

The Levels of Neonatal Care Practices at Health Facilities and Home Deliveries in Rural Sidama Zone, Southern Ethiopia

Journal of Primary Care & Community Health
Volume 9: 1–10
© The Author(s) 2018
Article reuse guidelines:
sagepub.com/journals-permissions
DOI: 10.1177/2150132718812181
journals.sagepub.com/home/jpc



Yusuf Haji¹ , Million Teshome¹, Akalewold Alemayehu¹, Mekdes Mekonnen¹, Fistum W/Gebrieal¹, and Achamyesh G/Tsasdik¹

Abstract

Background: Globally, there has been progress in reducing maternal and under-5 child deaths in the past 2 decades; however, the progress in reducing newborn mortality has been slower with estimated 3 million neonatal deaths per year. In Ethiopia, unhealthy newborn care is common at home deliveries compared with institutional births that might be associated with neonatal deaths. The purpose of the current study was to assess the practices of immediate newborn care at home and institutional deliveries in rural Sidama Zone, 2017. **Methods:** A population-based cross-sectional survey was used. The study was conducted in 5 districts of Sidama Zone, from January 21 to February 4, 2017. A total of 2300 mothers who gave live births in the past 6 months were selected using a 2-stage cluster sampling methods. Data were entered, cleaned, and recoded using Epi Data and SPSS for analysis. Accordingly, descriptive and bivariate analyses were done, and the results are presented using *P* values. **Results:** The response rate was 99% (2279/2300). About one-third of the mothers are in the age group of 20 to 24 years, and 94.6% of them had at least 1 antenatal care follow-up. Most (72%) mothers delivered at health facilities. The practices of skin to skin care of the babies was 52% (61% at health facilities, 28% at home; *P* < .002). Baby bathing delay for at least 24 hours was 78% and clean cord care was 73% overall (home 21% vs health institution 93.6%). The cord was not tied in 11.6% of cases all of whom were home births (*P* < .001). As to immediate breastfeeding of the child, most (78%) of the babies were put to the breast within an hour of birth with no significant difference between the 2 places of births (*P* = .75). **Conclusion:** In this study, giving birth at health facilities did not make immediate newborn care practices universal, but unhealthy practices were more common among home births. Therefore, more efforts to promote community-based immediate newborn care are needed with great emphasis to proper thermal care.

Keywords

neonate, immediate newborn care, home delivery, health facilities, Sidama

Background

Globally, there has been progress in reducing maternal and under-5 child deaths in the past 2 decades; however, the progress in reducing newborn mortality has been slower, with estimated 3 million neonatal deaths per year.¹ And, more than 1 million die within the first day of birth²; consequently, the neonatal death accounts 44% of all under-5 mortality.³

Similarly, despite Ethiopia's achievement in reducing child mortality, the reduction in neonatal mortality rate over the past decade has been slow. Neonatal deaths now account

for 42% of all under-5 mortalities, nearer to the 44% of global figure.⁴

According to the *Lancet* 2014 report, care by skilled provider during labor and delivery, plus immediate newborn

¹Hawassa University, Hawassa, Ethiopia

Corresponding Author:

Yusuf Haji, School of Public and Environmental Health, College of Medicine and Health Science, Hawassa University, PO Box 1560, Hawassa, Ethiopia.
Email: yusufhaji438@gmail.com



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 License (<http://www.creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use,

reproduction and distribution of the work without further permission provided the original work is attributed as specified on the SAGE and Open Access pages (<https://us.sagepub.com/en-us/nam/open-access-at-sage>).

care, can avert 1.49 million maternal and newborn deaths and stillbirths per year by 2025, of which almost 0.8 million are newborn lives. The immediate care of the neonate at birth alone could avert almost 190 000 deaths.⁵ The number of newborn deaths that could be prevented each year if essential health services were more equitably distributed would be about 38%.⁶ For example, nearly 98% of newborn and 99% of maternal deaths occur in developing countries, where pregnant women and newborn babies lack access to basic health care services before, during, and after delivery.⁷ The first day of life is the most dangerous day for mothers and babies.⁷ Worldwide, the day a child is born is by far the most dangerous day in a child's life. The first day is also a day of unequalled opportunity to save lives and set the stage for a healthy future.⁷ About 71% of the neonatal deaths occurred within the first week after birth and, the cumulative death rate reaches 79% in the second week. The risk of dying was lower for neonates whose mothers attended antenatal visits and neonates put to breast immediately on birth.⁸

The World Health Organization (WHO) has defined essential newborn care to include clean delivery and clean cord care, thermal protection, early and exclusive breastfeeding, initiation of breathing and resuscitation, eye care, immunization, care for the low-birth-weight newborn, and management of newborn illness; and these stated interventions are effective in reducing diseases and deaths in any newborn.⁹ Different studies have demonstrated that effective low-cost interventions reduce the rate of maternal and newborn deaths.¹⁰⁻¹² For example, a systematic review on visits by community health workers in developing countries showed that reduced risk of death during the neonatal period has association with home-based neonatal care.¹³

Ethiopia is 1 of the 10 countries with the highest number of neonatal deaths globally, with an estimated 122 000 newborn deaths per year.¹⁴ For example, the neonatal mortality was 29 per 1000 live births, and close to 74% of deliveries in Ethiopia take place at home, and attendance at antenatal care and postnatal care are also inadequate.¹⁵ Therefore, the Ethiopian newborn and child survival strategy proposed a package of 34 high-impact and cost-effective newborn and child survival interventions strategies targeted for 2020.¹⁶ And, a continuum of care approach will be used to deploy the delivery of the selected high-impact newborn and child health interventions addressing particular needs of women and children across time—scaling up essential newborn care in communities and primary health facilities.¹⁶

In Ethiopia, skilled birth attendance significantly improved to 60.7% in 2015, up from 41% in 2014. The proportion of health posts providing community-based newborn care (CBNC) services rose to 70% from 16%, making CBNC available to 9 069 776 children.¹⁷ The CBNC was an innovative strategy launched in Ethiopia in 2012 for the implementation of sustainable Development Goal 5, this

innovative strategy was to improve the survival of newborns through the integration of community case management (ICCM).¹⁷

As to the practices of essential newborn care in Ethiopia, previous studies undertaken in 4 regions (Oromia, Amhara, SNNPR [Southern Nations, Nationalities and Peoples' Region], and Tigray), southwest, and northern part of Ethiopia identified a wide spread unhealthy practices in cord care, thermal, and nutritional care like initiation of breastfeeding. In these studies, unhealthy practices of essential newborn care was common among home deliveries compared with institutional ones.¹⁸⁻²¹

Because of few or no previous studies assessed newborn care practices in the study area, the current study was focused on assessment of immediate newborn care practices both in home and health facility deliveries in rural districts of Sidama Zone, SNNPR, Ethiopia.

Materials and Methods

Study Setting

The study was conducted from January 21 to February 4, 2017 in 5 woredas (districts) of Sidama Zone (Shebadino, Boricha, Dale, Loka Abaya, and Wonsho). The Zone is found in SNNPR State and located in the northeastern part of the region and bounded by Oromia in the north, east, and southeast, with Gedieo Zone in the south, and Wolayta Zone in the west. Hawassa City located at 274 km south of Addis Ababa, is both regional and zonal headquarter.²² These woredas are the proposed Demographic Surveillance Sites of Hawassa University with total population of 1 099 345 (male 50.3% and female 49.7%) in 2016-2017 as projected based on the 2007 National Population Census, and total households estimated was 162 919.²³ There were 148 kebeles (the smallest administrative units) in these woredas. The study area has 2 district hospitals, 42 health centers, and 147 health posts. The common health problem of these woredas was pneumonia.

The study population consisted of all selected mothers who gave birth to alive child in the past 6 months (from birth to 6 months after live birth) and their infant (be dead or alive) residing in the study areas.

The proposal was reviewed and approved by the institutional review board of the College of Medicine and Health Science, Hawassa University. Then, letter of permission to conduct the study was obtained from Sidama Zone Health Office, and finally, permission was obtained from all the selected district Health Offices (namely, Boricha, Dale, Shebadino, Loka Abaya, and Wonsho districts). Informed consent was obtained from all study participants. In case of adolescent mothers (<18 years of age), consent was obtained from parents.

Study Design. Community-based cross-sectional survey was conducted among mothers who had given live birth in the past 6 months and their infants.

Sample Size and Sampling Procedure. This study was part of Maternal and Newborn Health Research and Training of Saving Newborn Lives Program (SNL-III Project) aimed at assessing the role of Health Extension workers (HEWs) in utilization of maternal and newborn health services in Rural Sidama Zone. The aim was to recruit 2300 mothers with live births aged 0 to 6 months. The main outcome measure of interest was the utilization of health care services by mothers with live births aged 0 to 6 months and received CBNC from health professionals during birth to 28 days compared with those mothers with live births aged 0 to 6 months who did not receive such services. Assuming that 50% neonates delivered at home, means did not received skilled delivery and essential newborn care (ENBC) services. We decided to use 80% power to detect an absolute difference of 15% in those neonates delivered at the health facilities.

- 50% of neonates with no skilled delivery did not receive ENBC
- 35% of neonates with skilled delivery did not receive ENBC
- Type I error (α) probability of 5% (2-tailed test), 95% confidence level
- Power of 80% ($Z_{\beta} = 0.84$) to detect at least a 15% difference between the 2 groups
- Design effect (*DEFF*) for cluster surveys: A *DEFF* of 2 was used as a multiplier to increase the sample size to account for the effect of the cluster sampling method related to the selection of Kebeles instead of simple random sampling.

After considering 10% nonresponses and refusals, the total sample size required for each group is 1189 mothers with neonates aged 0 to 6 months. This is obtained using Statal, of Epi Info 7

$$\frac{\left(Z_{1-\alpha/2} \left(\sqrt{P(1-P)} \right) + Z_{\beta} \sqrt{P_1(1-P_1) + P_2(1-P_2)} \right)^2}{(P_2 - P_1)^2}$$

where $P = (P_1 + P_2)/2$, $P_1 = 0.50$, $P_2 = 0.40$ and power of 80%, that is $(1 - \beta) = 0.80$, $Z_{\beta} = 0.84$

$$n = n_2 = \frac{\left(1.96 \sqrt{2(0.45)(0.45)} + 0.84 \sqrt{0.5(0.5) + 0.4(0.6)} \right)^2}{(0.4 - 0.5)^2}$$

$n_1 = n_2$, 523×2 design effect = 1046, 10% nonresponse rate, 104.6. A total sample size for each group was 1150.6,

making the overall sample size of 2301 mothers with children aged 0 to 6 months.

The study employed a 2-stage cluster sampling at kebele and household level. Five woredas were selected out of 21 woredas existing in the Sidama Zone purposively considering their health burden health problems and the proposed Demographic Surveillance Survey site of Hawassa University. The selected woredas have 148 kebeles of which Boricha had 39, Dale 35, Shebadino 32, Loka Abaya 26, and Wonsho 16. Then 30 kebeles were selected using random generated numbers by Open Epi software and accounts for 20% of the total and proportionally allocated as Boricha (8), Dale (7), Shebadino (7), Loka Abaya (5), and Wonsho (3). The overall estimated mothers with 0- to 6-month-old children were 2300 from all selected kebeles with an average 460 samples from each woreda. As a result of this we had taken the entire eligible mothers of infants 0 to 6 months old within the selected clusters.

Inclusion and Exclusion Criteria

All mothers with infants aged 0 to 6 months and mothers with live births within the past 6 months but the baby died within 28 days of birth residing in the study area for at least 12 months were included in the study. Mothers with still birth babies and mothers with live births who resided in the study area for <12 months were excluded from the study.

Data Collection

We adopted a standard questionnaire developed by the Saving Newborn Lives Program for this survey. The questionnaire includes questions on respondents and household characteristics, antenatal care, birth preparedness, delivery and immediate newborn care, nutrition, postnatal care for mother and baby, neonatal illness, and care seeking. The tool had been field tested and used in different previous studies in Ethiopia. Data were collected between January 21 and February 4, 2017 by 5 teams of 4 interviewers and 1 supervisor. All data collectors and supervisors were selected using their previous experience on data collection, local language ability, and being nurse/midwives/health officer by profession. Prior to the start of data collection, a 5-day training was provided by the investigators for the data collectors and supervisors to orient and familiarize the teams with study objectives and the tools. Following the household screening and selection procedures, interviewers were visited each selected woman at her home to administer the survey.

Data Quality Control

A data management manual detailing all field data collection procedures, storage, and entry was developed for the field

staff. Pretest was conducted in nearby districts with the same community characteristics, and discussion was held to improve the data collection tools. During the collection time data editors checked all the completed questionnaires for errors and missing information. And for any error identified it was verified and corrected immediately by the data collectors. Each supervisor was sampled and reinterviewed 3 respondents each day, in order to check consistency of the information being collected. Supportive follow-up was also done by all the investigators. Of the total 10% double data entry was done to ensure the quality of the data.

Data Entry, Analyses, and Processing

The collected data were entered using Epi Data 3.1 software. As one way of checking for consistency of data entry, double entry of 10% of the questionnaires was compared between the 2 datasets. The Epi Data 3.1 dataset was checked up and the data were transferred to SPSS Package version 20 for analysis. Descriptive data analyses were made. The association between the dependent and independent variables was assessed using *P* values. The output was presented using comparative form between health facility and home deliveries.

Operational Definitions

Provision of ENBC practices will be grouped into 5 categories: (a) optimal thermal care defined as: newborn after birth, was first dried, put skin-to-skin on mothers chest, wrapped in clean dry clothing and delayed bath (after 24 hours or more); (b) good cord care defined as type of instrument used to cut the cord (such as a brand new razor blade, surgical blade, or sterilized pair of scissors), type of material used to tie the cord (clean thread), and no medicinal substance (local or not local) put on the cord); (c) good feeding practices defined as initiating breastfeeding within the first 1 hour after birth and exclusively breastfeeding in the first month of life; (d) weighing the baby immediately after birth; and (e) immunization (if the baby was given oral polio vaccine (OPV) and/or BCG after birth).

Identification of sick newborns: HEWs, during the home visits early in the postnatal period, will identify sick neonates based on a standard checklist of danger signs.

Treatment of sick newborns: Management of sick newborns identified during early postnatal visit will depend on the nature of the problem and will be based on the sick newborn management protocol for HEWs and health workers.

Results

Sociodemographic Characteristics of the Study

The study that enrolled mothers with children aged 0 to 6 months had a response rate of 99% (2279/2300). Out of

2279 mothers/caretakers interviewed 622 (27.3%) were from Boricha Woreda, 606 (26.6%) were from Dalle Woreda, 624 (27.4%) were from Shebedino Woreda, 208 (9.1%) were from Loka Abaya Woreda, and the remaining 219 (9.6%) were from Wonsho Woreda. About one-third of the mothers were in the age-group of 20 to 24 years, followed by age-groups of 25 to 29 years (29%), while age-group 15 to 19 years accounted 10% of the participants with almost similar distribution among the 5 woredas. Regarding maternal occupation, majority 1940 (85%) were housewives, and about one-third of the mothers were illiterate (Table 1).

Child Demographic, Breastfeeding, and Health Characteristics. Table 2 presents demographic, breastfeeding, and morbidity of the studied children in the 5 woredas of Sidama Zone. Male sex accounted for 1182 (52%) and the rest 1097 (48%) of the children were females. Of total studied children, 1339 (59%) were 13 to 24 weeks old, while the neonatal age group (0-4 weeks) accounted for 331 (14.5%) with the mean age 13.8 weeks. Regarding birth interval of the children, most of 1516 (66.5%) of them had 5 or more years interval between their elder sibling. We also assessed current living status of the child and observed that only 21 (1%) of them were deceased. Almost all the children (2254, 98.9%) were breastfeeding during study. Concerning neonatal experience of illness, about 243 (10.7%) of children ever suffered from any illness.

Maternal Antenatal and Delivery Conditions

Of all studied mothers almost all (94.6%) had at least 1 antenatal follow-up. As to the place of delivery most 1639 (72%) of them gave birth at the health institutions of which only 98 (6.3%) underwent cesarean section (Table 3).

The Neonatal Care Practices at Home Versus Health Institutions

Table 4 summarizes the neonatal care practices during delivery and immediately after delivery at home and health institutions on thermal care, cord care, and nutritional practices according to WHO recommendations.

Thermal Care. As to the thermal care, about 999 (44%) of babies were reported to have been placed besides the mother but there was a significance difference between home deliveries, where majority (514, 80%) did this and the institutional births with only 485 (29.6%) were placed besides mothers; whereas, only 17% (home 8% vs institution 21%) of the babies were reported to have been placed on mothers belly/chest ($P < .001$). As regards skin-to-skin care of the babies, about 1181 (52%) of them reported to have received it of which institutional born babies received more (1004, 61%) compared with home births where only 177 (28%) of

Table 1. Sociodemographic Variables of Mothers in Rural Sidama Zone, Southern Ethiopia, 2016-2017.

Variable	Name of Woreda					Total, n (%)	P
	Boricha, n (%)	Dale, no (%)	Shebadino, n (%)	Loka Abaya, n (%)	Wonsho, n (%)		
Maternal age (years)							.21
15-19	65 (10.5)	59 (9.7)	58 (9.3)	29 (13.9)	22 (10)	233 (10.2)	
20-24	203 (32.6)	210 (34.7)	223 (35.7)	59 (28.4)	74 (33.8)	769 (33.7)	
25-29	180 (28.9)	194 (32.0)	170 (27.2)	62 (29.8)	60 (27.4)	666 (29.2)	
30-34	108 (17.4)	98 (16.2)	120 (19.2)	32 (15.4)	35 (16.0)	393 (17.2)	
>34	66 (10.6)	45 (7.4)	53 (8.5)	26 (12.5)	28 (12.8)	218 (9.6)	
Maternal occupation							.001
Housewife	554 (89)	497 (82)	544 (87)	153 (73.6)	192 (87.7)	1940 (85)	
Merchant/trader	29 (4.7)	54 (8.9)	46 (7.4)	26 (12.5)	15 (6.8)	170 (7.5)	
Farmer	25 (4)	25 (4)	15 (2.4)	20 (9.6)	8 (3.7)	93 (4.1)	
Daily laborers + others	14 (2.3)	30 (5)	19 (3)	9 (4.3)	4 (1.8)	76 (3.3)	
Maternal education							.001
Illiterate	245 (39.4)	175 (29)	185 (29.6)	74 (35.6)	83 (37.9)	762 (33.4)	
First cycle (1-4 grade)	186 (30)	146 (24)	150 (24)	58 (28)	59 (27)	599 (26.3)	
Second cycle (5-8 grade)	147 (23.6)	211 (35)	201 (32)	67 (32)	54 (24.7)	680 (30)	
Secondary school or +	44 (7)	74 (12)	88 (14)	9 (4.3)	23 (10.5)	238 (10.4)	
Marital status of mothers							.001
Married	616 (99)	588 (97)	619 (99)	207 (99.5)	218 (99.5)	2248 (98.6)	
Never married or formerly marries	6 (1)	18 (3)	5 (0.8)	1 (0.5)	1 (0.5)	31 (1.4)	
Spouse's education							.001
Illiterate	183 (29.4)	97 (16.0)	124 (20)	37 (17.8)	38 (17.4)	479 (21.0)	
First cycle (1-4 grade)	291 (46.8)	289 (47.7)	271 (43.4)	110 (53)	97 (44.3)	1058 (46.4)	
Second cycle (5-8 grade)	111 (17.8)	158 (26)	154 (24.7)	49 (23.6)	66 (30)	538 (23.6)	
Secondary school or +	37 (6)	62 (10.2)	75 (12)	12 (5.8)	18 (8.2)	204 (9.0)	
Distance from the health center							.001
< 1 hour walk	508 (82)	414 (68.3)	434 (69.6)	145 (70)	162 (74)	1663 (73)	
≥ 1 hour walk	114 (18.3)	192 (32)	190 (30.4)	63 (30.3)	57 (26)	616 (27)	
Family size							.65
< 5 persons	360 (58)	352 (58)	363 (58)	115 (55)	137 (62.6)	1327 (58)	
≥ 5 persons	262 (42)	254 (42)	261 (42)	93 (45)	82 (37.4)	952 (42)	

the children reported to have received skin-to-skin care ($P < .001$). About 1774 (78%) of mothers reported to have delayed bathing for their children for at least 24 hours (home 63%, health institutions 83.5%; $P < .001$).

Cord Care. With regard to substances used to tie the cord, sterile plastic/cord tie was 1669 (73%), home 21% versus institution 93.6%; string or thread was 122 (5.4%), home 16.6% versus institution 1%; while cord was not tied in 265 (11.6%) cases of whom all of them were home births ($P < .001$). Only 8% of the substances used to tie the cord were boiled. Mothers were also asked about substances used to cut the cord of their newborns and majority of them who delivered at facilities reported scissors, while 113 (18%) of the home deliveries used old razor blade ($P < .001$).

Nutritional Care. As to the immediate breastfeeding status of the child, most (1784, 78.3%) of the babies were put to the

breast within 1 hour of birth with no significant difference between the 2 sites of deliveries ($P = .75$). And almost all babies (98%) were given breast milk only in the first 2 days ($P < .5$). The practice of putting the baby to the breast before placenta delivery was low (138, 8%) in both places of deliveries ($P = .01$).

Discussion

A study exclusively conducted in Rural Sidama Zone, Southern Ethiopia among 2279 mothers and their children aged 0 to 6 months to assess immediate neonatal care practices at the community level revealed that there was a significant differences between home and institutional deliveries in most of the components of immediate newborn care though there existed some similarities. Therefore, it can be concluded that we have an adequate data to compare newborn care practices at home and health facility deliveries.

Table 2. Child Characteristics Among Children Aged 0 to 6 Months, Rural Sidama Zone, SNNPR, Southern Ethiopia, 2016-2017 (n = 2279).

Variable	Name of Woreda					Total, n (%)	P
	Boricha, n (%)	Dale, n (%)	Shebadino, n (%)	Loka Abaya, n (%)	Wonsho, n (%)		
Sex of the child							.64
Male	311 (50)	317 (52.3)	323 (51.8)	117 (56.3)	114 (52.1)	1182 (52)	
Female	311 (50)	289 (47.7)	301 (48.2)	91 (43.8)	105 (47.9)	1097 (48)	
Child age (weeks)							.06
0-4	100 (16)	75 (12.4)	102 (16.3)	25 (12.0)	29 (13.2)	331 (14.5)	
5-12	138 (22.2)	179 (29.5)	172 (27.6)	55 (26.4)	65 (29.7)	609 (26.7)	
13-24	384 (61.7)	352 (58.1)	350 (56.1)	128 (61.5)	125 (57.1)	1339 (58.8)	
Birth interval of the child (years)							.19
0-2	33 (5.3)	37 (6.1)	28 (4.5)	12 (5.8)	20 (9.1)	130 (5.7)	
3-4	189 (30.4)	158 (26.1)	167 (26.8)	63 (30.3)	56 (25.6)	633 (27.8)	
≥5	400 (64.3)	411 (67.8)	429 (68.8)	133 (63.9)	143 (65.3)	1516 (66.5)	
Child alive or deceased							.31
Alive	612 (98.4)	601 (99.2)	620 (99.4)	207 (99.5)	218 (99.5)	2258 (99.1)	
Deceased	10 (1.6)	5 (0.8)	4 (0.6)	1 (0.5)	1 (0.5)	21 (0.9)	
Proportions of children still breastfeeding	610 (98)	601 (99)	619 (99)	207 (99.5)	217 (99.1)	2254 (98.9)	.22
Child had any health problem during first month of life							.005
Yes	63 (10.1)	87 (14.4)	59 (9.5)	21 (10.1)	13 (5.9)	243 (10.7)	
No	559 (89.9)	519 (85.6)	565 (90.5)	187 (89.9)	206 (94.1)	2036 (89.3)	

In this study, more than two-thirds of the deliveries were in health institutions. This figure is high compared with the national institutional delivery report of the Ethiopian Demographic and Health Survey in 2016, which reported that 26% of deliveries were at the health facilities¹⁵; other similar study conducted in 4 regions of Ethiopia reported that only 28.3% of the deliveries were at health facilities.¹⁸ This is an interesting finding as increasing the institutional deliveries has great implication for maternal and child survival, for example, studies have shown that care during labor and birth, plus immediate newborn care, can avoid 1.49 million maternal and newborn deaths and still births per year by 2025.⁵ Moreover, the result might be due to presence of a package of high-impact child survival interventions along continuum of care planned to achieve 95% skilled delivery by 2020 in Ethiopia.¹⁶

In the current study, immediate neonatal care for thermal and cord care are significantly different between home and health facility deliveries, while nutritional care is similar across the institutions. For example, most home-born babies were placed beside mothers while most of facility-born babies were placed on child table/bed, and about half of the babies received skin-to-skin care of which majority were from the health facilities. Our findings is almost consistent with other similar study done in 4 regions of Ethiopia.¹⁸ The result simply depends on mothers' recall,

which is not free from recall bias as we could not observe the care or interview the health care providers. This findings show that providers may not always be adhering to the recommended newborn care practices. This can be evidenced by the study done in 6 sub-Saharan African countries that reported serious gaps in health facility readiness to provide quality newborn health services.²⁴ In addition, *The Lancet*, 2014 reported that to reduce neonatal death, effective available interventions—mainly clinical and facility based—is needed; however, this gap is wide and poses greatest challenges.²

In our study, bathing of the babies was delayed for >24 hours in 74% of the cases with significantly higher practices seen at health facility deliveries compared with home deliveries (83.5% vs 63%, respectively). The reason is that health information received from health care providers at the health facilities might have contributed and/or stay at the health facility as per recommendation might have helped delaying of bathing among health facility deliveries. The results is almost comparable to study done in Gulomekada district, Northern Ethiopia, revealed 78.4% of practices of delaying bathing of babies for more than 24 hours.²¹ However, this figure is higher than other similar studies done elsewhere.^{18,19,25} This is a good practice to be encouraged; however, health facilities are not guaranteed to universally provide all the immediate newborn care, and this

Table 3. Antenatal Care (ANC) and Delivery Practices of Mothers of Children Aged 0 to 6 Months, Rural Sidama Zone, SNNPR, Southern Ethiopia, 2016-2017.

Variable	Number (n = 2279)	Percentage
ANC follow-up status of mothers		
Received at least 1 ANC services	2155	94.6
Did not receive ANC services	124	5.4
Proportion of mothers referred for delivery services (n = 2279)	486	21.0
Place of delivery		
Mother's home	605	26.5
Others' home	24	1.1
Government hospital	271	11.9
Government health center	1317	57.8
Government health post	9	.4
Nongovernment health facility	39	1.7
Private hospital/clinic	3	.1
On the way to the facility	11	.5
Reasons for home delivery		
Due to emergency/urgent labor	320	50
Preferred to deliver home	193	30
Services at the facility is not user friendly	77	12
Delivered on the way to facility	54	8
Too far or no transportation	32	5
It is not necessary to delivery at the facility	13	2
Too much cost at facility	12	2
Lack of respectful care by health care workers	5	1
Overall place of delivery		
Home delivery (mother's home + others' home + on way to health facility)	640	28.1
Health institutions/skilled delivery (all facilities)	1639	71.9
Was the delivery Caesarian section?		
Yes	98	6.3
No	1446	93.7

requires multilevel approach to scale up quality newborn care at the health institutions.

In this study, the practices of using sterile cord tie and clean cord tie was high in institutional births. This is in line with similar studies done elsewhere.^{18,19,21,26,27} In home deliveries, more than one-third of babies' cord was untied, which needs due attention as untied cord may expose the newborns to infection or bleeding. This can be evidenced by 11% report of neonatal illnesses by mothers in the current study. The practices of leaving the cord untied was reported in Sidama Zone, the current study area, by previous qualitative study done in 4 regions of Ethiopia on umbilical cord care.²⁸ Furthermore, our finding regarding clean, dry cord care is in line with the WHO recommendation for newborns being born in health facilities and at home in low-mortality (<30 deaths per 1000 live births) settings. For example, Ethiopia has 28 Neonatal Mortality and the use of chlorhexidine in these situations may be considered only to replace application of a harmful traditional substance, such as cow dung, to the cord stump.²⁹

In this study, place of delivery did not have effect on early initiation of breastfeeding within 1 hour of delivery, and giving only breast milk in the first 2 days of life after birth. The practices of prelacteal feeding and squeezing and throwing away the first milk was high among the home deliveries compared with health facility deliveries. Our results show highest practices of early initiation of breastfeeding for the babies compared with other similar studies conducted in Ethiopia, which stated lower rates of this practice.^{18,19,21} This may be a result of deployment of HEWs and practices of CBNC in the region, but further study to verify reasons for the change should be conducted.

The current study is not free from limitations. Primarily, our study is a cross-sectional survey in the rural community, so that recall bias is very likely. Since we based our study on oral response without observation of the events or practices, the community might tend to provide socially desirable responses, and therefore further observational study to explore the real practices of ENBC in the community will be the priority.

Table 4. Neonatal Care Practices at Home Versus Institutional Delivery of Mothers of Children Aged 0 to 6 Months, Rural Sidama Zone, SNNPR, Southern Ethiopia, 2016-2017.

Characteristic	Home Delivery, n (%)	Institutional Delivery, n (%)	Total, n (%)	P
<i>Thermal care</i>				
Where was baby placed after delivery?				<.001
a. Besides mother	514 (80)	485 (29.6)	999 (44)	
b. On newborn table/bed	6 (1)	774 (47)	780 (34)	
c. On mother's belly/chest	51 (8)	340 (21)	391 (17)	
d. On the floor/someone else/other	69 (11)	40 (2)	109 (5)	
Proportions of babies placed skin to skin	177 (28)	1004 (61)	1181 (52)	<.001
When does baby placed skin to skin?				
a. Before cord cut	8 (4.5)	165 (10)	173 (14.6)	<.001
b. Before placenta expelled	27 (15)	261 (26)	288 (24)	.007
c. Before baby dried	70 (39.5)	305 (30.4)	375 (32)	.047
Proportion of baby wiped before placenta delivery	162 (25)	653 (40)	815 (36)	<.001
Proportion of baby wrapped with cloth before placenta	261 (41)	786 (48)	1047 (46)	.007
Time at which bathing babies undertaken				<.001
Within 24 hours of delivery	234 (36.6)	271 (16.5)	505 (22)	
After 24 hours of delivery	406 (63)	1368 (83.5)	1774 (78)	
<i>Cord care of the baby</i>				
Substance used to tie cord				<.001
a. Sterile plastic/cord tie	135 (21)	1534 (93.6)	1669 (73)	
b. String or thread	106 (16.6)	16 (1)	122 (5.4)	
c. Cord was not tied	265 (41)	0 (0)	265 (11.6)	
d. Other/unknown	134 (21)	99 (5.5)	223 (10)	
Was substance used to tie the cord boiled?				<.001
Yes	18 (7.5)	9 (8.6)	27 (8)	
No	170 (71)	18 (17)	188 (55)	
Do not remember	51 (21)	78 (74)	129 (37.5)	
Substance used to cut the cord				<.001
a. New razor blade	525 (82)	447 (27)	972 (43)	
b. Old razor blade	113 (18)	0 (0.0)	113 (5)	
c. Scissors	2 (0.3)	1177 (72)	1179 (52)	
d. Do not remember/do not know	0 (0)	15 (1)	15 (0.7)	
Was substances used to cut the cord boiled?				<.001
Yes	13 (11)	578 (48.5)	591 (45)	
No	95 (82.6)	0 (0)	95 (7)	
Do not remember/do not know	7 (6)	614 (51.5)	621 (47.5)	<.001
No. of babies anything applied to the cord	72 (11)	247 (15)	319 (14)	
<i>Nutrition</i>				
Proportions of babies breastfed only in the first 2 days	630 (98)	1606 (98)	2236 (98)	.5
How often did you breastfeed?				.02
<8 times per day	137 (21)	421 (26)	558 (24.5)	
8-12 times per day	387 (60.5)	880 (54)	1267 (55.6)	
>12 times per day	109 (17)	305 (18.6)	414 (18)	
Do not know	7 (1)	33 (2)	40 (2)	
Babies put to the breast before placenta delivery	35 (5.5)	148 (9)	183 (8)	.01
Proportion babies put to the breast within 1 hour	498 (78)	1286 (78.5)	1784 (78.3)	.73
Mothers squeezed and threw away the first milk	259 (40.5)	224 (14)	483 (21)	<.001
Substances given to the child in the first 3 days				
a. Hamessa/other substances	18 (50)	14 (42.4)	32 (46.4)	.52
b. Milk other than breast milk	3 (8)	5 (15)	8 (12)	.37
c. Plain water	7 (19)	11 (33)	18 (26)	.2
d. Sugar/glucose water	1 (3)	3 (9)	4 (6)	.26
e. Fruit juice	1 (3)	2 (6)	3 (4)	.5
f. Infant formula	2 (5.6)	1 (3)	3 (4)	.6
g. Tea/infusion	2 (5.6)	0(0)	2 (3)	.17

Conclusions

In this study, the practices of immediate newborn care practices was not satisfactory even in the health facilities, but was much lower in home deliveries. The practices of immediate neonatal care for thermal and cord care are significantly different between home and health facility deliveries; however, nutritional care practices was almost similar and high in both cases with exception of prelacteal feeding and “squeeze and throw away the first milk.” The positive findings that need to be encouraged were use of clean cord cut, cord tie, delay bathing, early initiation of breastfeeding, and giving only breast milk to the babies. Therefore, community-based immediate newborn care with great emphasis to proper thermal care in both facilities, including education around “squeeze and throw away the first milk” and its value for the newborn babies and possible prevention of infection needs to be tailored. In addition, health professionals in the zone need to receive proper in-service or refresher training on immediate newborn care practices.

Authors' Note

The datasets used and/or analyzed during the current study are available from the corresponding author on request.

Acknowledgments

First of all, we extend our thanks to the College of Medicine and Health Sciences, Hawassa University, for the opportunity and for overall material support. Our special thanks also goes to Sidama Zone Health Bureau and the 5 woreda Health Offices for their support in approving the study. Finally, we thank data collectors and study participants without whom this study could not be performed.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: Save the Children and Sirti supported the study through payments for the research staff.

ORCID iD

Yusuf Haji  <https://orcid.org/0000-0003-1128-4646>

References

1. Lawn JE, Blencowe H, Oza S, et al; Lancet Every Newborn Study Group. Progress, priorities, and potential beyond survival. *Lancet*. 2014;12:1898-205. doi:10.1016/S0140-6736(14)60496-7
2. Dickson KE, Simen-Kapeu A, Kinney MV, et al; Lancet Every Newborn Study Group. Health-systems bottlenecks and strategies to accelerate scale-up in countries. *Lancet*. 2014;38:438-454. doi:10.1016/S0140-6736(14)60582-1
3. Mason E, McDougall L, Lawn JE, et al; Lancet Every Newborn Study Group; Every Newborn Steering Committee. From evidence to action to deliver a healthy start for the next generation. *Lancet*. 2014;384:455-467. doi:10.1016/S0140-6736(14)60750-9
4. Central Statistical Agency (Ethiopia); ICF International. *Ethiopia Demographic and Health Survey 2011*. Addis Ababa, Ethiopia/Calverton, MD: Central Statistical Agency/ICF International.
5. Bhutta ZA, Das JK, Bahl R, et al. Can available interventions end preventable deaths in mothers, newborn babies, and stillbirths, and at what cost? *Lancet*. 2014;384:347-370. doi:10.1016/S0140-6736(14)60792-3
6. Save the Children International. *Ending Newborn Deaths. Ensuring Every Baby Survives*. London, England: Save the Children International; 2014.
7. Save the Children International. *State of the World's Mothers: Surviving The First Day*. London, England: Save the Children International; 2013.
8. Negera W, Eshetu W. Risk factors of neonatal mortality in Ethiopia. *Ethiop J Health Dev*. 2013;27:192-199.
9. World Health Organization. Essential newborn care: report of a technical working group (Trieste, 25-29 April 1994). <http://apps.who.int/iris/handle/10665/63076>. Accessed October 24, 2018.
10. Bhutta Z, Darmstadt GL, Hasan BS, Haws RA. Community-based interventions for improving perinatal and neonatal health outcomes in developing countries: a review of the evidence. *Pediatrics*. 2005;115(2 suppl):519-617.
11. Kirkwood B. Developing community-based intervention strategies to save newborn lives: lessons learned from formative research in five countries. *J Perinatol*. 2008;28(suppl 2):S2-S8.
12. Tyllesor T, Jackson D, Meda N, et al. Exclusive breastfeeding promotion by peer counsellors in sub-Saharan Africa (PROMISE-EBF): a cluster-randomised trial. *Lancet*. 2011;378:420-427.
13. Gogia S, Sachdev HS. Home visits by community health workers to prevent neonatal deaths in developing countries: a systematic review. *Bull World Health Organ*. 2010;88:658B-666B.
14. Lawn JE, Kinney MV, Black RE, et al. Newborn survival: a multi-country analysis of a decade of change. *Health Policy Plan*. 2012;27(suppl 3):iii6-iii28.
15. Central Statistical Agency (Ethiopia); ICF International Ethiopia. *Demographic and Health Survey 2016*. Addis Ababa, Ethiopia/Calverton, MD: Central Statistical Agency/ICF International; 2016.
16. Federal Ministry of Health Ethiopia; Maternal and Child Health Directorate. National newborn and child survival strategy document brief summary 2015/16-2019/20. https://www.unicef.org/ethiopia/Child_Survival_Strategy.pdf. Accessed October 25, 2018.
17. UNICEF Annual Report 2015. Implications of Demographic Changes in Ethiopia: 2015–2032, Ethiopia. [TNJ: Unable to find.]
18. Callaghan-Koru JA, Seifu A, Tholandi M, et al. Newborn care practices at home and in health facilities in 4 regions of Ethiopia. *BMC Pediatr*. 2013;13:198.

19. Tura G, Fantahun M, Worku A. Neonatal care practice and factors affecting in Southwest Ethiopia: a mixed methods study. *BMC Int Health Hum Rights*. 2015;15:18. doi:10.1186/s12914-015-0050-2
20. Berhe M, Medhaniye AA, Kahsay G, Birhane E, Abay M. Essential neonatal care utilization and associated factors among mothers in public health facilities of Aksum Town, North Ethiopia, 2016. *PLoS One*. 2017;12:e0175902. doi:10.1371/journal.pone.0175902
21. Misgna HG, Gebru HB, Birhanu MM. Knowledge, practice and associated factors of essential newborn care at home among mothers in Gulomekada District, Eastern Tigray, Ethiopia, 2014. *BMC Pregnancy Childbirth*. 2016;16:144.
22. Central Statistical Agency of Ethiopia. *The 2007 National Census Report for Ethiopia*. Addis Ababa, Ethiopia: Central Statistical Agency; 2008.
23. SNNP Regional State; Sidama Zone Administration. *Socio-economic Profile 2015. Finance and Economic Department, Socio-Economic Data Analysis and Dissemination Core Process*. Hawassa, Ethiopia: Sidama Zone Administration; 2015.
24. de Graft-Johnson J, Vesel L, Rosen HE, et al. Cross-sectional observational assessment of quality of newborn care immediately after birth in health facilities across six sub-Saharan African countries. *BMJ Open*. 2017;7:e014680. doi:10.1136/bmjopen-2016-014680
25. Mohammad TI, Nazrul I, Yukie Y, Monjura K, Nawzia Y. Newborn care in rural Bangladesh. *Res Rep Neonol*. 2015;5:65-72. doi:10.2147/RRN.S87122
26. Pagel C, Prost A, Hossen M, et al. Is essential newborn care provided by institutions and after home births? Analysis of prospective data from community trials in rural South Asia. *BMC Pregnancy Childbirth*. 2014;14:99.
27. Berhe KA, Tinsae F, Gebreegziabher G. Knowledge and practice of immediate newborn care among health care providers in eastern zone public health facilities, Tigray, Ethiopia, 2016. *BMC Pediatr*. 2017;17:157. doi:10.1186/s12887-017-0915-8
28. Amare Y. Umbilical cord care in Ethiopia and implications for behavioral change: a qualitative study. *BMC Int Health Hum Rights*. 2014;14:12.
29. World Health Organization. *WHO Recommendations on Postnatal Care of the Mother and Newborn*. Geneva, Switzerland: World Health Organization; 2013.

Author Biographies

Yusuf Haji, BSc, is an assistance professor of epidemiology. He has been working as clinician for Ethiopian Mistry of Health from 2006 to 2009; Yusuf had worked at Wolaita Sodo University for 6 years and currently working at Hawassa University with since 2015.

Milion Teshome, MD, is a gynecologist working for the past 11 years.

Akalewold Alemayehu, MPH in epidemiology. He has been working for the last 5 years in Hawassa University as a lecturer and head school of public health.

Mekdes Mekonnin, MSc in Nursing. She has been here in Hawassa university for the last 10 years, working as a clinician and lecturer.

Fitsum W/Gabriel, MD, Pediatrician. She has been working in Hawassa University Comprehensive Specialized Hospital both as a clinician and lecturer.

Achamelesh G/Tsadik, PhD in Public Health. She has been working in Hawassa University as lecturer and researcher for the past 11 years.