


# Newborn Care Practices and Associated Factors Among Lactating Mothers at Home in the Rural Districts of Gedeo Zone, Southern Ethiopia

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**Introduction:** Globally, approximately three million neonates die in the first month of life. Neonatal mortality is a public problem in low and middle-income countries. Home-based good newborn care practice by lactating mothers is vital to improve newborns' health. In Ethiopia, home-based cultural newborn care practice among lactating mothers is very common, in contrast to standard essential newborn care practice. Thus, this study aimed to assess home-based newborn care practices among lactating mothers and associated factors in rural districts of Gedeo Zone, Southern Ethiopia, in 2018.

**Methods:** A community-based cross-sectional study was conducted in the rural districts of Gedeo Zone, Southern Ethiopia. A single population formula was used to determine the sample size, and 834 lactating mothers were enrolled in the study. Multistage sampling techniques were used to select study participants. Data were collected using a pre-tested interviewer-administered structured questionnaire and analyzed by SPSS version 22 software (IBM Corporation, Armonk, NY, USA). To determine associated factors with good newborn care practice among lactating mothers, the odds ratio with 95% confidence interval was used.

**Results:** The level of good newborn care practice among lactating mothers at home was 24.1% with 95% CI: 2.5–9.7. The factors significantly associated were maternal education (adjusted OR=2.6; 95% CI: 1.8–3.9), maternal employment (adjusted OR=2.1; 95% CI: 1.4–3.1), pregnancy intention (adjusted OR=1.7, 95% CI: 1.2–2.2), antenatal care visit (adjusted OR=5.7, 95% CI 3.9–7.9), and birth interval (adjusted OR=1.9, 95% CI: 1.3–2.8).

**Conclusion:** The level of good newborn care practices among lactating mothers at home was found to be low. Thus, advancing women's education and employment in the community, and providing quality prenatal care are suggested to scale up good newborn care practice among lactating mothers at home. Additionally, an observational study might be needed to identify further associated factors.

**Keywords:** newborn care practice, lactating mothers, home, Ethiopia

## Background

Globally, approximately three million babies die in the first month of life; one million of these newborns die on the first day of life, which makes up 40% of the under-five mortality. The Ethiopian government implemented the “Health Extension Program” to improve health care at the community level through transfer of knowledge and skill to the household.<sup>1–3</sup>

According to the World Health Organization (WHO) findings on trends in child and maternal mortality, despite falling under-five mortality, there has been very little change in the neonatal mortality rate (NMR). The NMR fell from 36 per 1000 live

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births in 1990 to 19 in 2015, and the number of neonatal deaths declined from 5.1 million to 2.7 million.<sup>4-6</sup>

Ethiopia has achieved its Millennium Development Goal-4 targets, but newborn deaths have declined more slowly. In spite of many efforts applied by the government and other partner organizations, a sluggish decline has been achieved in the NMR.<sup>7</sup> The NMR (per 1000 live births) was 61 in 1990 and 28 in 2015. A survey at the household level revealed that the neonatal mortality ratio was 27 per 1000 live births, which accounts for 308 neonatal deaths.<sup>3-8</sup>

Neonatal mortality is becoming progressively a public problem. The essential newborn care interventions have been applied to reduce under-five children deaths, but do not yet completely address the causes of the under-five children's deaths.<sup>2,5,9</sup>

According to the Ethiopian Demographic Health Survey 2014, newborns who received postnatal care within the first two days of birth are only 12%.<sup>10</sup> The literature revealed that socioeconomic, demographic characteristics, good newborn care, and cultural practices were important determinants of neonatal mortality.<sup>11-13</sup>

Practicing effective interventions can avert neonatal mortality and quality care during the pre-pregnancy, antenatal, intrapartum, and postnatal period is vital to ensure the reduction of neonatal mortality.<sup>14,15</sup> Good newborn care practices are one of the strategies to improve newborn health.<sup>16,17</sup> For all newborns, clean delivery and cord care, thermal protection, early and exclusive breastfeeding, and immunization are recommended by the WHO.<sup>18-20</sup>

In low and middle-income countries, there were different cultural newborn care practices at home which are in contrast to WHO recommendations. Culturally sensitive newborn care practice is important to assure the quality of service and well-being of newborns.<sup>20,21</sup>

The literature findings have shown that newborn care practices were associated with maternal age, maternal education, parity, antenatal care visit, place of delivery, mothers' cultural practices, maternal decision-making, and knowledge on newborn danger signs.<sup>22-25</sup> In low and middle-income countries, studies have shown that home-based newborn care intervention can prevent 30-60% of newborn deaths, particularly in high mortality settings. Home-based good newborn care practice may improve the survival of the newborn.<sup>16,26-29</sup>

In Ethiopia, there are different home-based cultural newborn care practices among lactating mothers in contrast to WHO recommendations. However, little was known on

home-based newborn care practices (exclusive breastfeeding, cord care, colostrum use, and baby bath) among lactating mothers and associated factors in the study area. Determining the level of good newborn care practice and associated factors among lactating mothers at home is important to complement essential newborn care practices and improve newborn survival. Thus, this study aimed to assess the level of good newborn care practice and associated factors among lactating mothers at home in the rural districts of Gedeo Zone, Southern Ethiopia, 2018.

## Methods

### Study Setting

The study was conducted in Gedeo Zone which is found in the Southern Nations and Nationalities of Peoples (SNNP) regional state of Ethiopia, and the zone has six rural districts. According to the 2007 census of Central Statistical Agency of Ethiopia report, the zone has a total population of 847,434, of whom 424,742 are men and 422,692 women.

### Study Design, and Period

A community-based cross-sectional study was conducted among lactating mothers who have a baby of age less than or equal to six months in the rural districts of Gedeo Zone, Southern Ethiopia from April, 15 to May 15, 2018.

### Source Population

All lactating mothers in the study area during data collection.

### Study Population

All selected lactating mothers in the study area during data collection.

### Sample Size Determination

The sample size was determined using a single population formula by considering: ( $p=55.6\%$ ) prevalence of newborn care practice among postnatal mothers, in Udipi District (30); 95% confidence interval, 5% margin of error and considering design effect=2, and non-response rate of 10%. Finally, the total sample size was 834.

### Sampling Technique

A multistage sampling technique was used to select and enroll a total of 834 lactating mothers with babies aged less than six months in Gedeo Zone, Southern Ethiopia. In Gedeo Zone, there are six rural districts. Three rural districts were selected by a simple random method and, then, from each

rural district, six kebeles were selected randomly. The sample size was distributed proportionally to the selected kebeles. The study participants were framed from registration books of health extension workers in the corresponding kebeles. Study participants were selected by simple random sampling techniques at the household level.

### Data Collection Tool and Quality Assurance

Data were collected using a pre-tested interviewer-administered structured questionnaire. The questionnaire was adopted from related literature<sup>28,29</sup> and translated into the local language. It contains socio-demographic information, obstetrics characteristics, and newborn care practice. The instrument validity was assured by applying validity criteria and reliability assured by the stability of responses of participants under similar situations. Data were collected by nine Diploma Nurses. To assure data quality, training was given for data collectors. The principal investigators were supervised and checked the questionnaires for completeness daily.

### Ethics Statement

Ethical approval was obtained from the Research and Ethics Review Committee of the College of Health Sciences, Dilla University. A formal letter was obtained from Zonal and District Health Bureaus. The participants were informed about the purpose, procedures, and benefits of the study. Written informed consent was obtained from the participants. The information obtained was kept anonymous, thereby ensuring confidentiality. The study participants were ensured that refusal or withdrawal from the study would not put at risk their access to care.

### Data Analysis

Data were entered into Epi-INFO version 7 software and exported to Statistical Package for Social Science (SPSS) version 22 software (IBM Corporation, Armonk, NY, USA) for analysis. Descriptive statistics were done and the results presented using tables. Bivariable and multivariable logistic regression analyses were used to determine the association of the independent variables with the outcome variable. Explanatory variables with  $p < 0.25$  on bivariate logistic regression analyses were booked into the multivariable logistic regression model. The degree of association between independent and dependent variables was assessed using odds ratio with 95% confidence interval. Finally, variables with  $p < 0.05$  on the multivariable logistic regression analysis model were declared

statistically significant with the outcome variable. The model fitness was checked using Pearson's chi-square with a value of 4.341 and significance of 0.037.

### Inclusion and Exclusion Criteria

Mothers who have a baby age less than or equal to six months were included and those mothers who were too critically ill to practice newborn care were excluded.

### Operational Definitions and Descriptions

Good newborn care practice among lactating mothers at the household level during the postnatal period was operationalized using four newborn care practices. These four components are adopted from essential newborn practice standards. These four components were selected because of their practicality by lactating mothers at home irrespective of the place of delivery [Table 1].

### Study Variables

The dependent variable in this study was newborn care practice among lactating mothers and the independent variables were categorized as respondents' socio-demographic characteristics, obstetrics characteristics, and newborn care practices.

### Results

All study participants responded to the questionnaires, which made a response rate of 100%. The mean age of respondents was 28.6 ( $\pm 4.8$ ) years. Four hundred and ninety-five (59.4%) respondents cannot read and write, and six hundred and thirty-six (76.3%) were non-employed [Table 2].

### Respondents' Obstetric Characteristics

From the respondents, six hundred and forty-six (77.5%) lactating mothers had an antenatal care (ANC) visit, but only one hundred and thirty-one (20.3%) of the mothers had booked their first ANC visit within first 16 weeks of pregnancy. Regarding the pregnancy plan, two hundred and thirty-one (27.7%) pregnancies were unplanned among study participants. Three hundred and seven (42.8%) of the mothers had their last birth by a birth interval of less than two years [Table 3].

**Table 1** Operational Definition and Description of Explanatory Variables

Variables	Definition	Measurement
Baby bathing	Baby bathing should be taken after 24 hrs of delivery	If baby bathing is done after 24 hrs, scored "1" or If baby bathing done within 24 hrs, scored "0"
Exclusive breastfeeding	Baby should feed only breast milk within the first six months	If baby had feed only breast milk within the first six months, scored "1" or If baby started additional food within the first six months, scored "0"
Colostrum given	Mothers' first breast milk is suggested to be given to newborn	If first breast milk used by baby, scored "1" or If the first breast milk discarded, scored "0"
Cord care by mothers at home	Nothing advised to be applied to an umbilical cord [eg buttery, dung, oil, etc.]	If nothing applied on the umbilical cord, scored "1" but If any substance is applied on the umbilical cord, scored "0"
Good newborn care practice by lactating mothers at home		- Newborn care practices that scored "1" are WHO standard care practices - if mother scored "1" to four practices, categorized as good newborn care practice and if mother scored "0" to at least one practice, categorized as poor newborn care at home among lactating mothers

**Table 2** Socio-Demographic Characteristics of Respondents in the Rural Districts of Gedeo Zone, Southern Ethiopia, 2018 [n=834]

Variables	Categories	Frequency	Percentage
Age (mean=28.6 (±4.8) years)	≤24 years	160	19.2
	24–29 years	360	43.2
	≥30 years	314	37.6
Mothers' ethnicity	Gedeo	749	89.8
	Amhara	19	2.3
	Oromo	25	3
	Sidama	35	4.2
	Gurage	5	0.6
	Woliya	1	0.1
Mothers' religion	Orthodox	116	13.9
	Muslim	8	1
	Catholic	76	9.1
	Protestant	633	75.9
	Other (no religion)	1	0.1
Mothers' educational level	Cannot read and write	495	59.4
	Primary education	272	32.6
	Secondary education	43	5.2
	Diploma and above	24	2.9
Mothers' employment	Government employed	43	5.2
	Self-employed	154	18.5
	Housewife	636	76.3
	Other (student)	1	0.1

## Home-Based Newborn Care Practices Among Lactating Mothers

The prevalence of good newborn care practice among lactating mothers at home was 24.1% with 95% CI: 2.5–9.7. Four newborn cares of exclusive breastfeeding,

**Table 3** Obstetric Characteristics of Respondents in the Rural Districts of Gedeo Zone, Southern Ethiopia, 2018 [n=834]

Variables	Categories	Frequency	Percentage
Antenatal care visit	Yes	646	77.5
	No	188	22.5
Timing of first visit booking	<16 weeks	131	20.3
	≥16 weeks	515	79.7
Number of antenatal care visits	<4 visits	530	82
	≥4 visits	116	18
Birth interval	≤2 years	307	42.8
	>3 years	410	57.2
Birth order	First birth	117	14
	2nd–3rd birth	346	41.5
	4th–5th birth	219	26.3
	≥6th birth	152	18.2
Place of delivery	Home	544	65.22
	Health facilities	290	34.77
Mode of delivery	Spontaneous vaginal delivery	644	77.2
	Instrumental delivery	136	16.3
	Cesarean section	54	6.5
Types of birth	Singleton	796	95.4
	Twins	38	4.6
Gestation age at birth	Preterm (<37 weeks)	333	39.9
	Term (≥37 weeks)	501	60.1
Pregnancy planned	Yes	603	72.3
	No	231	27.7

colostrum using, baby bathing, and cord care were used to determine the level of newborn care practice among the lactating mothers at home. These four practices can

be practiced by lactating mothers to all newborns at home to support newborn well-being irrespective of the place of delivery.

For each newborn care practice by mothers at home, the standard practice was scored “1”; but practice that diverges from the standard practice was scored “0”. The mothers who had practiced all newborn care as standard newborn care were categorized as good newborn care practice; but mothers who had not practiced were categorized as poor newborn care at home.

Four hundred and seventy-seven (57.2%) lactating mothers have practiced exclusive breastfeeding and one hundred and eighteen (14.1%) mothers gave colostrum for their newborn. Concerning newborn bathing, two hundred and fifty-two (30.2%) of the babies had a bath within the first 24 hrs of delivery [Table 4].

## Factors Associated with Newborn Care Practices Among Lactating Mothers

Multivariable logistic regression analysis revealed that good newborn care practice was significantly associated with maternal education, employment, pregnancy plan, birth interval, and antenatal care.

Maternal education: educated mothers were 2.6 times higher (adjusted OR=2.6; 95% CI: 1.8–3.9) compared with non-educated mothers to have good newborn care practices.

**Table 4** Newborn Care Practices Among Lactating Mothers at Home in the Rural Districts of Gedeo Zone, Southern Ethiopia, 2018 [n=834]

Variable	Categories	Frequency	Percentage
Good newborn care practice	Yes	201	24.1
	No	633	75.9
Colostrum used	Yes	118	14.1
	No	716	85.9
Exclusive breastfeeding	Yes	477	57.2
	No	357	42.8
Food type given with in the first six months	Milk	163	45.6
	Fresh butter	86	20.8
	Sugar	90	20.2
	Other*	18	5.04
Baby bath after the first 24 hrs	Yes	582	69.8
	No	252	30.2
Not put any substance** on cord	Yes	640	76.7
	No	194	23.3

**Notes:** \*Cultural herbs, oil. \*\*Butter, oil, dung, powder.

Maternal employment: employed mothers were 2.1 times higher (adjusted OR=2.1; 95% CI: 1.4–3.1) compared with non-employed mothers to have good newborn care practice.

Antenatal care: mothers who had antenatal care follow-up were 5.7 times higher (adjusted OR=5.7, 95% CI: 3.9–7.9) compared with mothers who did not have antenatal care follow-up to have good newborn care practice.

Pregnancy intention: mothers who had planned pregnancy were 1.7 times higher (adjusted OR=1.7; 95% CI: 1.2–2.2) compared with mothers who had unplanned pregnancy to have good newborn care practice.

Birth interval: mothers who had birth interval greater than or equal to three years were 1.9 times higher (adjusted OR=1.9; 95% CI: 1.3–2.8) compared with mothers who had birth interval less than three years to have good newborn care practice [Table 5].

## Discussion

In this study, the prevalence of good newborn care practice among lactating mothers was 24.1% (95% CI: 2.5–9.7) in rural districts of Gedeo Zone, Southern Ethiopia. The finding of this study was lower as compared to previous studies in Northwest Ethiopia;<sup>11,27</sup> however, the finding is higher than studies conducted previously.<sup>22,30–33</sup> This finding discrepancy might be due to the differences in socioeconomic status of mothers, study participants, and scoring parameters used to level good newborn practices.

In this study, maternal educational status was significantly associated with good newborn care practice among lactating mothers at home. The finding of this study was comparable with Ethiopian Demographic Health Survey results<sup>7</sup> and other studies conducted in Tigray, Ethiopia, Uganda, Ghana, and India.<sup>25,28,30–36</sup> This findings consistency might be due to educating women being a community and political concern in developing and developed countries in comparable commitment. Women's education is a universal agenda to be implemented as a prospective countries program and is playing a great role to have good newborn care practice among lactating mothers.

Maternal employment was a significantly associated factor with good newborn care among lactating mothers. This finding corresponds with study findings in Tigray and North Ethiopia.<sup>31,34</sup> This might be that maternal employment helps mothers to improve their status in the community which means it empowers mothers to access education, health service care, decision-making, and economic independence. This directly and indirectly contributes to mothers having good newborn care at home.

**Table 5** Factors Associated with Good Newborn Care Practice Among Lactating Mothers in Rural Districts Gedeo Zone, Southern Ethiopia, 2018 [n=834]

Variables		Good Newborn Care		COR 95% CI	aOR 95% CI
		Yes	No		
Maternal education	Cannot read and write Formal education	143 281	352 58	Ref 1.96 (1.3, 2.7)	Ref 2.6 (1.8, 3.9)*
Employment	Not employed Employed	146 143	490 55	Ref 2.3 (2.6, 3.2)	Ref 2.1 (1.4, 3.1)*
Antenatal care visit	Yes No	543 90	103 98	6 (5.3, 6.6) Ref	5.7 (3.9, 7.9)* Ref
Birth interval	<3 years ≥3 years	104 332	203 78	Ref 2.2 (1.6, 3.1)	Ref 1.9 (1.3, 2.8)*
Pregnancy planned	Yes No	472 70	131 161	2 (1.8, 2.7) Ref	1.7 (1.2, 2.2)* Ref

**Notes:** \*Indicates p-value less than 0.05 and ref = referent.

Antenatal care follow-up was found to be a significantly associated factor for good newborn care practice among lactating mothers in this study. This study result corresponds with previously conducted studies in Ethiopia, Northern Ghana, and Nepal.<sup>11,22,33,34</sup> However, a community-based study conducted in Uganda showed that antenatal care follow-up was not significantly associated with good newborn care among lactating mothers at home.<sup>25</sup>

These findings inconsistencies might be due to the difference in study participants, socio-demographic characteristics, and period.

Planned pregnancy was found to be a significantly associated factor with good newborn care practice among lactating mothers in the study area. This result is consistent with the previous studies' findings.<sup>24,25</sup> When pregnancy is planned, the socioeconomic situation of mothers will be good and that may create an opportunity for mothers to access a good health service.

In this study, the birth interval was found to be a significantly associated factor with good newborn care practice among lactating mothers. This result was similar to a study done on cultural newborn practice among mothers in Indonesia;<sup>21</sup> however, other studies revealed that the birth interval was not significantly associated with good newborn care practice in Uganda and Sri Lanka.<sup>24,37</sup> Consequently, the difference in results might be due to differences in socio-demographic characteristics and health service utilization among study participants.

The study findings have programmatic implications meaning that providing good newborn care was expected

from health professionals as per the World Health Organization recommendation. But, this study finding infers that to assure quality newborn care services, home-based good newborn care practice by lactating mothers was suggested. Thus, the findings of the study give the clue to develop the program to link institution-based service to home-based newborn care practices to sustain good newborn care as per the standard.

## Strength and Limitation of the Study

As a strength, the study was one of the few studies conducted to assess newborn care among lactating mothers at home. The study also tried to show home-based newborn care practice by lactating mothers which might support the standard newborn care practice continuum.

The study also has limitations that should be considered while interpreting the findings. We used only four standard practices to determine the level of "good newborn care practice" that could be practiced by lactating mothers at home. The study was conducted at a point in time but it could be better to do an observational study to identify associated factors at the household level.

## Conclusion

The prevalence of good newborn care practice among lactating mothers was found to be low. Improving women's education, employment, antenatal care follow-up, and family planning service is recommended to assure good newborn care practices among lactating mothers.

## Abbreviations

ANC, antenatal care; BF, breastfeeding; EDHS, Ethiopian demographic and health survey; LBW, low birth weight; NMR, neonatal mortality rate; PMR, perinatal mortality rate; PROM, prolonged rupture of membranes; SNNPR, South Nations Nationalities Peoples; UNICEF, United Nation Children's Fund; WHO, World Health Organization.

## Ethics Statement

The study was conducted in accordance with the Declaration of Helsinki.

## Data Sharing Statement

All relevant data are within the manuscript.

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## Disclosure

All authors declare that they have no competing interests.

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