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# Assessment of Factors Associated with Practice and Knowledge of Essential Newborn Care Among Nurse and Midwives in Assosa Zone Governmental Health Facilities, Western Ethiopia

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## Abstract

**Introduction:** *Promoting basic newborn care skills and practices is a cost-effective approach to improving newborn health outcomes. Therefore, this study aimed to assess the essence of the essential knowledge about newborn care, practices and related factors among nurse and midwives in western Ethiopia.*

**Objective:** *This study intended to assess factors associated with Practice and knowledge of Essential newborn care.*

**Methods:** *Institutional based cross-sectional study design was conducted. A Convenient sampling technique was applied. Data was collected by interviewer administered structured questionnaires.*

**Data Processing and Analysis:** *The collected data was entered into Epi data 3.1version and analyzed by using SPSS version 26. The strength of association between independent and dependent variables was measured by odd ratios with 95% CI at p-value of < 0.05.*

**Result:** *98% nurses and midwives w. Mean value of good knowledge and good practice of essential newborn care were 61.7% [95% CI (56.4, 69.8)] and 41.5% [95% CI (38.3, 48.5)] respectively. Being trained, educational qualification, availability of newborn care materials and work experience were significantly associated with knowledge practice of essential newborn care.*

**Conclusion:** *This study identified that knowledge of essential newborn care was average among Nurse and Midwifes; however, the practice of essential newborn care was very low compared to other studies in Ethiopia. Therefore factors identified; in service training, improving educational qualification and increasing accessibility of new born care materials at all facility level are interventional areas to bring required knowledge and practice of Essential new born care.*

**Keywords:** Essential Newborn care, knowledge, Practice, Nurse and Midwives, Ethiopia

## Introduction

The transition from intrauterine to extra uterine life is dramatic and requires significant and effective physiological changes by the baby to ensure survival [1]. Not only the time of birth, but also the first hour after birth has a major impact on the survival, future health and well-being of a newborn. Health workers play an important role at the time of birth, and care during this time is critical to avoid complications and ensure survival [2]. Only qualified care during labor and delivery with immediate complication management can prevent around 50% of newborn mortality and 45% of intra-partum stillbirths [3].

The Essential Newborn Care Protocol is a set of time-bound, chronologically ordered standard procedures that a baby receives at birth to improve the health of newborns through interventions before conception, during pregnancy, during and shortly after birth, and in the postnatal period improve [4]. There are four heart of the protocol of ENC ;which are  time bound interventions: immediate drying, skin-to-skin contact, followed by disconnecting the umbilical cord after 1 to 3 minutes, not separating the baby from the mother, and starting breastfeeding [5].

Essential newborn care has standardized and effective procedural steps: drying and stimulating, assessing breathing, umbilical cord care, keeping the newborn warm (preventing hypothermia), initiating breastfeeding within the first hour, administering eye drops / eye ointment, administering vitamin K intramuscularly, newborn identification straps, weighing the newborn, when stable and warm, record all observations and treatments, postpone bathing the baby for 24 hours after birth [6]. Combined with adequate knowledge and practice of neonatal care in all healthcare facilities in the postnatal period, 75% of neonatal mortality, as well as thousands of stillbirths and maternal mortality, can be prevented. Therefore, WHO recommends basic neonatal care measures that should be given to all newborns at birth to protect against neonatal morbidity and mortality [7].

Every day  Globally; Nearly 7,000 newborns die, accounting for nearly half of all deaths in children under five; But the mild neonatal death rate (NMR) was halved from 36.6 deaths per 1,000 live births in 1990 to 18 deaths per 1,000 live births in 2017 [8].

A child born in sub-Saharan Africa or South Asia is ten times more likely to die in the first month of life than a child born in high-income countries [9]. In sub-Saharan Africa, central and southern Asia, around 27 and 24 newborns died for every 1,000 live births. Consequently , over 60 countries are expected to accelerate their progress towards achieving the SDGs (Sustainable Development Goals) on newborn mortality by 2030 [10]. Ensuring healthy living and promoting well-being for all age groups ending the preventable death of newborns and children under 5 years of age were a direct proposition for SDG 3[11].

Many newborn deaths could be saved with due care at birth and in the early neonatal period. Simple interventions to improve health care facilities - for example, improvement measures to help newborns to breathe during birth - have led to a reduction in newborn mortality in Tanzania [12]. According to reports from the Ethiopian Demographic and Health Survey (EDHS), the newborn death rate has not decreased significantly since 2011 and remains at around 30 newborn deaths per 1,000 live births; 37 in 2011, 29 in 2014 and 30 in 2016 and 33 in 2019 [13-15]. Most neonatal deaths occur in the first week of life and 93% of NMR cases are caused by asphyxiation at birth (34%), neonatal infections (31%), and premature birth; Delay in seeking out-of-home treatment (delay) was associated with 81% of deaths. Health care facility delays (Delay 3) and transportation delays (Delay 2) were associated with 16% and 3% of deaths, respectively [16 17].

Therefore, the aim of this study was to assess knowledge and practical skill of essential newborn care and associated factors among nurses and midwives in Assosa zone, western Ethiopia.

## Objectives
1. To assess knowledge status practice of Nurses and Midwiferys regarding to essential new born care.
2. To identify factors associated with practice of Nurses and midwifes towards essential newborn care.
3. To identify factors associated with knowledge of Nurses and midwifes towards essential newborn care.

## Methodology
### Study Area and Period
The study was conducted in Assosa Zone governmental health facilities from April to august 2021 in western Ethiopia. Assosa zone is bordered, by Begi town Oromia region in the south, in the west by Sudan. Based on the 2007 Census conducted by the Central Statistical Agency of Ethiopia (CSA), this Zone has a total population of 310,822, of whom 158,932 are men and 151,890 were women. 39,957 or 12.86% of population are urban inhabitants. In this Zone there are two Hospitals and 16 Health centers. A total of 72,879 households were counted in this Zone, which results in an average of 4.27 persons to a household, and 69,378 housing units.

### Study Design
Facility based cross-sectional study design was conducted in selected governmental health facilities of Assosa Zone a. Western Ethiopia.

### Population
Source Population: The source population is all nurses and midwives who were working in governmental Health facilities of Assosa Zone Western Ethiopia.

### Study Population
The study population was those Nurses and Midwifes who were engaged in Essential newborn care service provision in Assosa Zone selected governmental health facilities during the data collection period.

### Inclusion and Exclusion Criteria
Inclusion Criteria
Nurses and midwives fulfilling the following criteria were included in the study:
• All midwives and nurses who were working in delivery room, neonatal intensive care unit and immediate post natal care of selected health facilities.

### Exclusion Criteria
• Some nurses and midwives were excluded from the study because of the following:
• Health care providers who didn't provide immediate newborn care for more than three months were excluded from the study.
• Those who were on annual leave.

### Sample Size Determination
Since all nurses and midwives working in Assosa town governmental health facility were taken as sampling size, the sample size was all the number of study population which was 272. All 272 nurses and Midwives health care providers were enrolled in the study to increase representativeness of the sample.

## Sampling Procedures

The maximum effort was applied to ensure that all the nurses and midwives involved in Essential newborn care provision during the study period to be interviewed. The data collection was conducted during working hours also data collectors tried to reach to health facilities as early as possible to make possible arrangements for par timer workers.

## Procedure

Data was collected by interviewer administered structured and pretested questionnaires. The questionnaires had four parts: part one socio-demographic characteristics, part two: personal and institutional factors, part three was knowledge of essential newborn car and part four was practice of essential new born care. The questionnaires had close ended questions and participants were given explanation to complete the necessary information by themselves. Four Bsc holders nurse and midwife were recruited for data collection. Overall, the data collection procedure was coordinated and supervised by the principal investigator.

## Study Variables

**Dependent Variables**
Knowledge of Essential new born care
Practice of Essential new born care.

**Independent Variables**
Socio-demographic and personal institutional factors and individual related factors

## Operational Definition

**Good knowledge:** those health care providers who correctly answer at least half of the knowledge questions are categorized as having satisfactory knowledge [18].

## Poor Knowledge

If the health care provider answers the knowledge questions below mean score of knowledge questions [19].

## Good practice

Is when the health care providers perform more than or equal to 70% the practice procedures [20].

**Poor Practice:** If the health care providers perform less than 70% of the practice techniques [19].

## Data Quality Control

Data collectors have been trained on the study objective and the methods of data collection. The English version of the questionnaire was created and translated into the Tigrigna version (local language). The tool was pre-tested on five percent of the sample size at Assosa Hospital Assosa town. The supervisor and principal investigator performed continuous follow-up and monitoring to ensure the completeness and consistency of the data.

## Data Processing and Analysis

The Epi Data Manager was used to clean and enter data and then exported to SPSS version 26.0 for analysis. The knowledge questions were calculated and rated with 1 and 0 and dichotomized into good and bad knowledge. The practice of essential new born care answers on a 13-point scale: 0 = never,1 = some new born care was taken into account by assigning values to Likert scale and dichotomized into 1 and 0 based on the summed value of 70% score as the cut-off point. A binary logistic regression model was used to test the statistical relationship between the outcome variable with p-value 0.2 were entered into binary logistic regressive and independent variables. The goodness of fit of the model was checked by the Hosmerlemshow test. Finally, the statistical significance was declared with a p-value <0.05.

## Research Dissemination and Presentation

The research finding was presented to Assosa university department of public health. The hard copy was given to Assosa University College of health sciences, department of public health officer.

## Result

**Socio demographic and institutional characteristics of the participants**

In this study, 267 participant complete the interview which makes 98% of the response rate and the rest percent where left after many visit to get them. The largest proportion, 220 (82.3%) of the respondents were between the ages of 20 and 35 years. One hundred eighty nine (69.6%) were orthodox and 107 (40%) were a degree holder, 107 (41 %) were midwifery profession (50.3%). One hundred seven (40 %) of participants were trained about newborn care entirely. One hundred seventy two (64.5%) of health professionals had equipment's for immediate newborn care. One hundred eight four (69%) of the study participants had enough drugs and vaccines for caring the newborns (see Table 1).

**Table 1: Socio-demographic and institutional characteristics of the participants.**

| Variable | Frequency | Percentage |
|---|---|---|
| Age | | |
| 1. 20–35 | 220 | 82.3 |
| 2. 36–46 | 40 | 14.2 |
| 3. > 46 | 7 | 3.5 |
| Sex | | |
| 1. Male | 121 | 45.5 |
| 2. Female | 146 | 54.5 |
| Religion | | |
| 1. Orthodox | 189 | 69.6 |

| | | |
|---|---|---|
| 2. Muslim | 72 | 27 |
| 3.Others | 6 | 3.5 |
| Educational status | | |
| 1. Degree | 107 | 40 |
| 2. Diploma | 160 | 60 |
| Marital status | | |
| 1. Married | 126 | 47 |
| 2. Single | 136 | 51 |
| 3. Divorced | 5 | 2 |
| Field of study | | |
| 1. Nurse | 158 | 59 |
| 2. Midwifery | 109 | 41 |
| Monthly salary | | |
| 1. 2. 2500–3114 | 91 | 34 |
| 2. 2214–4446 | 09 | 41 |
| 3. > 4446 | 178 | 24 |
| Working experience (in the year) | | |
| 1. 0–2 years | 115 | 43 |
| 2. 2–4 years | 88 | 33 |
| 3. > 4 years | 56 | 21 |
| Workload | | |
| 1. Yes | 227 | 85 |
| 2. No | 40 | 15 |
| Training on immediate newborn care | | |
| 1. Yes | 105 | 39 |
| 2. No | 162 | 61 |
| Availability of equipments | | |
| 1. Yes | 172 | 64.5 |
| 2. No | 95 | 35.5 |
| Availability of drugs and vaccines. | | |
| 1. Yes | 184 | 69 |
| 2. No | 83 | 31 |

## Knowledge of Essential newborn care services

This study reports that; the overall mean score of participants had good knowledge of newborn care was 61.7% [95 CI (56.4, 69.8)]. One hundred seventy five (65.5%) of participants started newborn care immediately after birth. One hundred thirty five (50.5%) of the participants used skin to skin contact to prevent hypothermia. About 199 (74.6%) of the respondents' used a bag and mask for ventilation. Concerning the breastfeeding, about 196 (73.4%) of the participants reported that breastfeeding should be initiated within the first hour of birth. Eighty nine (33.2%) of study participants agreed on the umbilical cord should tie 2–3 min of delivery/after pulsation stop. One hundred eighty five (69.2%) used sterile Scissor to cut the umbilical cord. (SD = ± 3.68)(See Figure 1).
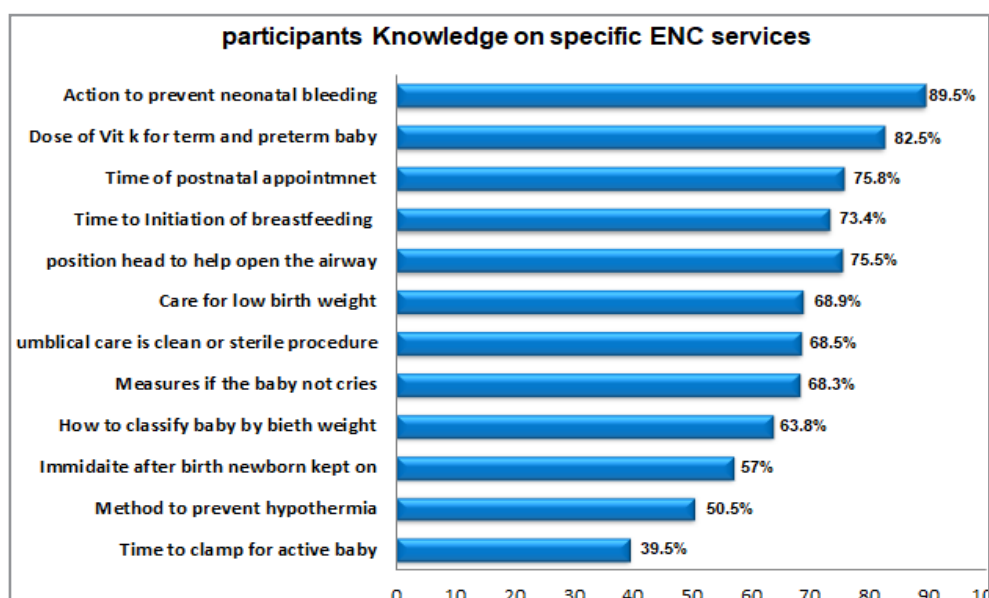
**Figure 1:** Knowledge of the participants on specific ENC components by correct answer

## Practice of Nurse and midwives on essential newborn care

Regards to Essential newborn care practices, 179 (67%) of our study participants washed their hand before the procedure. The mean score of good of practice essential new born care was found to be 41.5 percent with 41.5% [95% CI (38.3, 48.5)]. One hundred thirty-four (74.9%) used a sterile glove, 181 (67.8%) used an apron, and 211 (79%) used a mask during the procedure of newborn care practice. One hundred eighty eight (70.4%) of the study participants wiped eye & face immediately after delivery. One hundred fifty (83.8%) dried the baby immediately with a dry towel. About 223 (83.6%) study participants performed skin-to-skin contact with the caregiver of the newborn. Two hundred thirty six (88.4%) of the participants were counseled mother about danger sign of newborns before discharge (See Table 2)

**Table 2: Practice of Nurse and Midwives**

| Variable | Frequency | Percentage |
|---|---|---|
| Hand washing before procedure | | |
| 1. No, never | 88 | 33.1 |
| 2. Yes, performed | 179 | 66.9 |
| Put on sterile glove | | |
| 1. No, never | 78 | 29.3 |
| 2. Yes, performed | 134 | 70.7 |
| Wearing apron | | |
| 1. No, never | 86 | 32.3 |
| 2. Yes, performed | 181 | 67.7 |
| Wearing mask | | |
| 1. No, never | 56 | 21 |
| 2. Yes, performed | 211 | 79 |
| Wipe the eye &face when the head is delivered | | |
| 1. No, never | 79 | 188 |
| 2. Yes, performed | 29.6 | 70.4 |
| Dry the baby immediately with dry towel | | |
| 1. No, never | 49 | 18.5 |
| 2. Yes, performed | 218 | 81.5 |
| Check & sucks the airway after delivery | | |
| 1. No, never | 52 | 19.6 |

| 2. Yes, performed | 215 | 80.4 |
|---|---|---|
| **Take APGAR score** | | |
| 1. No, never | 76 | 28.4 |
| 2. Yes, performed | 191 | 71.6 |
| **Administer Vit K** | | |
| 1. No, never | 58 | 209 |
| 2. Yes, performed | 21.7 | 78.3 |
| **Give eye ointment** | | |
| 1. No, never | 53 | 19.8 |
| 2. Yes, performed | 214 | 80.2 |
| **Counsel mother about newborn danger sign before discharge** | | |
| 1. No, never | 31 | 11.6 |
| 2. Yes, performed | 236 | 88.4 |
| **Weigh & record the baby's weight** | | |
| 1. No, never | 49 | 18.5 |
| 2. Yes, performed | 218 | 81.5 |
| **Skin to skin contact** | | |
| 1. No, never | 223 | 83.6 |
| 2. Yes, performed | 44 | 16.4 |

## Factors associated with knowledge and practice of ENC

In order to identify factors associated with knowledge of ENC, logistic regression forward method was used with 95% CI and p-value < 5%, variables those have association in bivariate logistic regression were entered to multivariate logistic regression and final independent predictors of ENC were identified. Availability of newborn care equipments being trained on ENC and educational status were found to have significant association with participants' of knowledge of essential newborn care.

Factors significantly associated with essential new born care knowledge were; training on essential newborn care [AOR (95%CI ) ; 3.65(3.61, 4.07)],educational level [AOR (95%CI ) ; 2,27(2.18, 2.68)] and Availability of knowledge of ENC [AOR (95%CI ) ;2.25(2.08,3.46)] as well as practice of essential new born care was significantly associated with two factors : availability of drugs [AOR (95%CI ) ; 2.04(1.85, 2.43)] and being trained on essential new born care [AOR (95%CI ) ; 4.83(4.36,5.07)](See Table 3).

**Table 3: Factors associated with knowledge of Essential new born care**

| Variables | | Knowledge of ENC | | COR (95% CI) | AOR (95% CI) | P-Val |
|---|---|---|---|---|---|---|
| | | **Good** | **poor** | | | |
| Trained on ENC | Yes | 68 | 37 | 3.29(2.832,3.45) | 3.65(3.61,4.07) | 0.023 |
| | No | 58 | 104 | 1 | 1 | |
| Educational status | Degree | 65 | 42 | 2.04(1.72,2.45) | 2.27(2.18,2.68) | 0.034 |
| | Diploma | 69 | 91 | 1 | 1 | |
| Availability of ENC Materials | Yes | 113 | 60 | 1.52(1.22, 2.12) | 2.25(2.08,3.46) | 0.002 |
| | No | 52 | 42 | 1 | 1 | |
| Variables | | Practice of ENC. | | COR (95% CI) | AOR (95% CI) | P-Val |
| | | **Good** | **poor** | | | |
| Work experience | <5 years | 131 | 80 | 0.36 (0.31, 0.44) | 0.45(0.32,0.52) | 0.015 |
| | >5 years | 46 | 10 | 1 | 1 | |
| Work load | Yes | 116 | 111 | 0.56(0.44, 0.86) | 0.87(0.64,1.67) | 0.056 |
| | No | 21 | 19 | 1 | 1 | |
| Trained on ENC | Yes | 71 | 34 | 3.46(3.12, 3.52) | 4.83(4.36,5.07) | 0.001 |
| | No | 61 | 101 | 1 | 1 | |

## Discussion

The first hours after birth are the critical phase in an infant's life for further growth and development, which is largely, depends on the quality essential new born of care given. In this study the overall knowledge score of essential new born was 61.7% at 95% CI (56.4, 69.8)] which is in line with the Study conducted in Wolaita zone southern Ethiopia in which knowledge score of ENC was 57.9 % [21] and in Bahirdar 56% [22]. But this finding was higher than the study conducted in Bamako in Mali 54% and in Masindi Uganda was 46.5%[23,24] .However our finding is less than the study conducted in India was 76% and in Tigray was 74.6% [25,26].The discrepancy could be due to the difference in in-service training, difference of educational level of study participants and study setting.

Overall, it was found that the average good practice score was the basic neonatal care 41.5% at 95% CI (38.3, 48.5). This finding is relatively lower than what it should be as Ethiopian expectation strategic plan. Our finding is nearly similar to a study conducted in Gurage zone Southwest of Ethiopia (41%) and Nekemt city 44.1%, western Ethiopia. However less than the study done in Afar North East Ethiopia in which good practice of ENC is 62.7% and in Tigray Northwestern Ethiopia 59.8% [27-30]. These differences could largely due to the different educational levels of participants and access to essential neonatal care training for healthcare providers.

In this study' training on essential new born care brought significant change of essential newborn care knowledge; in which those trained nurse and midwives were three times more likely knowledgeable than their counterparts. This finding is consistent with the study conducted in West Guji, Ethiopia in on those service trained had more knowledge of essential newborn care than untrained health care providers and the study conducted in Afar North East Ethiopia[31,32].

Another factor significantly associated in multiple logistic regression was educational qualification. Those degree holders; health care providers in our study were 2.27 times more likely have knowledgeable of Essential newborn care than diploma holders of health care providers. This find is supported by the study conducted in Jimma Zone, Ethiopia in which diploma holders of health care providers were 70% less likely had knowledge of Essential new born care [33].

The availability of drugs for ENC was also significant factors for knowledge of Essential new born care in which the health care providers those who were working in faculty with availability drugs for ENC were 2.25 time more likely have knowledge of essential newborn care than those responded no availability of drugs for ENC in the facility where they were working. This result is supported by the study conducted in Northern Ethiopia in Tigray region and the study done in Nigeria [3,35].

In regards to the factors associated with practice of ENC among Nurse and Midwives; work experience was significantly associated with practice of essential newborn care in which those health care providers' works less than five years were 64 % less likely have good practice of essential newborn care services. This outcome is supported by the study done in west Guji, Oromia region Ethiopia in which working more than three years was associate with good practice of essential newborn care similarly supported by the study done in Bossaso, Somalia[31,36].

## Limitations

Limitations in the present study include the use of a consecutive sample, which precludes external generalization of the study results. Results were based on self-reports and may not be as objective as actual observation of the practices. Finally, the study did not examine the influence of culture, in which case a qualitative approach would have been desirable. This could be priority area of future research.

## Conclusion

The knowledge of essential newborn care was somewhat average among Nurse and Midwifes; however, the practice of essential newborn care was very low compared to other studies in Ethiopia. On-the-job training, Availability ENC materials and educational qualification were the factors associated with a good knowledge of ENC; while Working experience and the availability of on-the-job training were the factors associated with a good practice of Essential newborn care. Therefore, concerned bodies should consider the provision of refreshment on-the job training, upgrading the qualification of health professionals, and providing incentives and motivators to improve interest in working in the delivery room.

## Recommendations:

Based on the study results; forwarded the following recommendations to the respective institutions and bodies:-

- Promote regular training for healthcare professionals on immediate neonatal care for government and nongovernmental health organizations. forwarded the following recommendations to the respective institutions and bodies.
- To improve the educational status of health professionals who provide immediate neonatal care for the regional health department.
- Incentivize health care facility managers to those with good knowledge and experience of postpartum care.
- The curriculum for the student should include all of the steps outlined for the Immediate Baby for the College of Medicine and Health Science.
- Further in-depth study of knowledge and practice of health professionals is required.

## Declaration

### Abbreviations

OR: odds ratio; CI: confidence interval, SNNPR: Southern Nations Nationalities and People Region; WHO: World Health Organization, ENC:-Essential new born care.

### Authors' contributions

HD conceived the research idea and prepared the proposal, analyzed data and sent the manuscript.

DB and BK approved the proposal with some revisions, participated in data analysis, and reviewed the manuscript.

MD participate in designing and analyzing the data

All authors approved the final draft of the manuscript.

All the authors read and approved the final manuscript.

## Availability of Data and Materials
The datasets used and/or analyzed during the current study available from the corresponding author on reasonable request.

## Ethics Approval
Ethical clearance was obtained from the Institutional Review Board of Assosa University. Permission letter was obtained from the Benishangul Gumuz regional educational bureau.

Name of Ethical review board: Assosa University institutional research Ethical review Board.

Ethical review was approved under reference number ASU/IRB/008/14

## Consent to Participate
Verbal informed consent which is approved is dictated

## Consent for Publication
Not applicable for this section.

## Competing Interests
All authors declare that they have no competing interests.

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