

Quality of Essential Newborn Care Provision and Associated Factors in Western Ethiopia

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Abstract: *Background:* Improving essential newborn care knowledge and quality of the services are a cost-effective approach to increase newborn survival. *Objective:* This study intended to assess factors associated with knowledge and quality of essential newborn care provision in western Ethiopia among nurses and midwives *Methods:* Institutional based cross-sectional study design was conducted. Data was collected by interviewer-administered structured questionnaires, entered by Epi-data 3.1 version, 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 the p-value of < 0.05. *Result and Conclusion:* The Mean value of good score of essential newborn care provision was 41.5% with [95% CI (38.3, 48.5)]. Training, educational qualification, availability of newborn care materials, and work experience were significantly associated with knowledge and provision of essential newborn care. Since the quality score of essential newborn care is low compared to other studies in Ethiopia, the interventional area should be focused on newborn care providers' capacity building and increased equipment availability for essential newborn care provision.

Keywords: Essential Newborn Care, Quality, Knowledge, Provision, Ethiopia

1. Background

The change from intrauterine to extrauterine life is dramatic and requires significant and effective physiological changes by the baby to ensure survival [1]. 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 competent care provider during labor and delivery with immediate complication management can prevent around 50% of newborn mortality and 45% of intra-partum stillbirths [3].

Essential Newborn Care 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 core activities of the protocol of ENC;

which are time bound actions: 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 quality of essential neonatal care service in all healthcare facilities, 75% of neonatal mortality, as well as thousands of stillbirths and maternal mortality, can be prevented. Therefore, WHO recommends basic quality of essential newborn care should

be given to all newborns at birth to protect against neonatal morbidity and mortality [7].

Globally Every day; 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 and 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 was a direct intention 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. These all causes of neonatal morbidity and mortality can be averted by provision of quality essential newborn care services [16, 17].

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

2. Objectives

- 1) To determine knowledge status of essential new born care provision among Nurse and Midwives in western Ethiopia, 2021.
- 2) To assess quality of essential new born care provision among Nurse and Midwives in western Ethiopia, 2021.
- 3) To identify factors associated with knowledge status and quality of essential new born care provision among Nurse and Midwives in western Ethiopia, 2021.

3. Methodology

3.1. Study Area and Period

The study was conducted from April to August 2021 in western Ethiopia. Based on the 2007 Census conducted by

the Central Statistical Agency of Ethiopia (CSA), the total population of the source population was 310,822, of whom 158,932 are men and 151,890 were women. 39,957 or 12.86% of the population are urban inhabitants. In this Zone, there are two Hospitals and 16 Health centers. A total of 72,879 households were counted, with an average of 4.27 persons per household, and 69,378 housing units.

3.2. Study Design

The facility-based cross-sectional study design was conducted among selected governmental health facilities in Western Ethiopia.

3.3. Source Population

The source population is all nurses and midwives who were working in governmental Health facilities in Assosa zone, Western Ethiopia.

3.4. Study Population

The study population was those Nurses and Midwives who were engaged in Essential newborn care service provision in selected governmental health facilities during the data collection period.

3.5. Selection Criteria

3.5.1. Inclusion Criteria

All Midwives and Nurses who is working in the delivery room, neonatal intensive care unit and immediate post-natal care.

3.5.2. Exclusion Criteria

Health care providers who didn't provide immediate newborn care for more than three months or fresh employed less than three months were excluded from the study. Also those who are on annual leave were excluded.

3.6. Sample Size Determination

Since all nurses and midwives working in a governmental health facility were taken as sampling size, the sample size was all the study population was 272. All 272 nurses and Midwives health care providers were enrolled in the study to increase the representativeness of the sample.

3.7. Sampling Procedures

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

3.8. Data Collection Procedure

Data was collected by interviewer-administered structured and pretested questionnaires. The questionnaires had four parts: part one socio-demographic characteristics, part two: was personal and institutional factors, part three knowledge of

essential newborn care, and part four provision of essential newborn care. Four BSc holders' nurses and midwives were recruited for data collection. Overall, the data collection procedure was coordinated and supervised by the principal investigator.

3.9. Study Variables

3.9.1. Dependent Variable

Knowledge of essential newborn care provision

Quality of essential newborn care provision

3.9.2. Independent Variables

Participants' socio demographic factors, educational qualification, institutional related factors and individual related factors.

3.10. Operational Definition

Good knowledge of ENC provision: Assessed if the health care provider answers above or equal of the mean score of knowledge questions [18].

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

Good Quality of ENC provision: Is when the health care providers perform more than or equal to 70% the provision of essential newborn care procedures [20].

Poor Quality of ENC provision: Assessed when health care providers perform less than 70% of the practice of essential newborn care procedures [19].

3.11. 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 Amharic version (native language). The tool was pre-tested on five percent of the sample size at Assosa general Hospital Assosa. The supervisor and principal investigator performed continuous follow-up and monitoring to ensure the completeness and consistency of the data.

3.12. 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 poor knowledge. The provision of essential newborn care answers on a 13-point scale: 0 = never, 1 = some newborn care was taken into account by assigning values to the liker 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 a p-value of 0.2 and was 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.

4. Result

4.1. Socio-Demographic and Institutional Characteristics of the Participants

In this study, 267 participants complete the interview which makes up 98% of the response rate, and the rest percent were left after many visits 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 degree holders, 107 (41 %) were midwifery professionals (50.3%). One hundred seven (40 %) of participants were trained in newborn care entirely. One hundred seventy-two (64.5%) of the study participants reported availability of equipment for immediate newborn care provision. One hundred eight four (69%) of the study participants had enough drugs and vaccines for caring for the newborns (Table 1).

Table1. Socio-demographic and institutional characteristics of Participants.

Variable (N=267)	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 immediatenewborn 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

4.2. Knowledge of Essential Newborn Care Provision

This study reports that; the overall mean score of participants who 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 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 Scissors to cut the umbilical cord (SD = ± 3.68) (See Figure 1).

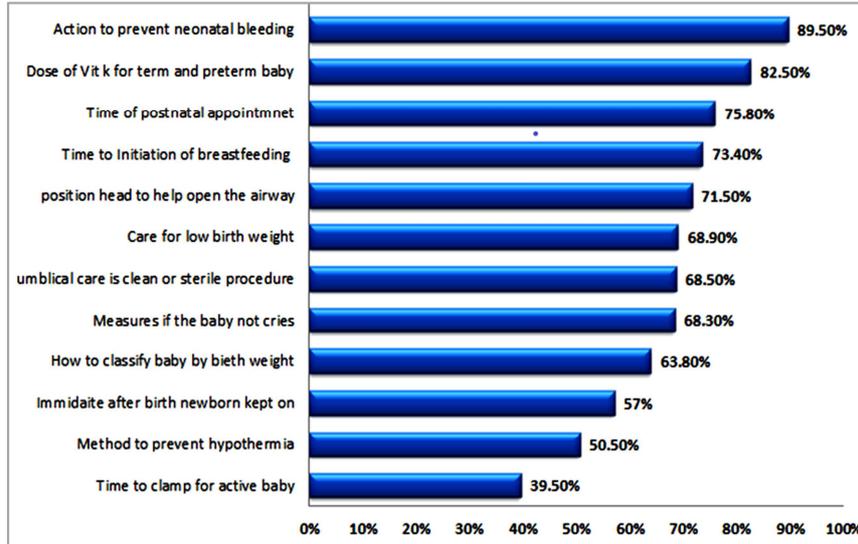


Figure 1. Knowledge of the participants on specific ENC components.

4.3. Components of Essential Newborn Care Service Provision

Regards to Essential newborn care provision, 179 (67%) of our study participants washed their hands before the procedure. The mean score of the good of providing essential newborn 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 their eyes & 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 mothers about the danger signs of newborns before discharge (See Table 2).

Table 2. Provision of Essential newborn care services.

Variable (N=267)	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

Variable (N=267)	Frequency	Percentage
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	29.6
2. Yes, performed	188	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	21.7
2. Yes, performed	209	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

4.4. Factors Associated with Knowledge and Quality of ENC Provision

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

essential newborn care.

Factors significantly associated with essential newborn care knowledge were: training of 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 ENC Equipments [AOR (95%CI); 2.25 (2.08, 3.46)]. The two factors; availability of the drugs [AOR (95%CI); 2.04 (1.85, 2.43)] and being trained on essential newborn care service [AOR (95%CI); 4.83 (4.36, 5.07)] were significantly associated with the quality of essential newborn care provision (See Table 3).

Table 3. Factors associated with knowledge and quality of Essential new born care services.

Variables (N=267)		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			
Educational status	Degree	65	42	2.04 (1.72, 2.45)	2.27 (2.18, 2.68)	0.034
	Diploma	69	91			
Availability of ENC Materials	Yes	113	60	1.52 (1.22, 2.12)	2.25 (2.08, 3.46)	0.002
	No	52	42			
Variables (N=267)		Quality 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			
Work load	Yes	116	111	0.56 (0.44, 0.86)	0.87 (0.64, 1.67)	0.056
	No	21	19			
Trained on ENC	Yes	71	34	3.46 (3.12, 3.52)	4.83 (4.36, 5.07)	0.001
	No	61	101			

5. Discussion

The first hours after birth are the critical phase in an infant's life for further growth and development, which largely, depends on the quality of the essential newborn care given. In this study, the overall knowledge score of the essential newborn 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 the knowledge score of ENC was 57.9% [21] and in Bahirdar 56% [22]. This similarity might be due to the similarity of the participants, study design and sampling techniques. But this finding was higher than the study conducted in Bamako in Mali 54% [23] and in Masindi Uganda was 46.5% [24]. However our finding is less than the study conducted in India was 76% [25] and in Tigray was 74.6% [26]. The discrepancy could be due to the difference service training exposure, difference of educational level among the study participants, the difference in study setting, study period and sample size, and the study settings.

Overall, the mean score for good quality of essential newborn care provision was found to be 41.5% with a 95% CI (38.3, 48.5). This finding is relatively lower than Ethiopian Ministry of health neonatal care strategic plan. Our finding is nearly similar to a study conducted in Gurage zone Southwest of Ethiopia (41%) [27] and Nekemt city 44.1% [28], western Ethiopia. However less than the study done in Afar North East Ethiopia in which good practice of ENC is

62.7% [29] and in Tigray Northwestern Ethiopia 59.8% [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 [31] and the study conducted in Afar North East Ethiopia [32].

Another factor significantly associated in multiple logistic regressions was educational qualification. Those degree holders; health care providers in our study were 2.27 times more likely have good knowledge of essential newborn care than diploma holders of health care providers. This finding is supported by the study conducted in Jimma Zone in Ethiopia, diploma holders of health care providers were 70% less likely had knowledge of Essential new born care services [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 [34] and the study done in Nigeria [35].

In regards to the factors associated with quality of ENC of provision: work experience was significantly associated with provision of essential newborn care in which those health care providers' works less than five years were 64 % less likely have good provision 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 provision of essential newborn care [31] similarly supported by the study done in Bossaso, Somalia region [36]. Being trained on essential newborn care service additionally associated with quality of essential newborn care provision.

6. Limitations of the Study

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.

7. Conclusion

The knowledge of essential newborn care was somewhat average among Nurse and Midwives; 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.

8. Recommendations

Based on the study findings, forwarded the following recommendations to the respective institutions and bodies:

- 1) The regional health bureau should give attention improving the educational status of health care professionals who provide immediate neonatal care for the regional health department.
- 2) Promote regular training for healthcare professionals on immediate neonatal care for government and nongovernmental health organizations.
- 3) Incentivize health care facility managers to those with good knowledge and experience of postpartum care.
- 4) The regional health bureau should increase availability of the equipments for neonatal intensive care unit.

Abbreviations

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

Declaration

Author Contributions

All authors contribute equally in any work to conduct this study.

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 Assosa University Institutional Review Board. Permission letter was obtained from the Benishangul Gumuz regional educational bureau. This review board belongs to Assosa University. Ethical issue was seen and approved under reference number 'ASU/IRB/008/14'.

Ethical Compliance

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and /or national research committee and with the 1994 Helsinki Declaration and its later amendments or comparable ethical standards.

Conflict of Interest

The authors declare that they have no competing interest.

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