Research Article

Level of Knowledge and Associated Factors of Postnatal Mothers' towards Essential Newborn Care Practices at Governmental Health Centers in Addis Ababa, Ethiopia

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Background. Globally 4 million newborns die every year before they reach the age of one month and approximately 3.4 million newborns die within the first week of life. Of these deaths, 66% occur during the 1st 24 hours. Late death, i.e., after 24 hours, still occurs 34% and may be prevented if mothers have knowledge about newborn care including dangers sign of newborn. *Objective.* The aim of the study was to assess level of knowledge and associated factors of postnatal mothers towards essential newborn care practices at governmental health centers in Addis Ababa. *Methodology.* Institutional-based cross-sectional study with internal comparison was conducted using multistage sampling method in AA health centers from December 5 to January 30, 2016. *Result.* A total of 512 mothers who came for postnatal visit were interviewed using structured pretest questionnaires. Knowledge was assessed using closed and open ended questions. Poor knowledge has strong association with women's occupation (**AOR** = 2.10, 95% CI : (1.38,3.20)). Parity of the women was found as one of significant predictors for poor knowledge of essential newborn care. Women who were primiparas are **1.99** times more likely to have poor knowledge of ENC compared to women who were multiparas **AOR** = 1.99,95% CI: (1.25,3.20). The other significant predictors for poor knowledge of ENC were ANC visit. Women who had less than four antenatal visits were 0.63 times less likely to have poor knowledge than those who visit four times and above. **AOR** = 0.63, 95% CI:(0.40,0.99). *Conclusion.* Maternal education programs should be given emphasis for the components of ENC for mothers' knowledge gaps. Special emphasis needs to be placed when educating vulnerable groups including those who failed to fully attend antenatal clinic visits.

1. Introduction

Essential newborn care (ENC) is a comprehensive strategy designed to improve the health of newborns through interventions before conception, during pregnancy, at and soon after birth, and in the postnatal period. This brief describes the components of ENC, criteria for prioritizing them, and strategies used in operationalizing them. Implementation of ENC will have a positive impact on neonatal and infant mortality. New born care comprises basic preventive newborn care such as temperature maintenance, eye and cord care, early and exclusive breastfeeding on demand day and night, immunization, and early detection of problems or danger signs [1].

Despite an established evidence base of simple, affordable and low-cost interventions to avert neonatal deaths, global progress in reducing neonatal mortality has stagnated in recent years. Clean cord care is one of the essential newborn care practices recommended by the World Health Organization to reduce morbidity and mortality amongst the World's newborns. Despite this, cord infections are still prevalent in developing countries because of the high rates of unhygienic cord care practices [2].

The burden of neonatal death is still high in developing countries where most of the causes could be prevented [3]. Globally 4 million newborns die every year before they reach the age of one month. Out of them 1.5 million newborns die in four countries of South Asia. Approximately 3.4 million

newborns die within the first week of life. Of these deaths, 66% occur during the 1st 24 hours. Late death, i.e., after 24 hours, occurs in the rest 34% and this may be prevented if mothers have good knowledge about newborn care including danger signs of newborn [4]. Up-to-date information on the causes of child deaths is crucial to guide global efforts to improve child survival [5].

The main focus of studies of childhood mortality has been the infant and under-five mortality rates. Neonatal mortality (deaths <28 days of age) has received limited attention. The World Health Organization recommends that improving newborn care practices at birth is crucial in order to reduce morbidity and mortality [6]. The three major causes of neonatal deaths (infections, complications of preterm birth, and intrapartum-related neonatal deaths) account for almost 90% of all neonatal deaths. The highest impact interventions to address these causes of neonatal death are summarized with estimates of potential for lives saved. A major gap is care during the early postnatal period for mothers and babies. There are promising models that have been tested mainly in research studies in Asia that are now being adapted and evaluated at scale including through a network of African implementation research trials [6].

Worldwide mortality in children younger than 5 years has dropped from 11.9 million deaths in 1990 to 7.7 million deaths in 2010, consisting of 4 million neonatal deaths, 2.3 million postneonatal deaths, and 2.3 million childhood deaths (deaths in children aged 1-4 years). 33.0% of deaths in children younger than 5 years occur in south Asia and 49.6% occur in sub-Saharan Africa, with less than 1% of deaths occurring in high-income countries. Across 21 regions of the world, rates of neonatal, post neonatal, and childhood mortality are declining. The global decline from 1990 to 2010 is 2.1% per year for neonatal mortality, 2.3% for post neonatal mortality, and 2.2% for childhood mortality. In 13 regions of the world, including all regions in sub-Saharan Africa, there is evidence of accelerating declines from 2000 to 2010 compared with 1990 to 2000. Within sub-Saharan Africa, rates of decline have increased by more than 1% in Angola, Botswana, Cameroon, Congo, Democratic Republic of the Congo, Kenya, Lesotho, Liberia, Rwanda, Senegal, Sierra Leone, Swaziland, and Gambia [7].

Two priority opportunities to address newborn deaths through existing maternal health programs are highlighted. First, antenatal steroids have high impact, feasible, and yet underused in low resource settings. Second, with increasing investment to scale up skilled attendance and emergency obstetric care, it is important to include skills and equipment for simple immediate newborn care and neonatal resuscitation [8].

For sub-Saharan Africa, on average, there has been no statistically significant change in neonatal mortality over the past decade. In sharp contrast, five African countries have reduced neonatal deaths by over 25%, more than double their neighbors. Important lessons emerge from this supplement, especially around seizing opportunities to promote community-based newborn care and to integrate newborn care interventions into frontline health worker delivery platforms, and especially into facility-based maternity care,

which is already being scaled up. At the same time, there are dozens of countries, mostly middle-income countries in Eastern Europe and Latin America, which have halved neonatal deaths in the last decade. As advanced previously in *The Lancet* Neonatal Survival Series, the analysis in paper 1 of this supplement demonstrates that while rapid progress in neonatal survival in these countries was linked with economic progress, significant improvements occurred in the absence of economic progress. Sri Lanka, for example, halved neonatal deaths due to prematurity despite a destabilizing internal conflict and weak economic growth, through extending their strong primary care system with effective referral level newborn care [9].

Promotion of essential newborn care practices is one strategy for improving newborn health outcomes. In settings where a majority of births take place at home without a skilled attendant and care seeking rates are low, preventive interventions included in essential newborn care should also be promoted at the community level [10]. For example, promotion of preventive behaviors through home visits by community health workers has been shown to improve key newborn care practices such as early initiation of breast-feeding, skin-to-skin contact, delayed bathing to prevent hypothermia, and clean care of the umbilical cord [11].

In Ethiopia about 120,000 newborns die every year in the first weeks of life which accounts for 42% of all deaths of under-five mortality. The study conducted in Addis Ababa health centers also indicated that level of essential newborn care practices were low even though the majority of respondents practice early initiation of breast feeding and safe cord care [12]. In Ethiopian demographic health survey (EDHS) 2011 neonatal mortality was at 37 deaths per 1,000 live births which was 49 deaths per 1,000 live births in 2000. Neonatal deaths accounts for 63% of all infant deaths and 42% of all under-five deaths which makes the reduction of neonatal mortality a critical intervention. The Ethiopian minidemographic health survey (EMDHS) 2014 reported coverage of 18% for PNC within the recommended 6-week period among these women who received a postnatal checkup; 8% were examined within 4 hours of delivery, 3% within 4-23 hours, 2% within 1-2 days, and 5% within 3-41 days of delivery; this is the time when the mother and baby are most vulnerable to morbidity and mortality associated with child birth. Infants who receive postnatal care within the first six weeks after birth are only 18% [13].

As indicated in the sustainable development goals (SDG), Ethiopia will intensify reproductive, maternal, newborn, child, adolescent, and health (RMNCAH) interventions to end preventable maternal and child deaths by 2030. The targets set in the health sector transformation plan (HSTP) are in line with the global aspirations. The impact-level targets of (HSTP) by 2020 are to reduce maternal mortality rate (MMR) to 199/100,000 LB; reduce under five-year infant and neonatal mortality rates 30, 20, and 10 per 1,000 live births, respectively; reduce stunting, wasting, and under-weight in under-5 year to 26%, 4.9%, and 13%, respectively [14]. Study in four regions (Amhara, Oromia, Tigray and Southern Nations, and Nationalities and People Region) of Ethiopia revealed that mothers' unprompted knowledge of newborn danger signs

was rather low, with only 29.3% of respondents able to name 3 or more danger signs out of a list of 11. Among women who delivered alive baby in the period 1 to 7 months prior to data collection found that exclusive breastfeeding was 87.6%, wrapping the baby before delivery of the placenta 82.3%, and dry cord care 65.2%. In Ethiopia reproductive, maternal, newborn, child, and adolescent health (RMNCAH) and nutrition will continue to be top priority for the next 5 years [15].

Study done in Eastern Tigray showed essential newborn care knowledge and practice of mothers revealed that 80.4% had good knowledge and 92.9% had good practice. Most mothers had good knowledge on temperature maintenance, breast feeding initiation, and first bathing time [16].

In addition to their knowledge, almost all mothers practiced the main essential newborn care except a substance (oil and butter) application to the cord stump. The majority of mothers apply oil and butter on the cord stump which may lead to many neonatal infections. However, mothers should not apply any preparations on the cord. 98% of Mothers had ANC follow-up though 18.2% mothers still delivered at home [17].

There has been an increasing trend towards early hospital discharge of the mother baby pair following delivery [18]. Two-thirds of babies in developing countries are born at home and the others are discharged from health facilities soon after birth [19].

There is very limited information about newborn care practices in Ethiopia because many key indicators are not currently measured by routine surveys like the Demographic and Health Survey. Improving neonatal survival and motivating healthcare providers to give information for pregnant mothers, postnatal mothers, and child care givers regarding essential newborn care practice help to reduce preventive neonatal mortality.

The ability to identify knowledge gaps early in the neonatal period would help healthcare workers identify and implement timely and appropriate interventions that would lead to better neonatal outcomes. Therefore, this study will be expected to investigate the mothers level of knowledge and associated factors towards essential newborn care practice which the researchers, policy makers, healthcare workers, and community and care givers use as a base line for their future interventions and activities.

The following conceptual framework is proposed after extensive review of different literatures which are mentioned as main factors/determinant of mothers' knowledge and associated factors of Essential Newborn Care (ENBC), which includes sociodemographic factors, obstetrics factors, knowledge and associated factors, tradition, source of information, and maternal health services (see Figure 1)

2. Methodology

2.1. Study Setting.
The study was conducted in Addis Ababa, capital city of Ethiopia, with an estimated area of 540 square kilometers, lies between 2326-3000 meters above sea level with lowest and highest annual temperature about 10°C and 32°C respectively and annual rain fall around 1200mm. Based on Addis Ababa city administration health bureau 2016/2017

Woreda base plan, Addis Ababa is estimated to have a total population of 3,433,999 consisting of 1,524,696(44.4%) males and 1,909,303(55.6%) females and reproductive age group of 1,189,537. Addis Ababa city administration health bureau is responsible for both curative and preventive health care services in the city. There are 10 subcity health departments which are directly accountable to their respective subcity administrations. In the city, there are 92 public health centers and all of them provide delivery service and newborn care.

2.1.1. Study Design & Study Period. Institution-based descriptive cross sectional study with internal comparison was conducted in ten A.A health centers from December 5 to January 30, 2017.

2.1.2. Source and Study Population. Source populations were all mothers in A.A who came for their postnatal visit within six weeks.

Study subject were all mothers who came for their postnatal visit within six weeks period during the data collection period consecutively and meet the inclusion criteria.

2.1.3. Sample Size Determination. To assess postnatal mothers level of knowledge towards essential newborn care. The required sample size was determined by using a single population proportion sample determination formula considering the following assumptions.

Based on the study conducted on four regions of Ethiopia, Proportion of mothers that were knowledgeable about newborn danger signs was 29.3% [15].

Level of significance = 95%
Margin of error = 5%
Non-respondent rate = 10%
The formula for calculating the sample size is

$$n = \frac{(Z\alpha/2)^2 \, p\,(1-p)}{d^2} \qquad (1)$$

where α-level of confidence is

p = % of postnatal mothers who were knowledgeable
q = (1-p)
n- Sample size
Z- Standard normal distribution curve value for 95% CI which is 1.96 (where α = 0.05)
d- Tolerable margin of error = 5% (0.05)
DEFF-design effect = 1.5
Hence, $n = (1.96)^2 \times 0.293 \times (1-0.293)/(0.05)^2 \times 1.5 = 466$

Additional 10% allowance (nonresponse rate)

Hence, the calculated sample size was 466. Adding a 10% nonresponse rate gave the required minimum sample size (n) = 512.

Thus, total sample size = **512.**

2.1.4. Sampling Procedure. In the study area there were ten sub-cities and in all sub-cities there were 92 health centers, from each sub city to get adequate sample size those health centers who have more than ten years' service are selected and then simple random sampling (lottery method) was used to identify the health centers from each subcities. Ten health

Socio-demographic
- Age
- Marital status
- Educational status
- Ethnicity
- Occupation
- Income
- Religion
- Age of child
- Sex of child

Obstetrics factors
- Parity
- Mode of delivery

Knowledge & Associated factors for ENBC
- Breast feeding
- Thermal care
- Immunization
- Eye care
- Cord care
- Danger sign identification

Tradition
- Feeding
- Bathing
- Applying substances on cord

Sources of information
- Health worker
- Health extension
- Mass media
- Relative and friends

Maternal health services
- ANC follow up
- Provider at ANC/PNC
- No/ Time of ANC visits
- Place of delivery
- Person assisted at delivery
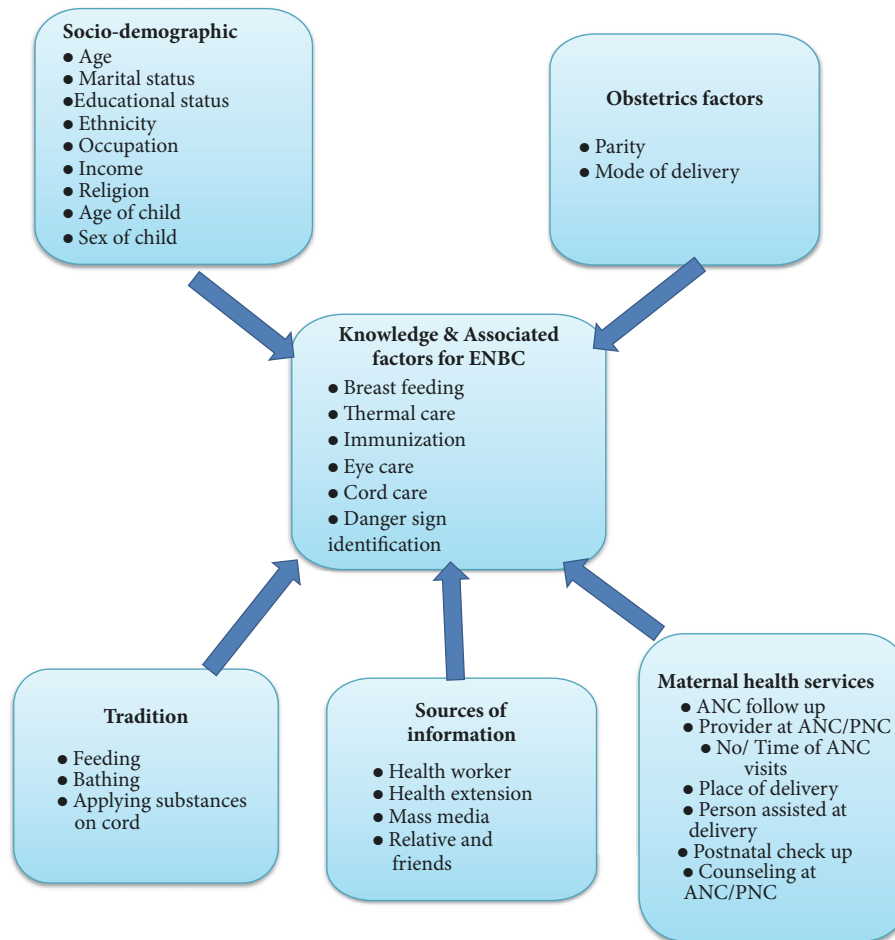- Postnatal check up
- Counseling at ANC/PNC

FIGURE 1: Conceptual frame work for factors that affects essential newborn care (adopted from Journal of perinatology 2002; 22:572–576).

centers, one from each subcities was selected using multistage sampling method. Study subject were all postnatal mothers who came for their postnatal visit within six weeks during the data collection period consecutively and meet the inclusion criteria.

The investigator identified those mothers who meet the eligibility criteria from the medical records and informed consent was obtained. Postnatal mothers of neonates born normal and alive and Post-natal mothers who give informed consent were included in the study. Postnatal mothers who refused to give informed consent and mentally ill were exclude form the study.

Data Collection Procedure. In each study area, one data collector from the staff nurse, who is able to communicate in Amharic was recruited. For effective and quality data collection, a two-day intensive training was given in Addis ketema health center for the selected nurses which covers study objectives, a thorough review of questionnaire, interview techniques, and directions as to how to administer the questionnaire.

Before starting the main data collection pretest by semistructured interviews questionnaire were given for 5% (25) of Nifas-silk lafto (Woreda 09 Health center) postnatal mothers

coming to the health center within six weeks period. The questionnaire was first prepared in English and then translated in to Amharic. The questionnaire was translated back to English to observe consistency of the variables under question. The questionnaire consists of semistructured questionnaire addressing the neonate's and parents sociodemographic data, antenatal and birth history of the neonate, and mother's knowledge on the WHO essential newborn care practices.

2.2. Data Quality Control. The training was given for the data collectors and supervisors a week before they went to distribute and collect data from the participants. The questionnaire was pretested by maternal and child health (MCH) nurses on Woreda 09. Health center from Nifas Silk Lafto subcity 5% (25) of postnatal mothers who came within six weeks period, to ensure validity of the questionnaire before commencement of the study. Study tools were revised accordingly. As a result of the pretest, based on the findings, necessary corrections were given for some of the questions of the questionnaires. Moreover, during data collection supervisors checked in the field how the data collectors did their task. The principal investigator also closely supervised the field activity on daily basis. At the end of each data collection day, the principal investigator also checked the completeness of filled

questionnaires and whether recorded information makes sense to ensure the quality of data collected. Besides this, the principal investigator carefully entered and thoroughly cleaned the data before the commencement of the analysis.

2.3. Data Processing and Analyzing. The quantitative collected data entered into EPI info version 7.2 and transported, cleaned and analyzed using SPSS version 20. Frequencies and percentages of different variables were computed for description as appropriate. Odds ratio with 95% confidence interval was computed to determine the degree of association between the dependent and independent variables; seven variables were examined independently using a bivariate analysis and then five variables those with a p-value of less than 0.20 were included into a logistic regression model to calculate the adjusted odds ratios and 95% confidence intervals while controlling for potential confounding factors. Level of significance was taken at p value < 0.05. A scoring system was used to analyze responses to closed ended questions on knowledge: 1 = coded as correct response (consistent with WHO essential newborn care guidelines).

0 = coded as incorrect response (inconsistent with WHO essential newborn care guidelines). Any mother who does not know the answer was considered to have an incorrect response.

Therefore, according to this study those scoring below the median are considered to have poor knowledge and above or equal to the median are considered to have good knowledge

The responses for the open ended questions summarized and descriptive statistics were carried out. During analysis for factors associated with maternal knowledge on newborn care, the median score was used as a cut off to distinguish between poor knowledge and good knowledge.

2.4. Ethical Considerations. The study was conducted after approval by Addis continental institute of public health (ACIPH) research ethical review committee and getting ethical paper from Addis Ababa health bureau ethical review committee. The researcher explained the purpose of the study to the mother before recruitment and informed consent was obtained. Any information pertinent to care of neonate was immediately communicated to the primary doctor. No invasive procedure was done as part of the study. No tissue specimen was collected as part of the study. Participation in this study was purely voluntary and there was no monetary gain. The postnatal mothers were expected to be free to withdraw from the study without any penalty. No compensation was offered for participation in the study. Once the primary caregiver discharged the mother and her neonate(s), no follow-up interviews were required. All the participants' response were kept confidential by using the information only for the purpose of the study and storing the study in a closed file. The rights of the respondents to refuse to answer for few or all of the questions were respected.

3. Results

3.1. Background Information of the Respondents. A total of 512 postnatal mothers were interviewed; among them 464 (90.6%) were married. Employed women accounted for 306(59.8%). The proportion of women who are illiterate is 42 (8.2%) as shown in Table 1. Orthodox Christians accounted for 304 (59.4%) of the respondents', while Muslims accounted for 126 (24.6%) and Protestants accounted for 82 (16%) (see Table 1).

3.2. Antenatal and Birth History. From the total 512 interviewed mothers, 504 (98.4%) had attended antenatal clinic. The mean gestation at first visit was 3-4 months with an average of 4 visits (SD=0.3). Of those interviewed, 355 (69.3%) of the mothers were primiparous. Vaginal deliveries accounted for 407 (79.5%) while Caesarean section accounted for 85 (16.6%). The proportion of male to female deliveries was almost equal with male neonates accounting for 259 (50.6%) and females 253 (49.4%).

3.3. Knowledge on Essential Newborn Care

3.3.1. Breast Feeding. Only 339 (66.2%) of mothers reported that their newborns were breastfed within the first hour after delivery. Additionally, 12 (2.3%) of mothers reported that they squeezed out the colostrum before breastfeeding the newborn; 89(17.4%) reported feeding their newborns food or liquid other than breast milk in the first two days. 350 (68.4%) of mothers knew about breastfeeding on demand, 436 (85.2%) reported exclusive breastfeeding for 6 months, and 500(97.7%) of mothers knew that colostrum should be given to their newborns. 139 (27.1%) of the mothers did not know that prelacteal feeds should not be given to neonates. Among those newborns that were given other foods, the most commonly food reported by mothers was cow's milk 332(64.8%), plain water 100 (19.5%), packed milk 61(11.9%), sugar water 17(3.3%), and others 2 (0.4%) (see Figure 2).

3.3.2. Immunization. 492 (96.1%) of mothers were aware of the need to vaccinate their newborns at birth while 461 (90%) knew that vaccines were given to prevent diseases. Only 199 (38.9%) knew that BCG vaccine was for prevention of tuberculosis and 246(48%) mothers reported that OPV was the vaccine given at birth to protect the child from polio (see Figure 3).

3.3.3. Cord Care. Among mothers interviewed, 339 (66.2%) correctly stated that the stump should be uncovered. Out of those interviewed, 384 (75%) of mothers believed that water should be used to clean the soiled umbilical stump, 340 (66.4%) of mothers believed that nothing should be applied to the cord, while 53 (10.4%) of mothers mentioned that butter should be applied to the stump, while 111 (21.7%) mother said they did not know, and 8 (1.6%) of mothers know that vaseline and oil was applied on the cord (see Figure 4).

3.3.4. Thermoregulation. 351 (68.6%) of mothers believed that warm cloth prevents heat loss from neonate, while 260 (50.8%) of mothers mentioned that mother-baby skin to skin contact prevents neonates from cold.

3.3.5. Eye Care. From the study participants, 410 (80.1%) of mothers are aware of signs of eye infection among which, 347

TABLE 1: Sociodemographic characteristics' of postnatal mothers in Addis Ababa health centers, Dec.1-Jan.30, 2017.

| Variable	Frequency	Percentage
Age of the mother		
15-25	207	40.4
26-35	245	47.9
36-45	60	11.7
Marital status		
Married	464	90.6
Single/Divorce/widowed	48	9.4
Occupation of mother		
Employed	306	59.8
Unemployed	206	40.2
Education level		
Illiterate	42	8.2
1-10	250	48.8
Higher than 10	220	43
Religion		
Orthodox	304	59.4
Muslim	126	24.6
Protestant	82	16
Ethnicity of mother		
Amhara	189	36.9
Oromo	148	28.9
Gurage	101	19.7
Others	74	14.5
Families monthly income (in Birr)		
≤1000	80	15.6
1001-2000	114	22.3
>2000	318	62.1
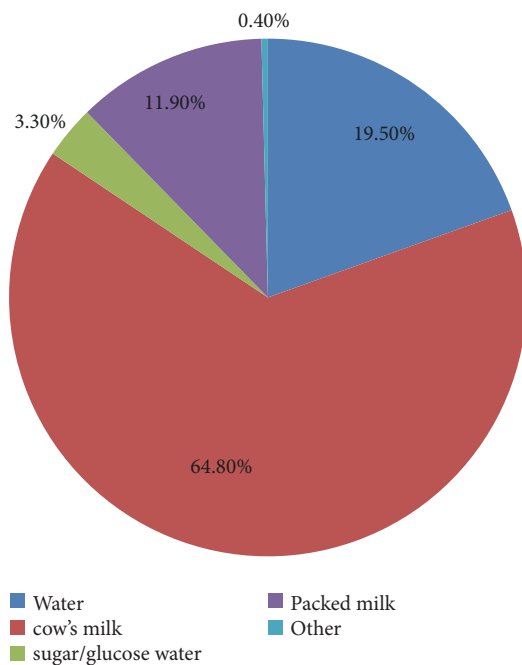
FIGURE 2: Knowledge of prelacteal feed given for neonate in Addis Ababa health centers, Dec. 1-Jan. 30, 2017.
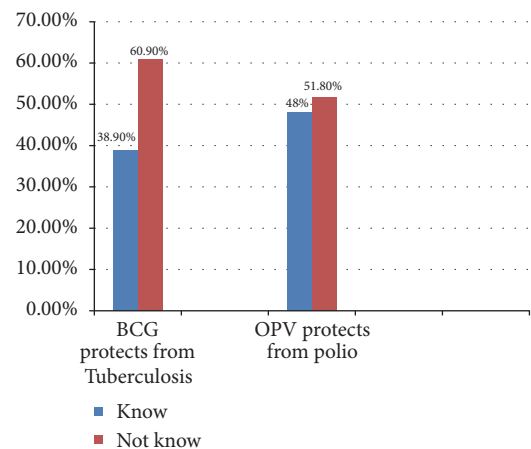

FIGURE 3: Proportion of postnatal mothers with knowledge on vaccines given at birth in Addis Ababa health centers, Dec. 1-Jan. 30, 2017.

(67.8%) of women reported that eye discharge is the main symptom while reddening of eye accounts for 305(59.2%), 179 (35%) mentioned swollen eye, and 3 (0.6%) for other symptoms (see Figure 5).
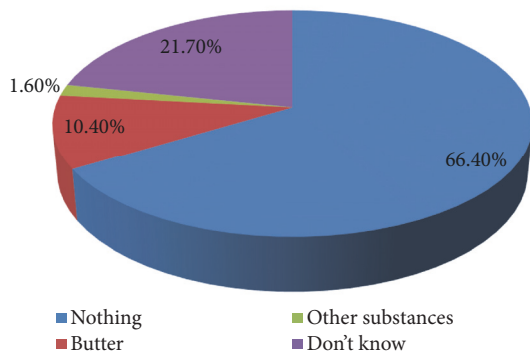
FIGURE 4: Substances applied on umbilical cord after cutting mentioned by postnatal mothers' in Addis Ababa health centers, Dec. 1-Jan.30, 2017.
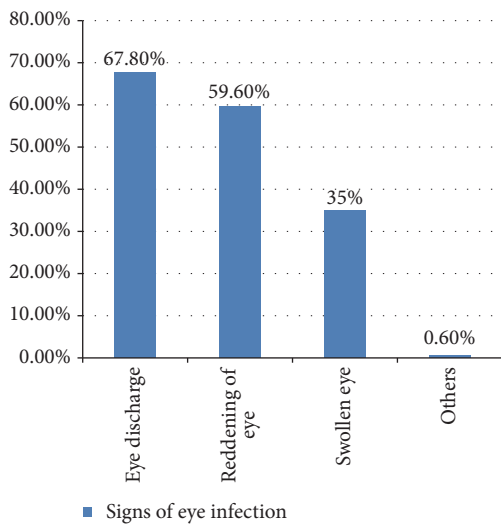

FIGURE 5: Knowledge of postnatal mothers' on sign of eye infection in Addis Ababa health centers, Dec.1-Jan. 30, 2017.

3.4. Knowledge on Danger Sign. Among 455 (88.9%) of mothers who have correct response towards danger sign, majority of them 382 (74.6%) recognized fever as a danger sign while few 77 (15%) of them recognized baby being too small/born being too early as a danger sign and 102(12.2%) did not have awareness on newborn danger signs. More than 74.6% of participants perceived that serious neonatal illness needs special attention to consult health personnel urgently.

3.5. Over All Knowledge Level of Mothers on ENC. Questions regarding knowledge of breast feeding, cord care, eye care, immunization, thermal care, and identification of danger sign measures for newborn care were scored and pulled together and the median score was computed to determine the overall knowledge of respondents.

The overall knowledge question composite showed that the median knowledge score was 25 with SD = 5.64 & mean 22.48. A woman who does not respond to all questions scored 0 and who responds to all questions scored 32, based on this

fact the minimum knowledge score, was 9 and maximum score was 32. Respondents who scored below the median are considered as having poor knowledge.

In this study among 512 post-natal mothers 60.2% of them had poor knowledge towards essential newborn care.

The multivariable logistic regression analysis showed that poor knowledge has strong association with women's occupation, parity, and number of ANC visits. Unemployed mothers had 2.10 times more chance of having poor knowledge than those who are employed (**AOR** =2.10, 95% CI: (1.38, 3.20).

Parity of the women was found as one of significant predictors for poor knowledge of ENC. Women who were primiparas were **1.99** times more likely to have poor knowledge of ENC compared to women who were multiparas **AOR** = 1.99,95% CI: (1.25,3.20).

The other significant predictors for poor knowledge of ENC was ANC visit. Women who had less than four antenatal visits were 0.63 times less likely to have poor knowledge than those who visited four times and above **AOR** = 0.63,95% CI: (0.40,0.99) (see Table 2).

4. Discussion

About 60.2% postnatal mothers had poor knowledge on essential new born care and those mothers who were unemployed, primiparous, and those mothers who had ANC visit greater than four had more likely poor knowledge. Similar study which was done in Fiche town shows that 53.6% of the respondents have poor knowledge towards essential newborn care; this shows that there is information gap.

The proportion of poor knowledge on essential new born care is lower than previous reports from Ethiopia, which was 85%. [12]. The suggested reason of this difference could be due to different sociodemographic characteristics of the study participants and the other possible explanation could be newborn health and maternal health are given due attention by the Government of Ethiopia, federal ministry of health (FMOH), NGO, and other stakeholder.

Education on newborn care practices was given in a lower rate when antenatal period is compared with postnatal period (70.5%, 83.6%), respectively. unless the information's were provided only regarding to pregnant mothers on birth preparedness. The importance of antenatal education shown by Darmstadt GL, Oot DA, Lawn JE, who demonstrated that antenatal education among expectant mothers resulted in sustained improvement in knowledge of newborn care in the postnatal period [7].

In this study majority of the newborn care education received among the study participants was related to exclusive breastfeeding and when to start immunization. Breastfeeding knowledge among mothers was encouraging with 85.2% of mothers are aware of exclusive breastfeeding and 68.4% are aware of breastfeed on demand and 72.9% of mothers are aware that Pre lacteal feeds should not be given to baby, Initiation of breastfeed immediately after birth accounts 66.2%.

Similar study in Cameroon on knowledge of postnatal mothers regarding initiation of breast feeding shows that 48% answered to initiate breast feed within one hour of

Table 2: Factors associated with poor maternal knowledge on newborn care in Addis Ababa health centers, Dec. 1-Jan. 30, 2017.

Variables	Knowledge of mothers		COR(95%CI)	AOR(95% CI)
	Good	Poor		
Age				
15-25	85 41.1%	122 58.9%	0.97(0.54,1.75)	0.73(0.37,1.42)
26-35	94 37.5%	151 62.5%	0.87(0.49,1.55)	0.73(0.39,1.37)
36-45	25 41.7%	35 58.3%	1	1
Education status				
Illiterate	9 21.4%	33 78.6%	0.35 (0.16,0.77)	0.77 (0.32,1.85)
1-10	99 39.6%	151 60.4%	0.85 (0.59,1.22)	1.21 (0.79,1.85)
Higher than 10	96 43.6%	124 56.4%	1	1
Marital status				
Married	188 40.5%	276 59.5%	1	1
Single/Divorce and widowed	16 33.3%	32 66.7%	1.36 (0.72,2.55)	1.40(0.72,2.71)
Occupation				
Employed	144 47.1	162 52.9%	1	1
Unemployed	60 29%	146 71%	2.16 (1.49,3.15)∗	2.10 (1.38,3.20)∗
Income				
≤1000	19 23.8	61 76.2%	0.42 (0.24,0.73)	0.60(0.32,1.10)
1001-2000	49 43%	65 57%	1.01 (0.65,1.55)	1.14(0.71,1.83)
>2001	136 42.8%	182 57.2%	1	1
Parity				
Primipara	158 44.5%	197 55.5%	1.93 (1.29,2.89)∗	1.99 (1.25,3.20)∗
Multipara	46 29.3	111 70.7%	1	1
No of antenatal visit				
< 4	36 31%	80 69%	0.59(0.38,0.92)∗	0.63(0.40,0.99)∗
≥ 4	168 43.2%	221 56.8%	1	1

∗significant at p <0.05 1: reference category.

birth. This shows that there are information gaps on the initiation immediate breastfeeding [3]. Similar studies in Sri Lanka shows that all (100%) respondents have had knowledge and practice to feed colostrum and exclusive breast feeding and 70 (70%) knew about early initiation of breastfeeding [17], these findings were similar to those reported by Indira Narayanan, who also found that majority of Sri Lankan postnatal mothers were aware of early and exclusive breast-feeding. More than 90% of mothers knew about breastfeeding on demand, the advantages of colostrum and the duration of exclusive breastfeeding [1]. Study in Cameroon showed that 64% of the participants were not aware of the duration of exclusive breastfeeding; this is because there may be information gaps regarding exclusive breastfeeding and 44% of participants obtained knowledge regarding child care from health workers.

A study reported by Indira Narayanan indicated that colostrum is highly nutritious and protective to the newborn. More than half of mothers knew that colostrum should be given to their babies. Cultural beliefs play role to squeeze out colostrum; people believe that colostrum was not clean and not important and can cause a disease. These findings are more encouraging than an Indian setting where strong cultural beliefs hampered the use of colostrum. In this study in contrast to the above study due to cultural reasons, lack of awareness, and influence of neighbor, only 12 (2.3%) of

mothers did not give colostrum; this shows knowledge level on colostrum is very interesting [1].

WHO advocates for hygienic practices while handling the cord which is a potential source of infection. In this study, knowledge level was assessed by determining maternal factors on handling the cord. 75% of mothers are aware of the opinion that water should be used to clean a soiled cord. Only 66.4% of mothers agreed with the recommendation of using the cord clean and dry without applying any substances.

In the study done in Kenya only four mothers agreed with the recommendation of using the cord clean and dry without applying any substances. This variation in opinions among postnatal mothers is likely due to lack of knowledge on packages of essential newborn care especially on cord care [18]. Also study done in south india indicated that knowledge of mothers on on umblical cord care was inadequate, which was only 35%.

In this study, 96.1% of mothers were aware of the need to vaccinate their neonates. Only 38.9% of mothers were aware of disease prevented by vaccine given on left forearm at birth (BCG). Only 48% of mothers were aware of disease prevented by vaccine given orally at birth (OPV) to newborns.

Mothers in this study scored poorly when asked to match vaccine given with the disease it prevented. Findings suggest poor dissemination of immunization information to mothers by healthcare providers. Similar study done by Darmstadt

GL and Bhutta ZA showed regarding the mothers knowledge on immunization of their infant that 95% of the participants were aware of the need for immunization of their infant. Among participants 76% were not aware of the names of the individual vaccines given for the newborn babies. Only 8% of the mothers had adequate knowledge on the different immunization component even though the immunization coverage was good; these may be because of information gap on the name and advantage of each component of vaccine during immunization [2].

This study found that information on danger sign was not adequately disseminated to mothers 36.3% and 44.1% for both antenatal and postnatal, respectively. In a similar study conducted in Kenya, information on danger signs in the neonate was not adequately disseminated to mothers both antenatally and postnatally [17].

Recognition of danger signs in the newborn by mothers has been shown to be a cause of concern in several studies conducted in developing countries [5]. In this study, the danger signs that were identified by most mothers included fever, poor feeding/sucking and fast breathing. Similar study in Kenya, the danger signs that were identified by most mothers included fever, diarrhea and vomiting.

In this study, mothers who were unemployed more likely had poor knowledge more than those who are employed. Studies in India and Sri Lanka showed similarly that mothers' who have poor knowledge/awareness were associated with unemployed women than counterparts [17].

Primparous mothers more likely had poor knowledge than multiparous. Similar study done in Sri Lanka showed mother's knowledge was strongly associated with parity, occupational status and month of first ANC visits [17]. According to this study, women who had visited antenatal care less than four times were less likely to have poor knowledge than those who visited four time and above. Literatures that support this result were not found.

5. Conclusion

A national health program is incomplete without community participation and this holds good for reproductive and child health program as well. Awareness on postnatal and early neonatal care is a fundamental prerequisite to effective community participation. This study has revealed the presence of knowledge gap, in spite of the fact that reproductive and child health (RCH) program is given top priority by the government. Despite the fact that participant records show highest number of ANC attendance and institutional deliveries, the existing knowledge gap in key areas of neonatal care will greatly affect the success of child care services.

Better maternal education on essential newborn care was received in the antenatal period. In this study, provision of information on essential newborn care to antenatal mothers was lower when compared to postnatal with regards to essential newborn care.

Postnatal mothers are most likely to have poor knowledge on essential newborn care practices including those who failed to fully attend antenatal clinic visits and those who did not receive any source of newborn education during pregnancy. Antenatal clinics provide an opportunity to educate mothers on newborn care which results in sustained knowledge in the postnatal period. The main finding in this study was that 60.2% of mothers have poor knowledge towards essential newborn care. Sociodemographic and maternal factors that were significantly associated with mothers knowledge score were occupation, parity, and number of antenatal visits.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Authors' Contributions

Demis Berhan participated in the design of the study and data collection, analyzed the data, and drafted the paper. Hanna Gulema participated in revising subsequent drafts of the paper from the design to final draft of the paper. Both authors read and approved the final manuscript.

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