

## Essential Newborn Care Practices and Determinants among Lactating Mothers of Biratnagar

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### ABSTRACT

**Background:** Essential Newborn Care is a set of practices that reduces neonatal morbidity and mortality, such as clean cord care, thermal care (keeping the baby warm by wrapping in clean and dry clothes and delaying bathing until 24 hours after birth), and initiating breastfeeding within the first hour of birth. Essential newborn care (ENC) around the time of birth is critical in improving neonatal survival.

**Methods:** A mixed-method, community-based cross-sectional study was conducted among 338 lactating mothers using a simple random sampling method and three focus group discussions (FGD) in which 10 mothers were involved for qualitative data. Data entry was carried out by EpiData version 3.1, and analysis was done by SPSS (Version 16). Binary logistic regression was used to identify predictors. Qualitative data were analyzed by using a thematic framework.

**Results:** This study found 82.1% of mothers had good practices in essential newborn care. Factors such as age, occupation, and income of the respondent and her husband, the timing of the ANC's first visit, type of family, place of delivery, type of house, latrine, and sources of drinking water were significantly associated with the practice. 250 (89.6%) of the respondent those who visited the health centre for more than 4 visit more likely to have practiced ENC, and it is statistically significance having p-value <0.001. 161(57.7%) of the respondent who delivered their baby in a governmental hospital are more likely to have practiced ENC, and it is statistically significance having p-value <0.001. According to the qualitative findings, most of the lactating mothers, though they were not familiar with the term essential newborn care, were practising it. The majority of mothers were aware of maternal and child health, with a good source of information gained by FCHVs.

**Conclusion:** Essential Newborn Care (ENC) practices among mothers were found to be satisfactory. Improving women's education, employment, antenatal care follow-up, and family planning service is recommended to ensure good newborn care practices among lactating mothers at the local level.

**Keywords:** Essential newborn care, Newborn danger sign, Breastfeeding, Optimal thermal care, Safe cord care, Biratnagar Metropolitan.

### INTRODUCTION

Each year nearly 7.7 million children under five years die around the world; out of which approximately 3.1

million newborns die during the neonatal period, and almost all these (99%) deaths occur in developing countries.<sup>1</sup> Neonatal mortality is a public problem in low and middle-income countries. Globally,

approximately three million neonates die in the first month of life. Community-based interventions are important for reducing neonatal deaths, even where levels of facility deliveries are high. After delivery, newborns should receive immediate newborn care, and these practices can be promoted at the facility, community, and household levels through a variety of channels including through post-natal home visits.<sup>3</sup>

Evidence showed that the under-5 mortality rate differs by province, mother's education, and wealth for the ten years before the survey. Children whose mothers have no education are more likely to die young (60 deaths per 1,000 live births) than children whose mothers have SLC and above education (21 deaths per 1,000 live births). Under-5 mortality is higher among children in the poorest households (62 deaths per 1,000 live births), compared to children in the wealthiest households (24 deaths per 1,000 live births).<sup>4</sup>

Nepal has made great efforts to improve maternal and child health by focusing on accessibility and outreach over the past decades.<sup>5</sup> Maternal mortality has declined from 548/100,000 deliveries in year 2000 to 258/100,000 in 2015. under-5 mortality has declined from 81/1000 to 36/1000 live births over the same period.<sup>6</sup> There are, however, indications that the neonatal mortality reduction is stagnating, thus constituting a larger part of overall child mortality. There is, therefore, a need to focus more on essential newborn care as a means to further reduce overall child mortality. 5 Nepal has 239 deaths per 100,000 live births for the seven-year period before the survey. The confidence interval for the 2016 MMR ranges from 134 to 345 deaths per 100,000 live births. Umbilical cord infection is a severe bacterial infection that contributes to neonatal morbidity and mortality. Among births in the two years before the survey, Chlorhexidine was applied on 39% of newborns, whereas nothing was applied on 37% of newborns. Breastfeeding is very common in Nepal with 99% of children ever breastfed. More than half (55%) of children are breastfed within the first hour of life. Three in ten children who were ever breastfed received a prenatal feed, though this is not recommended. In Nepal, 83% of children age 6-8 months are breastfed and receive complementary foods. The objective of this study was to assess prevalence and determinant of essential newborn care practices among lactating mothers Biratnagar Metropolitan.

## METHODOLOGY

A Community based Mixed method, both qualitative and quantitative, was conducted at 5 wards of Biratnagar Metropolitan City of Morang District from September 2020 to April 2021. There is a variation in education, occupation and population diversity in Biratnagar. There are many programs like safe motherhood, nutrition, IMCI, etc. Though it is an urban city, it still has a gap at the community level.

For the quantitative study, A multistage random sampling technique was used to select and enroll a total of 338 lactating mothers. Out of 19 wards, 5 wards were selected randomly. A list of mothers having children aged less than 1 year was collected through the health register from the FCHV of the selected wards. Equal proportion of study Participants were selected by simple random sampling techniques at the household level from each of the five selected wards.

For the qualitative study, three focus group discussions (FGDs) were conducted in a similar setting, with 10 mothers in each group. They were conducted according to focus group discussion guidelines. Each session of FGD was tape-recorded after the participants gave written and signed voluntary consent.

All lactating mothers who had babies less than 1 year old during the data collection period and were willing to participate in the study were included in the study. Whereas mothers who were pregnant and mothers who were critically ill were excluded from the study. Data was collected using a semi-structured questionnaire consisting of Socio-demographic information of the respondent, Obstetric characteristics of respondents, Essential newborn care practices among lactating mothers and environmental information. Ethical approval was taken from the Institutional Review Committee (IRC) of B.P. Koirala Institute of Health Sciences. Written permission was taken from the Biratnagar Metropolitan. The introduction of the researcher, research topic, and its importance were explained in detail. A direct interview was taken to the participants using semi-structured questionnaires. Collected data was checked after every day's work and entered in Epi data V.3.1. It was exported to Statistical Package for Social Sciences for statistical analysis (SPSS 16 version). Qualitative data were synthesized through thematic analysis, with coding

used to identify emergent themes within each care practice. Control, privacy and storage of data were strictly maintained. Only the researcher and the guide had access to data.

For descriptive statistics: Frequency, percentage, mean, and standard deviation was calculated. Tabular presentation were used.

For inferential statistics: Bivariate analysis was done using Chi-square test, p-value less than 0.05 was considered significant. Binary logistic regression was applied to find the relationship between each variable that had p-value less than 0.2 in bivariate analysis. Statistical significance was tested with 95% confidence interval and p-value less than 0.05 was considered significant.

## RESULTS

Prevalence of good essential newborn care practice was 82.1% and poor essential newborn care practice was 17.4%. Determinants of essential newborn care practices were tested to determine whether the composite newborn care practices (safe cord care, optimal thermal care and breastfeeding) were related to socio-demographic factors, adequacy of antenatal services and mothers' knowledge of specific newborn danger signs and obstetric history. Among 5 questions, mothers those score '3' out of 5 questions (>50%) are set as a good practice and those who score less than 2 (<50%) are set as a poor practice.

This study shows that the majority (56.2%) of lactating mother belongs to the age group 20-30 years, followed by age group more than 30 years (37.6%) the lowest number (6.2%) of lactating mother of age group less than 20 years. Majority (46.2%) of lactating mother was belonged to Terai/Madhesi ethnicity, and the least (10.4%) belonged to the Dalit ethnicity. Regarding religion, the majority (96.2%) of lactating mothers belong to the Hindu religion, and a low (3.8%) belong to the Muslim religion. Among respondents, 58.8% were unemployed.

The majority (99.4%) of lactating mothers reported that they visited for antenatal care, while a very less.3% of lactating mothers reported that they had not been for antenatal care. Regarding the number of antenatal care visits, 85.2% of respondents visited for >4 visits, and 14.8% had done <4 visits. Most of

the respondents, 63.3% were belong to primi gravida (primi parous) and 36.7% were multi gravida (multi parous). The majority (29.3%) of respondents had >3 years birth interval between 2 children, and 7.4 % had <2 years birth interval. Among the respondents, 57.4% deliver their baby in a government hospital, 38.8%, 3.8% deliver their baby in a private hospital and home. The majority (98.5%) of respondents have a single birth and only 1.5% has twins birth. The majority (95%) of respondents have term pregnancy, and only 5% have preterm pregnancy. Among the total respondents, 69.2% had no plan for the next baby, and 30.8% have a plan for the next baby. 72.5% of respondents have no knowledge about danger signs of newborns, and only 27.5% of respondents had knowledge. Most of the respondent 11.8% reported about fever regarding knowledge about the danger signs of a newborn (Table 1).

**Table 1: Obstetric Characteristics of Respondents**  
n=338

Characteristics	Frequency (N)	Percentage (%)
<b>Antenatal care visit</b>		
Yes	337	99.7
No	1	0.3
<b>Timing of first visit</b>		
First trimester	276	81.7
Second trimester	39	11.5
Third trimester	23	6.8
<b>Times of antenatal care visits</b>		
<4 visits	50	14.8
≥4 visits	288	85.2
<b>Gravida</b>		
Prim gravidae	214	63.3
Multigravida	124	36.7
<b>Parity</b>		
Prim parous	214	63.3
Multiparous	124	36.7
<b>Birth interval</b>		
≤2 years	25	7.4
>3 year	99	29.3
Not applicable	214	63.3
<b>Place of delivery</b>		
Home	13	3.8
Government hospital	194	57.4
Private hospital	131	38.8
<b>Mode of delivery</b>		
Vaginal delivery	178	52.6
Instrumental delivery	80	23.7
Cesarean section	80	23.7

The majority (98.5%) of respondents have a single birth, and only 1.5% has twins. The majority (95%) of respondents have term pregnancy, and only 5% have preterm pregnancy. 72.5% of respondents have no knowledge about danger signs of newborns and only 27.5% of respondents had knowledge (Table 2).

**Table 2: Obstetric Characteristics of Respondents, n=338**

Characteristics	Frequency (N)	Percentage (%)
<b>Types of birth</b>		
Single	333	98.5
Twins	5	1.5
<b>Gestational age</b>		
Preterm(<37weeks)	17	5.0
Term (≥37 weeks)	321	95.0
<b>Planned for next Pregnancy</b>		
Yes	104	30.8
No	234	69.2
<b>Knowledge of danger sign</b>		
Yes	93	27.5
No	245	72.5
<b>Danger sign of newborn (n=93)</b>		
Hypothermia	14	4.1
Chest indrawing	27	7.9
Fever	40	11.8

The majority (53%) of respondents had heard about essential newborn care practice, and only 47% had not heard about ENC practice. One fourth (25.7%) of the respondents had about ENC practices through health workers, 19.5%, 5%, 2.7% heard from mass media, relatives and friends, respectively. Among the respondents, 92.9% of them feed their baby colostrum milk within 1 hour. The majority (82.8%) of respondent feed their baby exclusive breastfeeding. The majority (95.3%) of respondents reported that sterile scissors were used to cut the umbilical cord, 4.7% of them said that a new blade was used to cut the umbilical cord .3% of them were unsure about it. Less than half (46.7%) of respondents said that betadine was used to

apply on the cord, 21.3%, 20.4%, 7.1%, 4.2% and .3% chlorohexidine, oil, nothing, unknown, Neosporin was applied on the cord during the delivery of the baby (Table 3).

**Table 3: Essential Newborn Care Practices**

n=338

Characteristics	Frequency (N)	Percentage (%)
<b>Essential newborn care practice</b>		
Yes	179	53.0
No	159	47.0
<b>Information about essential newborn care</b>		
Health worker	87	25.7
Mass media	66	19.5
Relative	17	5.0
Friends	9	2.7
<b>Colostrum milk fed to the baby</b>		
Yes	314	92.9
<b>Exclusive breastfeeding</b>		
Yes	280	82.8
<b>Food given with in the first six (n=58) months</b>		
Lactogen	56	97
Cow milk	2	3
<b>Instrument used to cut the umbilical cord</b>		
New blade	16	4.7
Sterile Scissors	322	95.3

The majority (46.7%) of respondents said that betadine was used to apply on cord, 21.3%, 20.4%, 7.1%, 4.2% and .3% chlorohexidine, oil, nothing, unknown. Neosporin was applied to the cord during the delivery of the baby. Reason for applying substance to cord stump, most of the respondents said that (58.9%) to

prevent infection, 31.4%, 9.7% for to add healing, keep it dry and not applicable respectively (Table 4).

**Table 4: Essential Newborn Care Practices among Lactating Mothers, n=338**

Characteristics	Frequency (N)	Percentage (%)
<b>Material w used to clamp cord</b>		
Thread	12	3.6
Cord clamp	326	96.4
<b>Material applied to cord</b>		
Oil		
Betadine	69	20.4
Chlorohexidine	158	46.7
Nesporin	7	21.3
Nothing	1	0.3
unknown	24	7.1
	14	4.2
<b>Time of baby wrapped</b>		
Immediately (< 5 min)	240	71.0
5–10 min	73	21.6
Unknown	25	7.4
<b>Newborn’s first bath</b>		
<b>1-6hrs</b>		
More than 6 h but less than 24 h	12	3.5
More than 24 h	316	93.5
Can’t tell	7	2.1
<b>Reasons for application</b>		
Prevent infection	199	58.9
To aid healing Keep it dry	106	31.4
Not Applicable	33	9.7

The majority of the respondents, 158 (56.6%), at the age of 20-30 years have more likely to have practised ENC, and age is statistically significance having p-value .0006. The majority, 271(97.1 %) of the Hindu religion are more likely to have practice about ENC and religion is statistically significance having p-value of 0.042. Education of the respondent and education of the respondent’s husband were not statistically significant (Table 5).

**Table 5: Association of Socio- demographic with Essential Newborn Care Practice**

Characteristics	ENC Good practices	ENC Poor practices	P-value
<b>Age</b>			
< 20 years	12 (57.1%)		
20-30years	158 (83.2%)	9 (42.9%)	0.006
>30 years	109 (85.8%)	32 (16.8%)	
		18(14.2%)	
<b>Ethnicity</b>			
Brahmin/Chhetri	67 (94.4%)	4 (5.6%)	NA
Janajati	49 (87.5%)	7 (12.5%)	
Dalit	23 (65.7%)	12 (34.3%)	
Terai/Madhesi	127 (81.4%)	29 (18.6%)	
Marwadi	4 (100%)	0 (0.0%)	
Muslims,	9 (56.3%)	7 (43.8%)	
<b>Religion</b>			
Hindu	271(83.4%)	54 (16.6%)	0.042
Muslim	8 (61.5%)	5 (38.5%)	
<b>Education of respondent</b>			
Illiterate	24 (66.7%)	12 (33.3%)	0.075
1-5std	34 (89.5%)	4 (10.5%)	
6-10 std	68(81.9%)	15 (18.1%)	
11-12std	88 (83.0%)	18 (17.0%)	
Graduate & above	65 (86.7%)	10 (13.3%)	
<b>Education of respondent’s husband</b>			
Illiterate	4 (100%)	0 (0.0%)	NA
1-5std	13 (72.2%)	5 (27.8%)	
6-10 std	66 (77.6%)	19 (22.4%)	
11-12std	80 (82.5%)	17 (17.5%)	
Graduate & above	116 (86.6%)	18 (13.4%)	

The majority, 279 (82.8%) of the respondents who visited the health centre for antenatal care are more likely to have practised ENC, and it is statistically significance having p-value of 0.084. The majority, 250 (89.6%) of the respondent those who visited 85.7% for the first trimester in health center are more likely to have practised ENC, and it is statistically significance having p-value <0.001. The majority, 250 (89.6%) of the respondent those who visited the health centre for more than 4 visit more likely to have practised ENC, and it is statistically significance having p-value of <0.001. The majority, 161(57.7%) of the respondent who delivered their baby in a governmental hospital are more likely to have practised ENC, and it is statistically significance having p-value <0.001.

There was no statistical association between Gravida, parity, birth interval, mode of delivery, type of birth, gestation age, planned for next pregnancy, knowledge about danger signs score p- value more than 0.05 and ENC (Table 6).

**Table 6: Association of Essential Newborn Care Practice with Obstetric Characteristics of Respondents**

Characteristics	Essential newborn care		P-value
	Good practices	Poor practices	
<b>Antenatal care visit</b>			
Yes	279(82.8%)	58 (17.2%)	NA
No	0 (0.0%)	1 (100%)	
<b>Timing of first visit</b>			
First trimester	239(86.6%)	37 (13.4%)	<0.001
Second trimester	24 (61.5%)	15 (38.5%)	
Third trimester	16 (59.6%)	7 (30.4%)	
<b>Antenatal care visits</b>			
<4 visits	29 (58.0%)	21 (42.0%)	<0.001
≥4 visits	250(86.8%)	38 (13.2%)	
<b>Gravida</b>			
Primi gravidae	181(84.6%)	33 (15.4%)	0.195
Multigravida	98 (79.0%)	26 (21.0%)	
<b>Parity</b>			
Primi parous	181(84.6%)	33 (15.4%)	0.195
Multiparous	98 (79.0%)	26 (21.0%)	
<b>Birth interval</b>			
≤2 years	17 (68.0%)	8 (32.0%)	0.138
>3 year	83 (83.8%)	16 (16.2%)	
Not applicable	179(83.6%)	35 (16.4%)	
<b>Place you deliver</b>			
Home	3 (23.1%)	10(76.9%)	<0.001
Government hospital	161(83.0%)	33 (17.0%)	
Private hospital	115(87.8%)	16 (12.2%)	
<b>Mode of delivery</b>			
Vginal delivery	14(82.6%)	31 (17.4%)	0.707
Nstrumental delivery	68 (85.0%)	12 (15.0%)	
Cesarean section	64 (80.0%)	16 (20.0%)	
<b>Types of birth</b>			
Single	275(98.6%)	58 (98.3%)	0.880
Twins	4 (1.4%)	1 (1.7%)	
<b>Gestation age</b>			
Preterm (<37 weeks)	13 ((76.5%)	4 (23.5%)	0.498
Term (≥37 weeks)	266(82.9%)	55 (17.1%)	
<b>Planned for next Pregnancy</b>			
Yes	81 (77.9%)	23 (22.1%)	0.132
No	198(84.6%)	36 (15.4%)	
<b>Danger sign of newborns</b>			
Yes	74 (79.6%)	19 (20.4%)	0.375
No	205(83.7%)	40 (16.3%)	
<b>Total</b>	279(82.54)	59(17.45)	

Binary logistic regression was applied between the outcome variable and the independent variable in order to adjust or explore the significance of the independent variables. The dependent variable was measured on a dichotomous scale. The independent variables with a p-value less than 0.2 in the bivariate analysis were then included in the logistic regression analysis.

The variables subjected to the model were age, ethnicity, religion, occupation of respondent,

occupation of husband of respondent, type of family, antenatal care visit, timing of antenatal care visit, place of delivery, type of house, sources of drinking water, latrine.

The final model in the logistic regression that occupation of respondent (p=0 .054), timing of first visit (p=0.010), and sources of drinking water (p=0 .048) were found to be statistically significant (Table 7).

**Table 7: Binary Logistic Regression Analysis of Selected Independent Variables with Essential Newborn Care Practices**

Variables	Odd ratio	CI of 95%		P value
		Upper case	lower case	
<b>Age</b>				
< 20 years	REF			
20-30years	.129	.022	.749	.022
>30 years	.689	.270	1.755	.434
<b>Occupation</b>				
Service	REF			
Business	.706	.147	3.397	.664
Farmer	1.073	.159	7.262	.942
Daily labour	.006	.000	.281	.009
Unemployed	.079	.005	1.166	.065
<b>Occupation of husband</b>				
Service,	REF			
Business	3.699	.474	28.846	.212
Farmer	1.939	.218	17.224	.552
Daily labour	45.865	.597	3524.490	.084
Unemployed	3.325	.346	31.923	.298
<b>Monthly Family Income</b>				
10000-20000	REF			
20000-30000	.547	.105	2.839	.472
30000-40000	2.314	.408	13.131	.344
40000 above	1.275	.304	5.349	.740
<b>Timing of first visit</b>				
First trimester	REF			
Second trimester	.083	.009	.801	.031
Third trimester	.058	.007	.510	.010
<b>Type of family</b>				
Nuclear	REF			
Joint	.578	.096	3.475	.549
<b>Place you deliver</b>				
Home	REF			
Government hospital	.075	.008	.693	.022
Private hospital	1.072	.374	3.070	.897
<b>Type of house</b>				
Cemented	REF			
Wooden	.415	.068	2.544	.342
Mud	.731	.108	4.715	.725
<b>Latrine</b>				
Yes	REF			
No	33.942	3.896	295.737	.001
<b>Sources of drinking water</b>				
Hand pump	REF			
Tap	.289	.084	.987	.048
Purified water	.302	.088	1.043	.058

### Analysis of Qualitative Data

Three focus group discussions were conducted among lactating mothers of infants less than 1 year old with the help of FCHV of each ward. The final sample size was mainly determined based on the information saturation level. Ten women participated in each FGD, hence the total number of participants was 30. Qualitative data on the practices were synthesized through thematic analysis. Essential Newborn Care Practices were themed as Information about antenatal care visits, about delivery, danger signs of newborns, and Essential newborn care practices.

#### 1. Essential Newborn Care Practices and Antenatal Care Visit.

All of the lactating mothers had visited a health center though it was a government or private. Most of them were visited for more than 4 visits, and some had visited for fewer than 4 visits. It can happen due to the awareness and motivation programme of safe motherhood and FCHV. According to the findings, the majority of lactating mothers who had done more than 4 visits had practised essential newborn care.

#### 2. Essential Newborn Care Practices and Delivery Place, Mode of Delivery.

A majority of 29 of the lactating mothers delivered their baby in government and private hospitals, and 1 had a home delivery. Despite home delivery, they had practice ENC. The mode of delivery they had practised was ENC until and unless a complication had occurred to the baby or mother.

#### 3. Essential Newborn Care Practices and Danger Signs of Newborns.

The majority of the lactating mothers had no knowledge about ENC, though they were practicing it.

#### 4. Component of ENC and its Practices

Components of ENC are safe cord care, thermal warmth and breastfeeding.

Most of the lactating mothers had stated that safe cord care had been practiced by using sterile scissors to cut the cord and applying betadine or chlorohexidine to the cord for the prevention of infection. Only one mother said that she used Neosporin of cord care.

Most of the lactating mother had stated that thermal/warmth had been practiced by the baby immediately within 5-10 min after birth, and for bathing practice they had bathed their baby after 24 hours of the baby's birth. The majority of the lactating mothers had stated that breastfeeding had been practised by giving colostrum milk to the baby within 1 hour of delivery and not giving any extra food like honey.

A 27-year-old FGD discussant said that, yes, I visited the health centre for antenatal care, more than 5 visits, and yes, a private hospital. I had normal delivery for 3<sup>rd</sup> times, has waited for a male baby. The cord was cut by sterile scissors and clamped by a cord clamp, which was white in colour, and a kind of ointment had been used. Yes, the baby was covered immediately, and colostrum milk was fed to the baby. I bath my baby after 7 days of birth, he, he...A 25-year-old FGD discussant said that, though I visited the MCH clinic of Koshi hospital for antenatal care, I delivered my baby at home. Yes, I visited for antenatal care 4 times. I tried to go to the hospital for delivery, but my mother-in-law did not agree. She called CMA near the chowk for delivery. He cut the cord with a sterile blade since the baby's condition was not good. He wrapped the baby after 20 minutes. I don't think he applied anything to the cord, but tied the cord with the thread.

My mother-in-law bathed my child after 6 hours to wash the white thing from the baby's body.

A 34-year-old FGD discussant said that, yes, I visited MCH of Koshi hospital for antenatal care more than 8 times. I delivered my baby through an operation. As I was not in my senses, I don't remember the exact time, cutting the cord. I feed colostrum milk to my baby. Um, I both my bath after 7 days.

## DISCUSSION

This study was conducted to assess the prevalence and determinants of essential newborn care practices among lactating mothers through the application of a mixed-method, cross-sectional study design in Biratnagar metropolitan, Morang. The prevalence of good essential newborn care practice was 82.1%, and poor essential newborn care practice was 17.4%.

Care provided during the perinatal and neonatal periods is critical to ensuring the health of mother

and baby. Maternal health and newborn health are inextricably linked; this brief primarily addresses the needs of the newborn infant and some selected maternal issues that influence birth outcomes. Essential newborn care (ENC) is a comprehensive strategy designed to improve the health of newborns. This is because all the women in the sample were drawn from only the rural areas of the district. This greater proportion of disadvantaged and Dalit caste/ethnicity women reflects the situation in rural areas throughout Nepal.

In this study, the majority of the respondent 96.2% were from the Hindu religion, and 3.8% were from the Muslim religion, which seems to be consistent with our national census report 2011<sup>4</sup>, northern India<sup>15</sup> and Rural Pondicherry, India<sup>16</sup>. It might be due to the population rate of Hindu is higher than Muslim as well as Nepal, and India is Hindu country. Religion is among the important predictors of neonatal health outcomes. In this study, essential newborn care among women belonging to the Muslim religion was low compared with the women belonging to the Hindu religion groups, which is similar as compared to studies done in underprivileged ethnic groups in Midwest Nepal<sup>6</sup>, northern India<sup>15</sup>, and Rural Pondicherry, India<sup>16</sup>. Although such a lower neonatal care practice among Muslim women could have been linked to their socio-cultural condition, it suggests further studies to explore the effects of religion on neonatal care utilization. Tharu ethnic groups in this study were more likely to practice essential neonatal care as compared to other minority ethnic groups, which is similar as compared to a study done in underprivileged ethnic groups in Midwest Nepal<sup>6</sup>. The proportions of the Brahmin /Chhetri and the Dalit caste/ethnicity women were 16.8% and 12.1%, respectively. About 46.2% of the women belonged to the 'others' caste like Teria, which is higher than the study done in home delivery in Nepal<sup>5,1,29</sup>, Midwest Nepal: a mixed method study.<sup>6</sup> In this study, majority (58.8%) of mothers were unemployed or housewives, which is lower than the study done in Rural Pondicherry, India<sup>16</sup> and Chench District, Southern Ethiopia, 2017<sup>12</sup>, Southern Ethiopia<sup>11</sup> and higher than the study done in Lawra District of Ghana<sup>10</sup>, North Ethiopia, 2016<sup>26</sup>. This difference might be due to the socio-economic and cultural aspects of the country.

In this study, the majority (31.4%) of mother has plus two level of education, which is lower than studies done in Chench District, Southern Ethiopia, 2017<sup>12</sup>, North Ethiopia, 2016<sup>9</sup> and higher than the study done in Southern Ethiopia<sup>11</sup>. This difference might be due to socio-economic and cultural aspects of the country.

In this study prevalence of good essential newborn care was 82.1%, which was higher than the research done in different settings<sup>11-12</sup>. Health system-related factors contributing to this difference could be due to the extensive work of health extension workers and various health care institutions in awareness creation on ENC in the study area.

As per Integrated Management of Neonatal and Childhood Illness Guidelines, the newborn should be quickly dried and wrapped in a warm and clean cloth immediately after delivery to prevent heat loss from the body<sup>13</sup>. In the present study, it was observed that 71.1% newborns were wrapped immediately after birth, which is lower than the study done in Chench District<sup>12</sup>, Southern Ethiopia, 2017,<sup>11</sup> Rural Pondicherry, India<sup>16</sup> and rural Bangladesh<sup>23</sup>. Res Reports Neonatal. 2015. This may be due to the high sample size done in other study.

Majority 91.4% of respondent stated that they fed their baby colostrum milk within 1 hour of birth. This is lower as compared to the study done in Rural Pondicherry, India,<sup>16</sup> Lawra District of Ghana<sup>10</sup> and rural Bangladesh<sup>23</sup> and higher as compared to Mekelle City, North Ethiopia<sup>26</sup>. There are a number of benefits associated with early initiation of breastfeeding, including stimulation of breast milk production and the release of oxytocin, which helps the contraction of the uterus and reduces post-partum blood loss. This may be due to low sample size in my study. In this study, the majority 95% stated that the cord is cut with the sterile scissor. This is lower as compared to the study done in Lawra District of Ghana<sup>10</sup>, and higher as compared to Southern Ethiopia, 2017<sup>11</sup>. In this study, 92.8% respondent that they bathed their baby within 24 hours of birth. This is higher as compared to the study done in Rural Pondicherry, India<sup>16</sup>, Chench District, Southern Ethiopia, 2017<sup>12</sup> and Mekelle City, North Ethiopia<sup>26</sup>. According to the WHO and UNICEF report on newborn care, bathing should be avoided immediately after birth in order

to prevent hypothermia and for a normal newborn, bathing should be started on the second day. This may be due to the extensive work of health extension workers on a home-to-home basis.

In this study, 39.8% of mothers reported that substances were applied to the stump; this finding was supplemented by qualitative findings. In this study, 81.7% of respondents seek first-trimester service, which is lower than the study done in the Lawra District of Ghana <sup>10</sup>. This difference might be due to easily accessibility and affordability of the NAC service in Nepal. In this study, 57.4% of the respondents go to a government hospital for their delivery, which is higher than the study done in Chenchu District, Southern Ethiopia, 2017<sup>12</sup> and Southern Ethiopia <sup>11</sup>. This difference might be due to the awareness and incentive factor given to pregnant mothers in Nepal. In this study, 52.6% of the respondents had a normal delivery, which is lower than the study done in Rural Pondicherry, India <sup>16</sup>. This might be due to focusing on normal delivery rather than other and high technology service in India.

## CONCLUSION

Essential newborn care practices were found to be a good reason behind the high percentage of institutional delivery among lactating community mothers due to pregnancy at an appropriate age, good education status, and proper health-seeking behaviour (ANC visit, institutional delivery).

The FGD shows that the majority of the lactating mothers, though they are not familiar with the term essential newborn care, were practising it. The majority of mothers were aware of maternal and child health, with a good source of information gained by FCHVs. Improving women's education, employment, antenatal care follow-up, and family planning service is recommended to ensure good newborn care practices among lactating mothers at the local level.

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