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## A study on breastfeeding practices of mothers undergoing normal delivery and caesarean section delivery

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### Abstract

WHO and UNICEF have recommended to initiate breastfeeding within 1 hour of birth and to exclusively breastfeed the child for complete 6 months of life to ensure optimum nutrition of the child. The aim of the study is to identify the breastfeeding practices and their associated factors among normal delivery mothers and mothers who have undergone caesarean delivery. A cross-sectional study was conducted on 100 postnatal mothers. Information on breastfeeding, complementary feeding practices and nutrition were collected through a structured questionnaire. 64% of the total participants had initiated breastfeeding within 24 hours. 33% of the mothers who delivered via C-section initiated breastfeeding at 24 hours when compared to the mothers who had undergone normal delivery, 67%, ( $p=0.026$ ). 9.4% of the mothers who delivered a preterm baby ( $p=0.003$ ) and 15.6% whose babies were admitted to Neonatal Intensive Care Unit ( $p=0.000$ ) initiated breastfeeding within 24 hours, which was significantly lower than their counterparts. 36% of the mothers faced the most common difficulty during breastfeeding and that was no rooming of the mother and child after delivery. The rate of exclusive breastfeeding till 6 months was only 35% and it has significantly decreased with increasing lactation difficulties at the time of birth ( $p=0.000$ ), complication during delivery ( $p=0.023$ ) and NICU admission of the baby ( $p=0.000$ ). 66% of the mothers were breastfeeding their child at the time of interview. 71% of the mothers had consumed calories more than 50% of the RDA and 43% had consumed protein less than 50% of the RDA. Women who give birth by C-section should be provided with better practical support by the hospital staff and better rooming-in facility. Dietary modification and counselling to the mothers during lactation is required for achieving the optimum health of the mother.

**Keywords:** Breastfeeding, C-section delivery, nutrition, rooming-in

### Introduction

Breastfeeding (BF) is one of the most important aspect for both mother and child's life. World Health Organization (WHO) has recommended initiating breastfeeding within 1 hour of birth, exclusive breastfeeding till 6 months, continuation of breastfeeding till 2nd year and introduction of appropriate complementary foods that ensures proper growth and development and builds up child's immunity<sup>[1]</sup>, thereby decreasing the rates of infection like pneumonia diarrhea, diseases like asthma and allergies and is crucial in preventing newborn deaths and influences childhood nutrition<sup>[2]</sup>.

However, the percentage of children under 3 years of age who were breastfed within one hour of birth according to national health family survey NHFS 2015-16 data is only 9.2% and exclusive breastfeeding is 54.9% better than 46.4% in the year 2005-06 but not good enough to ensure mother and child's optimum health<sup>[3]</sup>.

The attitude, practices and support among mothers regarding breastfeeding decide the success of breastfeeding. Mothers who were all excited, prepared and ready to breastfeed the infant even before the delivery were more likely to have higher breastfeeding rates than those who found breastfeeding as an embarrassing, disgusting and inconvenient act<sup>[4]</sup>.

The environment, availability of breast pumps, support and encouragement of family and coworkers, lactation room with dedicated space and lower workload are the factors that help the mother to breastfeed the baby successfully without any stress. (Su-Ying Tsai, 2013)<sup>[5]</sup> However, an Indian study revealed that majority of the mothers (90%) did not have breastfeeding facilities at the workplace and 87.8% of them ceased breastfeeding their child due to their working status<sup>[6]</sup>.

On the other hand, proper nutrition to a woman during the lactation phase is key to successful breastfeeding as it is important for both maternal and child health. After delivery, the mother loses the majority of the energy and blood and is in the absolute need for higher calories and good nutrients requirement. Also, the deficiency of fat soluble and water soluble vitamins in mothers decrease their levels in the breast milk and therefore mothers' nutritional status has an effect on lactation and eventually on the child's health [7].

Mode of delivery also influences breastfeeding practices and side effects of caesarean section deliveries on breastfeeding have been confirmed by many types of research. The rate of C-section has increased from 8.5% in 2005-06 to 17.2% in 2015-16 (NFHS 4) and this may be the reason of decrease in early initiation and exclusive breastfeeding since past 10years in India. This area needs more attention as proper breastfeeding to the child has profound benefits to the mother and child. Decreased breastfeeding is associated with many ill effects on the health of the mother and child, therefore the data collected by this study identifying factors affecting breastfeeding will help the health authorities to promote good breastfeeding practices.

**Materials and Methods**

A cross-sectional study was conducted among 100 postnatal mothers to identify the factors affecting breastfeeding practices and to assess their nutritional status. The participants were selected by random sampling method from Lokmanya Tilak Municipal and General Hospital, Sion and Fatima

hospital, Mira Road, Mumbai (Maharashtra). A sample population of 100 mothers belonging to the age group of 18 to 50 years and those who had children between the age group of 6 to 24 months were included in the study. Mothers who reside out of the city of Mumbai, those who had medical problems in breastfeeding secretion and feeding and those who had children with any major birth defects like cleft lip/palate, congenital heart disease and Down syndrome were excluded from the study.

The study was conducted by the means of an interview cum questionnaire method. The information regarding socioeconomic factors, gynaecology and medical history, birth history, breastfeeding and complementary feeding practices and dietary intake were gathered in this study from each participant.

Breastfeeding practices included the data of initiation of breastfeeding within 24 hours, exclusive breastfeeding till 6 months and continuation of breastfeeding until 2 years. 24-hour diet recall was taken to assess the nutritional status of the mothers.

**Results**

41% of the mothers had education from 6<sup>th</sup> to 10<sup>th</sup> standard and 42% of them were in the age group of 28 years to 40 years. 62% of the participants had their sanitation system outside their houses. 33% of the women have been pregnant for about 5 times. 37% of the mothers had 2 to 4 years of spacing between their current and previous childbirth.

**Table 1:** Factors affecting the Initiation of Breastfeeding within 24 Hours and Exclusive Breastfeeding until 6 months

Initiation of breastfeeding within 24 hour	Yes n=64	No n=36	$\chi^2$	p-value	Exclusive breastfeeding till 6 months	Yes n=42	No n=58	$\chi^2$	p-value
<b>Education</b>			2.275	0.321	<b>Education</b>			0.470	0.791
0-5 Std % (n)	34.4 (22)	22.2 (8)			0-5 Std % (n)	33.3 (14)	27.6 (16)		
6-10 Std % (n)	35.9 (23)	50 (18)			6-10 Std % (n)	40.5 (17)	41.4 (24)		
11-17 Std % (n)	29.7 (19)	27.8 (10)			11-17 Std % (n)	26.2 (11)	31 (18)		
<b>Education about breastfeeding</b>			0.039	0.843	<b>No of pregnancies</b>			5.887	0.05*
Yes % (n)	87.5 (56)	86.1 (31)			1 % (n)	21.4 (9)	32.8 (19)		
No % (n)	12.5 (8)	13.9 (5)			2 % (n)	59.4 (19)	22.4 (13)		
<b>The term of the baby</b>			8.960	0.003*	More than 2 % (n)	65 (26)	44.8 (26)	2.196	0.138
Full term % (n)	90.6 (58)	66.7 (24)			<b>Education about breastfeeding</b>				
Preterm % (n)	9.4 (5)	33.3 (12)			Yes % (n)	92.9 (39)	82.8 (48)		
<b>Mode of delivery</b>			4.927	0.026*	No % (n)	7.1 (3)	17.2 (10)	1.760	0.185
Normal delivery % (n)	67.2 (43)	44.4 (16)			<b>Mode of delivery</b>				
C- section delivery % (n)	32.6 (21)	55.6 (20)			Normal delivery % (n)	66.7 (28)	53.4 (31)		
<b>Complications during delivery</b>			9.946	0.002*	C- section delivery % (n)	33.3 (14)	46.6 (27)	5.165	0.023*
Yes % (n)	15.6% (10)	44.4% (16)			<b>Complications during delivery</b>				
No % (n)	84.4% (54)	55.6% (20)			Yes % (n)	14.3 (6)	34.5 (20)		
<b>Birth weight</b>			9.904	0.019*	No % (n)	85.7 (36)	65.5 (38)		
1	4.7	25 (9)			<b>Admission of the child in Neonatal</b>				

% (n)	(3)				<b>intensive care unit (NICU)</b>				
2	53.1 (34)	47.2 (17)			Yes	15.6	46.6	13.438	0.000*
% (n)					% (n)	(5)	(27)		
3	28.1 (18)	22.2 (8)			No	88.1	53.4		
% (n)					% (n)	(37)	(31)		
4	14.1 (9)	5.6 (2)			<b>Difficulties during lactation</b>				
% (n)					Yes	2.4	41.4	19.759	0.000*
<b>Admission of the child in Neonatal intensive care unit (NICU)</b>					% (n)	(1)	(24)		
Yes	15.6(10)	61.1(22)	21.907	0.000*	No	97.6	58.6		
% (n)					% (n)		(41)	(34)	
No	84.4(54)	38.9(14)							
% (n)									

\*p<0.05

64% of the mothers had initiated breastfeeding within 24 hours, while 36% of them didn't initiate. Out of 100 mothers, 25% of them faced problems during breastfeeding due to which they had difficulties feeding the baby and the most common reason was no rooming in for the mother and child right after the birth (36%), followed by less milk production (20%), incapability of the baby to breastfeed (16%), complications/ pain after C-section delivery (12%), cracked/cut nipples (8%) and no milk production (8%).

The factors influencing the initiation of breastfeeding within 24 hours and exclusive breastfeeding until 6 months is summarized in table 1. Mode of delivery was significantly associated with breastfeeding initiation (p=0.026). A higher proportion of the mothers who did not initiate breastfeeding within 24 hours of birth had delivered the baby by caesarean section (55.6%, n=20) when compared to mothers who gave birth via normal delivery. The term of the baby was seen to be positively associated with the initiation of breastfeeding (p=0.003), where 9.4% of mothers who had delivered a preterm baby initiated breastfeeding within 24 hours. Also, birth weight (p=0.019) and NICU admission of the baby (p=0.000) were significantly associated with the initiation of breastfeeding within 24 hours. A higher proportion of the infants who received breast milk within 24 hours of birth were those who had a birth weight of 2 kgs (53.1%, n=34) and those who were not admitted in the NICU after birth (84.4%,

n=54). Complications during delivery (p=0.002) were significantly associated to initiate breastfeeding within 24 hours. 84.4% of the mothers who had no complications during delivery initiated breastfeeding within 24 hours. The delayed initiation of breastfeeding among preterm/ low birth weight infants may be because of NICU admission of the baby and eventually, it leads to a poor rooming-in which makes breastfeeding a challenging task to the mother. However, the education of the mother is not significantly associated with the initiation of breastfeeding within 24 hours of birth.

Concerning exclusive breastfeeding practices, 35% of the mothers have exclusively breastfed their child for a complete 6 months. The factors that are significantly associated with the exclusive breastfeeding for 6 months are complications during delivery (p=0.023), a number of pregnancies (p=0.05), NICU admission of the baby (p=0.000), the interval between pregnancies (p=0.053) and difficulties faced during lactations (p=0.000). 85.7% of the mothers who didn't face any complications during delivery and 59.4% who had conceived for more than 2 times had continued exclusive breastfeeding for 6 months. 15.6% of the mothers whose babies were admitted to NICU received exclusive breastfeeding for 6 months. 97.6% of the mothers who did not face difficulties during lactation after birth, breastfed their babies exclusively for 6 months. Mode of delivery was not significantly associated with exclusive breastfeeding practices. (Table 1)

**Table 2:** Factors affecting the Continuation of Breastfeeding and Complementary Feeding practices

Still breastfeeding	Yes n=42	No n=58	z <sup>2</sup>	p-value	Complementary feeding	Less than 7 months n= 11	7 months n=57	More than 7 months n=27	z <sup>2</sup>	p-value	
<b>Education</b>			3.835	0.147	<b>Education</b>				4.787	0.310	
0-5 Std	24.2	41.2			0-5 Std	9.1	31.6	40.7 (11)			
% (n)	(16)	(14)			% (n)	(1)	(18)				
6-10 Std	47	29.4			6-10 Std	63.6	36.8	37			
% (n)	(31)	(10)	% (n)	(7)	(21)	(10)					
11-17 Std	28.8	29.4			11-17 Std	27.3	31.6	22.3			
% (n)	(19)	(10)			% (n)	(3)	(18)	(6)			
<b>Sanitation system</b>			4.579	0.032*	<b>Mode of delivery</b>				1.191	0.551	
Inside	45.5	23.5			Normal delivery	54.5	54.4	66.7 (18)			
% (n)	(30)	(8)			% (n)	(6)	(31)				
Outside	54.5	76.5	C- section delivery	45.5	45.6	33.3					
% (n)	(36)	(26)	% (n)	(5)	(26)	(9)					
<b>Interval between pregnancies</b>			8.310	0.040*	<b>Exclusive breastfeeding for 6 months</b>				13.330	0.001*	
1	22.2	22.7			Yes	0	56.1	33.3			
% (n)	(10)	(5)			% (n)	(0)	(32)	(9)			
2	35.6	40.9			No	100 (11)	43.9	66.7 (18)			
% (n)	(16)	(9)	% (n)		(25)						
3	31.1	4.5	<b>Education about breastfeeding</b>								
% (n)	(14)	(1)	Yes	100 (11)	86	85.2 (23)	1.809	0.405			
4	11.1	31.8	% (n)		(49)						
% (n)	(5)	(7)									

Education about breastfeeding					No % (n)	0 (0)	14 (8)	14.8 (4)		
Yes % (n)	89.4 (59)	82.4 (28)	0.964	0.321	Difficulties during lactation				9.391	0.009*
No % (n)	10.6 (7)	17.6 (6)			Yes % (n)	54.5 (6)	14 (8)	29.6 (8)		
Mode of delivery					No % (n)	45.5 (5)	86 (49)	70.4 (19)		
Normal delivery % (n)	57.6 (38)	61.6 (21)	0.163	0.687	Do you feel your child is getting enough milk				9.607	0.008*
C- section delivery % (n)	42.4 (28)	38.2 (13)			Yes % (n)	54.5 (6)	86 (49)	59.3 (16)		
					No % (n)	45.5 (5)	14 (8)	40.7 (11)		

\*p≤0.05

66% of the mothers were breastfeeding their child at the time of the interview. Sanitation system (p=0.032) and the interval between pregnancies of the mothers (p=0.040) were significantly associated with the duration of breastfeeding. A higher proportion of mothers who did not continue breastfeeding until 2 years were those who had their sanitation system outside their houses (76.5%, n=26) and those who had a space of 2 years between their pregnancies (40.9%, n=9)  
95% of the mothers have started giving complimentary feeds, out of which 60% of them have started by the 7 months as recommended by the World Health Organization (WHO). Exclusive breastfeeding until 6 months (p=0.001) and

difficulties faced during lactation (p=0.009) have a statistically significant association with the complementary feeding practices. Also, the mother's perception of the baby getting enough milk (p =0.008) was seen to have a statistically significant association with the complementary feeding practices. 56.1% of the mothers who exclusively breastfed the child for 6 months and 86% of those who did not face any difficulty during lactation had initiated complementary feeding at 7 months of age. 86% of the mothers who thought that their breast milk was sufficient for their child had started complementary feed at 7<sup>th</sup> month. (Table 2)

**Table 3:** Nutritional status of the mothers when compared with the number of pregnancies

Nurient intake	Total	Number of pregnancies			f value	p value
		1	2	More than 2		
Energy (kcal)	1441.37 ± 413.872	1301.32 ± 379.803	1396.59 ± 355.898	1575.23 ± 447.397	4.128	.019*
Protein (gms)	37.67 ± 13.756	33.25 ± 11.884	35.09 ± 9.603	42.83 ± 16.204	5.226	.007*
Carbohydrate (gms)	170.85 ± 48.148	156.71 ± 38.701	167.22 ± 43.062	183.65 ± 55.241	2.810	.065
Fats (gms)	63.73 ±	73.04 ± 76.313	61.13 ± 18.881	69.30 ± 21.42	0.595	.554
Calcium (mg)	351.97 ± 175.045	317.57 ± 173.187	314.53 ± 121.066	406.00 ± 200.926	3.327	.040*
Phosphorus (mg)	728.98 ± 297.091	631.96 ± 204.278	693.13 ± 220.418	825.58 ± 373.045	4.079	.020*
Iron (mg)	8.35 ± 3.839	7.61 ± 3.685	7.47 ± 2.590	9.58 ± 4.483	3.582	.032*
Vit b12 (mcg)	0.60 ± 1.054	.61 ± 1.066	.56 ± 0.75	.63 ± 1.254	0.32	.969
Total fiber (gm)	18.98 ± 9.083	16.43 ± 7.946	18.41 ± 2.879	21.23 ± 9.641	2.461	.091*
Soluble fiber (gm)	3.49 ± 1.592	3.00 ± 1.24	3.53 ± 1.759	3.80 ± 1.620	2.143	.123
Insoluble fiber (gm)	14.79 ± 8.418	12.36 ± 6.578	15.06 ± 10.292	16.28 ± 7.689	1.839	.164
Zinc (mg)	5.05 ± 1.997	4.36 ± 1.615	4.94 ± 1.831	5.63 ± 2.227	3.571	.032*
Folate (mcg)	231.86 ± 773.303	164.64 ± 179.620	358.31 ± 1354.361	177.75 ± 135.141	0.627	.536
Vitamin c (mg)	44.93 ± 30.516	41.32 ± 31.925	38.72 ± 16.946	52.43 ± 36.487	2.112	.127
Vitamin a (mg)	824.11 ± 1974.911	425.21 ± 1200.935	580.31 ± 1383.248	1298.38 ± 2643.412	2.008	.140
B1(mcg)	0.75 ± 0.479	.64 ± 0.488	.69 ± 0.471	.88 ± 0.463	2.397	.096

\*p≤0.05

The average caloric intake by the mothers was 1441 kcal which is lower than the RDA for a lactating woman i.e. 2420kcal. The average protein consumption among mothers was 37.67 gms which was also very less than the RDA of 68gms. 29 mothers out of 100 had a caloric consumption of less than 50% of RDA, while the majority of the mothers (n =71) mothers had consumed more than 50% of RDA and 2 mothers more than 100% of RDA. The protein consumption in 43 mothers was seen to be less than 50% of the RDA, while 57 mothers consumed more than 50% and 2 more than 100%. It has been observed that the mean consumption of calcium in the mother's diet was 352 mg which is 848mg less than the RDA and the level of iron in the diet was also far much less than the RDA i.e. 8.35mg. Intake of water-soluble vitamins, Folate, Vitamin C and Vitamin B1 and fat-soluble Vitamin A,

was also less than the RDA. Majority of the mothers (n=60) had a calcium consumption of less than 30% of the RDA, while 39 mothers consumed more than 50% of RDA and 1 consumed more than 100% of RDA. Majority of the mothers (n=86) had an iron consumption of less than 50% of RDA, While 12 mothers consumed more than 50% and 2 consumed more than 100%.

The level of energy and the amount of some macronutrients and micronutrients in the mother's diet is positively associated with the number of pregnancies. The mothers who have conceived for more than 2 times had a higher consumption of calories (p =0.019), proteins (p= 0.007), calcium (p=0.40), phosphorus (p=0.020), iron (p = 0.020) and zinc (p=0.032) in their diet. (Table 3)

## Discussion

The present study has analyzed the findings in support of national and international guidelines regarding initiation, exclusivity and continuation of breastfeeding and also the initiation of complementary feeding.

The findings of this study provide evidence that the rate of the initiation of breastfeeding within 24 hours was 65%, other studies done on breastfeeding practices have also shown similar results, where one study revealed that the rate of initiation of breastfeeding among mothers was only 60.6% [8]. Initiation of breastfeeding was significantly associated with the mode of delivery ( $p=0.026$ ), where 33% of the mothers who delivered via C-section initiated breastfeeding at 24 hours. Also, mothers giving birth to preterm babies ( $p=0.003$ ) and NICU admission of the baby ( $p=0.000$ ) has a significant association with initiating breastfeeding within 24 hours. 9.4% of the mothers who delivered a preterm baby and 15.6% whose babies were admitted to NICU initiated breastfeeding within 24 hours. Similarly, separation of mother and baby after delivery was significantly associated with increased time of initiation of breastfeeding in one study [9]. Out of the mothers who have not initiated breastfeeding within 24 hours, the majority of them have started it by the 2<sup>nd</sup> and 3<sup>rd</sup> day and the most common difficulty faced by the mothers was no rooming in after delivery. The findings are consistent with other studies which draw special attention to delay in rooming in and exhaustion after delivery as the major deterrent to early initiation of breastfeeding [10].

On the other hand, the rate of exclusive breastfeeding till 6 months was only 35% among mothers and it has decreased with increasing lactation difficulties at the time of birth ( $p=0.000$ ), complication during delivery ( $p=0.023$ ) and NICU admission of the baby ( $p=0.000$ ). Exclusive breastfeeding until 6 months was not seen to be associated with mode of delivery; in contrast, mode of delivery in some studies was associated with exclusive breastfeeding, where mothers undergoing c section delivery were more likely to breastfeed exclusively for about 2 months only.[11] Majority of the mothers who have not exclusively breastfed their infants have given hospital feeds followed by water. Mothers believed that giving water was essential due to the fear of their child being thirsty.

Concerning the continuation of breastfeeding, 66% of the mothers were breastfeeding their child at the time of the interview. The findings have revealed that mother's sanitation system ( $p=0.032$ ) and interval between pregnancies ( $p=0.040$ ) had significantly influenced the breastfeeding duration, where 76.5%, the mothers who had their sanitation system outside their did not continue breastfeeding for 2 years this may be due to the use of public toilets and long queues for it that makes it difficult for the mother to breastfeed her child every time. However, previous studies done on breastfeeding practices have given a negative association of mother's educational level, and mothers who were housewives [12]. On the other hand, 40.9%, mothers who had spacing between pregnancies for about 2 years did not breastfeed their child for 2 years. But according to the studies done in past, mode of delivery was also shown to have an effect on the duration of breastfeeding, where mothers who delivered via normal delivery were breastfeeding for a higher duration [13].

Regarding complementary feeding, 60% of the mothers have started it by 7<sup>th</sup> month after being advised by a healthcare worker before or during the time of delivery. These findings arises a need to appreciate the awareness among healthcare

workers and good response of mothers to the professional's advice, which can be increased even more by providing correct breastfeeding education at every healthcare institute to every mother during her pregnancy. Mothers who have exclusively breastfed the infant for complete 6 months ( $p=0.001$ ), were those who have not faced any difficulty during lactation ( $p=0.009$ ) and those who believed that their breast milk was sufficient for the infant ( $p=0.008$ ). Mothers who had right exclusive breastfeeding practices were seen to be having the right complementary food initiation time and this can be because of increasing awareness and knowledge among mothers. Difficulties faced during lactation by the mothers at birth can be a source of demotivation to exclusively breastfeed their infant for a complete 6 months and to start complementary feeding at 7<sup>th</sup> month.

Majority of the mothers had consumed more than 50% of the RDA with an average mean of 1441kcal. The intake of protein in the mother's diet was seen to be very poor than the RDA of 68gms which was 38 gms only. 43% of the mothers had consumed protein of less than 50% of the RDA. The consumption of micronutrients like calcium and iron were also seen to be very less than the RDA.

## Conclusion

The support and seriousness of the hospital for promoting good breastfeeding practices is critical in early initiation and exclusivity of breastfeeding. With the rising C-section deliveries, NICU admissions and preterm babies, the rate of breastfeeding is decreasing and this can be a wake-up call for the hospitals to provide better rooming in facilities and more practical support after delivery. The need for a good amount of calories and good quality nutrients increases in the mothers due to loss of blood during delivery and loss of nutrients during lactation. So there is a need for good educational sessions that focuses on the importance of nutrition to the mothers as well as the families because the family also plays a very essential role in ensuring mothers health status.

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