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Neonatal Care Practice and Associated Factors Among Postnatal Mothers Who Have Neonates in Ethiopia, Mixed Study

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Abstract

Introduction: *Few studies identified variables associated with neonatal care practices were varied from place to place. However, little is known about the prevalence of neonatal care practice and associated factors in Ethiopia including the study area. This study was aimed to assess the prevalence of neonatal care practice and associated factors among postnatal mothers who have neonates in Kombolcha town.*

Methods: *Community-based cross-sectional study supplemented with the qualitative inquiry was conducted among 625 postnatal mothers in selected Kebeles of Kombolcha town .Multistage systematic random sampling technique was used to select study participants for a quantitative study. Data were collected using a structured interviewer-administered questionnaire. Eighteen participants for qualitative in-depth interviews were selected through the purposive sampling technique. Data were entered into Epi-Data version 4.6 and then exported to Statistical Package for Social Science (SPSS) version 25 for further analyses. Binary logistic regression was performed to identify factors associated with the outcome variable of interest. The level of statistical significance was declared at P-value less than 0.05. Qualitative data were transcribed and coded during and after the data collection period, then were analysed manually by using a thematic approach.*

Results: *Out of the total 606 participants, the prevalence of neonatal care practice was [49.7%, 95%CI: (45.72%, 53.68%)]. On multivariable logistic regression model, number of antenatal care visits [AOR = 3.28; 95%CI (1.40, 7.67)], birth interval of current baby [AOR = 2.56; 95%CI (1.06, 6.16)] and knowledge of mothers towards neonatal care practice [AOR = 8.66; 95%CI (4.83, 15.56)] were significantly associated with neonatal care practice.*

Conclusion: *prevalence of neonatal care practice was relatively low among postnatal mothers in Kombolcha town compared to other literature. The number of antenatal care visits, the birth interval of the current baby, and knowledge of mothers towards neonatal care practice were found to be independent predictors.*

Keywords: neonatal, care practice. Factors, mixed study

Introduction

Neonatal care is caring for a newborn during the first 28 days of life from the moment it is born [1]. The World Health Organization (WHO) has established a minimum care regimen for newborns, which must be provided during pregnancy, labor, and delivery, immediately after birth, and during the first 28 days of life. This minimum neonatal care package includes tetanus toxoid (TT) immunization, birth preparedness and complication readiness (BPCR), antenatal care (ANC) visit and appropriate information on neonatal care during pregnancy; quality care during delivery, and Social support during labor and delivery and immediate thermal care, clean and safe cord care, timely and exclusive breastfeeding, appropriate bathing time and immunization on date of birth during the post-partum period [2,3].

Neonatal mortality accounts for approximately two-thirds of all infant mortality and 45% of under-five mortality globally. Ninety-nine percent of these deaths occur in low- and middle-income

countries, and half of the births occurred at home. Although the neonatal period is short and brief, neonatal deaths during this period account for a large proportion of under-five mortality [4]. A study done in Mewat Haryana India showed that only 58.6% of the participants had ever performed good neonatal care practice properly [5].

Different studies were done in sub-Saharan Africa various identified a wide application gap in Neonatal care practices; the overall status of neonatal care practice was remaining low and variable in different nations such as Rwanda at 65.1%, Tanzania at 59%; Uganda at 49%; and Ghana 37% [6,7].

Studies done in Ethiopia indicated that it varies from 24% - to 60.6% [4,8-10]. Federal democratic republic of Ethiopia Mini Demographic and Health Survey in 2019 revealed that about 29 deaths per 1,000 live births and remained stable since the 2016 EDHS, with a larger share of (43%) all deaths of under-five mortality [11,12]. The single most cost-effective intervention to reduce neonatal mortality and morbidity both in developed and developing countries is the promotion of appropriate Essential newborn care practice [13].

Recent studies showed that Place of residence, maternal education, husband's occupation, monthly income, birth order, inter-birth interval, parity and counseling on essential newborn care during delivery, Age of the mother, occupation, the month of pregnancy at first ANC visits, overall knowledge and attitude level were having an association to Neonatal care practices [8,10,14].

Almost all countries, including Ethiopia, have adopted this strategy and have been implementing it for nearly a decade. However, newborn care often receives less-than-optimum attention. As a result of these efforts, Ethiopia has little improvement in neonatal care practice [15]. However, recent studies in Ethiopia revealed that variables associated with neonatal care practices varied from place to place, and neonatal death is still high. Additionally, there are no studies to show the effect of culture on the practice of Neonatal care among postnatal mothers. Therefore, this study was aimed to assess the prevalence of neonatal cares practices and associated factors and explored more culture-specific reasons that may affect neonatal care practices among postnatal mothers in Kombolcha town. Effective neonatal care practice will improve survival and health of subsequent lifetimes as well as play a good role in the fulfillment of sustainable development goals [16]. This study aimed to assess the prevalence of Neonatal care practice and its associated factors among postnatal mothers in Kombolcha town. Therefore, the finding of this study helps; researchers as input information for further study, provide important information for health sector program managers and health policymakers to focus on and improve neonatal care. It can also give clues in the assessment of hinders to the fulfillment of the sustainable development goal.

Materials and Methods

Study Design and Period

Community-based cross-sectional study with a mixed-method (both quantitative and qualitative components) was conducted in Kombolcha town from March to April 2021.

Study Populations

All mothers in the reproductive age group who have neonates in Kombolcha town were the source of the population. All mothers in the reproductive age group who have neonates in selected Kebeles of the town during the data collection period were the study population. For qualitative study purposively selected mothers in the reproductive age group who have neonates and who were not included in the quantitative study. Mothers who have neonates and lived in the study area for six or more months before data collection were included in the study. Participants who were found critically ill and unable to communicate during the study period were excluded from the study.

Sampling method and sample size determination

The sample size was determined by using the single population proportion formula by taking the "p" proportion of neonatal care practice 44.1 % from a study conducted on neonatal care practices and associated factors in Nekemte town [10]. confidence level of 95%, 5% margin of error, and 1.5 design effect.

$$n = \frac{(Za/2)^2 * p(1-p)}{d^2} * DE$$

Where; n = the required sample size
P= proportion of neonatal care practice
a= level of confidence
z= degree of accuracy at 95%
d=margin of error
DE= design effect

$$n = \frac{(1.96)^2 * 0.441(1-0.441)}{0.05^2} * 1.5$$

$$n = 378 * 1.5$$

$$n = 568 + 57 = 625$$

The total sample size will be 625. By 2nd objective sample size determination was taken from different literature (Table 1). Based on information saturation eighteen mothers who have neonates for the qualitative part of the study were purposively selected. A multistage systematic sampling technique was employed to select the study participants and followed by a systematic sampling technique with a fixed sampling interval. For the qualitative study was used purposive sampling (figure 1)

Table 1: sample size calculation procedure with epi-info for Neonatal care practice and associated factors among postnatal mothers in Kombolcha town, Northeast Ethiopia 2021

Factors	Assumptions	Calculated sample size	citation
ANC visit Yes	% outcome in unexposed group = 12.37%, AOR = 3.13, CI = 0.95, Power = 80, Ratio = 0.18	363	[34]
Birth interval >3 years	% outcome in unexposed group = 33.87%, AOR = 1.9, CI= 0.95, Power = 80, Ratio = 0.74	352	[15]
Got counselling about new-born care Yes	% outcome in unexposed group = 26.05%, AOR = 2.32, CI= 0.95, Power = 80, Ratio = 0.399	273	[10]
Maternal education (Yes)	% outcome in unexposed group = 22.95%, AOR = 2.6, CI= 0.95, Power = 80, Ratio = 3.25	366	[15]

Since sample size calculated for the first objective (sample size calculation using single population proportion) is greater than the second objective (sample size calculation for associated factors of NBCP) which was 378, with DE and 10% non-response rate [12] to increase the power and compensate for non-response rate 568+57 = 625 mothers who have neonate were included in the study.

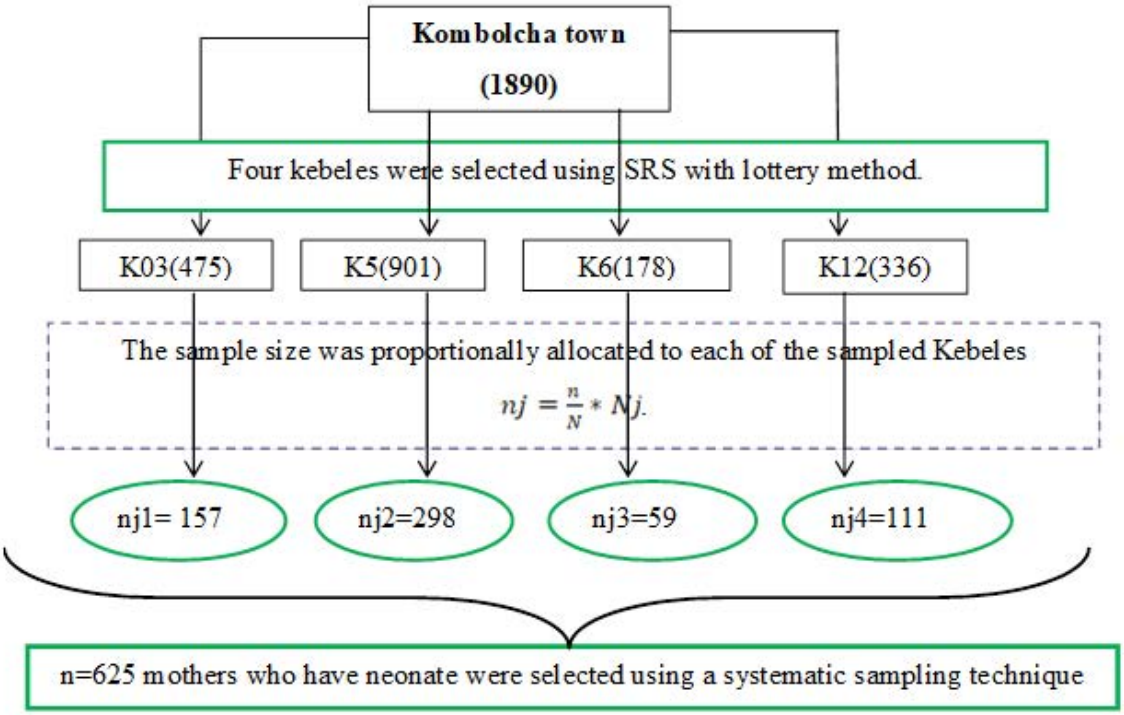

Figure 1: Schematic Presentation of sampling procedure for Neonatal care pratice

Data Collection Procedure

The data were collected using a structured interviewer-administered questionnaire adapted from the EDHS, and other relevant literature [15,17,18]. The questionnaire has included all the questions that assess the neonatal care practice of post-natal mothers who have neonates. The tool was prepared in the English version and translated to Amharic (regional language) and then translates back to the English language to check for consistency. Finally, the data was collected in the Amharic language. The data collectors administer the questionnaire to mothers who have been selected for the study. Each questionnaire was completed within 30 minutes.

For the qualitative study, semi-structured Face-to-face in-depth interview (IDIs) questionnaires were prepared. Data were collected using a note-taker and were tape-recorded. Eighteen IDIs were undertaken to get insight into issues that could not be addressed by the quantitative survey. The interview was started with a couple of questions prepared to create rapport with the study participants. After a rapport is created, the objective of the study was introduced. And continued interviewing participants until the semi-structured questionnaire ended with probing in each question. These questions focus on the life experiences, beliefs, and attitudes on neonatal care practice of post-natal mothers who have neonates. Upon completion of each interview and based on the recorded audio a detailed transcription that captures all the discussion was developed. Those texts and the emerging themes identified during the interviews were confirmed. All the interviews were transcribed and prepared for coding and thematic analysis. The interview was held in the participant's home which is convenient for them.

Knowledge of breast self-examination was assessed through 11 items on NCP. The variables were measured in terms of multiple choices. However, to compute the median each variable was changed into "Yes" or "No" response categories by transforming into a different variable and assigning "1" for "No" responses and "2" for "Yes" responses. While computing the median, collinearity between the independent variables was checked by producing a correlation matrix. However, no correlation coefficient was 0.7 or above for a variable to be excluded. Respondents who score above or equal to the median value with a cut point of 2 were considered as good knowledge. Respondents who scored less than the median value were considered as having poor knowledge.

Neonatal care practice: was assessed through 12 composited variables of the WHO minimum neonatal care package. Each variable was measured in terms of "Yes" or "No" response categories and assigning "0" for "No" responses and "1" for "Yes" responses. While computing the median, collinearity between the independent variables was checked by producing a correlation matrix. However, no correlation coefficient was 0.7 or above for a variable to be excluded. Respondents who score above or equal to the median value with a cut point of 1 were considered Good practice. Otherwise who score less than the median value were considered as poor practice

Data Processing and Analysis

The data were entered into Epi data version 4.6.1 and exported to SPSS version 25 for advanced analysis. The descriptive analysis was computed to describe the characteristics of the study participants. Binary logistic regression was computed to identify the association between the explanatory variables and neonatal care practice. The model was fitted if the p-value was greater than 0.05 in Hosmer and Lemeshow test. The odds ratio with their 95% confidence interval was employed to show the strength of association. The statistical significance of variables was determined if the p-value was less than 0.05.

Qualitative data was gathered in the form of audio recordings & notes from the in-depth interview. The text was analyzed thematically. Before analysis, all the collected data were transcribed into English. The transcribed data were transcribed into text files, then manually narrated, summarized, and analyzed thematically. Coding was conducted carefully and read line by line several times by the principal investigator. The codes were grouped into categories and then analyzed thematically. Triangulation of the interpreted finding was an issue of the study.

Results

Socio-demographic Characteristics of Participants

Six hundred twenty-five participants participated in this study. Six hundred mothers who have neonates were involved in the study with a response rate of 96.96%. The mean (±SD) age of the participants was 29.84 (±6.77) years and 278 (45.9 %) were in the age range of 24 – 29 years. The minimum and maximum age of subjects was 18 year and 47 years. The majority of study participants 444(73.26%) were urban residents (Table 2).

Table 2: Socio-demographic characteristics among postnatal mothers in Kombolcha town, Northeast Ethiopia 2021

Variables	NCP	Good	Poor
Age group (years)	≤24 years	64 (10.6%)	77(12.7%)
	25–34 years	91(15.0%)	96(15.8%)
	≥35 years	146(24.1%)	132(21.8%)
	Mean age (±SD)	29.84 (±6.77) year	
Educational status	No formal schooling	37(6.1%)	58(9.6%)
	High school and less	165(27.2%)	159(26.2%)
	College and above	99(16.3%)	88(14.5%)
marital status	Widowed and Divorced	27(4.5%)	32(5.3%)
	Single	16(2.6%)	19(3.1%)
	Separated	14(2.3%)	21(3.5%)
	Married	244(40.3%)	233(38.4%)
Ethnicity	Amhara	243(40.1%)	251(41.4%)
	Tigrie	17(2.8%)	19(3.1%)
	Oromo	23(3.8%)	24(4.0%)
	Afar	18(3.0%)	11(1.8%)
Resident	Urban	212(35.0%)	232(38.3%)
	Rural	89(14.7%)	73(12.0%)
Income	<3200EB	127(21.0%)	136(22.4%)
	3201-5250EB	149(24.6%)	135(22.3%)
	>5250EB	25(4.1%)	34(5.6%)

Neonatal care practices among postnatal mothers

The proportion of good NCP among postnatal mothers in Kombolcha town was [49.7%, 95% CI, (45.72, 53.68)] (Figure 2) A 29-year-old in-depth interviewer added: " *My birth attendant was female midwifery, and she dries the baby and wraps it in a clean towel shortly after birth, which is the first thing she does, she gave me that." Baby let me sit on my stomach. Then she said we'd have to wait until tomorrow to bathe the baby. On the other hand, she encouraged me to breastfeed as much as possible right away. I've heard this before in training courses for health professionals. "A 33-year-old interviewer explained: "My neighbor helped me during the delivery, and shortly after the birth she bathed the baby and wrapped him in a towel before letting me breastfeed again".*

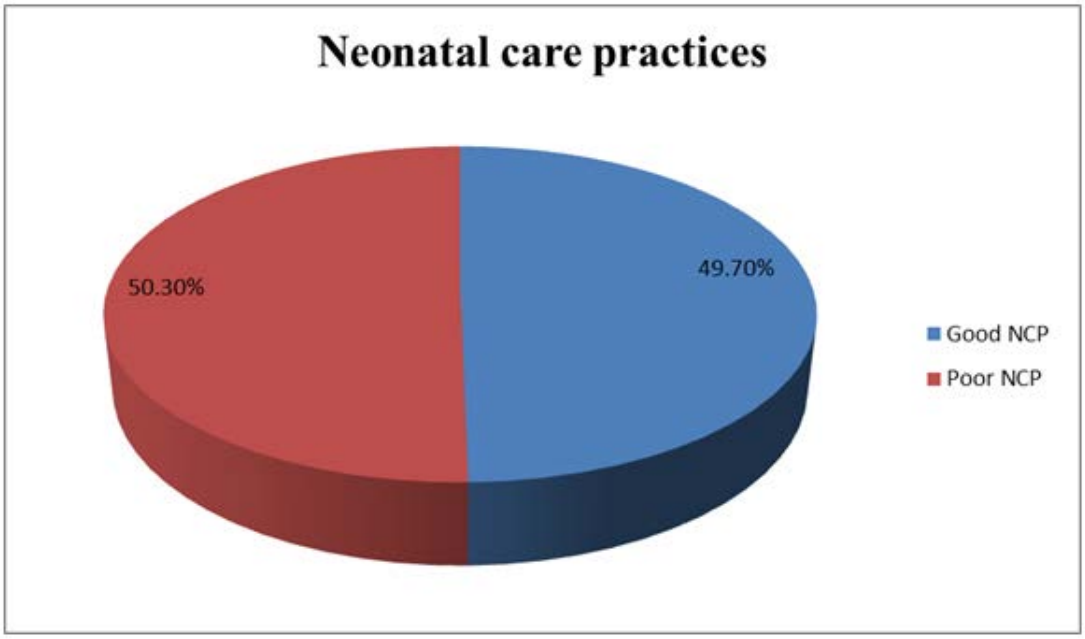

Figure 2: Neonatal care practices among postnatal mothers in Kombolcha town, Northeast Ethiopia 2021

Obstetric factors and Health service utilization

All participants have attended antenatal care (ANC) for their current pregnancy of which only 76(12.6%) had completed their 4th ANC visit. Regarding the place of delivery 47(7.7%) of mothers delivered at the home of whom only one-fifth 10(21.2%) had good NCP (Table 3).

Table 3: Obstetric and health service utilization factors among postnatal mothers in Kombolcha town, Northeast Ethiopia 2021

Variables		NCP	
		Good	Poor
Birth interval	<3years	10(1.6%)	37(6.1%)
	3 and above years	167 (27.5%)	152(25.1%)
Month of pregnancy at first ANC visit	Before 4 months	124(20.5%)	129(21.3%)
	At 4 month and above	177(29.2%)	176(29.0%)
No of ANC visits	1st visits	86(14.2%)	117(19.3%)
	2nd visits	91(15.0%)	91(15.0%)
	3rd visits	74(12.2%)	71(11.7%)
	4th and above visits	50(8.3%)	26(4.3%)
Place of ANC visits	Private Health institutions	151(24.9%)	143(23.6%)
	Gov't health institutions	150(24.8%)	162(26.7%)
Mode of delivery	SVD	217(35.8%)	230(38.0%)
	C/S	66(10.9%)	58(9.6%)
	Instrumental delivery	18(3.0%)	17(2.8%)
Health extension worker home visit	Yes	23(3.8%)	23(3.8%)
	No	278(45.9%)	282(46.5%)

Cultural and gender-based related factors

More than two-thirds (67.8%) of mothers reported that they were able to change their baby's cloth in front of other people. This study showed that 30.2% of the participants administered herbs or powders to the baby's umbilical cord (figure 3). A 25-year-old in-depth interviewer added, "...I gave birth at home as soon as I was ready to go to the hospital; after the birth, she picked up the baby and spoon-fed the baby a mixture of water and sugar [pre-lacteal feeding], then put him to sleep for a while. My family bathed the baby while I sat waiting for the placenta. After the placenta came out, they gave me something to eat and I breast-fed my baby," Approximately 45% of the respondents stated that they were able to decide together with their husbands to make payment for any fee at home. Only 13.5% of the respondents were deciding by themselves to make payment for any fee at home. Particularly on the health of neonates, 40.1% of mothers were able to decide by themselves (Figure 4).

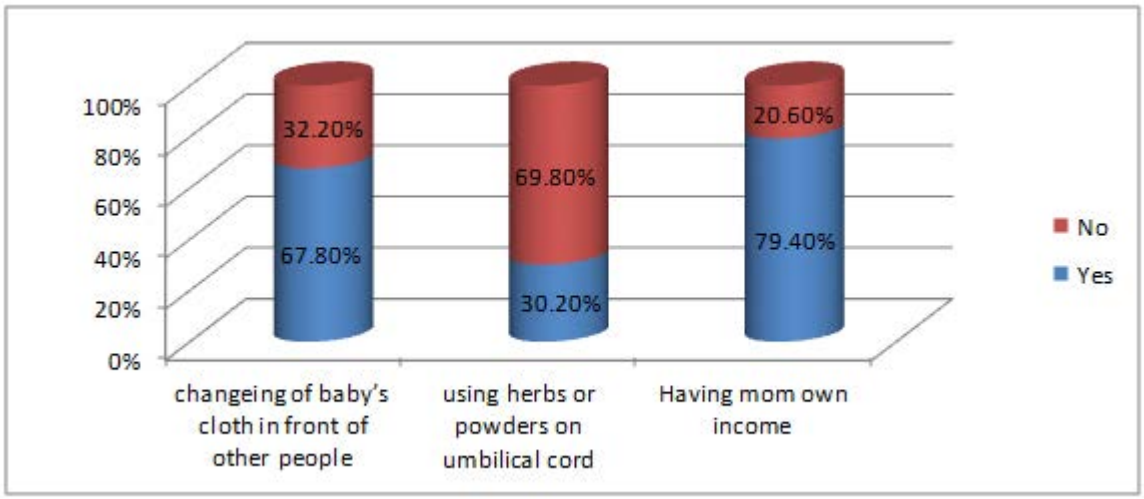

Figure 3: Cultural factors among postnatal mothers in Kombolcha town, Northeast Ethiopia

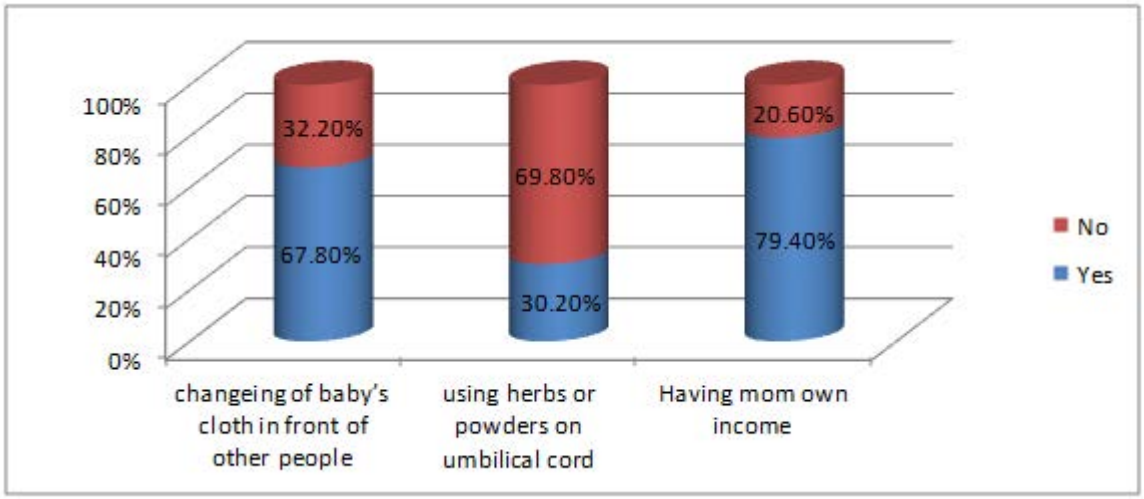

Figure 4: Gender based related factors among postnatal mothers in Kombolcha town, Northeast Ethiopia 2021

Knowledge of NCP among postnatal mothers

More than two-thirds of the study participants, 414 (68.3%) had a good knowledge of NCP of whom 266 (43.9%) had good practice of NCP. Out of the total 606 respondents, 544 (89.77%) of them stated that they had information about newborn danger signs. The majority of the respondents 374 (61.7%) were aware of the need for a newborn baby to be kept warm at birth (Table 4).

Table 4: Knowledge towards NCP among postnatal mothers in Kombolcha town, Northeast Ethiopia 2021

Variables		NCP	
		Good	Poor
Breast feeding immediately after birth within an hour is important	Yes	269(44.4%)	198(32.7%)
	No	32(5.3%)	107(17.7%)
knowing about Colostrum	Yes	260(42.9%)	141(23.3%)
	No	41(6.8%)	164(27.1%)
knowing about how to keep a new-borns thermal care	Yes	252(41.6%)	122(20.1%)
	No	49(8.1%)	183(30.2%)
Do you think delay bathing is advantageous for the baby	Yes	220(36.3%)	111(18.3%)
	No	81(13.4%)	194(32.0%)
Keeping the cord clean, nothing apply and avoid injuries is mandatory.	Yes	223(36.8%)	100(16.5%)
	No	78(12.9%)	205(33.8%)
Knowing about vaccination (Purpose, timing, type…)	Yes	242(39.9%)	80(13.2%)
	No	59(9.7%)	225(37.1%)
know how to care for low birth weight	Yes	264(43.6%)	123(20.3%)
	No	37(6.1%)	182(30.0%)
Only breast milk is more important for the baby in the first six-month	Yes	280(46.2%)	242(39.9%)
	No	21(3.5%)	63(10.4%)
Knowing about new-born danger sign	Yes	283(46.7%)	262(43.2%)
	No	18(3.0%)	43(7.1%)
Overall level of respondents knowledge	Good	266(43.9%)	148(24.4%)
	Poor	35(5.8%)	157(25.9%)
Cut point (Median = 2)			

Factors associated with NCP practice

In the bi-variable analysis factors such as educational status of the mother, ethnicity, residence, birth interval, number of ANC visits, age, knowledge, and monthly income are found to be statistically significant at p<0.2. On multivariable logistic regression, three of the eight variables were significantly associated with NCP at a 5% level of significance. The significant predictors of NCP were: No of ANC visits-2[AOR = 2.17; 95%CI (1.09, 4.31)], No of ANC visits-4[AOR = 3.28; 95%CI (1.40, 7.67)], Birth interval [AOR = 2.56; 95%CI (1.06, 6.16)] and Knowledge [AOR = 8.66; 95%CI (4.83, 15.56)] (Table 5). The qualitative part also supported the quantitative one and the reasons for good neonatal care were themed as good awareness level, number of ANC, and place of delivery. The majority of the respondents had the feeling that most of the women, particularly those who had no ANC follow-up care have no adequate knowledge about the risks of neonatal health problems and the importance of neonatal care. *A 25-year-old in-depth interviewer's statement adds to this: "...when I go to a medical facility for an ANC follow-up, the health care provider gives me different types of counseling every day. So, I think I have enough knowledge to take care of my baby and I am interested in implementing your suggestions. Another major issue repeatedly cited by most respondents is that home birth is a barrier to newborn care. Respondents also highlighted that most women who give birth at home are insignificant, so they don't place a special emphasis on the health of their families and less emphasis on newborn care. A 34-year-old in-depth interviewer's statement adds to this: "...I had two babies at home and nothing happened, but my TBA never told me how to take care of mine Baby. That's why I'm doing this. I don't have information on newborn care practices.*

Table 5: Factors associated with NCP among postnatal mothers in Kombolcha town, Northeast Ethiopia.

Variables		NCP		COR(95%CI)	AOR(95%CI)
		Good	Poor		
educational status of the mother	No formal education	37	58	0.56(0.34,0.93)*	0.47(0. 18,1.19)
	High school and less	165	159	0.92(0.64,1.32)	0.84(0.45,1.55)
	College and above	99	88	1	
Ethnicity	Afar	18	11	1.69(0.78,3.65)	1.93(0.59,6.32)
	Oromo	17	19	0.92(0.47,1.82)	0.42(0.13,1.40)
	Tigrie	23	24	0.99(0.54,1.80)	0.74(0.28,1.97)
	Amhara	243	251	1	
Resident	Urban	212	232	0.75(0.52,1.07)	0.98(0.42,2.30)
	Rural	89	73	1	
Birth interval	< 3 years	10	37	1	
	3 and above year	167	152	4.06(1.95,8.45)**	2.56(1.06,6.16)*
No of ANC visits	1st	86	117	1	
	2nd	91	91	1.36(.91,2.03)	2.17(1.09,4.31)*
	3rd	74	71	1.42(.92,2.17)	1.57(0.70,3.49)
	4th and above	50	26	2.61(1.51,4.53)*	3.28(1.40,7.67)*
Knowledge	Good	266	148	8.06(5.31,12.2)**	8.66(4.83,15.56)**
	Poor	35	157	1	
Age	< 24 years	64	77	0.75(0.50,1.13)	0.87(0.36,2.07)
	24-29 years	91	96	0.85(.59,1.24)	1.11(0.56,2.21)
	> 30 years	146	132	1	
Monthly income	< 3200 EB	127	136	1.27(.72,2.24)	0.60(0.23,1.56)
	3201-5250 EB	149	135	1.50(.85,2.64)	0.96(0.38,2.37)
	> 5251 EB	25	34	1	

Discussion

This study was conducted to assess the proportion and factors associated with NCP among postnatal mothers in Kombolcha town. The overall status of good neonatal care practice in this study was [49.7% (45.72, 53.68)].

The quantitative findings are also supported by qualitative findings, which state that there are problems in the proportion of neonatal care particularly on the neonatal care package to be given during a period of pregnancy, as soon as the postpartum period and the first 28 days of life such as birth preparedness and complication readiness antenatal care visit and getting enough information on neonatal care at the time of pregnancy. Even though it revealed that specifically concerned with breastfeeding, thermal care, and cord care. Based on the information of most respondents' opinions, there were problems in newborn feeding practices previously that most mothers do not begin breastfeeding immediately. They also used to feed the newborn a mixture of water and sugar using a spoon. Currently, the health providers are educating the mothers and the majority of mothers are breastfeeding right away.

The prevalence of NCP in this study was higher than in the community-based cross-sectional studies conducted in Awabel district East Gojam zone (23.1%) and Damon please southern Ethiopia (24%) [19,20]. The possible reason may be due to the sample size difference. The sample size in Awabel district and Damot pulasa were 325 and 450 respectively but in this study, it was 621; as the highest sample size, the greater the chance of getting the case. On the other hand, the differences might be due to the difference in place of delivery and knowledge about neonatal care which has a significant influence to increases neonatal care practices. The studies were done in Awabel district and Damot pulasa were conducted solely among home-delivered mothers. Where in this study more than 90% of study participants were delivered to a health institution by a skilled birth attendant and did get the chance to postnatal care including counseling about neonatal care practice.

In contrast, the result was lower than the studies conducted in India (60%), Nepal (58.6%), and Ruanda (65.1%) [6,21,22]. The possible explanation for these great differences might be due to the difference in knowledge of NCP, socioeconomic and socio-demographic characteristics among the study population, and their compositions. Additionally, the possible reason for the lower than may be due to the difference in the availability of effective policy and strategies related to the problem.

Similarly, it was lower than a mixed study conducted in Southwest Ethiopia (59.5%) [15]. The possible reason for lower than

may be due to socio-economy and cultural differences between the two populations.

In this study, a significant relationship had been found between NCP practice and Knowledge, Birth interval, and Number of ANC visits.

In the current study, participants who had good knowledge of NCP were 8.66 times more likely to perform NCP as compared to those who had poor knowledge. This result was consistent with a cross-sectional mixed study method conducted in Nepal [22]. Similarly, it was in line with community-based cross-sectional studies in Damot Pulasa district, Wolaita zone, and Hossana town13,19. This may be explained by the fact that knowledge of NCP was recognized as a necessary precursor to the mother's performance of NCP.

The birth interval was one of the associated factors for NCP. This is interpreted as participants who had three and above year birth intervals were more than 2.56 times more likely to practice NCP as compared to those counterparts. This study was in line with evidence in Nepal and Southwest Ethiopia [15,22]. The reason could be, that when mothers get closely spaced births, they are expected to care for both children and themselves, which may lead to maternal exhaustion and negligence. As a result, the care for the latter one gets decreased.

The number of ANC visits was also one of the associated factors for NCP. This is interpreted as participants who had twice ANC follow-up was more than two times more likely to practice NCP as compared to those who had only 1st ANC follow-up. And participants who had four and above ANC follow-up were more than three times more likely to practice NCP as compared to those who had only 1st ANC follow-up. This finding was consistent with a study done in Mandura district and Bangladesh [18,22]. This might be due to the possibility of getting information about the components and importance of neonatal care practice from healthcare providers during ANC. The main strength of the current study is that it involves both quantitative and qualitative methods. This study may have its limitations in that all the findings concerning neonatal care practices were based on mothers' reports, which might have been affected by their memories and might introduce recall bias, and under-reporting.

Conclusions

This study revealed that the prevalence of NCP practice was low among postnatal mothers in Kombolcha town compared to other similar literature. The study also illustrated significant associated factors which contribute to NCP which include; Knowledge of mothers toward neonatal care practice, Birth interval, and Number of ANC visits. Experts should design effective programs and strategies focusing on the enhancement of the community awareness about NCP in the study area especially. Interventions targeting neonatal care should address all the components of the minimum neonatal care package along the continuum of care starting from before pregnancy, during pregnancy, during labor, and after birth. Should work to raise public awareness about NCP in collaboration with public media and through social media. Community-level interventions need to be strengthened to address spaced births, improve ANC, and enhancement of community awareness. Behavioral change communication to the family, particularly mothers, also needs to be strengthened on the risks of neonatal health problems. In collaboration with public media and through social-media awareness creation of community should be addressed.

Abbreviations

ANC: Ante-Natal Clinic, AOR: Adjusted odds ratio, COR: Crud odd ratio, EBF: Exclusive Breastfeeding, EDHS: Ethiopian Demographic And Health Survey, ENAP: Essential Newborn Action Plan, ENC: Essential Newborn Care Practices, EPHI: Ethiopia Public Health Institute, ESA: Ethiopian Statistical Agency, GDP: Growth Domestic Product, HSDP: Health Sector Development Goals, MDG: Millennium Development Goals, MOH: Ministry Of Health, NCP: Neonatal Care Practice, NMR: Neonatal Mortality Rate, PNC: Postnatal Clinic, SDG: Sustainable Development Goal, UNICEF: United Nations International Children's Education Fund, WHO: World Health Organization.

Declarations

Ethical Approval and Consent to Participate

Ethical approval was obtained from the Institutional Review Board of the school of Public health, College of Medicine and Health Sciences, Wollo University. Informed consent is an inevitable requirement before every research involving a human being as the subject for study. The Institutional Review Board of the school of Public health, College of Medicine and Health Sciences, Wollo University decided and approved that verbal informed consent obtained from each study participant could be enough to be ethically assured in the research process. This was because unless the name and the participants' medical registration number (MRN) were used during data collection, there is no ethical issue that will be raised. During obtaining consent from the participants, the investigators informed the subjects about their rights, the purpose of the study, procedures to be undertaken, potential risks and benefits of participation, the expected duration of the study, the extent of confidentiality of personal data, so that the participation of subjects in this study was entirely voluntary. Therefore, verbal informed consent was obtained from each study participant after clarifying the objective of the study. The data were collected from postnatal mothers who are above 18 years of age during the study period. All the risks, burdens, and benefits that the participants will take were by the Declaration of Helsinki. Confidentiality of information collected is kept anonymously.

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References

1. Fossari Sippel Marcio A IN MHA MK (2014) Neonatal Care Public Policy and Care for the Neonate.
2. WHO (2016) Neonatal and perinatal mortality: country, regional and global estimates.
3. MFaAw GT (2015) Neonatal care practice and factors affecting in Southwest Ethiopia: a mixed-methods study.
4. WAKUMA B (2017) Essential Newborn Care Practice And Associated Factors Among Mothers in Public Health Institutions of Nekemte Town, East Wollega Zone, Oromia Regional State, Ethiopia 2-4.
5. Keshab Sanjel SRO, Archana Amatya, Prem Basel (2019) Patterns and determinants of essential neonatal care utilization among underprivileged ethnic groups in Midwest Nepal: a mixed-method study.
6. Miriam Batamuriza EU, Adejumo Oluyinka (2020) Essential Newborn Care Among Postnatal Mothers at Selected Health Centers in Eastern Province, Rwanda Rwanda Journal of Medicine and Health Sciences 3: 139-151.
7. Margaret Bee1 ASaZH (2018) Neonatal care practices in sub-Saharan Africa: a systematic review of quantitative and qualitative data. Journal of Health, Population, and Nutrition.
8. Tesfaye Yitna Chichiabellu BM, Feleke Hailemichael Astawesegn, Birhanu Wondimeneh Demissie and Antehun Alemayehu Anjulo (2018) Essential newborn care practices and associated factors among home-delivered mothers in Damot pulasa Woreda, southern Ethiopia. BMC Reproductive Health 15: 1-11.
9. Abebe Alemu, Akine Eshete (2018) Newborn Care Practices and Associated Factors Among Lactating Mothers at Home in the Rural Districts of Gedeo Zone, Southern Ethiopia. Dove Press journal: Pediatric Health, Medicine and Therapeutics 47-54.
10. Kebede A (2016) Knowledge, practice and associated factors of newborn care among postnatal mothers at health centers, Bahir Dar City, Northwestern Ethiopia. BMC Research Notes.
11. Yaregal Semanew ME, Alemayehu Tizazu, Desalegn Abebaw,Tsegaye Gebremedhin(2019) Newborn care practices and its determinants among postnatal mothers in Dessie Referral Hospital, Northeast Ethiopia. BMC 12(96).
12. ETHIOPIA FDRO. Ethiopia Mini Demographic and Health Survey 2019.
13. Amanuel Nuramo Sakelo NA, Lemessa Oljira, and Zebene Mekonnen Assefa (2020) Newborn Care Practice and Associated Factors among Mothers of One Month-Old Infant in Southwest Ethiopia. International Journal of Pediatrics.
14. Tura G, Fantahun M (2015) Neonatal care practice and factors affecting in Southwest Ethiopia: a mixed-methods study. BMC international health and human rights 15: 1-10.
15. Alkema L, New JR, Pedersen J, You D (2014) Child mortality estimation 2013: an overview of updates in estimation methods by the United Nations Inter-agency Group for Child Mortality Estimation. PloS one 9: e101112.
16. Girma T(2008)Traditional newborn care in Jimma town, Southwest Ethiopia. Ethiopian Journal of Health Sciences 18: 3.
17. Tegene T, Andargie G, Nega A, Yimam K (2015) Newborn care practice and associated factors among mothers who gave birth within one year in Mandura District, Northwest Ethiopia. Clinics in Mother and Child Health 12: 1.
18. Chichiabellu TY, Mekonnen B, Astawesegn FH, Demissie BW, Anjulo AA (2018) Essential newborn care practices and associated factors among home-delivered mothers in Damot pulasa Woreda, southern Ethiopia. Reproductive health 15: 1-11.
19. Gowdhaman P AK AV. Facility-based essential newborn care practice and associated factors among women in rular facility of awabel district East Gojam 2015.
20. Latika Nath Sinha PK RG, Suresh Dalpath, Vinod Goyalc, Manoj Murhekara (2014) Newborn care practices and home-based postnatal newborn care program Mewat, Haryana, India.
21. Sanjel K, Onta SR, Amatya A, Basel P (2019) Patterns and determinants of essential neonatal care utilization among underprivileged ethnic groups in Midwest Nepal: a mixed-method study. BMC pregnancy and childbirth 19: 1-10.
22. Mosiur Rahman SEH SZ,Ohidul Islam (2011)Non-institutional births and Newborn Care Practices Among Adolescent Mothers in Bangladesh.