | 22.8 |
| Total Work experience | less than 1 year | 12 | 10.5 |
| | 1 to 2 years | 37 | 32.5 |
| | 3 to 4 years | 48 | 42.1 |
| | above 5 years | 17 | 14.9 |
| Work experience at NICU | less than 1 year | 30 | 26.3 |
| | 1 to 2 years | 37 | 32.5 |
| | 3 to 4 years | 38 | 33.3 |
| | above 5 years | 9 | 7.9 |
| Year of residency | year 1 | 30 | 34.1 |
| | year 2 | 26 | 29.5 |
| | year 3 | 15 | 17.0 |
| | year 4 | 17 | 19.3 |
| Job training | Yes | 64 | 56.1 |
| | No | 50 | 43.9 |
| Interest in working in the delivery room/ NICU | Yes | 108 | 94.7 |
| | No | 6 | 5.3 |
| Total | | 114 | 100.0 |

**Knowledge score and level among midwives and Gynecology/obstetrics residents towards essential newborn care**

Knowledge about essential newborn care was measured using the cumulative score of 25 questions. The mean ± SD knowledge score of the total participants were 19.15 (±1.94). Whereas based on profession (residents and midwives) the mean ± SD knowledge score were 19.57± 1.68 and 17.7 ±2.13 respectively. Regarding Average practice score by year of residency, Year four residents had highest mean score 20.7 ± 1.36 followed by Year three 20.2 ±1.37.

Nearly a quarter of the participant (95% CI, 17.0_33.5%) had good knowledge about

essential newborn care. 28(31.8%) of the residents had poor knowledge on essential newborn care. All (100%) of the midwife had poor knowledge. Year four residents 11(64.7%) had good knowledge about essential newborn care, followed by year three 7(46.7%) and year two 6(23.1%) respectively (Table 2).

Table 2: Knowledge score and level of residents and midwife on essential newborn care, in TASH October 2022 .

| Study Populations characteristics | | N | Mean score | Std. Deviation | Poor Knowledge | Good knowledge | P value |
|---|---|---|---|---|---|---|---|
| Total population | | 114 | 19.15 | 1.94 | | | |
| Profession | Gyn/obs resident | 88 | 19.57 | 1.68 | 60(68.2%) | 28(31.8%) | <0.001 |
| | Midwife | 26 | 17.73 | 2.13 | 26(100%) | 0(0%) | |
| Residency year | year 1 | 30 | 19.00 | 1.64 | 26(86.7%) | 4(13.3%) | <0.001 |
| | year 2 | 26 | 19.12 | 1.66 | 20(76.6%) | 6(23.1%) | |
| | year 3 | 15 | 20.20 | 1.37 | 8(53.3%) | 7(46.7%) | |
| | year 4 | 17 | 20.71 | 1.36 | 6(35.3%) | 11(64.7%) | |

**Practice among midwives and Gynecology/ obstetrics residents towards essential newborn care**

Practice of essential newborn care was measured using the cumulative score of 12 questions. The mean ± SD practice score of the total participants were 10.3 ±1.19. Whereas in case of residents and midwife the mean ± SD practice score were 10.3± 1.19 and 10.58 ±1.2 respectively.

Ninety-one of participants (95% CI,69.4-85.3) had sufficient skill about essential new bore care and based on profession, more than two third 70(80.7%) of residents, and 21(80.8%) of midwives had sufficient skill toward essential new borne care. Whereas practice level by year of residency, 15(88.2%) of year four residents had sufficient skill towards essential new bore care,12(80%) and 20(78%) year three and years two respectively (Table 3).

Table 3: Practice score and level of residents and midwife on essential newborn care, in TASH October 2022

| Population characteristics | | N | Mean | Std. Deviation | Insufficient Skill | Sufficient Skill | P value |
|---|---|---|---|---|---|---|---|
| Total population | | 114.00 | 10.39 | 1.19 | | | |
| Profession | Gynecology/ obstetrics resident | 10.33 | 1.19 | 88.00 | 20(22.7%) | 70(80.7%) | |
| | Midwife | 10.58 | 1.21 | 26.00 | 5(19.2%) | 21(80.8%) | |
| Year of residency | year 1 | 10.47 | 1.36 | 30.00 | 7(23.3%) | 23(76.7%) | 0.60 |
| | year 2 | 10.50 | 1.14 | 26.00 | 6(22%) | 20(78%) | |
| | year 3 | 9.93 | 1.28 | 15.00 | 3(20%) | 12(80%) | |
| | year 4 | 11.18 | 1.21 | 17.00 | 2(11.8%) | 15(88.2%) | |

**Factors associated with knowledge among midwives and Gynecology/obstetrics residents towards essential newborn care**

Profession, year of residency, total work experience, working experience at NICU, and training was analyzed first by bivariable analysis. Since two of the variables, profession and total work of experience, have zero response on their categories only two variables with P-values less than 0.25 were integrated in a multivariable logistic regression model. The odds of good knowledge towards ENC were 96.3% lower in-year one residents as compared to year four (AOR= 0.084; 95% CI: 0.002 – 0.35; p-value: 0.009). The odds of good knowledge towards ENC were 90.5% lower in-year two residents as compared to year four (AOR= 0.164; 95% CI: 0.042 – 0.63, p-value: 0.018). The odds of good knowledge were towards ENC 84 % lower in untrained participants as compared to trained participants (AOR= 0.16; 95% CI: 0.038 – 0.68, p-value: 0.013) (Table 4).

Table 4: Bivariable and Multivariable logistic regression analysis results of factors associated with knowledge level of residents and midwife on essential newborn care in TASH October 2022

| Population characteristics | | Knowledge level | | COR | AOR |
|---|---|---|---|---|---|
| | | Poor | Good | | |
| Year of residency | year 1 | 26(86.7%) | 4(13.3%) | 0.084(0.020-0.35) | 0.037(0.003-0.43) |
| | year 2 | 20(76.6%) | 6(23.1%) | 0.164(0.042-0.631) | 0.095(0.014-0.66) |
| | year 3 | 8(53.3%) | 7(46.7%) | 0.47(0.115-1.97) | 0.44(0.09-2.1) |
| | year 4 | 6(35.3% | 11(64.7%) | 1.00 | 1.00 |
| NICU working experience | less than 1 year | 24(80%) | 6(20%) | 2(0.2-19.2) | 2(0.2-19.2) |
| | 1 to 2 years | 31(83.8%) | 6(16.2%) | 1.5(0.16-14.7) | 1.5(0.16-14.7) |
| | 3 to 4 years | 23(60.5%) | 15(39.5%) | 5.2(0.5-46.0) | 5.2(0.5-46.0) |
| | above 5 years | 8(88.9%) | 1(11.1%) | 1.00 | 1.00 |
| Training | Yes | 41(64.1%) | 23(35.9%) | 1.00 | 1.00 |
| | No | 45(90%) | 5(10%) | 0.19(0.06-0.56) | 0.16(0.038-0.68) |

**Factors associated with essential newborn care practice among midwives and Gynecology/obstetrics residents towards essential newborn care**

Practice level was independent of factors like profession(P=0.7), year of residency(P=0.6), work experience(P=0.5), working in neonatal ICU(NICU)(P=0.9), training(P=0.16) and knowledge level(P=0.13).

Table 5: Bivariable analysis results of factors associated with practice level of residents and midwife on essential newborn care in TASH October 2022.

| Variables | | Practice level | | P-value |
|---|---|---|---|---|
| | | insufficient Skill | Sufficient Skill | |
| Year of residency | year 1 | 7(23.3%) | 23(76.7%) | 0.6 |
| | year 2 | 4(15.4%) | 22(84.6%) | |
| | year 3 | 5(33.3%) | 10(66.7%) | |
| | year 4 | 4(23.5%) | 13(76.5%) | |
| Work experience | less than 1 year | 3(25%) | 9(75%) | 0.5 |
| | 1 to 2 years | 5(13.5%) | 32(86.5%) | |
| | 3 to 4 years | 13(27.1%) | 35(72.9%) | |
| | above 5 years | 4(23.5%) | 13(76.5%) | |
| NICU Work experience | less than 1 year | 6(20.%) | 24(80%) | 0.9 |
| | 1 to 2 years | 8(21.6%) | 29(78.4%) | |
| | 3 to 4 years | 9(23.7%) | 29(76.3%) | |
| | above 5 years | 2(22.2%) | 7(77.8%) | |
| Training | Yes | 11(17.2%) | 53(82.8%) | 0.16 |
| | No | 14(28%) | 36(72%) | |
| Knowledge level | poor Knowledge | 16(18.6%) | 70(81.4%) | 0.13 |
| | Good knowledge | 9(32.1%) | 19(67.9%) | |

## Discussion

The proportion of residents and midwives who had good knowledge about essential newborn care were 24.2 %.This finding was lower than 38.2 % in Bench Sheko (11)**,** 57.9% in Wolaita, 74.7% in Tigray (12)(13), 53.8% in Afar (14), 47.8% in Jima zone (15) Ethiopia, and 56.2% in Ekiti, Nigeria (17)**,**65.1% in Rwanda(18),46.5% in Uganda (19)**,**30% in Pakistan (20). This finding is unexpected as health care professionals working in our study setting have better access to better training and educational material.

The amount of health care professionals having good practices on ENC was 80.7%. Regarding practice level by profession, more than two third 70(80.7 %) of residents, and 21 (80.8%) of midwives had sufficient skill toward essential new borne care. The finding was reasonably higher than 61.8%in Bench Sheko (11),62.7% in Afar (14),51.1% in the Jima zone, Ethiopia (15) and slightly higher than 72.8% in the Tigray, Ethiopia (12), 62.9% in Nigeria (17). This could be attributed to the large amount of patient pool in our study setting giving the healthcare professional more access to improve skill and practice.

Furthermore, the detected incongruity can be attributed to the different operational definitions used (this study takes a threshold of 80 % to dichotomize knowledge and practice of study participants, but the other studies took

mean score value). Moreover, our study participants included Midwives and Gynecolo-obstetrics residents who are primary health workers that give essential newborn care, while others use all health professionals and some others selectively included only midwives and nurses. This can potentially cause a difference in the results of the study since we can expect more accurate replies from midwives and residents compared to different professionals as a result contact with such an intervention. The sample size also has significant difference from other studies.

Regarding factor associated with knowledge variables such as: Profession, Year of residency, working experience, working experience at NICU, and training were used. The result of the multivariable analysis revealed being year one and year two resident as well as Training were significantly associated with knowledge level.

The odds of good knowledge towards ENC were 96.3% lower in-year one residents as compared to year four. The odds of good knowledge towards ENC were 90.5% lower in -year two residents as compared to year four. This indicates that year of clinical practice influences the level knowledge on essential newborn care. The finding was supported by similar studies conducted in Jimma Zone, Bench Sheko and Tigray region, Ethiopia (11,12,15). This can be attributed to the acquisition of progressive knowledge throughout training.

On-the-job training was statistically associated with good knowledge among residents and midwives toward ENC. The odds of good knowledge were 84 % lower in untrained as compared to. This finding is supported by a similar study conducted in Bench Sheko and Jimma, Ethiopia (11, 15). This result shows us that continuous updates and on the job trainings are required to have good quality ENC in an institution.

Practice level was independent of factors like profession (P=0.7), year of residency (P=0.6) ,work experience (P=0.5),working in neonatal ICU(NICU)(P=0.9),training(P=0.16) and knowledge level (P=0.13) unlike the study in Bench Sheko that showed better educational qualification (AOR = 4.12, 95% CI [1.67, 10.18]) and the availability of on-the-job training (AOR = 3.60, 95% CI [1.58, 8.18]) were the factors associated with good practice of ENC (11). The finding on ENC practice in our setting can be attributed to the large pool of patients in the setting and that lower level professionals usually learn their practice from senior personal without a full understanding of the reason behind the performed procedure.

**Limitations**

As a result of the cross-sectional nature of the study temporal and cause-effect relationships were not identified, and the study was not considering other institutions in Addis Ababa. The fact that the study includes two different professions can be taken as a potential limitation in this study. However, the study tried to account for this by analyzing this subgroup separately. Furthermore, multiple other studies

have used the same multi-professional approach with good outcome.

## Conclusion

A significant number of health care professionals lacked essential newborn care knowledge and practice. In this study, the factors influencing the essential newborn care knowledge level of midwives and Gyn/Obs residents were the availability of on-the-job training and profession (being a resident or midwife). Hence, providing in-service training, supportive supervision, and supplies should be strengthened to improve essential newborn care activities. Based on the findings, we recommend strengthening and refreshment of in-service training on immediate newborn care at a regular interval. Follow up assessment, providing health institutions the national guideline of newborn care could also have a paramount importance. Moreover, necessary materials to provide immediate newborn care need to be available. It is also essential to create a space to sharing experience between Hospital staffs and health center staffs working on newborn care through mentoring.

## Declarations

### Ethical consideration

An ethical clearance and official letter were obtained from the Department of Research and Publication Committee of Addis Ababa university, Department of pediatric and child health. After getting permission from the hospitals to participate in the study, written consent was obtained from each Gynecology/ obstetrics residents and midwife. Confidentiality was maintained at all levels of the study, and the collected information was kept in a secured place.

### Authors contribution

All three authors were actively involved in the study from research idea conception to write up of the manuscript.

### Competing Interest

The authors assert that the manuscript was accepted by all authors in its present state and no competing interest exists.

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