A cross-sectional study to investigate factors related to the time of initiation of breastfeeding in Jamnagar district of Gujarat, India

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ABSTRACT

Background: Early initiation of breastfeeding (EIBF) and exclusive breastfeeding for the first 6 months of life prevents around 20% newborn deaths and 13% under-five deaths. EIBF is predominately associated with socioeconomic, health related, and individual factors. Very few studies in Gujarat and probably none in Jamnagar district have been conducted to know factors related to the timing of initiation of breastfeeding. **Objectives:** This study was carried out with the objective to find out the prevalence of EIBF and association of demographic, antenatal, and intranatal factors with prelacteal feeding practice in Jamnagar district of Gujarat. **Materials and Methods:** This study was carried out in 2015–2016 in four talukas of Jamnagar district with a sample size of 426 mother-infant pairs calculated with appropriate formula using prevalence of EIBF. Out of this, 400 samples with adequate response were analyzed. Multistage sampling was done and mothers who gave valid consent were taken as respondent. Chi-square, Fisher exact, and Pearson corelation tests were used for statistical analysis. **Results:** The prevalence of EIBF was 62% in Jamnagar district. About 94.8% newborn of 15–19 years aged mothers, 96.4% newborns of mothers of Class-V socio-economic class, 87.5% newborns of illiterate mothers, 96.5% newborns of farmer mothers, and 77.4% of 1st birth order newborns received breastfeeding within 1 h of their birth. The proportion of newborn receiving breastfeeding within 1–4 h after birth increased significantly with increasing number of antenatal care (ANC) visits ($P < 0.01$). Among mothers with prolonged labor, 43.5% could initiate breastfeeding early. Mode of delivery and health facility for delivery were a significant determinant for the time of initiation of breastfeeding. **Conclusion:** EIBF decreased with increasing age of mothers, increasing socio-economic class and increasing the education level of mothers. The practice of EIBF is also low among employed mothers, among newborn with high birth order and among mothers of general caste. EIBF is high in mothers with fewer ANC visits, among mothers with prolonged labor, in case of normal delivery, delivery at primary health care, and delivery assisted by female health staff.

KEY WORDS: Early Initiation; Breastfeeding; Socio-demographic Factors; Antenatal Care

INTRODUCTION

Every infant and child has the right to good nutrition according to the "Convention on the Rights of the Child."

Undernutrition is associated with 45% of child deaths.[1] Globally in 2016, 155 million children under 5 years of age were estimated to be stunted, 52 million were estimated to be wasted, and 41 million were overweight or obese.[1]

Infant feeding practices are one of the determinants for the nutritional status of a child.[2] Recent scientific evidence reveals that malnutrition has been responsible directly or indirectly for 60% of all deaths among under-five age children annually. Inappropriate feeding practices results in over two-third of under-five deaths. Poor feeding practice in infancy and childhood, resulting in malnutrition contribute

to impaired cognitive and poor social development, poor school performance, and reduced productivity in later life. WHO and United Nations Children's Fund (UNICEF) recommend early initiation of breastfeeding (EIBF) within 1 h of birth,[3] exclusive breastfeeding for the first 6 months of life; and introduction of nutritionally-adequate and safe complementary foods at 6 months together with continued breastfeeding up to 2 years of age or beyond.[1] EIBF and exclusive breastfeeding for the first 6 months of life prevent around 20% newborn deaths and 13% under-five deaths.[4] It can also reduce mortality due to neonatal infections (sepsis, pneumonia, tetanus, and diarrhea),[5] which contribute to 36% in neonatal deaths from all causes.[6] The first breast milk is known as colostrums, which is highly nutritious and contains antibodies that protect the newborn from diseases.[3] Many newborns are given prelacteal feeding before starting breastfeeding. It consists of honey, jaggery, sugar water, etc. This may be specific to a family, caste, or religion.[7] The harmful effects of prelacteal feeding include a delay in the initiation of breastfeeding and prevention of the initial bonding between the mother and the baby.[8] With discarding colostrum and delaying breastfeeding, a marked increase in neonatal mortality has been reported from different parts of the world.[9] The deleterious effects of infections causing infant deaths can be prevented by EIBF and exclusive breastfeeding, which is the easiest, cost-effective, and life-saving intervention for the health of a newborn.[10]

Worldwide countries are scaling up efforts to increase rates of optimal breastfeeding practices to decrease child mortality. Breastfeeding is linked to many objectives of the 2030 agenda for Sustainable Development Goals. World Breastfeeding Week is celebrated every year for raising awareness regarding the fact that breastfeeding is a key to sustainable development. India has made great strides in improving child nutrition over the past decade. The government of India has promoted child health programs and is advocating healthy infant child feeding practices. One such program is the implementation of the "National Infant and Young Child Feeding" Guideline, which discourages prelacteal feeding practices and encourages optimal breastfeeding practices. The concept of baby friendly hospital initiative (BFHI) was launched globally in 1991 by UNICEF and the WHO for promoting and supporting breastfeeding. Including India, many hospitals from different countries have been designated to BFHI. In the year of 2016, the Government of India launched the National Breastfeeding Promotion Programme mothers' absolute affection to ensure adequate awareness is generated among the masses, especially mothers, on the benefits of breastfeeding. The programe will be implemented at three levels: Macrolevel through mass media; meso level in health facilities, and microlevel at communities.[11]

Prior studies have shown that EIBF is associated with a lower risk of neonatal mortality.[12–14] It is found globally that only half of newborn babies are breastfed during their 1st h of birth,

despite strong evidence of nutritional and immunological benefits of early initiation in reducing neonatal mortality and morbidity.[14–16] The first milk (colostrum) contains bioactive immune factors which protect a neonate against a variety of infections and allergic diseases.[17] A recent systematic review of literature based on 25 studies from seven countries in South Asia revealed that EIBF is predominately associated with socioeconomic, health related, and individual factors.[18]

Very few studies in Gujarat and probably none in Jamnagar district have been conducted to know factors related to the timing of initiation of breastfeeding.[19,20] Hence, we have carried out this study with the objective to know the role of women's demographic factors; antenatal care (ANC) and delivery care with the timing of initiation of breastfeeding to their newborn.

MATERIALS AND METHODS

Study Area

This community-based cross-sectional retrospective study was carried out during the period of September 2015–August 2016 in Jamnagar district of Gujarat. Jamnagar district is situated in the coastal area of Saurashtra region of Gujarat and spread over the area of 14,184 sq. kms, with a population of 21, 60,119 (Census 2011).

Study Participants

Mothers-infant pairs who were delivered during the past 6 months before the period of data collection were the respondents.

Sample Size

1. Sample size was calculated using 49.9% as prevalence of EIBF in Gujarat according to the National Family Health Survey (NFHS-4).[21]
2. Considering 5% allowable error, sample size turned out to be 384 (N1) using formula

   $$\text{sample size (N1)} = (z_{1-\alpha/2})^2 \, p \, (1\text{-}p)/d^2.$$
3. Considering 10% non-response rate, the sample size was refined to 426 (N2) using formula

   $$\text{sample size N2=N1/1-Non response rate}$$

We have considered the response of 400 mothers into the analysis of our study.

Study Design

Sampling was done by multistage sampling [Figure 1] in the study district. Four talukas were selected by random sampling, and from each taluka, two primary health care (PHC) were selected by random sampling. Hence, a total of 8 PHC were taken. From each PHC area, 55 mother-infant
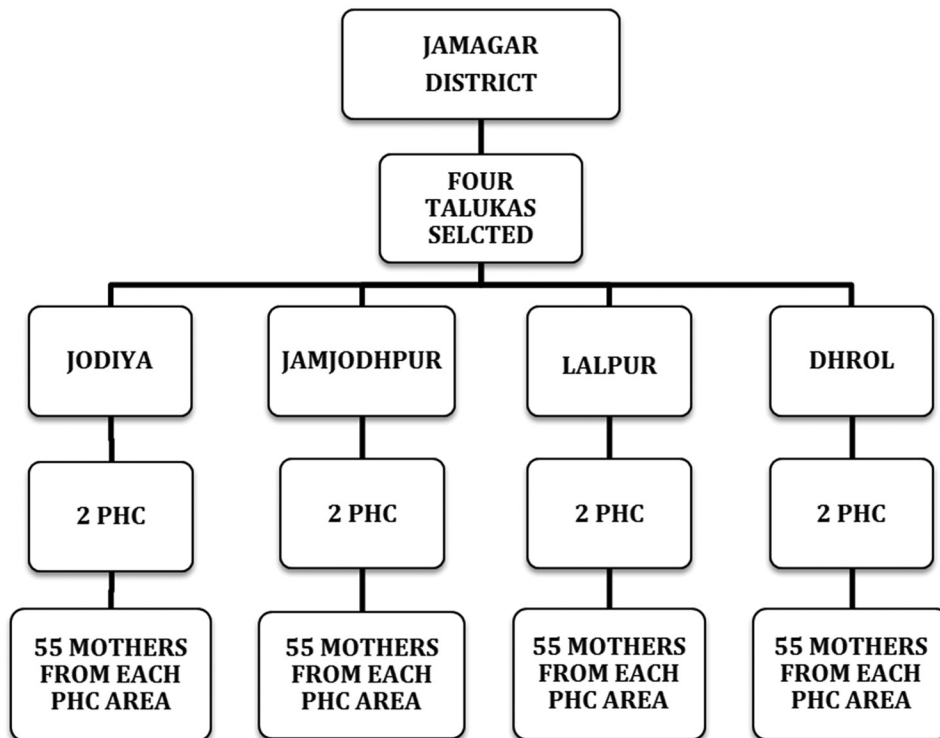
Figure 1: Study design-multistage sampling

pairs were included in the study (including nonresponse). List of mothers who delivered during the past 6 months were obtained from e-mamta. Mothers were selected by systematic random sampling.

Data Collection

Household visits of mothers were carried out with prior telephonic intimation. In case of locked house or nonresponse, we excluded that mother from the study. After taking the informed consent, detailed interview of mother was conducted, and answers were recorded in the pre-designed pre-validated structured questioner. Feeding practice of the latest born child was asked.

Ethical Consideration

Prior ethical approval of the Institutional Ethical Committee was obtained for the study.

Study Tool

Study tool consisted of structured questioner with two parts. First part recorded the socio-demographic information including age of mother; education of mother, occupation of mother, type of family, family size, caste, family income, questions for socio-economic class, etc. The second part of the questionnaire was consisting of the timing of initiation of breastfeeding and about ANC. The timing of initiation of breastfeeding was defined as when after birth, the mother initiated breastfeeding. We used the term EIBF to indicate initiation within 1 h of delivery

according to the WHO recommendation and late initiation to indicate after 1 h of birth.[22]

Inclusion Criteria

The following criteria were included in the study:
- The mothers who delivered during the past 6 months at the time of interview
- The mother whose child was currently alive
- The mothers who gave valid consent.

Exclusion Criteria

- Mothers who did not gave valid consent were excluded from the study.

Statistical Methods

Data were analyzed using Microsoft Excel and Epiinfo. Chi-square tests (χ^2) and Fisher exact tests were performed to evaluate the association of the independent variables with the EIBF. Pearson corelation test was used to examine linear corelation for quantitative variables.

RESULTS

The mean age of mothers is 25.59 years and standard deviation is 5.41 years. Distribution of newborns according to time of initiation of breastfeeding after birth shows that 62% newborn received breastfeeding within 1 h of birth, i.e., EIBF. The

proportion of newborns who received breastfeeding between 1 and 4 h after birth and more than 4 h after birth was 20.3% and 17.7%, respectively [Figure 2].

Analysis of relation of demographic characteristics of mother with time of initiation of breastfeeding after birth shows that highest 94.8% mothers in age group of 15–19 years initiated breastfeeding within 1 h of birth as compared to lowest 15.8% mothers in age group of 35–39 years which is also statistically significant ($P < 0.01$). Caste wise analysis shows that 92.3% mothers of SC caste and 74.6% of OBC community had started breastfeeding within 1 h of delivery as compared to general caste in which 42% mothers had initiated breastfeeding early ($P < 0.01$). A statistically significant difference in EIBF was observed across different socio-economic classes ($P < 0.05$). EIBF was highest (96.4%) among mothers of Class-V family followed by Class-II with 71.1%. Religion-wise 65.4% of Hindu mothers initiated breastfeeding within 1 h of delivery as compared to 41.1% among other religion ($P < 0.01$). Education of mother wise analysis shows that EIBF was highest (87.5%) among illiterate while no one from graduate mothers could initiate it early ($P < 0.01$). Occupation wise only 29.9% of employed mothers could initiate early breastfeeding. Interestingly 96.5% of farmers and 75.3% housewife initiated breastfeeding within 1 h of birth ($P < 0.01$). Statistically significant decrease in the prevalence of EIBF practice was observed with increased parity ($P < 0.01$). The highest prevalence of EIBF was found among those mothers having one child and lowest in mothers with previous four children[Table 1].

It is evident from Table 2 that 77.8% of mothers who were neither registered during the antenatal period and nor received ANC had initiated breastfeeding within 1 h of birth. However, 20.9% of those mothers who were registered and received ANC initiated breastfeeding within 1–4 h duration after delivery as compared to only 5.6% of mothers who were not registered and not received ANC. The difference in a time of initiation of breastfeeding among ANC received mothers, and those not received ANC is not significant statistically ($P = 0.84$). Interestingly 94.1% of mothers who received only one ANC initiated breastfeeding within 1 h as compared to lowest 47.5% mothers who received ANC 5 times ($P < 0.01$). However, increasing number of ANC led to increasing percentage of newborn who received breastfeeding within one to four of birth (Pearson coefficient=0.96, $R^2 = 0.925$, $P < 0.01$) [Figure 3]. Analysis of source of ANC shows 80% mothers who received ANC from Community Health Centre (CHC)/district hospital/trust hospital initiated within 1 h of delivery as compared to 61% of those mothers who received ANC from PHC/Urban Health Centre as well as from Mamta session in subcenter and Anganwadi. Analysis of the impact of complication on time of initiation of breastfeeding shows that 43.5% of mothers who had prolonged labor could practice EIBF. There is statistically significant ($P < 0.01$) difference
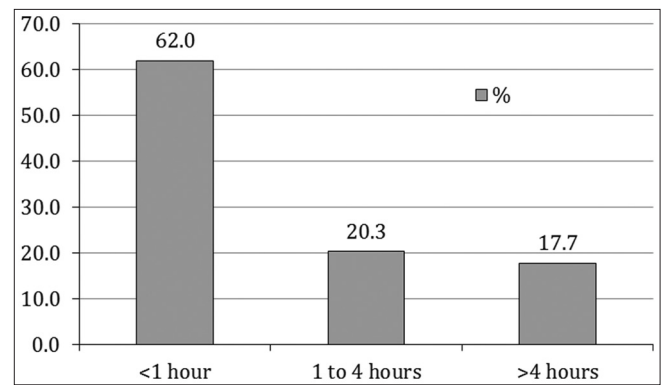

Figure 2: Distribution of newborns according to the interval between delivery and initiation of breastfeeding ($n = 400$)
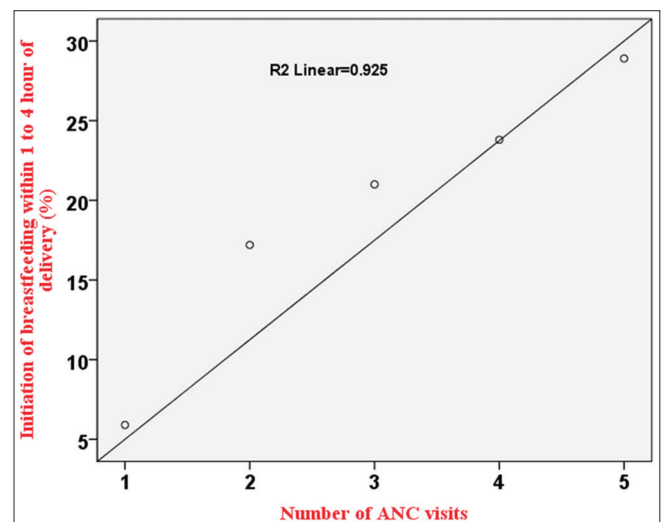

Figure 3: Corelation between the number of ANC visits and initiation of breastfeeding within 1–4 h after delivery ($n = 382$)

in time of initiation breastfeeding among mother without complications and those with other complications such as bleeding and hypertension. It is observed that 75.2% of those mothers who had normal delivery initiated breastfeeding within 1 h as compared to 11% of those mothers who had delivery by cesarean section ($P < 0.01$). There is no statistically significant difference in the time of initiation of breastfeeding between institutional and home delivery ($P = 1$). However, within institutional deliveries, the difference is statistically significant ($P < 0.01$). Among mothers, who delivered baby at PHC; 98.4% of them initiated breast feeding early while 42.5% of mothers who delivered at private hospital initiated early breast feeding. The assistance of delivery by Auxiliary Nurse-Midwife (ANM) or staff nurse led to EIBF among 76.8% newborns.

DISCUSSION

The prevalence of EIBF was 62% in Jamnagar district of Gujarat. About 94.8% newborn of 15–19 years aged mothers, 92.3% newborns of scheduled caste (SC), 96.4% newborns of mothers of Class-V socio-economic class, 65.4% of Hindu

Table 1: Relation of initiation of breastfeeding with demographic details of pregnant women (*n*=400)

Demographic characteristics	Breastfeeding initiated (h)			Total No. (%)	Statistical results
	<1 No. (%)	1–4 No. (%)	>4 No. (%)		
Age group					
15–19	55 (94.8)	0 (0)	3 (5.2)	58	χ^2=279.26, df =8, *P*<0.01
20–24	80 (64)	45 (36)	0 (0)	125	
25–29	90 (74.4)	31 (25.6)	0 (0)	121	
30–34	20 (26)	5 (6.5)	52 (67.5)	77	
35–39	3 (15.8)	0 (0)	16 (84.2)	19	
Caste					
General	71 (42)	28 (16.6)	70 (41.4)	169	χ^2=135.42, df=6, *P*<0.01
OBC	100 (74.6)	33 (24.6)	1 (0.7)	134	
SC	60 (92.3)	5 (7.7)	0 (0)	65	
ST	17 (53.1)	15 (46.9)	0 (0)	32	
Socio-economic class					
Class-I	13 (21.3)	1 (1.6)	47 (77)	61	χ^2=209.9, *P*<0.01, df=8
Class-II	81 (71.1)	21 (18.4)	12 (10.5)	114	
Class-III	55 (53.9)	36 (35.3)	11 (10.8)	102	
Class-IV	46 (67.6)	21 (30.9)	1 (1.5)	68	
Class-V	53 (96.4)	2 (3.6)	0 (0)	55	
Religion					
Hindu	225 (65.4)	62 (18)	57 (16.6)	344	χ^2=10.59, df=2, *P*<0.01
Others	23 (45.1)	19 (37.3)	9 (17.6)	51	
Education of mother up to					
Graduate	0 (0)	0 (0)	35 (100)	35	χ^2=312.4, *P*<0.01, df=10
Higher secondary	14 (26.9)	5 (9.6)	33 (63.5)	52	
Secondary	80 (68.4)	37 (31.6)	0 (0)	117	
Primary	56 (82.4)	9 (13.2)	3 (4.4)	68	
Just illiterate	56 (70)	24 (30)	0 (0)	80	
Illiterate	42 (87.5)	6 (12.5)	0 (0)	48	
Occupation					
Employed	26 (29.9)	5 (5.7)	56 (64.4)	87	χ^2=227.86 , *P*<0.01, df=8
Farmer	55 (96.5)	0 (0)	2 (3.5)	57	
Housewife	128 (75.3)	39 (22.9)	3 (1.8)	170	
Labourer	28 (57.1)	21 (42.9)	0 (0)	49	
Student	11 (29.7)	16 (43.2)	10 (27)	37	
Birth order					
1st	89 (77.4)	23 (20)	3 (2.6)	115	χ^2=254.32, df=8, *P*<0.01
2nd	118 (74.2)	41 (25.8)	0 (0)	159	
3rd	39 (48.8)	17 (21.3)	24 (30)	80	
4th	2 (6.5)	0 (0)	29 (93.5)	31	
5th	0 (0)	0 (0)	15 (100)	15	

OBC: Other backward class, SC: Scheduled caste, ST: Scheduled tribes

religion newborns, 87.5% newborns of illiterate mothers, 96.5% newborns of farmer mothers, and 77.4% of 1st birth order newborns received breastfeeding within 1 h of their birth. There is no statistically significant difference in timing of initiation of breastfeeding among mothers who received antenatal and who did not receive it. However, with the increasing number of ANC visits, the proportion of newborn receiving breastfeeding within 1–4 h after birth increased significantly (*P* < 0.01). Among mothers with prolonged labor, 43.5% could initiate breastfeeding early. Mode of delivery and health facility for delivery were a significant determinant for the time of initiation of breastfeeding.

Table 2: Relation of initiation of breastfeeding with ANC and obstetric care of pregnant women (*n*=400)

ANC/Obstetric care	Breastfeeding initiation (h)			Total	Statistical results
	<1	1–4	>4		
ANC registered					
Yes	234 (61.3)	80 (20.9)	68 (17.8)	382	Yates' corrected, χ²=0.03, df=1,
No	14 (77.8)	1 (5.6)	3 (16.7)	18	*P*=0.84 (between <4 h and >4 h
ANC received					
Yes	234 (61.3)	80 (20.9)	68 (17.8)	382	Yates' corrected, χ²=0.03, df=1,
No	14 (77.8)	1 (5.6)	3 (16.7)	18	*P*=0.84 (between <4 h and >4 h
Number of times ANC received					
0	14 (77.8)	1 (5.6)	3 (16.7)	18	χ²=32.48, *P*<0.01, df=10
1	32 (94.1)	2 (5.9)	0 (0)	34	
2	24 (82.8)	5 (17.2)	0 (0)	29	
3	100 (56.8)	37 (21)	39 (22.2)	176	Pearson coefficient=0.96,
4	60 (57.1)	25 (23.8)	20 (19)	105	R²=0.925, *P*<0.01
5	18 (47.4)	11 (28.9)	9 (23.7)	38	
Source of ANC (*n*=382)					
PHC/UHC	128 (61)	43 (20.5)	39 (18.6)	210	Not applicable
Sub center/Anganwadi	98 (60.5)	35 (21.6)	29 (17.9)	162	
CHC/District hospital/Trust hospital	8 (80)	2 (20)	0 (0)	10	
Pregnancy-related complications					
No complication	164 (60.3)	40 (14.7)	68 (25)	272	χ²=67.89, *P*<0.01, df=8
Bleeding	26 (70.3)	11 (29.7)	0 (0)	37	
Convulsion	13 (65)	7 (35)	0 (0)	20	
Hypertension	25 (100)	0 (0)	0 (0)	25	
Prolonged labor	20 (43.5)	23 (50)	3 (6.5)	46	
Type of delivery					
Normal	239 (75.2)	76 (23.9)	3 (0.9)	318	χ²=300.36, *P*<0.01, df=2
Cesarean section	9 (11)	5 (6.1)	68 (82.9)	82	
Place of deliver					
Institutional	237 (61.7)	79 (20.6)	68 (17.7)	384	Fisher exact test *P*=1,
Home	11 (68.8)	2 (12.5)	3 (18.8)	16	(between <4 h and >4 h
Health facility utilized for delivery (*n*=384)					
CHC	36 (60)	24 (40)	0 (0)	60	χ²=91.09, *P*<0.01, df=8
District hospital	52 (57.1)	26 (28.6)	13 (14.3)	91	
NGO/Trust hospital	52 (61.2)	8 (9.4)	25 (29.4)	85	
PHC	60 (98.4)	1 (1.6)	0 (0)	61	
Private hospital	37 (42.5)	20 (23)	30 (34.5)	87	
Who assisted delivery					
ANM/Staff nurse	76 (76.8)	23 (23.2)	0 (0)	99	Not applicable
Dai (TBA)	3 (50)	1 (16.7)	2 (33.3)	6	
Doctor	161 (56.5)	56 (19.6)	68 (23.9)	285	
Untrained dai	8 (80)	1 (10)	1 (10)	10	

UHC: Urban health center, PHC: Primary health care, ANC: Auxiliary Nurse-Midwife

NFHS-4 conducted in 2015–2016 has shown the total prevalence of EIBF as 49.9% in Gujarat[21] and 52.1% in a rural area of Jamnagar district.[21] Gandhi *et al*. in their study conducted in Navsari district of Gujarat in 2012–13 found that 56.4% of mothers initiated breastfeeding within 1 h.[20] Our study found a slightly higher prevalence (62%) than NFHS-4 and study by Gandhi *et al*. but lower than Garje *et al*.[23] who found 70.1% prevalence in their study conducted among rural mothers in with sample size similar to our study, i.e., 400. The prevalence of EIBF was reported to be 43.5% in Kerala in 2018[24] and 73.4% in Uttar Pradesh in 2016.[25] All these findings suggest that there exists interstate variability in the

prevalence of EIBF within India. Local demographic factors of different states including customs, culture, and education level affect the time of initiation of breastfeeding.

Early initiation of exclusive breastfeeding serves as the starting point for a continuum of care for mother and newborn that can have long-lasting effects on health and development.[26] We found a significantly higher prevalence (94.8%) of EIBF practice in mothers with 15–19 years age group than any other age groups ($P < 0.01$). Similarly Islam *et al.* in their nationwide study conducted in 2014 in Bangladesh also found that the rate of EIBF was significantly ($P < 0.05$) higher (52.5%) among those who were married before 18 years as compared to those mothers who were married after 18 years of age (48.5%).[27] They also found that there was a significantly ($P < 0.05$) higher rate of EIBF in newborns of mothers with <20 years of age (53.0%) when compared to those who were older than 20 years (46.9%) when they delivered their first child.[27] Garje *et al.* in Kerala found that 74.3% mothers in the age group of 21–25 years initiated breastfeeding within 30 min as compared to only 6.6% of those mothers having more than 26 years of age.[23] Younger mothers are more receptive to the advice given by health worker as well as they have less psychological stress, which may lead to EIBF. Physiologically, breast milk secretion decreases with increasing age. Dewey *et al.* reported that lactational capacity is greatest before age 20, and declines thereafter.[28] They further stated that "older" primiparae (24 years or older) produced less milk in the 1st week postpartum than younger primiparae (16–23 years).[28] Garje *et al.* demonstrated that 53.6% of schedule caste mothers initiated breastfeeding within 30 min and 69.1% within 30 min to 1 h as compared to 4.9% and 3.1% of general caste, respectively.[23] Our findings are in line with these results, suggesting 92.3% SC mother practiced EIBF. Gandhi *et al.* also found similar results with 67.2% prevalence of EIBF among scheduled tribe mothers. Increasing prevalence of EIBF was observed as moving down from higher to lower socio-economic classes. Similarly, Islam *et al.* in Bangladesh observed that 54.9% of families with poor wealth index practiced EIBF as compared to 47% of those with rich wealth index.[27] Mothers of higher socio-economic class may be more stressful, which may lead to delay in the secretion of breast milk. Moreover, we found that higher education among mothers was not a favoring factor for EIBF. The proportion of EIBF practice was higher among illiterate and just illiterate mother as compared to those who were graduate or had studied up to higher secondary class ($P < 0.01$). Similarly, Islam *et al.* also reported that education had a negative influence on EIBF, implying that mothers with secondary education and higher education were less likely to practice EIBF than those who were uneducated ($P < 0.01$).[27] Garje *et al.* found that 44.8% and 41% mothers with primary and secondary education, respectively, initiated breastfeeding within 30 min of delivery as compared to 9.3% and 1.1% of those with who were illiterate and undergraduate, respectively.[23] Higher education women

are mostly employed and employment stress may delay secretion of breast milk secretion. Moreover, highly educated and employed women may be more conscious about the cosmetic outlook and may have myths that breastfeeding may disfigure them. Women with lower education, housewives, farmers, and laborers may be more receptive to feeding advice given by health-care provider. That is why 96.5% of farmer mothers, 75.3% of housewives practiced EIBF as compared to 29.9% of employed mothers. Similarly, Garje *et al.* reported that 59.6% of daily wedge women, 34.4% of farmers and 6% of business women initiated breastfeeding within 30 min of delivery.[23] Various other studies conducted in various parts of India support our findings of relations of socio-demographic factors with EIBF.[24,28-30] Higher proportion of EIBF was found among newborns with birth order 1st and 2nd as compared with those with birth order three or more ($P < 0.05$). In contrast to that Gandhi *et al.* in Navsari district of Gujarat found 48.5% of 1st birth order newborn and 65% of 2nd and 3rd birth order newborns were given early breastfeeding as compared to 83.5% of those with birth order four and above.[20] We presume that the age of mother would be also more for those newborn with high birth order in our study and increased age has a negative effect on EIBF in our study. High birth order also impairs the nutritional status of mother leading to decreased and delayed breast milk secretion.

ANC is not statistically significantly associated with EIBF. One of the reasons for this may be small sample size (i.e.,18) in the category of those mothers who did not receive ANC, and second, they may have received advice for EIBF from relatives, neighbors and even during delivery. ANC services basically focus on maternal health. However, a number of antenatal visits is strongly corelated with the initiation of breastfeeding within 1–4 h of delivery (Pearson coefficient=0.96, $R^2 = 0.925$, $P < 0.01$). Islam *et al.* also found that mothers who regularly attended the antenatal clinic (3 and more times) were 1.24 times more likely to practice EIBF compared to mothers who did not attend the ANC visits ($P < 0.05$). An increasing number of antenatal visits give more opportunity to health-care provider to counsel mother about newborn care in addition to maternal care. Naturally, intranatal complications such as prolonged labor delay initiation of breastfeeding to newborn as found in our study; however, antenatal complications such as bleeding, convulsion, and hypertension individually were not inhibiting factors for EIBF. Islam *et al.* found that 58.3% of those mothers with normal delivery practiced EIBF as compared to 30.1% of those delivered by cesarean section.[27] Our findings are also in line with this study. It may take time for recovery from anesthesia and trauma in case of cesarean delivery, which delays breastfeeding. Place of delivery although not significantly associated for EIBF; our finding of a higher proportion of EIBF (68.8%) in case of home delivery as compared to institutional delivery (61.7%) is supported by the study of Islam *et al.* who found 58.8% EIBF in home

delivery versus 40.6% in institutional delivery.[27] Mother may feel more privacy at home for feeding of newborn. Health facility where mother delivered was found to be associated with EIBF in our study; as high as 98% of those mothers who were delivered at PHC practiced EIBF (*P* < 0.01). Mothers who deliver in PHC have normal vaginal delivery while complicated cases are generally referred to CHC or higher level where due to cesarean section, breastfeeding may be delayed. Assistance of delivery by dai and ANM was a favoring factor for EIBF. Dais are also now aware of the benefits of EIBF and ANM being female gender can easily communicate with the mother for feeding advice.

Strength and Limitations of Study

The strength of this study is that it was a community based and we could include four out of total six talukas of the district which could make a better representation of the district. However, we did not examine factors related to the newborn in relation to the time of initiation of breastfeeding. We also did not include other aspects of feeding practice such as exclusive breastfeeding and duration of breastfeeding. These are limitations of the study and simultaneously scope for further study.

CONCLUSION

Pregnancy at optimum reproductive age, i.e., between 25 and 29 years can be a favoring factor for EIBF. Mothers with higher education, mothers in higher socio-economic class and employed mothers should also understand the importance of EIBF as its found low among them. Normal delivery, delivery at PHC, and delivery assisted by female assistant are positively related with EIBF. Along with maternal care advice of correct feeding practice during later ANC visits and after delivery can help in EIBF leading to decrease in malnutrition.

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