

Research Article

Timely initiation of breastfeeding and associated factors among mothers with vaginal and cesarean deliveries in public hospitals of Addis Ababa, Ethiopia

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Abstract

Background: WHO and UNICEF recommend breastfeeding to be initiated within an hour of birth. However, timely initiation of breastfeeding remains low in Ethiopia. Therefore, this study aimed to compare the timely initiation of breastfeeding and associated factors with cesarean and vaginal deliveries in public hospitals in Addis Ababa, 2021.

Methods and materials: Comparative cross-sectional study was conducted from January 2021 to February 2021 in public hospitals of Addis Ababa. 322 mothers within three days of delivery at the postnatal ward of the respective public hospitals were selected. A multi-stage sampling method was employed with the final participants being recruited by systematic random sampling. Data was entered to Epi data Version 4.6 and analysis was performed by SPSS Version 26. A Binary and multivariate logistic regression statistical model was used. Adjusted odds ratio with 95% CI was computed to see the strength of association.

Result: Timely breastfeeding initiation was 79 (51.2%) and 123 (80%) for cesarean and vaginal deliveries. With a vaginal delivery, pre-lacteal feeding (AOR = 5.50, 95% CI: 1.83 - 16.57) was significantly associated with timely initiation of breastfeeding. Multiparity (AOR = 2.14, 95% CI: 1.02 - 4.50), support from health care workers (AOR = 2.602, 95% CI: 1.16 - 5.82), and pre-lacteal feeding (AOR = 2.55, 95% CI: 1.13 - 5.75) were significantly associated with timely initiation of breastfeeding with cesarean delivery.

Conclusion: The rate of timely initiation of breastfeeding differs according to the mode of delivery. Cesarean delivery, as compared to vaginal delivery, was associated with a lower rate of timely initiation of breastfeeding.

Introduction

Breast milk is the ideal food for the infant. It contains all the energy and nutrients in optimal amounts the infant requires [1]. The recent World Health Organization reviews of the short and long-term benefits of breastfeeding concluded that there is strong evidence for many public health benefits of breastfeeding [2]. The benefits for the infant include improved cognitive development, decreased rate of necrotizing enterocolitis, common childhood infections, and decreased risk of sudden infant death syndrome [2-4].

Breastfeeding helps the mother to return to pre-pregnancy weight and improves birth spacing. Additionally, it is important in decreasing rates of chronic illnesses, ovarian and breast cancer [4]. Timely initiation of breastfeeding (TIBF) is defined as breastfeeding within an hour of birth for mothers with vaginal delivery (VD) and Cesarean delivery (CD) with spinal anesthesia; if general anesthesia was used for the procedure, it is defined as the initiation of breastfeeding as soon as the mother regains consciousness [5]. Breastfeeding initiation is a simple intervention that has the potential to significantly improve neonatal outcomes and should be

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Keywords: Timely initiation; Early initiation; Breastfeeding; Cesarean delivery; Vaginal delivery





universally recommended [6]. TIBF, by reducing mortality risk, is beneficial for child survival within the first 28 days of birth, including all causes of mortality [7-9]. It also reduces neonatal hypothermia and fosters attachment and bonding through close contact with the mother [10].

Several factors related to the mother and the baby affect the initiation of breastfeeding. Mode of delivery is one of these factors [11-19]. When delivery takes place by cesarean section, the mother becomes a surgical patient with all the inherent risks and problems. Mothers with cesarean section have to cope with having surgery just as they are also trying to care for their newborn children [20]. Cesarean delivery is known to affect the normal physiology of labor and the process that comes after delivery [21-23]. Delayed skin-to-skin contact, fatigue, postoperative pain, and anesthetic drugs may lead to delayed initiation of breastfeeding [21-25]. On the other hand, mothers with a vaginal delivery are devoid of the deleterious effects of surgery and anesthetic drugs on breastfeeding initiation. Other factors identified from a literature review with both delivery modalities include age, educational status, residence, place of birth, employment status, socio-economic status, knowledge of breastfeeding, ANC, infant sex, colostrum, and pre-lacteal feeding status, access to media, parity, counseling on breastfeeding, and singleton births [19,20,27-37].

Globally more than 80% of neonates receive breast milk in nearly all countries, however only about half of them begin breastfeeding within an hour of life [37]. In Africa, TIBF varies regionally. It is 35% in North Africa, 65% in Eastern, and Southern Africa, and 40% in West and Central Africa [38]. In Ethiopia, the national prevalence of timely initiation of breastfeeding is 73% with the lowest prevalence in afar regional state (42%) and the highest prevalence in Dire Dawa city administration (90.5%) [39]. When the mode of delivery is taken into account, the rate of TIBF varies globally, regionally, and nationally. Globally the TIBF for CD and VD is 33.9% and 64.2% respectively [40]. The prevalence of timely initiation of breastfeeding among cesarean delivered mothers ranged from 16.4% to 85.4% across the 33 sub-Saharan African countries with one-third of these countries having a prevalence of less than 50% [17]. With the vaginal mode of delivery, the rate of timely initiation of breastfeeding is 35.1% in Nigeria [41], 78.8% in Malawi [18], and 84.4% in Namibia [35]. In Ethiopia, the trend from 2000-to 2016 EDHS showed that only 38.8% of mothers with cesarean delivery and 61.5% with vaginal delivery initiated breastfeeding [14].

The Ethiopian Ministry of Health had a plan to increase the proportion of newborns to start breastfeeding within the first hour of life to 92% by 2015 as one strategy to improve child health [42]. Despite the plan data from EDHS 2016 showed that the national rate is 67.5% and which is well below the plan [39]. Studies have indicated that it is possible, successful, and feasible to breastfeed within an hour of birth after a CD

[29,43]. A quality improvement approach alone has shown to increase the rate of TIBF from 0% to 93% and interventions to improve breastfeeding initiation rates following CD can improve overall breastfeeding rates [23,43]. Despite this, comparative studies on the TIBF with regards to the mode of delivery in the Ethiopian context are lacking and therefore this study will compare the timely initiation of breastfeeding and associated factors among mothers with cesarean and vaginal deliveries in public hospitals of Addis Ababa, Ethiopia.

Materials and methods

Study setting, design and period

A comparative cross-sectional study design was conducted in Addis Ababa from January to February 2021. Addis Ababa is the largest and the capital city of Ethiopia. According to data from the Addis Ababa city administration health bureau 12 public hospitals provide both cesarean and vaginal deliveries.

Inclusion and exclusion criteria

The respondents included in this study were mothers with either cesarean or vaginal delivery who had Antenatal care (ANC) follow up in the same hospital and attended the post-natal ward of selected public hospitals during the study period. Mothers who were critically ill and/or with neonates having gross congenital anomalies that can affect breastfeeding initiation were excluded.

Sample size determination and sampling procedure

The sample size was calculated using the double population proportion formula. The following assumptions were made to determine the required sample size: desired precision (d) = 5%, Confidence level = 95% ($Z_{\alpha/2} = \pm 1.96$ value), power (β) = 80%, the prevalence of TIBF with VD was 75% [44], and the prevalence of TIBF with CD was 56.2% [27]. Hence the final sample size with a 10% non-response rate and a design effect of 1.5 was 322. Accordingly, equal proportions of mothers were employed from both delivery modalities. 12 public hospitals provide both cesarean and vaginal deliveries. A multi-stage sampling procedure was employed to recruit final study participants. To make the samples representative 30% of the public hospitals were selected by simple random sampling technique. As a result, Gandhi Memorial hospital, Zewditu Memorial hospital, Ras Desta Damtew hospital, and Dagmawi Menelik referral hospital were selected. Data from the Addis Ababa city administration health bureau showed that a total of 6623 mothers were expected to give birth in the two-month data collection period. This was proportionally allocated based on the number of deliveries. Study participants were finally recruited by systematic random sampling from the respective post-natal ward of the hospitals.

Data collection tool & assurance

The interviewer-administered face-to-face structured questionnaire was used for data collection which was adapted



from previous works of literature. The study tool contained five parts with 40 items for CD and 39 items for VD. The data was collected by midwives and nurses after explaining the purpose of the study. Continuous follow-up and supervision were made by a facilitator and Principal Investigators (PI) throughout the data collection period. The data was checked daily for completeness and consistency throughout the data collection period by the facilitator and PI. A unique code was given to each questionnaire. Before commencing the data collection, a pre-test was conducted on 5% of the total sample size at Tirunesh Bejing hospital. The participants recommended no change be made to the questionnaire. The facilitator and data collectors attended training about the objective of the study and the contents of the questionnaire for a one-day duration.

Study variables

Dependent variable: Timely initiation of breastfeeding.

In this study, first, the time elapsed for initial breastfeeding after delivery was asked and then it was categorized as a mother who initiated in less than or equal to an hour after delivery or not.

Independent variables: The independent variables were socio-demographic characteristics (age, marital status, Mothers and spouse/partners' educational level, employment status, Infant sex, and income level), Obstetric and healthcare-related factors (Parity, ANC, health care provider support, previous obstetric history, and labor history), traditional belief factors (colostrum avoidance, pre-lacteal feeding, and family support), and awareness related factors (awareness on TIBF & colostrum).

Operational definitions: Timely initiation of breastfeeding: putting the newborn on the mother's breast to suckle within one hour of birth with VD and CD (if spinal anesthesia is used) or putting the newborn on the mother's breast to suckle as soon as consciousness is regained with CD (if general anesthesia used) as reported by the mother.

Health care provider support: health care professionals, who counsel and assist the mother for proper attachment and positioning to initiate breastfeeding within one hour of birth.

Pre-lacteal feeding: feeding an infant with something other than breast milk after birth to three days.

Good awareness about the timely initiation of breastfeeding: If the mother can answer five or more questions asked to measure awareness of the timely initiation of breastfeeding.

Poor awareness about the timely initiation of breastfeeding: If the mother answers less than five questions asked to measure awareness of the timely initiation of breastfeeding.

Data processing and analysis

All the questionnaires were checked for completeness,

and entered into EpiData version 4.6 and then exported to SPSS version 26 for data analysis. The descriptive statistics were presented in the form of a figure, tables, and text using frequencies and numerical summary statistics such as mean and median. Variables in the bivariate analysis with a p - value ≤ 0.25 were further considered in the final logistic regression analysis. The degree of association between independent and dependent variables was assessed by using an adjusted odds ratio at a 95% confidence interval.

Ethical consideration

Ethical clearance was obtained from Addis Ababa public health research and emergency management directorate and the Ethical Committee of Kotebe Metropolitan University Menelik II Medical and Health Science College. A formal letter was submitted to the public health hospitals. Data collection was conducted after receiving written consent from the participants following an adequate explanation of the purpose of the study.

Results

Socio-demographic characteristics

A total of 322 mothers with vaginal or cesarean delivery at the postnatal ward of selected public hospitals in Addis Ababa, Ethiopia were interviewed with a response rate of 307 (95.3%). The mean age of respondents with cesarean delivery was 31.2 years (95% CI = 30.6 - 31.8) and 30.4 years (95% CI = 30.0 - 30.8) with vaginal delivery. Other results of the socio-demographic characteristics are shown in Table 1.

Table 1: Socio-demographic characteristics of study participants.

Variables	Category	CD (n = 154)	VD (n = 153)	Total (n = 307)
Maternal age	15-19	5 (3.2%)	8 (5.2%)	13 (4.2%)
	20-24	36 (23.4%)	25 (16.9%)	61 (19.8%)
	25-29	62 (40.3%)	63 (40.9%)	125 (40.7%)
	30-34	35 (22.7%)	33 (21.4%)	68 (22.1%)
	≥ 35	16 (10.4%)	24 (15.6%)	40 (13%)
Educational level	Primary education	49 (31.8%)	55 (36.4%)	104 (33.8%)
	Secondary education	49 (31.8%)	53 (34.4%)	102 (33.2%)
	Higher/Technical education	35 (22.7%)	29 (18.8%)	64 (20.8%)
	No education	21 (13.6%)	16 (10.4%)	37 (12%)
Marital status	In union	145 (94.2%)	138 (90.3%)	283 (92.1%)
	Not in union ^a	9 (5.8%)	15 (9.7%)	24 (7.8%)
Spouse/partner educational level	Primary education	51 (35.2%)	42 (27.3%)	93 (32.8%)
	Secondary education	35 (22.7%)	55 (36.4%)	90 (31.8%)
	Higher/Technical education	49 (31.8%)	36 (23.4%)	85 (30%)
	No education	10 (6.5%)	5 (3.2%)	15 (5.3%)
Newborns sex	Male	86 (55.8%)	77 (50.6%)	168 (53%)
	Female	68 (44.2%)	76 (49.4%)	144 (46.9%)
Occupation	Currently employed	79 (51.3%)	50 (32.5%)	129 (42%)
	Currently unemployed	75 (48.7%)	103 (67.5%)	178 (57.9%)
Monthly income	<5000	59 (38.3%)	53 (34.9%)	112 (36.5%)
	5000-10000	55 (35.7%)	53 (34.9%)	108 (35.2%)
	>10000	40 (26%)	47 (30.3%)	87 (28.3%)

^asingle, divorced, widowed, cohabited or separated.



Timely initiation of breastfeeding

Timely initiation of breastfeeding regardless of the method of delivery was 204 (66.5%). With CD, 79 (51.2%) initiated breastfeeding within an hour of birth whereas 123 (80%) with VD initiated timely. The reasons stated for delayed initiation of breastfeeding by mothers with CD were the effect of anesthesia 25 (33.3%), lack of assistance 20 (26.6%), baby sickness 15 (20%), inadequate breast milk 8 (10.6%), and maternal sickness 7 (9.3%). Respondents with VD identified baby sickness 14 (46.6%), maternal sickness 6 (20%), inadequate breast milk 6 (20%), and lack of assistance 4 (13.3%) as a cause for delaying breastfeeding initiation. The mean and median time for vaginal delivery was 90.3 minutes (95% CI = 26.56 - 154.03) and 30 min respectively. For cesarean delivery, the meantime was 414.57 minutes (95% CI 261.13 - 568.00) whereas the median time was 60 minutes.

Obstetric and healthcare-related factors

With both delivery methods, ANC coverage was high. Other obstetric and healthcare-related characteristics of the respondents are displayed in Table 2.

Traditional belief related factors

The majority of the mothers with CD 113 (73.4%) and VD

Table 2: Obstetric and health care related factors of study participants.

Variable	Category	CD	VD
Parity	Primi parous	80 (51.9%)	73 (47.3%)
	Multi parous	74 (48.1%)	80 (53.3%)
ANC follow up	Yes	153 (99.4%)	147 (96.1%)
	No	1 (0.6%)	6 (3.9%)
Multiple gestations	Yes	6 (3.9%)	4 (2.6%)
	No	148 (96.1%)	149 (97.4%)
Reason for CD	Medical indication	152 (98.8%)	-
	Self-request	1 (0.6%)	-
	I do not know	1 (0.6%)	-
Type of CD	Emergency	103 (66.9%)	-
	Elective	51 (33.1%)	-
Primary/ repeat CD	Primary	114 (74.5%)	-
	Repeat	39 (25.5%)	-
Anesthesia used	General	5 (3.3%)	-
	Spinal	149 (96.7%)	-
Pain after delivery	Yes	45 (29.3%)	29 (19%)
	No	109 (70.7%)	124 (81%)
Fatigue after delivery	Yes	55 (35.7%)	65 (42.5%)
	No	99 (64.3%)	88 (57.5%)
Skin to skin contact	Yes	21 (13.8%)	86 (56.2%)
	No	127 (82.8%)	67 (43.8%)
	I do not know	5 (3.4%)	-
Developed complications	Yes	23 (14.9%)	25 (16.3%)
	No	131 (85.1%)	128 (83.7%)
Support from HCW	Yes	100 (64.9%)	85 (55.6%)
	No	54 (35.1%)	68 (44.4%)
Labor onset	Spontaneous	-	123 (80.4%)
	Induced	-	30 (19.6%)
Augmentation	Yes	-	38 (24.8%)
	No	-	115 (75.2%)
Type of VD	Spontaneous	-	128 (83.6%)
	Assisted	-	25 (16.4%)

125 (81.7%) fed colostrum to the neonate. Giving pre-lacteal feeding was avoided by the majority of the mothers with CD 96 (62.4%) and VD 133 (86.9%) Table 3.

Awareness of timely initiation of breastfeeding

Participants were offered to answer nine questions that assess their awareness of the timely initiation of breastfeeding. Per the operational definition, 68% of mothers with CD and 58% of mothers with VD had good awareness about the timely initiation of breastfeeding (Figure 1).

Factors associated with timely initiation of breastfeeding

Variables having a *p* - value less than 0.25 were inserted into the multivariate logistic regression model to determine the relationship between the dependent and independent variables. Adjusted odds ratio with 95% CI was computed to see the strength of association. With CD, multiparity (AOR = 2.14, 95% CI: 1.02 - 4.50), health care worker (HCW) support (AOR = 2.60, 95% CI: 1.16 - 5.82), and, avoiding pre-lacteal feeding (AOR = 2.54, 95% CI: 1.13 - 5.75) were significantly associated with TIBF. For respondents with VD avoiding pre-lacteal feeding (AOR = 2.54, 95% CI: 1.13 - 5.75) was the only significantly associated factor (Table 4).

Discussion

This study aimed to compare the timely initiation of breastfeeding by the mode of delivery. The study identified that TIBF was higher for mothers with VD (80%) than mothers with CD (51%). The rate of TIBF for mothers with CD

Table 3: Traditional belief related characteristics of the respondents.

Variable	Category	CD	VD
Fed colostrum	Yes	113 (73.4%)	125 (81.7%)
	No	41 (26.6%)	28 (18.3%)
Pre-lacteal feeding	Yes	58 (37.6%)	20 (13.1%)
	No	96 (62.4%)	133 (86.9%)
Partner/spouse support	Yes	76 (52.4%)	85 (58.2%)
	No	63 (43.4%)	42 (28.8%)
	Absent during delivery	6 (4.2%)	19 (13%)
Mother/in-law support	Yes	55 (35.9%)	51 (33.3%)
	No	26 (17%)	19 (12.4%)
	Absent during delivery	72 (47.1%)	83 (54.2%)

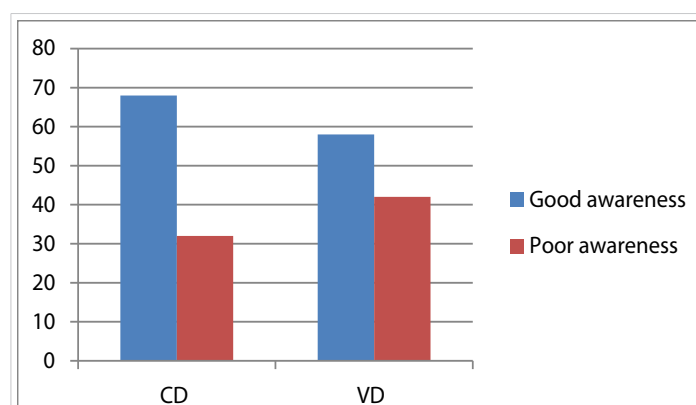


Figure 1: Awareness of participants towards timely initiation of breastfeeding.



Table 4: Factors associated with timely initiation of breastfeeding.

Variable by delivery mode	Category	TIFF		95% CI	AOR
		Yes	No	COR	
Cesarean delivery					
Parity	Primi parous	55	25	2.58 (1.34,4.99)	2.14 (1.02-4.50)*
	Multi parous	34	40	1	1
HCW	Yes	51	49	1	1
	No	13	40	3.20 (1.53-6.70)	2.60 (1.16-5.82)*
Pre-lacteal feeding	Yes	45	13	4.01 (1.92-8.38)	2.54 (1.12-5.75)*
	No	44	51	1	1
Vaginal delivery					
Pre-lacteal feeding	Yes	14	6	7.67 (2.72-21.65)	5.49 (1.82-16.57)*
	No	31	102	1	1

*Significant at $p < 0.05$; COR: Crude Odd Ratio; AOR: Adjusted Odds Ratio; HCW: Health Care Worker.

was higher in studies done in Sudan [16], Nigeria [41], Saudi Arabia [45], United Arab Emirates (UAE) [46], and China [47]. The TIBF rate was low in studies done in Dese, Ethiopia [48], and Brazil [49]. For the vaginally delivered mothers, the TIBF was higher as compared to studies from different parts of Ethiopia [14,50], Sudan [16], Nigeria [41], Saudi Arabia [45], UAE [46], while it was low for a study done on Namibia [29]. The inconsistency of findings could be a result of differences in the study area, study period, or socio-cultural factors which may lead to discrepancies in the practice of breastfeeding initiation.

Multiparity and support from the health care provider were significantly associated with the timely initiation of breastfeeding among mothers with CD. While pre-lacteal feeding status was significantly associated with TIBF among mothers with VD. Colostrum feeding status was significantly associated with the practice of timely initiation of breastfeeding with both delivery methods. With cesarean delivery, multiparous mothers were 2.14 (AOR = 2.14, 95% CI: 1.02 - 4.50) more likely to initiate breastfeeding within an hour than primiparous mothers. Women who have breastfed previously have significantly different breastfeeding experiences than primiparous women [51]. Multiparous mothers could have a personal experience in the practice of timely initiation of breastfeeding while primiparous mothers are devoid of any personal experience. Our finding was supported by studies done in the South Gondar zone in Ethiopia and Sudan [16,52]. This can be justified by the fact that multiparous mothers will have more information exposure regarding the importance of timely initiation of breastfeeding while receiving care at ANC, labor, and delivery, or post-natal services. Based on this finding, we recommend health care providers give extended support to primiparous mothers to initiate breastfeeding early.

Mothers with CD who got support from health care workers were 2.60 (AOR = 2.60, 95% CI: 1.16 - 5.82) times more likely to initiate breastfeeding than those mothers who did not get support. Breastfeeding difficulties in mothers with CD could be multifactorial. Some of the difficulties can

be decreased from support and professional counseling from the health care provider about attachment and positioning of breastfeeding. Our study finding was consistent with studies done in the South Gondar zone and Goba, Ethiopia [33,52]. While breastfeeding is a natural human behavior, most mothers need practical help in learning how to breastfeed [53]. This might be the reason for the consistent finding between our study and other studies. Similar to our recommendation with primiparous mothers, health care providers should offer protracted support to mothers with cesarean section.

For mothers with VD, those who did not give pre-lacteal feeding were 2.54 (AOR = 2.54, 95% CI: 1.12 - 5.75) times more likely to initiate breastfeeding timely than their counterparts. Pre-lacteal feeding is one of the sociocultural mal-practice which may interfere with breastfeeding initiation. Our study finding was supported by studies done in different parts of Ethiopia [26,54]. The similarities of the findings could be a result of the perception of mothers about the harmfulness of pre-lacteal feeding. We recommend pre-lacteal feeding should be discouraged and mothers should be given pertinent health education regarding the harmful effect of pre-lacteal feeding during ANC follow-up.

The limitation of this study is it lacks a qualitative approach that may help to know how the mode of delivery affects breastfeeding initiation. Additionally, the nature of the study by itself does not assess the cause-and-effect relationship of factors affecting breastfeeding initiation rates. Recall bias may be introduced since the elapsed time for the first breastfeeding after delivery was recorded solely based on maternal response. Another limitation is the small sample size used for the study.

Conclusion

The study showed that the rate of timely initiation of breastfeeding was low from the plan set by the Ministry of Health, Ethiopia to increase the proportion of newborns to start breastfeeding within the first hour of life by the year 2015. The breastfeeding initiation rate was different from the mode of delivery. Cesarean delivery was associated with a lower breastfeeding initiation rate and a higher mean time of breastfeeding initiation. Therefore we would like to recommend the health care providers in the maternity ward of public hospitals in Addis Ababa give appropriate and adequate support to the mothers for timely initiation of breastfeeding with emphasis on cesarean delivered and first-time mothers.

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Informed consent statement: Informed consent was obtained from all subjects involved in the study.

Data availability statement: The datasets analyzed during the current study are available from the corresponding author on reasonable request.

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