

Knowledge of Essential Newborn Care among Nurses and Midwives working in Lideta Subcity Government Health Centers

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Abstract

Background: Neonatal mortality constitutes a major public health problem. Ethiopia has made a great progress on institutionalization of deliveries where deliveries are mainly facilitated by midwives and nurses by providing essential newborn care. Hence, assessing the knowledge of these professionals is a primary concern. Therefore, this study is intended to identify knowledge gap on essential newborn care.

Objective: The objective of this study was to assess the knowledge of essential newborn care and associated factors.

Methods: Facility based cross-sectional study was conducted. All nurses and midwives who provide delivery and neonatal care were involved in the study. Self-administered questionnaires were distributed to participants to collect data and facilitated by data collectors. Data was entered to statistical package for social sciences version 21 and analyzed. Finally, the results were illustrated in the form of text, tables and graphs.

Results: The mean knowledge score of study participants was 12.66. The study revealed that 55% of the respondents had good knowledge of essential newborn care. Field of study was found to have significant association with the knowledge of essential newborn care.

Conclusion and recommendation: The study population had poor knowledge on some aspects of essential newborn care. Field of study was found to be independent predictor of knowledge. Therefore, strengthening and incorporation of all components of essential newborn care in the curriculum was recommended.

Keywords:

Knowledge • Essential newborn care • Midwives • Nurses

Introduction

The immediate neonatal period is the most crucial period for neonatal survival and subsequent well-being. Deliveries should be attended and facilitated by health care providers at the time of birth and after birth by providing essential newborn care [1]. Identification of high risk pregnancies and neonates requiring neonatal resuscitation is critical at this stage in delivery rooms, neonatology units and pediatric intensive care unit to safeguard the health and well-being of neonates. Skilled care during labor and childbirth with

prompt management of complications alone can prevent about 50% of newborn mortality and 45% of intra-partum stillbirths [2, 3]. Although neonatal death is multi-factorial, the most important causes of neonatal deaths are preterm birth, birth asphyxia, sepsis and pneumonia. Every newborn should be considered at a high risk of birth asphyxia since most cases of asphyxia cannot be predicted [3]. Therefore, WHO recommends ENC; is a compressive strategy to improve the health of newborns through interventions before conception, during pregnancy, at and soon after birth and in the postnatal period [4]. The ENC protocol is a series of time bound and chronologically- ordered that a baby receives at birth and it has standardized effective procedural steps: dry and stimulate, evaluate breathing, cord care, keep the newborn warm, initiate breastfeeding within the first one hour, administer eye ointment, administer vitamin K intramuscularly, place the newborn's identification bands, weigh the

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newborn when it is stable and warm, record all observations and treatment provided, delay bathing of the baby for 24 hrs. after birth. As many as two-third of neonatal deaths can be saved with ENC [5]. Newborns are most vulnerable during the first hours and days of life, that is why this critical period should not be missed. Some non-breathing babies with primary apnea will respond to simple stimulation alone, such as drying and rubbing. Basic resuscitation with a bag and mask is required for an estimated 6 million of these babies each year, and is sufficient to resuscitate most neonates with secondary apnea, as their bradycardia primarily results from hypoxemia and respiratory failure. More advanced measures including endo-tracheal intubation, chest compressions and medications are required in <1% of births, and most of these babies require ongoing intensive care which is not available in most low income county settings. Unless newborns receive appropriate basic care, they quickly fall sick and too often they die [6]. Ethiopia is one of the ten countries with the highest number of neonatal deaths globally and neonatal mortality has remained stable around 28 deaths per 1000 live births in recent years. In Ethiopia, the main causes of neonatal deaths were birth asphyxia (31.6%), prematurity (21.8%), and sepsis (18.5%) in 2015 [7, 8]. Promotion of ENC is one strategy for improving newborn health outcomes. This requires health system that provides continuity of care starting from the beginning of pregnancy and continuing through professional skilled care at birth into the postnatal period. But, the standardized procedure for providing ENC is not commonly practiced. Knowledge is one of the most important aspects of health systems to adhere to ENC practices. But, in Ethiopia hospitals health workers' mean knowledge score for immediate newborn care was relatively low [9]. In addition to this gaps, although midwives and nurses are providing primary care during pregnancy, labor, neonatal period and the post-partum period in all health facilities, still there only one study about knowledge of ENC among nurses and midwives in Addis Ababa. Therefore, the main purpose of this study is to identify whether there is knowledge gap on essential newborn care among nurses and midwives.

Methods

Facility based cross-sectional study was conducted in 6 health centers found in Lideta sub city, Addis Ababa, from September 05 to October 25, 2019. To estimate the desired sample size, the following assumptions were made: proportion of knowledge of study participants on ENC was taken as 50% ($p=0.5$), level of significance was considered to be 5% ($\alpha=0.05$), for 95% confidence level ($Z_{\alpha/2}=1.96$) and margin of error tolerated 5% ($d=0.05$). Because the source population is less than 10,000; sample size correction was made to estimate the final sample size and 10% of the sample size added for non-response rate that made the final sample size 126. All qualified diploma and degree nurses and midwives recruited by the government who provide delivery care services at the 6 health centers were included whereas those who did not provide delivery care services within the last six months prior to data collection to the time of data collection were excluded. Data was collected by self-administered structured questionnaire that was adopted from published articles and further modification was based on the Ethiopian Federal Ministry of health newborn care training manual and the interest of the study. The questionnaire was pre-tested on 5% of the sample size at TZNA hospital, a private general hospital found

in kolfe keranio sub city, Addis Ababa. Modification of tools was done prior to actual data collection based on the pretest result. The questionnaire had both closed and open ended questions and participants completed all the necessary information by themselves. Data collectors facilitated data collection process. They waited for each respondent to complete their questionnaire and immediately retrieved after completion. Data collectors were two diploma nurses and two diploma midwives. Supervisor was one medical doctor. Detail training was given for data collectors and supervisor. Daily, supervisor and principal investigator supervised and checked the completeness and quality of data. Incomplete and inconsistent questionnaires were excluded from analysis. Data was coded and entered to SPSS version 21 and analyzed. Each correct alternative under each knowledge question was graded as 1 point and incorrect was graded as [10]. Finally, it was dichotomized as good knowledge and poor knowledge based on the sum of correct responses by taking the median score as cut-off point. Bivariate analysis was done to determine candidates for multivariate analysis. Those variables which have significant association were further analyzed by multivariate Logistic regression to identify the independent predictors of knowledge of ENC. Confidence interval of 95% was used to see the precision of the study and the statistical association was considered as significant if the p-value is less than 0.05. Ethical clearance and approval was obtained from the ethical committee of Addis Ababa University. Official letter was obtained from Lideta sub city health office to each health centers found in the sub-city. Verbal permission was obtained from each health center medical directors. Finally, the data collectors gave detail explanation of the purpose and possible benefit of the study, clarified that participation is voluntary, as well as respect of the subject privacy was ensured, obtained written consent of participants and confidentiality of the data was maintained.

Results

Socio-demographic characteristics

From the total 126 estimated sample, six questionnaires were excluded as a result of incompleteness, making the response rate 95.23%. The analysis was done based on the data collected from 120 participants [11]. Accordingly the largest proportions of the respondents were between the ages of 24 and 30 years and smallest portion found between 40 and 50 years. The participants age ranges from 21 to 50 years with the mean of 29.8 ($SD = \pm 6.50$) years. From the participants 51 (42.5%) were Diploma midwives and nurses. More than half of the study participants had less than six years' experience of delivery care service. Of all the participants 85 (70.8%) were Females. The study revealed that, only 33 (27.5%) of respondents took training on new born care. Among the study participants 21 (17.5%) of them had no interest of working in the delivery room. 92 (76.7%) and 99 (82.5%) of the study subjects responded that all equipment, vaccines and drugs are available at their health facility respectively.

Questions	Category	Frequency	Percent (%)
Gender	Male	35	29.2
	Female	85	70.8

Profession		Nursing	69	57.5
		Midwifery	51	42.5
Experience Years	in	0-5 Years	59	49.2
		6-10 Years	41	34.1
		11-15 Years	6	5
		>15 Years	14	11.7
Interest working Delivery room and maternity ward	of in	Yes	99	82.5
		No	21	17.5
Availability Equipments	of	Yes	92	76.7
		No	28	23.3
Availability Drugs and Vaccines	of and	Yes	99	82.5
		No	21	17.5
On Trainings	Service	Yes	33	27.5
		No	87	72.5

Table 1: Selected socio-demographic, personal and institutional characteristics of nurses and midwives working in public health centers, Lideta Sc, A.A, Ethiopia, September-October, 2019, (n=120).

Knowledge of attending delivery

Regarding knowledge of health care providers about attending delivery 113 (94.2%) and 70 (58.3%) of them responded that it is important to make sure the area for delivery is clean, warm and well lighted and to have an assistant and should review the emergency plan respectively. From the participants 112 (93.3%) of them were found knowledgeable about hand washing and use of sterile gloves while attending delivery and the need to ensure the area for newborn resuscitation is prepared and necessary equipment's (mucus extractor, ambu-bag, correct sized masks for ventilation and pediatric stethoscope) are clean and ready to use for every delivery and the importance of providing emotional support and reassurance for the mother as feasible. 78 (65.5%) of the participants responded that during the Golden minute it is important to help a baby breath if necessary.

Variable	Response	Frequency	Percent (%)
Preparation for a Birth	Identify a helper and review emergency plan	70	58.3
Preparing room for delivery	Make sure the area is clean, warm and well lighted	113	94.2
Delivery Tasks	Tell the woman what is going to be done	1	0.8
	Make sure area for NR is prepared	5	4.2
	Provide emotional support	2	1.7
	All	112	93.3

What should be done during the Golden minute	Help a baby breath necessary if	78	65
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Table 2: Distribution of knowledge of Attending Delivery among nurses and midwives working in public health centers, Lideta Sub city, Addis Ababa, Ethiopia, September-October, 2019, (n=120).

Knowledge of immediate newborn care

Regarding knowledge of immediate new born care 70 (58.3%) of the participants were aware that only those newborns who cry and/or breath well can receive routine care and 104 (86.7) of them know that routine cares involve drying the baby, removing wet clothes and positioning the baby skin-to-skin with the mother. 112 (93.3%) of the participants were found to be aware that the baby should be immediately placed on the mother's abdomen and dried quickly and thoroughly with a warm, dry cloth while simultaneously assessing the baby's crying, color and breathing effort, the umbilicus should be clamped and cut 2-3 minutes later or after pulsations have ceased and apply tetracycline eye ointment to prevent eye infections and IM administration of Vitamin K to prevent bleeding [12]. Regarding techniques of keeping the baby warm and clean 104 (86.7%) of the respondents were aware of placing the baby skin-to-skin with the mother and the need to wash hands before touching the baby and advise mother to wash her hands before breastfeeding. To prevent infection from dirty umbilical cord, only 22 (17.6%) of the study participants were aware of cleaning the cord with soap and water and dry with a sterile bandage and no need to cover. Regarding knowledge of health care providers on options of breastfeeding of the newborn 111 (92.5%) of the participants stated that breastfeeding should be started within one hour of delivery, 96 (80%) of participants stated that exclusive breastfeeding should continue for the next six months.

Variable	Response	Frequency	Percent
Immediate born care	Place on mother's abdomen, dry the baby, cover with warm, dry cloth	1	0.8
	Assess baby's crying, color, breathing	6	5.8
	Clamp and cut cord	1	0.8
	All	112	93.3
Keeping the baby warm and clean	Place hot water bottles next to the baby's skin	2	1.7
	Place the baby skin-to skin with the mother	118	98.3
Baby that can receive routine care	A baby who is not breathing	29	24.2
	A baby who is gasping	19	15.8
	A baby who is crying/ breathing well	70	58.3

	A baby who is limp	2	1.7
Care for dirty umbilical cord	Clean with soap and water and cover bandage with	10	8.3
	Clean with soap and water and do not cover	21	17.5
	Use alcohol to clean	7	5.8
	Clean with sterile water and apply topical antibiotics	81	67.5
Initiation of BF	Within 1hr of delivery	111	92.5
	1-6hr delivery after	3	2.5
	>6 hrs delivery after	4	3.3
	After 24 hrs.	2	1.7
Duration of EBF	< 6 months	14	11.7
	For 6 months	96	80
	> 6 months	8	6.7
	12 months	2	1.7

Table 3: Distribution of Knowledge of Immediate New born care among nurses and midwives working in public health centers, Lideta Sub city, Addis Ababa, Ethiopia, September-October, 2019, (n=120).

Knowledge of newborn resuscitation

According to the study 74 (61.7%) of the study participants were found to be knowledgeable on how to ventilate a newborn using bag and mask to produce gentle movement of the chest and 67 (55.8%) were aware of the need to reapply the mask to get a better seal if the chest is not moving on initiation of ventilation. Regarding the measures to be taken if the baby is not breathing with initial attempt of ventilation 64 (53.3%) of the respondents were aware how to improve the ventilation by repositioning the head, reapply the mask, clear secretions, open the mouth slightly and squeeze the bag harder and to continue ventilation and after wards if the HR is >100, baby is breathing spontaneously and if there is no chest in-drawing and/or grunting the baby can be put in skin-to-skin contact with the mother. 49 (40.8%) of the participants were aware that suctioning a baby unnecessarily might make the baby stop breathing by blocking the airway and 87 (72.5%) of them know that ventilation should be stopped when the baby's heart rate is normal and the baby is breathing well or crying. 70 (58.3%) of the participants choose to keep the baby with the mother after successful ventilation and continue observation. Regarding the post-procedural activities 97 (80.8%) of the responded correctly to place disposable suction catheters and mucus extractors in a leak-proof container; place reusable catheters and mucus extractors in 0.5% chlorine solution for decontamination; clean and decontaminate the valve and mask; wash hands thoroughly; ensure the mother is aware of the

resuscitation outcome and provide support and lastly to record pertinent information on the mother's/newborn's record [13].

Variable	Response	Frequency	Percent
How to ventilate with bag and mask	Mask should cover the eyes	3	2.5
	Air should escape b/n the mask and face	19	15.8
	Squeeze the bag to produce gentle movement of the chest	74	61.7
	Squeeze the bag to give 80-100 breaths/min	24	20
What to do if chest is Not moving with bag and mask	Stop Ventilation	13	10.8
	Reposition head, clear secretions, reapply mask and continue ventilation	67	55.8
	Slap the baby's back	28	23.3
	Give adrenalin	12	10
What to do if baby is still Not breathing	Call for help and improve ventilation	29	24.2
	Palpate umbilical cord listen to HR with stethoscope	9	7.5
	Arrange immediate referral	18	15
	All	64	53.3
Suctioning the baby unnecessarily	Cause the baby to stop breathing	49	40.8
	Make a baby to start coughing	34	28.3
	Stimulate baby to cry	17	14.2
	Increase the baby's HR	20	16.7
When to stop ventilation	When a baby is blue and limp	16	13.3
	When baby's HR is normal and the baby is breathing	87	72.5
A baby received ventilation who	Needs continued observation with the mother	70	58.3
	Cannot be fed	6	5
	Always needs advanced care	33	27.5

Should receive antibiotics	11	9.2
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Table 4: Distribution of Knowledge of Newborn Resuscitation among nurses and midwives working in public health centers, Lideta Sub city, Addis Ababa, Ethiopia, September-October, 2019, (n=120).

Overall knowledge of essential newborn care

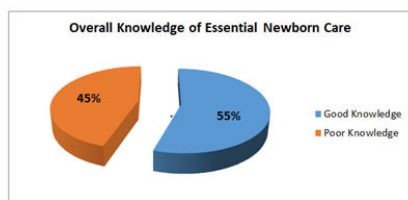


Figure 1: The overall knowledge of essential newborn care among nurses and midwives working at health centers in Lideta sub city, Addis Ababa, Ethiopia, September to November, 2019 (n=120). The mean knowledge score of study participants was 12.66 (SD= ± 2.51) out of the total 20 points. The study revealed that 55% of the respondents had good knowledge of essential newborn care where as 45% had poor knowledge.

Factors associated with knowledge of essential newborn care

In order to identify factors associated with ENC knowledge, logistic regression was used with 95% CI and P-value <5%, all variables that have association by binary logistic regression were entered to multiple- logistic regression and final independent predictors of ENC were identified [14]. Age, sex, Level of Education, Experience in the facility, experience in delivery and maternity ward, interest of working in delivery or maternity ward, availability of equipment's, availability of drugs and vaccines and in service training were not found to have significant association with participants' level of knowledge of essential newborn care. Field of study was significantly associated with participants' knowledge of essential newborn care ($p < 0.001$). Midwives were 8 times more knowledgeable about essential newborn care than nurses [AOR (95% CI) 0.08 (0.03-0.22)].

Variable	Knowledge		COR(95 % CI)	P-Value	AOR (95%CI)	P-Value
Age	Good	Poor				
<30	53 (59.6%)	36(40.4%)	0.6(0.25-1.46)	0.26	0.43(0.14-1.26)	0.098
>30	22 (71.0%)	9 (29.0%)	1		1	
Sex						
Male	24(68.6%)	11 (31.4%)	0.68 (0.29-1.58)	0.38	1.25(0.45-3.47)	0.66
Female	51 (60.0%)	34 (40.0%)	1		1	
Level of Education						

Diploma	28(54.9%)	23(45.1%)	1.75 (0.83-3.7)	0.14	0.58(0.24-1.4)	0.23
Degree	47(68.1%)	22 (31.9%)	1		1	
Interest of working in delivery ward						
Yes	62 (62.6%)	37 (37.4%)	0.97 (0.37-2.56)	0.95	1.3(0.4-3.9)	0.67
No	13 (61.9%)	8 (38.1%)	1		1	
Availability of Equipment's						
Yes	56(60.9%)	36 (39.1%)	1.35(0.55-3.32)	0.5	3.32(1.0-10.9)	0.05
No	19 (67.9%)	9 (32.1%)	1		1	
Availability of Drugs and Vaccines						
Yes	63 (63.6%)	36(36.4%)	0.76(0.29-1.9)	0.57	0.25(0.6-0.9)	0.037
No	12 (57.1%)	19(42.9%)	1		1	
In- Service Training						
Yes	23(69.7%)	10(45.5%)	0.64(0.27-1.52)	0.32	0.73(0.24-2.2)	0.58
No	52 (59.8%)	35(40.2%)	1		1	
Field of study						
Nursing	31(44.9%)	38(55.1%)	7.7(3.0-19.4)	<0.001	0.08(0.26-0.23)	<0.001
Midwifery	44(86.3%)	7(13.7%)	1		1	

Table 5: Association of socio-demographic and some selected variables with participants' level of knowledge on essential newborn care in Lideta sub city, Addis Ababa Ethiopia.

On both bivariate and multiple logistic analysis age, sex, work experience, experience in delivery and maternity ward, interest of working, availability of equipment's, availability of drugs and vaccines and in service training were statistically insignificant with the knowledge of essential newborn care. Being a nurse or midwives was found to have significant association with their knowledge of essential newborn care ($p < 0.001$). Midwives were 8 times more knowledgeable in essential newborn care compared to nurses [AOR (95%CI) 0.08 (0.03-0.23)].

Discussion

Knowledge is one of the crucial aspects of health systems to adherence of essential newborn care and lack of knowledge may impede provision of essential newborn care. In this study, the average knowledge score about ENC was 55%. This knowledge report is lower compared to report of study conducted in India, which was 78% for all providers [15]. The discrepancy could be due to the difference in in-service training. The other possible reason might be difference of educational level of study participants. As in the case of

this study, majority of participants were degree holders and majority of the participants had no in-service training on newborn care. This result is relatively higher compared to study conducted in Egypt, where 43.5% and 47.8 % of nurses and midwives had good and poor knowledge of ENC respectively [16]. The study also identified knowledge gaps on the steps of ENC. These gaps were mainly noted with the measures to take during the 'golden minute' and identification of neonates that can receive routine care where 35% and 41.7% of the participants were found not knowledgeable. Major knowledge gaps were also seen with the steps of cleaning a dirty umbilicus, consequences of unnecessary suctioning and steps to undertake if a baby fails to respond to initial steps of resuscitation, where 82.5%, 59.2% and 75.8% of the respondents were found to have less knowledge [17]. The study has highlighted the importance of knowledge in empowering nurses and midwives to master their work in the way they prepare the delivery room for the birth and helping neonates' breath at birth within 'The Golden Minute'. Furthermore, the study shows the importance of the relationships between knowledge, level of education, and field of study. Participants with a qualification in midwifery were more likely to have higher knowledge scores. However, the results did not show a great impact of in service training [18]. Training may be a factor that can be explored further. Focus on training will need to be broadened to include attitudes, competencies and skills. Other studies prove in-service training as having a direct effect in reducing neonatal mortality rate [19-25]. Midwives as part of the health care professionals play a critical role in knowledge generation and management which are vital in neonatal resuscitation and reduction of neonatal mortality. Therefore, different types of knowledge may invariably contribute in equipping midwives to address neonatal mortality. Factors like highest qualification in midwifery, continual training in neonatal resuscitation, professional position, as well as experience in practicing as a midwife help to level the playing fields in ensuring that midwives are knowledgeable in basic neonatal resuscitation. Thus, this is instrumental in improving their work performance. This implies therefore that the interplay of factors might have an effect on the knowledge score in support of the afore-mentioned statement.

Limitation of the Study

The study focused on Knowledge, which is not the only component of competency that includes elements such as skills and attitudes which were not within the scope of this study. The sample size used in this study was small compared to similar studies.

Conclusion

Even though the participants had good knowledge of ENC in general, they had poor knowledge on some components of ENC. The study population had knowledge gap with regard to measures to be taken during the 'golden minute' and identification of neonates that can receive routine care. The study population had knowledge gap on the precise cord clamping time and the care given to dirty umbilicus. The study population had knowledge gap on resuscitation domains including, consequences of unnecessary suctioning and steps to undertake if a baby fails to respond to initial steps of resuscitation, which leads to malpractice and increase the risk of

asphyxia and its complications. The study population had good knowledge on initiation of breast feeding and duration of EBF. Majority of the study population had good knowledge on thermal protection which prevents hypothermia and its complications. Field of study was found to be independent predictor of knowledge of EN in the study area.

Recommendations

Based on the study findings, the following recommendations were forwarded. Federal Ministry of Health, Addis Ababa Regional Health Bureau, Ministry of Education and others working in this area in collaboration were encouraged to Strengthen the quality of undergraduate education provided especially regarding delivery and newborn care in the curriculum for both diploma and degree program. Facilitate in service trainings to nurses and midwives on ENC including newborn resuscitation and upgrade their educational level. Provide all necessary equipment's, vaccines and drugs of newborn care for each health facilities.

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