Optimal breastfeeding practice and associated factors among infants aged less than six months in Boke district, eastern Ethiopia: community-based cross-sectional study

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Original Article

Optimal breastfeeding practice and associated factors among infants aged less than six months in Boke district, eastern Ethiopia: community-based cross-sectional study

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Abstract

Background: Optimal breastfeeding is one of the best and cost-effective strategic interventions to prevent and reduce child death. Globally, it prevents 13% of childhood death, yearly. Few previous studies addressed the levels of domains of optimal breastfeeding practice separately, more emphasized the practice of urban-dwellers and employee mothers' infants and focused on the practice of infants aged 6-24 months. This study assessed optimal breastfeeding practice and associated factors among infants aged 0-6 months in Boke district in rural eastern Ethiopia.

Method: Community-based cross-sectional study was conducted among 390 randomly selected mother-infant pairs from February 01-30, 2018. Pretested-structured questionnaire was used to collect data from mother-infant pairs. Data were entered using EpiData version 3.1 and analyzed by SPSS version 24. Multivariable logistic regression analysis was used to identify factors associated with optimal breastfeeding practice. P-value<0.05 and AOR (95% CI) were used to report significance and association, respectively.

Results: Optimal breastfeeding practice among infants aged 0-6 months was 55.9% (95%CI: 50.7%, 60.8%). Mothers' age of 15-24 years (AOR=3.58, 95%CI: 1.06, 11.95) and 25-34 years (AOR=3.49, 95%CI: 1.08, 11.28), having formal education (AOR=2.98, 95%CI: 1.92, 4.62), facility delivery (AOR=1.96, 95%CI: 1.24, 3.12) and good knowledge about breastfeeding (AOR=1.82, 95%CI: 1.16, 2.86) significantly associated with optimal breastfeeding practice.

Conclusions: Prevalence of optimal breastfeeding practice among infants of 0-6 months was low. Youth maternal age, institutional delivery and knowledge on breastfeeding were significant predictors of optimal breastfeeding practice. Promoting institutional delivery and enhancing maternal awareness about breastfeeding practice through existing healthcare services, formal education and Media-outlets would be essential.

Keywords: Breastfeeding, Optimal breastfeeding practice, Infants aged 0-6 months, Ethiopia

Introduction

Breastfeeding has multiple health and developmental advantages through promoting child health. Optimal breastfeeding is the initiation of breastfeeding within first hour of birth and continuing exclusive breastfeeding till first six months of age and then, introduction of complementary foods alongside continued breastfeeding up to two years of age or beyond [1,2]. It is one of the best and most effective interventions to prevent and reduce infant and young child morbidity and death [3]. It prevents around 13% of childhood death worldwide, which saves the lives of estimated 1.4 million children aged under-five, every year [3].

An early nutritional deficit in the child leads to short-term and long-term different health problems. Infants who non-exclusively breastfed were more commonly affected by acute infectious diseases [4,5]. Artificially-feeding children have an increased risk of long-term chronic diseases [6] while optimal breastfeeding reduces the risks of chronic diseases [7]. Sixty-percent of child death occur worldwide due to inappropriate breastfeeding and infection related, a two third of this death were due to sub-optimal breastfeeding [8]. This leads to different infectious diseases in LMIC, which account for 55% of diarrheal death and 53% of acute respiratory death in the first six months of life [9].

Globally, 11.6% sub-optimal breastfeeding related preventable death occurred among children aged under five years, yearly [10]. In LMIC, delayed early-initiation of breastfeeding and non-exclusive breastfeeding were associated with the higher rates of childhood illness and deaths [11]. The infants who feed the human milk optimally have lower risk of acquiring infections in the first 1000 days of life [1]. The global public health recommendation is that infants have to have optimal breastfeeding, exclusively breastfed till first six months of life and continued

breastfeeding till 2 years, to achieve optimal growth, development and health in order to prevent and reduce neonatal, infant and childhood morbidity, disability and death [12].

Optimal breastfeeding is an important key elements in reducing acute infection related child death by 50–95% and mother to child transmission of Human Immunodeficiency Virus (HIV) by 10–20% [13]. Globally, despite WHO recommendation and benefit of optimal breastfeeding , only 44% of the newborns were optimally breastfed [14] and 40% of infants were exclusively breastfed [2]. Overall, the magnitude of optimal breastfeeding of infants in Saharan Africa (SSA) till 2015 were ranged from 17 .6% in East Africa to 46.4% in West Africa while the level of bottle feeding was ranging from 8.2% to 30.1% [15].

An estimated 70,000 infants death occur each year in Ethiopia due to suboptimal breastfeeding, which accounts for 24% of infants death occurred per a year [16]. In other hand, around 57% of child death secondary to diarrheal and pneumonia diseases could be preventable through optimal breastfeeding practice[17]. Even though Ethiopian Federal Ministry of Health aimed to increase the prevalence of optimal breastfeeding among infants aged less than six months to 70% by 2015 [16], the current breastfeeding practice across different regions were still unsatisfactory, low by coverage and remained problematic, poor quality, in Ethiopia. Moreover, though breastfeeding is one of the components of Primary Health Care in Ethiopia, there is a wide range of harmful breastfeeding practice in the country even after implementation of related national and international recommendations [16,18-20]. For instance, in Ethiopia, the proportion of infants who received optimal breastfeeding was 58% in 2016 indicating slight improvement, only 6% compared to preceding survey [21]. Beside, the magnitude of optimal breastfeeding was low; half (51.5%) of the infants initiated breastfeeding within a hour after birth while over half (57.5%) of infants were exclusively breastfed up to six months of age [21].

Studies demonstrated factors like maternal literacy [22], exclusive breastfeeding, antenatal care [23], postnatal care, exposure to media and institutional delivery [24], child's age and family size [25,26], mother's decision making autonomy [27] were linked with optimal complementary feeding practice while poor socioeconomic status, undesirable socio-cultural beliefs [28], lower parental education [29] were determinants of sub-optimal complementary feeding practice, yet there is dearth of literature on main local risk factors for suboptimal breastfeeding practice, which could vary across and between the regions and communities.

Moreover, few previous studies conducted in and outside of Ethiopia were adequately addressed the burdens and risk factors of domains of optimal breastfeeding practice separately (colostrums feeding, exclusive breastfeeding, prelacteal feeding, bottle feeding and frequency of breastfeeding)[11,30-34] and more emphasized on the practice of urban dwellers [11,30,33,35] and working mothers [30,33,36,37] as well as disproportionately focused on the practice of infants aged 6-24 months [36,38]. Overall, there is little information on the level of optimal breastfeeding practice and related factors among infants of 0-6 months in rural eastern Ethiopia. Therefore, this study assessed the prevalence of optimal breastfeeding practice and associated factors among mothers of infants aged less than six months in Boke district, eastern Ethiopia.

Materials and Methods

Study Setting

Community-based cross-sectional study was conducted in Boke district in eastern Ethiopia from February 1-30, 2018. Boke district is located at 388 kilometres, East of Addis Ababa, Capital of Ethiopia. Administratively, the district has 22 rural and one town kebeles. In 2017, the district has estimated total populations of 141907 (141907 male and 72373 female), 31404 women in

reproductive age and 4924 pregnant women while children aged under five and under one year were 23315 and 4569 respectively with a total of 2260 infants aged less than six months [39]. In 2018, there were five government health centers, 22 health posts, 10 private clinics and four drug shops giving health service for general public in the district [39].

Population, and Eligibility Criteria

All mothers and infants aged less than six months in Boke district were considered as the source population. Mother-infant (aged less than six months) pairs in randomly selected kebeles of the district were the study population. The study included permanent residents and infants who had biological mothers. Critically sick and mentally ill participants who could not respond during data collection period were excluded from the study.

Sample Size and Sampling Procedure

The sample size was computed by Epi-Info version 7.2 using a single population proportion formula for assessing optimal breastfeeding practice and two population proportions formula for factors associated with optimal breastfeeding and the larger sample size was considered to conduct the study. Accordingly, sample size for optimal breastfeeding practice was computed with the following assumptions: 57% proportion of optimal breastfeeding practice[40], 95% confidence level, 5% margin of error and 5% non-response with 2260 source populations and hence, a minimum of 395 participants required to conduct the study. Similarly, the sample size for factors associated with optimal breastfeeding practice was determined with the following assumptions: 80% power of the study, 95% confidence level, 38.5% proportion of optimal breastfeeding among unexposed group and AOR of 1.99 [37] with a 10% non-response rate and a minimum of 324 subjects required to conduct the study. Then, we compared those two sample sizes and used the larger sample size (n=395) and accordingly, a minimum of 395 participants required to conduct the study.

Stratified sampling technique was used to recruit the participants. Ten out of 22 rural kebeles were randomly selected using lottery method and one town kebele in the district was included. Then, total households with permanently residing mother-infant pairs (aged 0-6 months) in selected kebeles were identified using the last community health information system registries of 2018 available in the district. Then, sample size was proportionally allocated to each kebele and finally, actual participants were recruited using a systematic sampling technique.

Data Collection Tool and Measurement

A pretested-structured questionnaire adapted from validated instrument [13] and published literature [35,41,42] used to collect data from mother-infant pairs through face-to-face interview. The questionnaire contains information on socio-demographic characters, reproductive and healthcare related factors and optimal breastfeeding practice**.** The tool was initially prepared in English and translated to Afaan Oromo language and back to English for checking the consistency. The tool was pretested on 5% of the sample size (20 subjects) in a similar area just 10 days prior to the study and the findings based modifications were made. Supervisors checked each filled questioner and investigators were monitored the overall quality of data collection.

Optimal breastfeeding practice: It was measured using six questions assessing about optimal breastfeeding practice of infants aged less than six months. Accordingly, the six components of optimal breastfeeding practice are initiation of breastfeeding within 1 hours of birth of newborn, practicing colostrums feeding, absence of prelacteal feeding, absence of bottle feeding practice, continuing exclusively breastfeeding practice (from birth to time of interview), and adequate breastfeeding frequency (at least six to eight times per 24 hours) practice. Then, the composite index indicator score was summed from six components/items each coded '1' point when the participant answered/practiced a right response (conducted recommended practice) and '0' point when answered/practiced a wrong response (conducted non-recommended practice) and the optimal breastfeeding practice was considered 'yes' when the participant scored above the mean computed from six components/items of optimal breastfeeding and 'no' unless otherwise [36,38].

Knowledge about breastfeeding practice: It was assessed using nine dichotomous questions asking about maternal awareness on breastfeeding practice and then, a composite index score was computed from nine-items each coded '1' point when the participant answered a right response and '0' point when responded a wrong response and knowledge about breastfeeding was considered 'yes' when the participant scored above the mean and 'no' unless otherwise

Data Quality Control

To maintain the data quality, questionnaires were adapted from standard instruments and published literatures. We pre-tested adapted tool on 5% of the total sample to check validity of questionnaire in one non-selected kebele of the district. Data were entered using EpiData version 3.1. Strict supervision of data collectors and validation of collected data were carried out by supervisors and investigators.

Data Processing and Analysis

After checking for completeness, data were entered into EpiData version 3.1 and analyzed using SPSS version 24. Descriptive statistics such as frequencies, the measure of central tendency and measures of dispersion were used to characterize the participants. Before any analysis, we checked internal consistency of items used to measure composite index score using reliability analysis (Cronbach's α). Variables with P-value<0.25 in the bivariable analysis were considered for our multivariable analysis**.** Multivariable logistic regression analyses were used to identify factors associated with optimal breastfeeding practice. Adjusted odds ratio (AOR) (95%CI) was used to report association and significance was declared at *P*-value<0.05.

Results

Characteristics of participants

Out of 395 mother-infant pairs invited to the study, 390 (98.7%) were participated. The mean (±SD) age of infants and mothers were 2.91±1.41 months and 26.16±4.78 years, respectively. Around one-third (39.2%) of the infants were in the age group of 2-3 months and more than half (55.6%) of mothers' age found in 25-34 years age group. Seventy-one percent of infants' mothers were housewife and 45.4% of the mothers had no formal education (Table 1). The majority 324 (83.5%) of mothers were multi-parous, 77.4% of mothers had at least one antenatal care follow up and more than half (56.9%) of mothers delivered at health facility. One hundred sixty-five (42.3%) of the mothers had good knowledge on breastfeeding practice. Few, 31 (7.9%) of mothers had a breast related problem (Table 2).

Optimal breastfeeding practice

Prevalence of optimal breastfeeding practice among infants of 0-6 months was 55.9% (95% CI: 50.7%, 60.8%). Regarding the six domains/components of optimal breastfeeding practice, 74.1% were initiated breastfeeding as recommended (within a hour of birth), 70.5% had breastfed colostrums, 72.6% of the infants had no prelacteal feeding, 61.0% of infants were exclusively breastfed, 51.1% of infants had no bottle feeding and 70.8% of the infants have breastfeeding at least six times per a day. The main reason reported for not practicing the optimal breastfeeding practices were mother's own milk alone is insufficient for infant (40.7%), low mother's own milk secretion (29.1%), lack of time to breastfed (13.4%) and breastfeeding malpractice (16.9%).

Factors associated with optimal breastfeeding practice

The bivariable analysis showed that maternal age, maternal education, birth order of infant, antenatal care and postnatal care, delivering in health facility and mothers' knowledge on breastfeeding practice were significantly associated with optimal breastfeeding practice. Variables with *P*-value <0.25 in the bivariable analysis were considered in our multivariable analysis model (Table 3). In the multivariable analysis, mothers age of 15-24 and 25-34 years were 3.58 times (AOR= 3.58, 95% CI: 1.06, 11.95) and 3.49 times (AOR=3.49, 95% CI: 1.08, 11.28) more likely to practice optimal breastfeeding compared to mothers aged above 35 years. Mothers who had formal education were almost three times (AOR=2.98, 95% CI: 1.92, 4.62) more likely to practice optimal breastfeeding than mothers who had no formal education. Mothers delivered at health facility were almost two times (AOR=1.96, 95% CI: 1.24, 3.12) more likely to practice optimal breastfeeding than those who delivered at home. Mothers who have knowledge on breastfeeding practice were nearly two times (AOR=1.82, 95% CI: 1.16, 2.86) more likely to practice optimal breastfeeding compared to mothers who hadn't (Table 3).

Discussion

In this study, around one in every two mother- infant (aged less than six months) pairs had optimal breastfeeding practice. This finding was consistent with the studies conducted in Arba Minch, southern Ethiopia (57%) [40], Goba, southeast Ethiopia (52.4%) [41], Debre Markos, northwest Ethiopia (50.2%) [35] and northwest Ethiopia (55.3%) [31]. However, this finding was higher than the studies conducted in Jimma, southwest Ethiopia (24.6%) [32], Hula, southern Ethiopia (43.1%) [42], and Gondar, northern Ethiopia [37]. This discrepancy might be due to difference in participants' characteristics across the studies. For instance, in the study conducted in Gondar, northern Ethiopia, the participants were employed mothers [37] while our study included all mothers. In addition, this difference might be due to high proportion of knowledge

about breastfeeding (57%) in our study while 32.2% in study conducted in Jimma [32]. The possible explanation is in fact more understood importance of breastfeeding more practiced. This mentioned above reason might enhance opportunity to practice optimal breastfeeding.

Among factors associated with optimal breastfeeding practice, mothers in age group 15-24 years and 25-34 year were 3.58 and 3.49 times more likely to practice optimal breastfeeding than mothers in age group greater than or equal 35 years. This finding was similar with study conducted in Dilla, southern Ethiopia [30]. This result was also supported by study done in Debra Berhan, northern Ethiopia that reported younger mothers less likely to had early cassation of breastfeeding than the older mothers [35]. This might be due to the fact that younger mothers are more likely to understand the importance of optimal breastfeeding than mothers aged above 35 years that could enhances willingness to practice optimal breastfeeding. In addition, the younger mothers were more wanted and planned to become pregnancy than the mothers above 35 years [34]. This might be a vital in increasing intention to practice optimal breastfeeding [43]. Finally, this could be the fact a younger mothers have less burden to care house hold activities than the elders mothers. This might enhance optimally breastfeeding practice [30]. This finding shows that, mothers who had good knowledge about optimal breastfeeding practice were two folds more likely to practice optimal breastfeeding than those mothers who had poor knowledge about breastfeeding practice. This finding was somewhat similar with the studies done in Arbaminch, southern Ethiopia [40] and Hula, southern Ethiopia [42].

Mothers who delivered at health institution were almost two times more likely to practice optimal breastfeeding than those who delivered at home. This finding was supported by the studies in Goba, southeast Ethiopia [41] and Debre Tabor, northwest Ethiopia [23] that mothers delivered at health facility might be counselled about optimal breastfeeding practice and trained

on breastfeeding skill by healthcare workers. This adequate information and good skill on breastfeeding practice might help the mothers to practice optimal breastfeeding with satisfaction [44]. Besides, harmful traditional practices were less applied among mothers delivered at health facility [45]. This might support initiation of breastfeeding within one hour of gave birth and feeding colostrums [33].

Educated mothers were three times more likely to practice the optimal breastfeeding than the counterpart. This finding was supported by the studies conducted in Goba, southeast Ethiopia [41], Jimma Arjo, southwest Ethiopia [32], and Nigeria [46]. This might be the fact educated mothers were more exposed to information about optimal breastfeeding practice through different ways [42]. This might increased the chance to exercise optimal breastfeeding than non-educated mothers

As the strength, the study was focused among biological mothers of infants aged less than six months that help to reduce recall bias unlike studies conducted among mothers of infants aged less than 24 months. However, the study was limited among mothers of infants aged less than six months and hence; it might not be generalized mothers of children aged 6-24 months.

Conclusion

In this study, only nearly half of the infants aged less than six months in Boke district in eastern Ethiopia were practiced an optimal breastfeeding practice. Youth maternal age and education, place of delivery, maternal knowledge about breastfeeding practice were factors significantly increased the prevalence of optimal breastfeeding practice. Strengthening mothers to deliver at health facilities was found to be essential to improve the level of optimal breastfeeding practice. Increasing education opportunity for all women and enhancing maternal awareness on the breastfeeding practice were essential activities to prevent suboptimal breastfeeding practice.

Abbreviations

AOR: Adjusted Odds Ratio, ANC: Ante Natal Care: EDHS: Ethiopian Demographic Health Survey, IHRERC: Institution Health Research Ethical Review Bureau, LMIC: Low and Middle Income Countries, WHO: World Health Organization.

Authors Contributions

JHA, HAA, AAU, NB and FM participated in the conception of the idea, designing the study, data collection and analysis, and write-up the results. JHA, HAA, AAU, NB and FM reanalyzed the data, drafted and revised manuscript. Authors agree to take responsibility and be accountable for the contents of the article and agreed on the journal to which article will submitted. All authors read, critically revised and approved important intellectual content of the final manuscript.

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Declaration of Conflicting Interests

The authors declare that there is no conflict of interest.

Ethical Approval and Informed Consent

Institutional Health Research Ethical Review Committee of the College of Health and Medical Sciences, Haramaya University approved the protocol of the study (Ref.no: IHRERC/069/2018). Formal permission was obtained from West Hararghe Zone and Boke district Health Offices and respective kebeles. Informed, voluntary, written and signed consent was obtained from the biological mothers of each infant before the study after explaining the purpose and benefits of the study. Data collector interviewed biological mothers of the infants after informed the collected information would be kept confidential and not shared without permission. The authors confirmed that this study complies with Declaration of Helsinki.

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Data Availability

Data supported the findings is available from the correspondence author on reasonable request

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473 Table 1: Socio-demographic characteristics of mother-infant pairs in Boke district, eastern

474 Ethiopia, 2018 (*N*=390)

Characteristic	**Frequency**	**Percent**
Age of infant (in months)		
0-1	88	22.6
2-3	153	39.2
4-5	149	38.2
Sex of infant		
Male	198	50.8
Female	192	49.2
Age of mother (in years)		
15-24	152	39.0
25-34	217	55.6
35-44	21	5.4
Current marital status (of mother)		
Married	367	94.1
Other[*a]	23	5.9
Religion		
Muslim	341	87.4
Orthodox	49	12.6
Ethnicity		
Oromo	363	93.1
Amhara	27	6.9
Maternal education		
No formal education	177	45.4

Primary education	393	49.5
Secondary education and above	20	5.1
Paternal education (n=372)		
No formal education	146	39.3
Primary education	194	52.1
Secondary education and above	32	8.6
Main occupation of mother		
House wife	277	71.0
Farmer	85	21.8
Employee	28	7.2
Main occupation of father (n=372)		
Farmer	293	78.7
Merchant	59	15.9
Employee	20	5.4
Monthly income of family (in Ethiopian birr)		
<1000	184	47.2
≥1000	206	52.8

Note: a=Single/Divorced/Widowed

Table 2: Reproductive and healthcare characteristics of mother-infant pairs in Boke district, eastern Ethiopia, 2018 (*N*=390)

Characteristic	**Frequency**	**Percent**
Birth order of the infant		
1	66	16.9
2 -3	191	49.0
≥4	133	34.1
Antenatal care follow up		
Yes	302	77.4
No	88	22.6
Place of the last delivery		
Health facility	222	56.9
Home	168	43.1
Postnatal care follow up		
Yes	240	61.5
No	150	38.5
Counselling about breastfeeding		
Yes	262	67.2
No	128	32.8
Time to reach near public health facility		
≤30 minutes	244	62.6
>30 minutes	146	37.4

Table 3: Factors associated with optimal breastfeeding practice among mother-infant pairs in Boke district, eastern Ethiopia, 2018 **(*N*=390)**

Characteristic	Optimal breastfeeding practice		cOR (95%CI)	aOR (95%CI)
	Yes, n (%)	No, n (%)		
Sex of infant				
Female	115(59.9)	77(40.1)	1.38 (0.92, 2.06)	1.31(0.85, 2.00)
Male	103(52.0)	95(48.0)	1	1
Age of mother (in years)				
15-24	97(63.8)	55(36.2)	7.50(2.40, 23.40)*	3.58(1.06, 11.95)*
25-34	117(53.9)	100(46.1)	4.97(1.62, 15.26)*	3.49(1.08, 11.28)*
35-44	4(19.1)	17(81.9)	1	1
Maternal educational status				
Formal education	147(69.0)	66(31.0)	3.33(2.19, 5.05)**	2.98(1.92, 4.62)**
No formal education	71(40.1)	106(59.9)	1	1
Monthly income of family				
≥1000 birrs	122(59.2)	84(40.8)	1.33(0.89, 1.99)	1.02(0.49, 1.54)
<1000 birrs	96(52.2)	88(47.8)	1	1
Birth order of the infant				
1	46(68.3)	21(31.3)	2.75(1.48, 5.13)*	1.35(0.57, 3.10)
2-3	114(59.4)	78(40.6)	1.84(1.17, 2.88)*	1.41(0.81, 2.45)
≥4	58(44.3)	73(55.7)	1	1
Antenatal care follow up				
Yes	183(60.6)	119(39.4)	2.33(1.43,3.78)**	1.13 (0.61, 2.08)
No	35(39.8)	53(60.2)	1	1
Place of the last delivery				
Health facility	145(65.3)	77(34.7)	2.45(1.62,3.70)**	1.96(1.24, 3.12)**
Home	73(43.5)	95(56.5)	1	1
Postnatal care follow up				
Yes	153(63.8)	87(36.2)	2.30(1.56,3.49)**	1.12(0.58, 2.17)
No	65(43.3)	85(56.7)	1	1
Time to reach near public health facility				
≤30 minutes	144(59.0)	100(41.0)	1.40(0.93, 3.12)	1.10(0.55, 1.56)
>30 minutes	74(50.7)	72(49.3)	1	1
Knowledge about breastfeeding practice				
Good	112(67.9)	53(32.1)	2.37(1.56, 3.61)**	1.82(1.16, 2.86)**
Poor	106(47.1)	119(52.9)	1	1

Notes: Significant at P<0.05=*, P<0.01=**, cOR=Crude Odds Ratio and aOR=Adjusted Odds Ratio