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Community-based newborn care utilization and associated factors in Nekemte City, Oromia, Ethiopia, 2023

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Abstract

Background Community-Based Newborn Care [CBNC] program aims to improve the health of the newborns. Despite management improvements, many young infants with serious bacterial infections [PSBI] in resource-limited settings are not receiving recommended inpatient treatment due to accessibility, affordability, or family acceptance issues. Therefore, this study aimed to assess the level of CBNC utilization and associated factors among women who delivered recently their newborns in Nekemte city, West Oromia, Ethiopia.

Methods A community-based cross-sectional study design was carried out. A two-month infants' mother interview was conducted from March 1 to April 30, 2023, using data from 556 mothers in Nekemte city. Nurses trained and working in this city collected the data. Data were collected using Kobo Toolbox software and exported to STATA Version 14 for analysis. A binary logistic regression analysis was carried out. In the multivariable logistic regression analysis, a *p* value of < 0.05 and adjusted OR [AOR] with a 95% CI were used to identify factors statistically associated with CBNC service utilization.

Result The overall level of community based care utilization was 35.25% [95% CI: 33.85–44.60]. While time of first antenatal care contacts [AOR: 0.14; 95% CI: 0.08–0.25], maternal age [AOR: 3.36; 95% CI: 1.35–8.31], marital status [AOR: 0.24; 95% CI: 0.08–0.75], and estimated wealth level [AOR: 6.54; 95% CI: 2.24–19.11] were significantly associated factors with the level of community-based utilization of newborn care.

Conclusion Community-based newborn care utilization was low from the study area in related to the previous studies and national recommendation. Therefore, creating awareness for mothers to start their antenatal contacts early or at the first trimester, giving information about community-based utilization of newborn care services to teenagers, and supporting mothers who are widowed and of medium or high income to use the community-based utilization of newborn care services.

Keywords Community-based, Ethiopia, Factors, New-born care, Utilization

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Background

The Community-Based Newborn Care [CBNC] program is a comprehensive strategy designed to improve the health of newborns during pregnancy, childbirth, and the postnatal period through health extension workers at community levels and it is integrated into the health system largely within the health extension program [HEP] [1].

The first month of a newborn's life can be the most extremely full of joy. But it can also be the most dangerous, especially if a serious illness or infection goes untreated [2]. Globally, 2.4 million infant deaths occurred in the first month of life in 2022 [3]. Neonatal mortality declined slowly than under-five mortality, in which the highest neonate mortality rate was in Africa with 27 deaths per 1000 live births [4, 5]. Nearly 60% of all neonatal deaths occur in the first three days of life [6].

Referral to a hospital for treatment with a seven-to-ten-day course of injectable antibiotics [penicillin or ampicillin with gentamicin] is the current WHO recommendation for managing infections in neonates and young infants [7]. However, studies indicate that in settings with low resources, a large number of newborn infants exhibiting symptoms of a potentially serious bacterial illness [PSBI] do not receive the suggested inpatient care because their families cannot afford, access, or tolerate this kind of care [8].

Early pregnancy identification, focused prenatal care, skilled birth attendance promotion, postnatal care, identification and management of sick newborns at the community level, information, education, and communication [IEC], behavior change communication [BCC], and community mobilization were among the strategies of CBNC [9].

Health professionals and community volunteers conducted interventions in the home, providing newborn care, well-being techniques, anticipatory guidance, financial and social support resources, and referral routes [10].

In the majority of developing countries, there was a significant barrier to daily primary and community care for the management and prevention of the most common medical problems among newborns [3]. The advice of community health workers to recognize signs of danger, assess newborns for sickness, and seek medical assistance was overlooked by mothers of missing children, which resulted in death [11]. It has been difficult to provide postnatal care in the majority of countries, including Ethiopia [12].

Ethiopian newborns encounter numerous obstacles when trying to receive healthcare; some stem from cultural norms and fatalism, while others are physical access issues brought on by distance and poor communication [13]. Only around 50% of sick babies in the nation have been identified and treated, despite the fact that

the majority of HEWs have received training in treating severe neonatal infections as part of the CBNC program [13, 14].

A national project called IDEAS [Informed Decisions for Actions in Maternal and Newborn Health] aims to improve newborn survival, and the study carried out in Ethiopia evaluated the efficacy of community-based newborn care and found that the practice is difficult [15].

Therefore, this study aims to assess the implementation status of the CBNC program and its associated factors among women in Nekemte city, West Oromia, Ethiopia.

Methods

Study design and setting

A community-based cross-sectional study design was carried out from March 1 to April 30, 2023, among mothers having less than 2 months of infants in Nekemte City, West Oromia Ethiopia. The city is divided into six urban and one rural sub city, the total population was 145,299, of which 71,197 [49%] were females.

Pregnant women account for 5042 and around 1818 are infants under two months. [Western Oromia, Statistical Agency, eastern Wollega, Nekemte: Administrative Council; 2018.] In the city, there are three public hospitals in which two of them are comprehensive specialized hospitals and one is primary hospital, two health centers, one health post, and about 48 primary and medium clinics.

Population

Source population and study population

The source population was all mothers who have given birth in the previous two months in Nekemte city.

Study population

All mothers who had less than two months of infants in selected sub city.

Study unit

Randomly selected mothers who had less than two months of infants.

Inclusion and exclusion criteria

Inclusion criteria

Mothers who gave birth both at home and in health facilities in the selected sub city and who has less than two months live young infants were included in the study.

Exclusion criteria

Mothers, who delivered in another district and came to the study area and residence less than six months, lost their current babies, critically ill and unable to respond to interviews were excluded.

Sample size determination and sampling procedure

Sample size determination

Sample size was calculated by using the single population proportion formula with considerations of the following statistical assumptions based on previous study a 37.5% [16] of utilization [$p=0.375$ and $q=0.625$], a 95% confidence level, and a 5% margin of error.

$$\text{Sample size} = \frac{[Z_{\alpha/2}]^2 P [1 - P]}{D^2}$$

Where; n_i =initial sample size

$Z=1.96$ the corresponding Z-score for the 95% CI.

α =confidence interval [95%].

p =proportions of death, 0.375.

$n_i = \frac{[1.96]^2 \cdot [0.375][0.625]}{[0.05]^2} = 360.16$ by considering the non-respond rate, 10 of the initial sample sizes was added, and then for the design effect, the sample size was multiplied by 1.5. The final sample size was **596**.

Sampling technique and procedure

Five sub cities were randomly selected from seven sub cities of Nekemte City and a sample of 596 mothers of less than two-month-old infants was selected from five sub-cities. The list of these mothers was obtained from the registration file of the health post, and participants were selected using a random number generator. From the final selected sample size [596], proportional allocation was done for each sub-city. After identifying the mothers who fulfilled inclusion criteria, study participants were selected by a simple random sampling technique.

Variables

Dependent variable

Community based newborn care utilization programme utilization.

Independent variables

Socio-demographic factors Age of mother, age of newborn, residency, marital status, religion, educational status, occupation.

Obstetric characteristics and maternal health services factors ANC contact history, number of ANC contacts, time of first ANC, level of health facility for ANC contacts, number of children, parity, time of delivery, place of delivery, pregnancy related danger sign, health facility they visited if their infant developed danger sign.

Postpartum and immediate newborn care services Postnatal visit, number of postnatal visit, time of BF initiation, exclusive breast feeding, source of CBNC information.

Newborn care services Birth weight, newborn weight at first 7 days, danger signs, visited health facility if danger signs occurred, obtained post natal care services.

Operational definitions

Community based new born care; it was measured based on participant service uptake of such components of the programme as early identification pregnancy, receiving focused antenatal care [ANC], institutional delivery, postnatal care [PNC] for mother and child within 2 months of the postpartum period, and identification and management of sick newborns at community level up to the age of 2 months [9]. Only mothers with their young infants who obtained all expected services were considered to have utilized the services.

Postnatal period, Is the period beginning immediately after the birth till six weeks after delivery [42 days].

Anti natal care service utilization; the mother should make a minimum of eight contacts during her pregnancy, the first of which must be within the first trimester [17].

Institutional delivery service; when a woman gives birth at a health post, health center, hospital or other private health facilities; otherwise, it is considered as home delivery.

Post natal care service; was considered as received if the mother and her newborn received healthcare services and were visited by providers within 2 months of birth.

The EDHS's main component analysis was used to evaluate the wealth index, which was then categorized into five categories (poorest, poorest, medium, wealthiest, and richest) based on household assets [18].

Data collection tool and procedure

A data abstraction format was adapted from the peer-reviewed article [16, 19, 20]. Data abstraction has been designed based on the study objectives, and tool validation was done, and translated from English to local language [Afaan Oromo] by the expert. The study used primary data obtained directly by interviewing the mothers. Two supervisors were assigned for supervision during data collection, and five BSc nurses were assigned as data collectors. The health post-registration book was used to obtain a medical record number to identify individual mothers.

Data quality control

Before data collection, one-day training was given to data collectors and supervisors on the objectives of the study, data collection instruments, techniques, and procedures. The consistency and completeness of the data were checked by the principal investigator every night. A pretest was conducted on 5% of the sample size of sorga sub-city [which was not selected as source population]. Before the actual data collection, all findings from the

pretest were incorporated into the final questionnaire, and amendments were made.

Data processing and analysis

The data were cleaned and checked for completeness and consistency before being exported to the STATA 14 version for analysis. Descriptive statistics were presented by written and tabular forms. Both bivariable and multivariable logistic regression analyses were computed to determine the associated factors. Variables with p values less than 0.2 in the bivariable logistic regression were candidates for the multivariable analysis after checking the multicollinearity [Table 1]. In the final multivariable logistic regression analysis model, a p value less than 0.05 and adjusted OR [AOR] with a 95% CI were used to identify statistically associated factors.

Table 1 Socioeconomic and demographic characteristics of the mother and their newborn baby in Nekemte town, Oromia, Ethiopia, Community-based cross-sectional study 2023 ($n = 556$)

Variables	Category	Frequency	Percent (%)
Maternal age	<=20 years	109	19.60
	21–34 years	374	67.27
	> 34 years	73	13.13
Marital status	Married	506	91.01
	Widowed	33	5.94
	Divorced	17	3.06
Educational status	Unable to read and write	70	12.59
	Elementary school (grade1-8)	138	24.82
	High school (Grade 9 to 12)	202	36.33
Occupational status	College and above	146	26.26
	Housewife	189	33.99
	Daily labour	140	25.18
Family size	Gov't employee	116	20.86
	Self-business	111	19.96
	2	14	2.52
Religion	3	190	34.17
	4–5	283	50.90
	>=6	69	12.41
Wealth status	Protestant	353	63.49
	Orthodox	119	21.0
	Muslim	58	10.43
Infants' age	Catholic	26	4.68
	Poorest	60	10.79
	Poorer	249	44.78
Infants' age	Middle	146	26.26
	Richer	37	6.65
	Richest	64	11.51
Infants' age	<=7days	11	1.98
	8-15days	78	14.03
	16-30days	201	36.15
	31-45days	161	28.96
	>=46days	105	18.88

Results

Socioeconomic and demographic characteristics

Among all, 556 [93.29%] participants were interviewed. About two third [67.27%] of the participated mothers were aged between 21 and 34 years old, with a median age of 28 years. Almost all [91.01%] were married, and more than one third [36.33%] of the mothers had a high school [grade 9 to 12] level of education. About one-third [33.99%] were housewives, and 283 [50.90%] had 4 to 5 family members. About two-thirds [63.49%] were protestant, and 249 [44.78%], were mothers living in poorer levels of wealth status. Around one-thirds [36.15] of the infants of the mothers were 16–30 days of age during data collection [Table 1].

Obstetric characteristics and maternal health services

About two-thirds [62.95%] of the participants were multiparty, and about 214, or 38.49% of them had two children. The majority [98.38%] of the interviewed mothers had ANC contacts and started at the first trimester pregnancy [60.51%], five and above times ANC contacts [55.02%], at the hospital [67.09%]. More than three fifth had iron/folic acid [61.51%] for 31–89 days during their current pregnancy. The majority [99.28%] of the interviewed mothers gave birth at a health facility or hospital [61.23%]. Three fourth of the participants, 75.90% have awareness about pregnancy-related danger signs. About [24.88%] of respondents faced these danger signs, and 134 or 24.10%, had a history of stillbirth or death [Table 2].

Infants' health services

From the interviewed mothers, [77.69%] of them have information about CBNC. One-third [31.29%] of the infants received newborn care two times [46.55%] postnatally during their 2 months of age, and about 78 or 44.83% infants had additional follow-up because of prematurity or LBW. However 141 or 81.03%, of the infants' weight was measured during the first 7 days of the visit. From the total respondents [24.46%] got postnatal contacts after three days [72.80%], and 31 or 22.79% of them visited over the following days and weeks.

The majority [89.39%] of infants birth weight was in the normal rang, about 446 or 80.22% initiated breast feeding within the first hour, and practiced exclusive breast feeding [76.80%]. More than three fourth [76.26%] interviewed mothers recalled neonatal danger signs, from them 79 or 26.51% of their infants developed danger signs after two weeks [38.46%] of life. Neonates who developed a danger sign treated at the hospital [56.41%] within 24–48 h [47.86%], and didn't obtain all necessary medications without any payment [64.95%] [Table 3].

Table 2 Obstetric characteristics and maternal health services of the mother and their newborn baby in Nekemte town, Oromia, Ethiopia, Community-based cross-sectional study 2023 (n = 556)

Variables	Category	Frequency	Per-cent (%)
Parity	Primipara	206	37.05
	Multipara	350	62.95
Number of children	One	189	33.99
	Two	214	38.49
	Three and above	153	27.52
Pregnancy intention	Intended	473	85.08
	Unintended	83	14.93
ANC visit	Yes	547	98.38
	No	9	1.62
ANC visit in number	One and two	44	8.04
	Three and four	202	36.92
	Five and above	301	55.02
Timing of first ANC visit	First trimester	331	60.51
	Second trimester	185	33.82
	Third trimester	31	5.67
Type of health facility visited for ANC	Hospital	367	67.09
	Health center	146	26.69
	Private clinic	34	6.22
Duration of iron/folic acid received during current pregnancy	No	79	14.21
	<=30days	111	19.96
	31–89 days	342	61.51
	>=90days	24	4.32
Place of delivery	Health facility	552	99.28
	Home	4	0.72
Type of health facility delivery conducted	Hospital	366	61.23
	Health center	158	28.62
	Private clinic	56	10.14
Maternal knowledge about pregnancy related danger signs	Yes	422	75.90
	No	134	24.10
Pregnancy related danger signs	Swelling of hands and face	360	85.31
	Blurred vision	319	75.59
	Convulsion	310	73.46
	Severe headache	312	73.93
	Severe lower abdominal pain	325	77.01
Source of information about pregnancy related danger signs	Vaginal bleeding	365	86.49
	HEWs	97	22.99
	HC care providers	129	30.57
History of faced these danger signs	Hospital care providers	196	46.45
	Yes	105	24.88
History of still birth or died baby	No	317	75.12
	Yes	134	24.10
	No	422	75.90

Utilization of community based newborn care

A woman and her newborn were considered to have utilized the CBNC program when they received all of its components at home during the first two months of life. As a result, 35.25% of the women and their newborns used the entire CBNC program [95% CI: 0.31–0.39] [Fig. 1].

Factors associated with community-based newborn care utilization

Occupational status, maternal level of education, time of first ANC contacts, type of HF for ANC, marital status, wealth level, infant age, parity, maternal age, and type of HF for delivery were selected for multivariable regression. However, in the multivariable analysis, time for the first ANC contacts, maternal age, estimated wealth level, and marital status were significantly associated factors with CBNC service utilization [Table 5].

Widowed mothers were about 76% [AOR: 0.24; 95% CI: 0.08–0.75] less likely to obtain CBNC services compared with those who were married. Mothers who started their ANC contacts at the second trimester were 86% less likely to use CBNC services compared with mothers who started at the first trimester, while other variables remained constant [AOR: 0.14; 95% CI: 0.08–0.25]. Keeping other variables constant, the women who are poorest in estimated wealth level utilized 6.5 times more community-based maternal and newborn care services compared to higher-income mothers [AOR: 6.54; 95% CI: 2.24–19.11]. Among mothers who were >35 years old, they had threefold higher odds of obtaining CBNC services when compared to mothers who were <24 years old [AOR: 3.36; 95% CI: 1.35–8.31].

Discussion

Current evidence suggests a reduction in the global neonatal and infant mortality rates [21]. However, in Ethiopia, neonatal mortality is not following the global direction of reduction, as the current evidence reports that it is increasing from the previous mortality rate, which mostly occurs in their early age [22]. With a focus on 27 high-priority countries, including Ethiopia, USAID's global flagship Maternal and Child Survival Program introduces and supports high-impact sustainable reproductive, maternal, neonatal, and child health treatments to prevent newborn and mother mortality [23].

The primary objective of this study was to estimate the level of utilization of CBNC among mothers and their newborn babies during their first 2 months and its associated factors. This study revealed that, 35.25% [95% CI: 0.31–0.39] of them and their newborn obtained CBNC.

This study finding is in line with study conducted in southern [37.5%] and northern Ethiopia [38.4%] [19, 20]. The reason may be that the study areas were in the same

Table 3 Infants' health services of the mother and their newborn baby in Nekemte town, Oromia, Ethiopia, community-based cross-sectional study 2023 ($n = 556$)

Variables	Category	Frequency	Percent
Having information about CBNC	Yes	432	77.69
	No	124	22.31
Infant received PNC from HEWs at home within 2 months of age	Yes	174	31.29
	No	383	68.71
Frequency of follow-up received from HEWs	One time	75	43.10
	Two times	81	46.55
	Three times and above	18	10.81
History additional follow up because of prematurity/LBW	Yes	78	44.83
	No	96	55.17
Baby's weight was measured within the first 7 days of birth	Yes	141	81.03
	No	33	18.97
History of a postnatal visit for mothers by HEWs	Yes	136	24.46
	No	420	75.54
Period of postnatal visit after the delivery	First three days	37	27.20
	> 3days	99	72.80
History of other visits over the following days and weeks	Yes	79	58.08
	No	57	49.92
History of the third visit over the following days and weeks	Yes	31	22.79
	No	105	77.21
Time of breast feeding initiation	< 1 h	446	80.22
	≥ 1 h	110	19.78
Birth weight	LBW	31	5.58
	NBW	497	89.39
	Macrosomia	28	5.04
Exclusive breast feeding	Yes	427	76.80
	No	129	23.20
Knowledge about neonatal danger signs	Yes	424	76.26
	No	132	23.74
Danger signs	Hypothermia	278	65.56
	Hyperthermia	338	79.72
	Poor feeding	348	82.08
	Convulsion	322	75.94
	Diarrhea	342	80.66
	Lethargy	318	75.00
	Respiratory difficulty	339	79.95
	Pus draining umbilical cord	305	71.93
History of neonatal danger signs	Yes	117	27.59
	No	307	72.41
Age he/she developed danger signs	First week	38	32.47
	Second week	34	29.05
	After 16 days	45	38.46
Time of health care seeking after danger sign developed	Immediately after diagnose	39	33.33
	24–48 h	56	47.86
	48–72 h	22	18.80
Type of health facility sake for care of neonatal danger signs	Brought to hospital	66	56.41
	Brought to health center	27	23.07
	Private clinics	24	20.51
Accessibility of all necessary medications without any payment	Yes	41	35.05
	No	76	64.95

Table 4 Multicollinearity check for community-based newborn care utilization and associated factors in Nekemte town, Oromia, Ethiopia, 2023 ($n = 556$)

Variable	VIF	1/VIF
Maternal age	1.42	0.705833
Parity	1.40	0.711954
Occupational status	1.30	0.771808
Estimated wealth level	1.23	0.816079
Educational level	1.22	0.817035
Type of HF conducted delivery care	1.17	0.855607
Type of HF followed ANC visit	1.06	0.940914
Time of first ANC visit	1.05	0.948158
Marital status	1.05	0.949758
Infants age	1.05	0.952134
Mean VIF 1.20		

context and had the same policies and strategies for the application of maternal and newborn care [24, 25].

Community based newborn care utilization service utilization was lower than study conducted in southern Ethiopia [40.5%] [26], Egypt [50.4%] [27]. The reason for the difference may be due to the difference in the consideration of when to say CBNC utilized, as the study conducted in southern Ethiopia defined CBNC utilization from an operational definition that is different from the current study. In addition to this, the study of southern Ethiopia included mothers who had less than one year of infants, while the current study only included mothers

with less than two months of infants relayed on national CBNC guidelines [28].

And another difference with the study conducted in Egypt may have resulted from the use of the mother-only continuum of care, which excluded newborn care that might have led to better results [27]. In addition to this sociodemographic difference could be another influential reason to the outcome.

The prevalence of CBNC utilization in this study finding is higher than the study conducted in Sierra Leone [29] [17.9%], Ghana [30] [8%]. This difference might be due to the difference in population size data obtained, as the study conducted in Sierra Leone used data from the whole national demographic health survey data. In addition to this, both Ghana and Sierra Leone included the majority of the rural population with poor road networks and the long distances between settlements which needs intensive resources for program implementation [16], while the current study area was the urban population.

According to the current study, ANC contacts were 98.38%, institutional delivery was 99.28%, and PNC was 31.29%. This finding is greater than the study conducted in south-west Ethiopia, in which the ANC contacts, institutional delivery, and PNC were 93.3%, 77.4%, and 78.9%, respectively [31]. The difference could be due to the study done in south-west Ethiopia was conducted with a rural population while the current study was conducted with an urban population. For this reason, the urban population is more advantageous to obtain CBNC services

Level of CBNC utilization

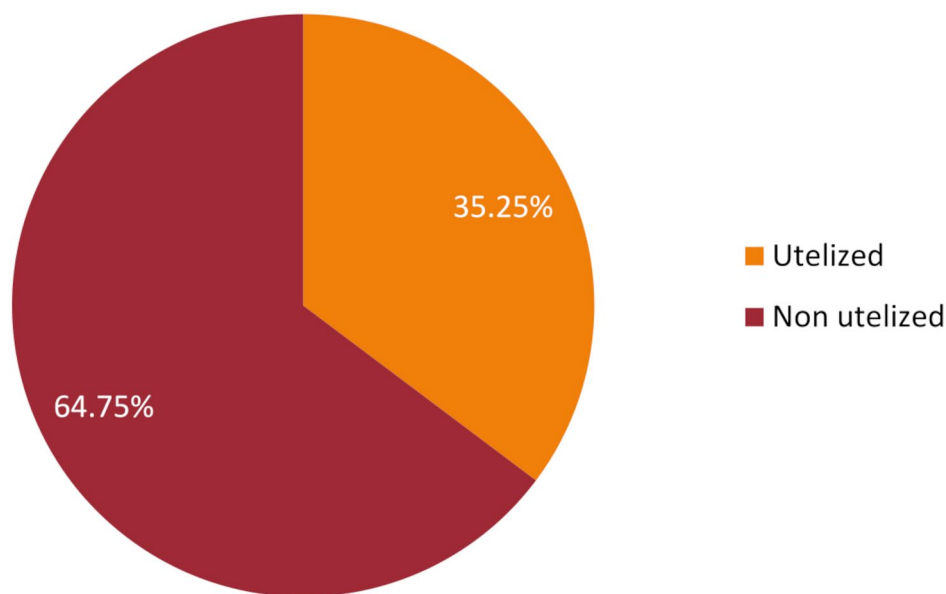
**Fig. 1** Overall level of CBNC utilization among mothers and their newborn babies in Nekemte City, Oromia, Ethiopia, community-based cross-sectional study 2023 ($n = 556$)

Table 5 Multivariable logistic regression analysis of factors associated with CBNC utilization among mothers having less than 2 months of infants in Nekemte town, Oromia, Ethiopia, 2023 (n = 556)

Variables	Category	Status		COR(95%CI)	AOR (95%CI)		
		CBNC utilized	CBNC not utilized				
Occupational status	House wife	36	27.27%	96	72.72%	0.46(0.28–1.77)	0.53 (0.26–1.05)
	Daily laborer	35	48.46%	56	61.54%	0.91(0.55–1.51)	1.12 (0.53–2.35)
	Government employee	33	40.25%	49	59.75%	0.99(0.58–1.69)	0.80(0.38–1.68)
	Self-business	48	40.75%	33	59.25%	1	1
Maternal education level	Unable to read and write	9	32.14%	19	67.86%	0.68(0.37–1.26)	0.74(0.31–1.77)
	Elementary school (grade1-8)	28	45.16%	34	54.84%	1.06(0.66–1.71)	1.28(0.64–2.55)
	High school (grade 9–12)	56	30.43%	128	69.57%	0.74(0.47–1.16)	0.58(0.29–1.14)
	College and above	44	39.28%	68	60.72%	1	1
Time for first ANC visit	First trimester	107	51.14%	112	48.86%	1	1
	Second trimester	16	13.22%	105	86.78%	0.21(0.13–0.33)	0.14(0.08–0.25)**
	Third trimester	11	38.89%	7	61.11%	0.96(0.38–2.43)	0.41 (0.13–1.30)
Type of HF for ANC	Hospital	97	36.92%	164	63.08%	1	1
	Health center	37	38.14%	60	61.86%	1.19(0.80–1.76)	1.08(0.65–1.77)
Estimated wealth level	Poorest	22	55.00%	18	45.00%	1.96(0.95–4.02)	6.54(2.24–19.11)**
	Poorer	58	33.92%	113	66.08%	0.71(0.40–1.24)	1.57(0.72–3.41)
	Middle	28	28.86%	69	71.14%	0.50(0.27–0.94)	1.18(0.53–2.59)
	Richer	7	29.16%	17	70.84%	0.34(0.13–0.87)	0.76(0.25–2.26)
	Richest	22	40.74%	32	59.26%	1	1
Infant age	< 8 days	19	63.34%	11	36.66%	2.18(0.61–7.71)	2.19(0.36–13.10)
	8-15days	22	44.00%	28	56.00%	2.36(1.27–4.38)	1.88(0.84–4.17)
	16–30 days	39	31.20%	86	68.80%	1.36(0.81–2.29)	1.29(0.66–2.50)
	31–45 days	37	33.64%	73	66.36%	1.39(0.81–2.39)	1.38(0.71–2.68)
	>=46 days	20	33.05%	51	66.95%	1	1
Parity	Primipara	43	35.60%	99	64.40%	0.79(0.55–1.14)	0.72 (0.41–1.25)
	Multipara	94	30.87%	150	69.13%	1	1
Maternal age	< 24 years	25	33.78%	49	66.22%	1	1
	24–35	87	57.35%	171	42.65%	1.10(0.69–1.73)	1.25(0.65–2.42)
	> 35	25	46.30%	29	53.70%	1.74(0.94–3.21)	3.36(1.35–8.31)*
Type of HF for delivery	Health center	73	30.67%	165	69.33%	1.90(1.30–2.77)	1.61(0.99–2.64)
	Hospital	59	48.36%	63	51.64%	1	1
Marital status	Married	121	35.58%	219	64.42%	1	1
	Widowed	9	33.34%	18	66.66%	0.40(0.16–0.99)	0.24(0.08–0.75)*
	Divorced	7	36.84%	12	63.16%	2.58(0.96–6.91)	2.66(0.69–10.13)

ANC=Antenatal Care, CBNC=Community Based Newborn Care, HF=Health Facility, NDS=Neonatal Danger Signs. NB: ** significant (p -value<0.005), * significant (p <0.05)

compared to the rural population because they can get more information and access information about the services [32, 33]. In addition to this, the difference may be due to the time difference between the two studies, as the south-west study was conducted before four years.

This study showed that mothers who started their ANC contacts in the second trimester of their current pregnancy were about 86% less likely to obtain CBNC when compared with mothers who started in the first trimester. This finding is supported by the study conducted in Ethiopia [34, 35]. The reason could be due to the fact that mothers who started their ANC contacts early in the first trimester have higher relationships and communication with health care providers, which increases their

likelihood of getting CBNC services compared to others [35, 36].

Our study revealed that families whose estimated wealth level was the poorest were 6.5 times more likely to use the CBNC program compared with those who were rich. This finding is supported by the study conducted in the southern part of Ethiopia [37], interventional study conducted in Malawi [38]. But those studies conducted in Nigeria [39], Nepal [40], and Myanmar [41] showing women with higher economic status has positive impact for maternal and child service utilization. A possible reason might be due to the fact that CBNC is a free service that implicates the prevention of morbidity and mortality among mothers and their newborns by increasing the provision of services at the community level [16].

Mothers who aged >35 years were 3.4 times more likely to use CBNC services when compared with those who were <24 years old. Our findings are the same as those of the study conducted in Kenya [42], Myanmar [41]. The reason for this finding could be due to the experiences of the mothers and contacts with health care providers as majority of those mothers were multi-parity [43].

According to this study, mothers who were widowed were 76% less likely to use CBNC services compared to those mothers who married. This finding is supported by the study conducted in Ethiopia [44]. Possible justification for this finding might be that mothers who were widowed are mostly facing unwanted pregnancies, and they may not seek health care or even want to show their pregnancy [45]. In other words, mothers who are with their couples want to care for their pregnancy and newborns because they have a plan to have a child.

Limitations of the study

The study didn't triangulate the qualitative methods; there may be social desirability bias because the interviewer administered the question. Recall bias from the mothers since we asked them about the previous services.

Conclusion and recommendation

The study found that community-based newborn care utilization was low compared to national recommendations. Besides, the overall CBNC utilization of the study area was 35.25%. Estimated wealth level, marital status, time for the first ANC contacts, and maternal age were significant associated factors in the utilization of CBNC. Therefore, creating awareness for mothers to start their ANC contacts early or at the first trimester, giving information about CBNC services to teenagers, and supporting mothers who are widowed and of medium or high income to use the CBNC services, moreover, future researchers should include qualitative methods to explore the barriers to low utilization of CBNC services and also better include community health care providers to elaborate on the hinders of the program.

Abbreviations

ANC	Antenatal Care
AOR	Adjusted odd ratio
CBNC	Community based newborn care
CI	Confidence interval
ETB	Ethiopian Birr
HEP	Health extension program
HEWs	Health extension workers
PI	Principal Investigator
PNC	Post natal care
TBA	Traditional birth attendants
WHO	World health organization

Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s12887-024-05337-2>.

Supplementary Material 1

Acknowledgements

We would like to thank the Nekemte City Health Bureau administrative staff, health extension workers, and Nekemte City community managers for their cooperation. Again, we want to express our heartfelt thanks to data collectors and supervisors for their patience and commitment to gathering data.

Author contributions

Dawit Tesfaye was involved in the design, data collection, statistical analysis, and interpretation. Bizuneh Wakuma: review and editing, Werku Etafa: methodology, Dereje Temesgen: methodology, editing, and review, Bruck Tesfaye and Wandimu Muche were involved in the statistical analysis and manuscript drafting. Yohannis Midakso prepared the tables and figures; Mekdelawit Birhanu and Ashenafi Zewdie did the data curation and validation. All authors have read and approved the manuscript.

Funding

No fund was obtained.

Data availability

No datasets were generated or analysed during the current study.

Declarations

Ethical considerations and consent to participate

Ethical clearance was obtained from Wollega University; institute of Health Sciences Research ethics review committee at minute No: 1012/2023. Informed consent was taken from mothers before the interview and confidentiality was maintained on the data obtained from extraction and used only for the study purpose.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

Received: 26 December 2023 / Accepted: 16 December 2024

Published online: 06 January 2025

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