

Influencing factors on time of breastfeeding initiation among a national representative sample of women in India

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ABSTRACT

Breastfeeding is seen as vital for mother and child and therefore is of great public health concern. Early initiation of breastfeeding within one hour of delivery is important as it reduces neonatal mortality. Increasing our understanding of barriers and reasons for not commencing early breastfeeding is important to improve strategies and conditions to overcome such barriers. Hence, the present study aimed to investigate factors influencing time of breastfeeding among women in India, focusing on health care utilisation related issues and partner behaviour. Data from the Ministry of Health and Family Welfare of the Government of India's National Family Health Survey (NFHS) from 2005-2006 (NFHS-3) have been used in this study. Breastfeeding for the latest child was considered in the study. A total of 35,795 female respondents are included in this study. Chi square test and adjusted logistic regression analysis were used. Among all 35,795 women in the study, a total of 31.1% initiated breastfeeding within one hour and 68.6% initiated breastfeeding within the first week. Educational level, economic status and women's caste or tribe, place of delivery, prenatal visits to health care facilities and assistance during delivery as well as partner's controlling and violent behavior are important factors influencing time of initiation of breastfeeding. It is evident that policy makers need to ensure that all health professionals support and promote early breastfeeding initiation. It is also important to promote deliveries in hospitals and other healthcare facilities as they may increase early initiation. Fur-

thermore, it is fundamental that efforts are intensified for girls and women to obtain education to increase women's empowerment and improved gender equality.

Keywords: Breastfeeding; Socioeconomic; Partner Violence; India

1. INTRODUCTION

Breastfeeding has an important role in public health due to its numerous health benefits for children and mothers [1,2], for example, there is convincing evidence that breastfeeding has beneficial effects in the prevention of gastrointestinal infections, including diarrhoea [3-6], and otitis media [7,8]. Furthermore, studies have shown that it has proven beneficial for mothers in reducing risk of rheumatoid arthritis [9] as well as, to a certain extent, reducing risk of pre-menopausal breast cancer [10] and ovarian cancer [11-14].

It has been demonstrated that infants born in a particular ward where time of first suckling was earlier generated a higher incidence of breastfeeding [15]. Moreover, the first breast milk contains colostrum, which especially protects the infant against infections. A study carried out in Ghana demonstrated an increased risk of neonatal mortality if initiation of breastfeeding was delayed from 1 hour to day 7 [16]. The same study also showed that late initiation, defined as after day 1, was related with an increase of risk of neonatal death by 2.4 times [16]. Similar results were demonstrated in a study in Nepal, where a higher mortality was associated with later initiation of breastfeeding, defined as after 24 hours, compared to early initiation, defined as before 24 hours [17]. For this reason, WHO recommends breastfeeding to be initiated within 1 hour after giving birth [18]. Hence

promoting and providing possibilities to initiate early breastfeeding is vital to reduce the risk of ill health for the infant. In India, according to statistics from International Baby Food Action Network (IBFAN), 24.5% mother initiated breastfeeding within 1 hour [19]. It is worthwhile to mention here that the neonatal mortality rate in India is 43 per 1000 live births, in comparison with for example Australia, which has 1 per 1000 live births [18].

Utilisation of health care, and particularly maternal health care, is vital for the health of mothers and infants [20,21]. It is important for pregnant women to receive antenatal care; the WHO recommends at least four visits or assessments of antenatal care [18]. Furthermore, it is highly encouraged that delivery occurs in a suitable and hygienic environment under the supervision of health professionals. As such, to reduce health risk of mothers and infants it is important that they receive sufficient care before, during and after delivery, including neonatal care such as breastfeeding. Unfortunately, there is a lack of utilisation of health care facilities in India [22]. Reasons for this vary but too far a distance to a facility, long waiting time and poor quality of healthcare are some of the reasons that have been found to impact upon this [23]. As such, availability of health care services for women giving birth is limited, especially for women living in rural areas, and may impact on possibilities of early initiation of breastfeeding.

Partner behaviours, such as controlling behaviour or violent behaviour, have several negative effects on women's health behaviour such as contraceptive use, sanity, reproductive health issues and neonatal care [24,25]. Therefore, it may have a negative effect on breastfeeding initiation. There is a lack of studies focusing on controlling behaviour and the effect it may have on breastfeeding initiation. However, studies have shown that experience of abuse and violence affects breastfeeding [26-28]. For example, Lau and Chan [28] found that women who have not experienced violence from a partner during pregnancy were more likely to initiate breastfeeding compared to women who had experience of partner violence. Regrettably, prevalence of domestic violence or gender-based violence is quite high in India [29] and there is a fairly high social acceptance of gender-based violence [30]. It is therefore of importance to investigate what influence partner's behaviour may have on breastfeeding initiation. Several studies have tried to explore influencing factors for the initiation of breastfeeding in different country contexts. In India, there is no such study using national representative samples.

As early initiation of breastfeeding is vital for the health of the child understanding barriers and reasons for not commencing early breastfeeding are important to increase our knowledge of these barriers and hence im-

prove conditions and strategies to overcome these barriers. Early initiation of breastfeeding is also a contributing factor towards the achievement of the Millennium Development Goal of increased levels of child survival. WHO not only highlights the importance of increasing early initiation of breastfeeding but question why it has not received more attention [31]. Hence, the current study aims to examine factors influencing time of initiation of breastfeeding among women in India, using nationally representative samples. Health care utilisation related issues and partner behaviour were emphasized as predicting factors of breastfeeding initiation.

2. METHOD

Data from the Ministry of Health and Family Welfare of the Governments of India's National Family Health Survey (NFHS) from 2005-2006 (NFHS-3) has been used in this study. A total of 124,385 women between the age of 15 - 49 from all 29 member states of India participated in the NFHS. In the present study a total of 35,795 female respondents are included. This is based on the number of women who reported that they had breastfed at least one child and represent 29% of the overall participating women in the NFHS.

2.1. NFHS Questionnaire

The questionnaire being used in the NFHS is focused upon information on health and family welfare issues. Data was collected via three different questionnaires, one for the household, one for women and one for men. It is the questionnaire for women that form the basis for the current study. The questionnaire for women contained details on background and demographics, reproductive history, family planning methods, fertility preferences, antenatal and delivery care, child care and nutrition, child and adult mortality, information regarding STDs, AIDS, marriage, sexual behaviour, empowerment and social indicators, domestic violence, use of health care. In regards of the present study, attention has been given to the sections on antenatal and delivery care, child care and nutrition and domestic violence.

2.2. NFHS Data Collection and Sampling

The data for the NFHS-3 was collected between December 2005 and August 2006. Sampling for the NFHS-3 was based on the sampling design of probability proportional to size (PPS). The initial sample size was determined to comprise 1500 completed interviews in states with a population less than 5 million (based on the 2001 Census), 3000 completed interviews in states with 5 to 30 million and finally 4000 completed interviews in states with a population over 30 million. The only exception to this was in the largest state, Uttar Pradesh, where

a fixed number of 10,000 completed interviews was determined. All of the completed interviews were with ever-married women (*i.e.* married at any time in their lives) between the age 15 and 49. In the rural areas, a two stage sample design was conducted where the first stage consisted of selecting Primary Sampling Units (PSUs), villages, using PPS and the second stage consisted of systematic selection of households within each PSU. In the urban areas a three-stage sample design was used instead due to larger wards. The first step consisted of selecting Primary Sampling Units (PSUs), municipal wards, using PPS, the second step involved random selection of census enumeration blocks (CEB) and finally the third stage consisted of randomly selecting households within each CEB. For more information on the details of the sampling design used in the NFHS-3 can be found in the final report of the NFHS-3 [32]. The NFHS-3 fieldwork was conducted by 18 research organizations between December 2005 and August 2006.

2.3. Dependent Variables

Time of breastfeeding initiation was defined as when after birth the women commenced breastfeeding. Breastfeeding was initiated immediately (*i.e.* within one hour of the delivery) within 24 hours (*i.e.* after one hour to 24 hours) of the delivery or after 24 hours of the delivery. Breastfeeding for the latest child was included in the study.

2.4. Independent Variables

Demographic factors were defined as age, urban or rural residency, economic status, educational level, religion, caste or tribe. Age was categorized into seven groups (15 - 19, 20 - 24, 25 - 29, 30 - 34, 35 - 39, 40 - 44, 45 - 49); education was categorized into four groups (no education, primary, secondary, higher); religion was grouped into Hindu, Muslim, Christian and Others; and economic status was measured as the quintiles of all household economic assets and grouped into poorest, poorer, middle, richer and richest [23]. In India there are difference racial and ethnic minorities. Some of these groups are classified into scheduled caste, scheduled tribe, and other backward class (OBC) by the Indian Government as they are socially and economically disadvantaged. Belonging to one of these three categories grants the opportunity of positive discrimination in areas of education and employment [33].

Health care utilisation factors included place of delivery, pre-natal visit and delivery assistance. Place of delivery included home delivery, public hospital and private hospital delivery. Pre-natal visits of the respondents were categorized into three groups: 1) visit to doctor; 2) visit to nurse/midwife/auxiliary nurse midwife (ANM)/

lady health visitor (LHV); and 3) visit to trained birth attendants (TBA)/health persons (IIPS, 2007). Assistance during delivery was provided by 1) doctor; 2) nurse/midwife/auxiliary nurse midwife (ANM)/lady health visitor (LHV); 3) trained birth attendants (TBA)/health persons; and 4) by the relatives or friends. These variables had yes/no answering options.

Husband's/partner's controlling behaviour was measured by six variables: Husband jealous if talking with other men; Husband accuses her of unfaithfulness; Does not permit her to meet her girlfriends; Husband tries to limit her contact with family; Husband insists on knowing where she is; and Husband doesn't trust her with money. Violence against women was measured by whether respondent had experienced (during conjugal life) any emotional, physical and sexual violence by the husband/partner. These variables had yes/no answering options.

2.5. Statistical Analyses

The proportions and Chi-square tests were performed to explore the cross-relationships between dependent and independent variables. Dependent variables were breastfeeding initiation immediately, within 24 hours and after 24 hours. Independent variables were demographic factors, healthcare utilisation and husband's controlling and violent behaviour. Multivariate logistic regressions were calculated to study the potential association between time of initiation of breastfeeding and subjects' demographic status, healthcare utilisation and husband's controlling behaviour and violence behaviour. Data were analysed using IBM SPSS. Two separate multivariate logistic regression analyses were run for two dependent variables: breastfeeding initiation within one hour (immediately) or not and within 24 hours or not. A significant level at $p < 0.05$ was employed in the analyses.

2.6. Ethical Issues

Informed consent was obtained from the participants prior to starting the survey, and the right to withdraw was emphasized throughout the survey. Ethical approval for the survey was obtained from the Institutional Review Board of Opinion Research Corporation (ORC), Macro International Incorporated, who was the main technical support provider for the whole survey.

3. RESULTS

Of the total amount of women participating in the study ($n = 35,795$), 39% of them lived in urban areas and 61% in rural areas. The level of education differed between the responding women with 38% of all women having no education, 14% having primary education,

39% secondary education and only 9% higher education. A majority of women were Hindu (74%) and the remaining women were either Muslim (13%) or belonging to other religion (13%). Most women either belonged to other backward class (34%) or general (32%), a minority of the women belonged to a scheduled caste (18%) or scheduled tribe (16%). Among all 35,795 women in the study, a total of 31.1% initiated breastfeeding within one hour and 68.6% initiated breastfeeding within first week.

3.1. Demographics

As seen in **Table 1**, women belonging to age groups 35 - 39 and 45 - 49 reported highest percentage of initiation of breastfeeding within one hour, 32.5% respectively 32.7%. The youngest women, belonging to age group 15 - 19, reported lowest percentage of initiation of breastfeeding within the first hour, 25.3%.

Of women belonging to a scheduled tribe 44.8% reported initiation of breastfeeding within one hour compared scheduled caste 26.8%, OBC 25.8% and finally general 31.6%. Regarding breastfeeding initiation after 24 hours 41.8% of women in the scheduled caste reported doing so and 42.7% of women belonging to OBC compared to 32.5% of general women and 22.9% of women belonging to a scheduled tribe. Scheduled caste women were less likely to initiate breastfeeding within one hour (OR = 0.86, CI = 0.77 - 0.96) as well as within 24 hours (OR = 0.86, CI = 0.77 - 0.96) compared to general. Same goes for other backward class, results showed that the women belonging to this class were less likely to initiate breastfeeding within one hour (OR = 0.77, CI = 0.71 - 0.84) and within 24 hours (OR = 0.79, CI = 0.72 - 0.87) than women belonging to general. Furthermore, women belonging to a scheduled tribe were 1.57 times more likely to initiate breastfeeding within the first hour and almost twice as likely (OR = 1.82, CI = 1.61 - 2.06) to initiate breastfeeding within 24 hours compared to general (**Table 1**).

In regard of educational level, 22.7% of women with no education initiated breastfeeding within one hour, 29.1% within 24 hours and 48.1% after 24 hours. Of women with primary education 33.2% initiated breastfeeding within one hour, 33.5% within 24 hours and 33.3% after 24 hours. Of women with secondary education 37.9% started breastfeeding within one hour, 35.9% within 24 hours and 26.2% after 24 hours. Of all women with higher education 37.1% of them stated initiation of breastfeeding within one hour, 37.2% within 24 hours and 25.7% after 24 hours. Women without education were less likely to initiate breastfeeding within one hour (OR = 0.54, CI = 0.45 - 0.64) and within 24 hours (OR = 0.58, CI = 0.48 - 0.71) compared to women with higher education. Difference was also noted between primary educational level and higher educational level, where

women with primary education were less likely (OR = 0.73, CI = 0.60 - 0.87) to initiate breastfeeding within one hour, no significant results were obtained for initiation within 24 hours.

The results demonstrated that 22.8% of the poorest women initiated breastfeeding within one hour and 29% initiated within 24 hours and 48.2% initiated after 24 hours. The richest women however initiated breastfeeding within one hour more often (34.2%) and 37.5% after 24 hours and 28.3% after 24 hours. Poorest women were less likely to initiate early breastfeeding compared to richest women. However, women belonging to the second lowest wealth index (poorer) were more likely to initiate breastfeeding within one hour (OR = 1.25, CI = 1.07 - 1.45) compared to the richest women. Same results can be seen for middle income women, women in this category were even more likely to initiate breastfeeding within the first hour (OR = 1.35, CI = 1.18 - 1.54) compared to the richest women.

There were differences in time of breastfeeding depending on how many children the women ever gave birth to. Compared to four children or more, women with three children or less were more likely to initiate breastfeeding early. Women with only one child were most likely to initiate breastfeeding within one hour (OR = 1.24, CI = 1.12 - 1.36) as well as within 24 hours (OR = 1.38, CI = 1.24 - 1.52) compared to women with four children or more. More women living in urban areas started breastfeeding within one hour (33.3%) than women living in rural areas (30.1%). Urban women were less likely to initiate breastfeeding both within one hour (OR = 0.85, CI = 0.78 - 0.93) and within 24 hours (OR = 0.84, CI = 0.76 - 0.91) compared to rural women.

3.2. Health Care Utilisation Related Issues

More women who delivered their child in a public hospital initiated breastfeeding within one hour (41%) than women delivering in private hospital (32.5%) and home delivery (26.2%). Similarly, less women who delivered their child in a public hospital initiated breastfeeding after 24 hours (19.7%) than delivery in a private hospital (31.5%) and home delivery (45%). These results were also demonstrated with multiple regression where women who gave birth in a private hospital were less likely to initiate breastfeeding compared to public hospital as well as at home. The results demonstrated that women who gave birth in a private hospital were 0.67 (CI = 0.57 - 0.79) times less likely to initiate breastfeeding compared to when giving birth at home. Furthermore, the likelihood of initiating breastfeeding within 24 hours increased (OR = 1.63, CI = 1.39 - 1.92) when giving birth in a public hospital compared to at home (**Table 2**).

When it comes to prenatal visits, 36.6% of women who visited a doctor before birth started breastfeeding

Table 1. Respondent's demographics and their time of breastfeeding initiation.

Variable	Immediately		Within 24 hours		After 24 hours		Total	P-values
	N	%	N	%	N	%	N	
Age								<0.001
15 - 19 years	529	25.3	645	30.8	921	44.0	2095	
20 - 24 years	3326	30.3	3700	33.7	3937	35.9	10,963	
25 - 29 years	3880	32.0	4114	34.0	4116	34.0	12,110	
30 - 34 years	2240	32.0	2221	34.0	2306	34.0	6767	
35 - 39 years	918	32.5	849	30.1	1057	37.4	2824	
40 - 44 years	261	31.5	257	31.0	310	37.4	828	
45 - 49 years	68	32.7	60	28.8	80	38.5	208	
Place of residence								<0.001
Urban	4689	33.3	4914	34.9	4488	31.9	14091	
Rural	6533	30.1	6932	31.9	8239	38.0	21704	
Educational level								<0.001
No education	3108	22.7	3986	29.1	6587	48.1	13,681	
Primary	1693	33.2	1713	33.5	1700	33.3	5106	
Secondary	5232	37.9	4958	35.9	3617	26.2	13,807	
Higher	1188	37.1	1189	37.2	823	25.7	3200	
Religion								<0.05
Hindu	5276	34.3	5189	33.7	4921	32.0	15,386	
Muslim	893	33.5	909	34.1	867	32.5	2669	
Other	929	32.8	1045	36.9	860	30.3	2834	
Type of caste or tribe								<0.001
Scheduled caste	1642	26.8	1925	31.4	2567	41.8	6134	
Scheduled tribe	2509	44.8	1815	32.4	1281	22.9	5605	
OBC ¹	2983	25.8	3631	31.5	4931	42.7	11,545	
General	3503	31.6	3975	35.9	3597	32.5	11,075	
Economic status								<0.001
Poorest	1366	22.8	1740	29.0	2890	48.2	5996	
Poorer	1825	29.0	1797	28.6	2670	42.4	6292	
Middle	2479	34.3	2309	32.0	2429	33.7	7217	
Richer	2679	34.0	2847	36.1	2365	30.0	7891	
Richest	2873	34.2	3153	37.5	2373	28.3	8399	
Total children ever born								<0.001
1 child	3174	31.6	3408	34.0%	3448	34.4%	10,030	
2 children	3745	35.1%	3806	35.7%	3104	29.1%	10,655	
3 children	1972	32.1%	2076	33.8%	2103	34.2%	6151	
4 or more children	2331	26.0%	2556	28.5%	4072	45.5%	8959	

¹OBC = Other backward class.

Table 2. Health care related issues and time of breastfeeding initiation.

Variable	Immediately		Within 24 hours		After 24 hours		Total	P value
	N	%	N	%	N	%	N	
Place of delivery								<0.001
Home delivery	4875	26.2	5355	28.8	8354	45.0	18,584	
Public hospital	3637	41.0	3480	39.3	1746	19.7	8863	
Private hospital	2710	32.5	3011	36.1	2627	31.5	8348	
Prenatal visit: by doctor								<0.001
No	3342	23.4	4138	29.0	6779	47.5	14,259	
Yes	7878	36.6	7704	35.8	5947	27.6	21,529	
By ANM/nurse/midwife/LHV								<0.001
No	8222	32.8	8213	32.8	8622	34.4	25,057	
Yes	2998	27.9	3629	33.8	4104	38.2	10,731	
By TBA/ICDS/health person								<0.001
No	10,463	31.6	10,855	32.8	11,794	35.6	33,112	
Yes	757	28.3	987	36.9	932	34.8	2676	
Assistance: by doctor								<0.001
No	5326	26.9	5919	29.9	8553	43.2	19,798	
Yes	5892	36.9	5924	37.1	4172	26.1	15,988	
By ANM/nurse/midwife/LHV								<0.001
No	7188	29.8	7418	30.7	9530	39.5	24,136	
Yes	4030	34.6	4425	38.0	3195	27.4	11,650	
By TBA/Health person								<0.001
No	8581	36.0	8156	34.3	7072	29.7	23,809	
Yes	2637	22.0	3687	30.8	5653	47.2	11,977	
By relative/friend								<0.001
No	7811	33.8	8203	35.5	7090	30.7	23,104	
Yes	3407	26.9	3640	28.7	5635	44.4	12,682	

ANM = Auxiliary nurse midwife; LHV = lady health visitor; TBA = Traditional Birth Attendant.

within one hour compared to 23.4% who did not visit a doctor. Of the women who did not see a doctor before birth 47.5% of them initiated breastfeeding after 24 hours. The findings of the multiple regression showed that women who had prenatal assessment by a doctor were 1.4 (CI = 1.27 - 1.54) times more likely to initiate breastfeeding within one hour as well as within 24 hours (OR = 1.40, CI = 1.27 - 1.54) compared to women not seeing a doctor. However, women who received a prenatal assessment by another health professional than a doctor, such as traditional birth attendant or personnel related to the integrated child development services, were only more likely to initiate breastfeeding within 24 hours (OR

= 1.27, CI = 1.11 - 1.45) compared to women who did not receive this assessment. Furthermore, the findings demonstrated a difference between types of assistance during delivery. Women who received assistance by a nurse or midwife were less likely to initiate breastfeeding compared to women who did not get this assistance. Similar results were demonstrated for assistance by relative or a friend. Also, assistance during delivery of other personnel, such as traditional birth attendant or personnel related to the integrated child development services, were women who received such assistance were 0.57 (CI = 0.51 - 0.63) times less likely to initiate breastfeeding within one hour and 0.67 (CI = 0.61 - 0.75) times less

likely within 24 hours compared to women who did not receive that assistance.

3.3. Husband's Controlling and Violent Behavior

Of women reporting that their husband tries to limit their contact with the family 25.3% initiating breastfeeding within one hour compared to 32.8% of women who reported no such limitations from husband. Of women experiencing sexual violence, 24.9% initiating breastfeeding within one hour compared to 32.9% of women who did not report sexual violence (**Table 3**).

Women who reported their husband does not trust

them with money, 27.4% of them initiated breastfeeding within one hour compared to 33.1% of women who did not report such matter. It was demonstrated with multiple regression that woman who had husband that did trust her with money was more likely to initiate breastfeeding within one hour (OR = 1.28, CI = 1.14 - 1.44) compared to woman whose husband did not trust her with money. Similarly, women who had husbands that did get jealous when they talked with other men were more likely to initiate breastfeeding within both 1 hour (OR = 1.21, CI = 1.10 - 1.34) and 24 hours (OR = 1.29, CI = 1.17 - 1.41).

Table 4 describes adjusted odds ratios (ORs), confi-

Table 3. Husband's/partner's controlling and violent behaviour as predictor of time of breastfeeding initiation.

Variable	Immediately		Within 24 hours		After 24 hours		Total	P value
	N	%	N	%	N	%	N	
Husband jealous if talking with other men								<0.001
No	7167	33.8	7083	33.4	6953	32.8	21,203	
Yes	1856	27.1	2150	31.4	2847	41.5	6853	
Husband accuses her of unfaithfulness								<0.005
No	8411	32.4	8558	32.9	9010	34.7	25,979	
Yes	611	29.5	673	32.5	789	38.1	2073	
Does not permit her to meet her girl friends								<0.001
No	7914	32.9	7851	32.6	8300	34.5	24,065	
Yes	1109	27.8	1380	34.6	1499	37.6	3988	
Husband tries to limit her contact with family								<0.001
No	8386	32.8	8351	32.7	8810	34.5	25,547	
Yes	632	25.3	880	35.2	989	39.5	2501	
Husband insists on knowing where she is								<0.01
No	7885	32.3	7937	32.6	8554	35.1	24,376	
Yes	1136	30.9	1293	35.2	1244	33.9	3673	
Husband doesn't trust her with money								<0.001
No	7749	33.1	7609	32.5	8043	34.4	23,401	
Yes	1272	27.4	1620	34.9	1756	37.8	4648	
Ever any emotional violence								<0.001
No	7940	32.8	7983	33.0	8257	34.1	24,180	
Yes	1084	28.0	1250	32.3	1540	39.8	3874	
Experienced physical violence								<0.001
No	6524	34.3	6504	34.2	6001	31.5	19,029	
Yes	2498	27.7	2725	30.2	3795	42.1	9018	
Experienced any sexual violence								<0.001
No	8388	32.9	8389	32.9	8724	34.2	21,203	
Yes	636	24.9	844	33.0	1074	42.1	6853	

Table 4. Multivariate logistic regression predicting timing of breastfeeding initiation by demographics, healthcare utilisation and husband's controlling and violent behaviour (only significant results are presented).

Variable	Initiation within 1 hour	Initiation within 24 hours
	OR (95% CI)	OR (95% CI)
Economic status		
Poorest	0.88 (0.74 - 1.05)	0.76 (0.63 - 0.90)**
Poorer	1.25 (1.07 - 1.45)**	0.94 (0.80 - 1.10)
Middle	1.35 (1.18 - 1.54)*	1.08 (0.94 - 1.25)
Richer	1.10 (0.97 - 1.24)	1.13 (0.99 - 1.28)
Richest	1.0	1.0
Type of caste or tribe		
Scheduled caste	0.86 (0.77 - 0.96)***	0.86 (0.77 - 0.96)***
Scheduled tribe	1.57 (1.41 - 1.76)*	1.82 (1.61 - 2.06)*
Other backward class	0.77 (0.71 - 0.84)*	0.79 (0.72 - 0.87)*
General	1.0	1.0
Total children ever born		
1 child	1.24 (1.12 - 1.36)*	1.38 (1.24 - 1.52)*
2 children	1.19 (1.06 - 1.34)**	1.37 (1.21 - 1.55)*
3 children	1.08 (0.95 - 1.24)	1.12 (0.98 - 1.28)
4 or more children	1.0	1.0
Education level		
No education	0.54 (0.45 - 0.64)*	0.58 (0.48 - 0.71)*
Primary	0.73 (0.60 - 0.87)**	0.77 (0.63 - 0.95)
Secondary	0.87 (0.75 - 1.00)	0.96 (0.81 - 1.14)
Higher education	1.0	1.0
Place of residence		
Urban	0.85 (0.78 - 0.93)*	0.84 (0.76 - 0.91)*
Rural	1.0	1.0
Health care related issues		
Place of delivery		
Home delivery	1.0	1.0
Public hospital	0.97 (0.83 - 1.12)	1.63 (1.39 - 1.92)*
Private hospital	0.67 (0.57 - 0.79)*	0.92 (0.78 - 1.08)
Prenatal: by doctor		
No	1.0	1.0
Yes	1.40 (1.27 - 1.54)*	1.40 (1.27 - 1.54)*

Continued

By TBA/ICDS/ health person		
No	1.0	1.0
Yes	0.88 (0.76 - 1.02)	1.27 (1.11 - 1.45)**
Assistance: by ANM/ nurse/midwife/LHV		
No	1.0	1.0
Yes	0.84 (0.76 - 0.91)*	0.95 (0.86 - 1.05)
By TBA/ICDS/ health person		
No	1.0	1.0
Yes	0.57 (0.51 - 0.63)*	0.67 (0.61 - 0.75)*
By relative/friend		
No	1.0	1.0
Yes	0.75 (0.68 - 0.82)*	0.80 (0.73 - 0.87)*
Partner controlling behaviour		
Husband doesn't trust her with money		
No	1.28 (1.14 - 1.44)*	1.11 (0.99 - 1.25)
Yes	1.0	1.0
Husband jealous if talking with other men		
No	1.21 (1.10 - 1.34)*	1.29 (1.17 - 1.41)*
Yes	1.0	1.0

Note: The contrast category is denoted with OR = 1.0. *p < 0.001, **p < 0.005, ***p < 0.010.

dence interval (CI) and level of significance. Only significant results of the multivariate analyses are shown in the result.

4. DISCUSSION

This study has focused on factors influencing time of initiation of breastfeeding among women in India. It is evident that addressable factors such as place of delivery, prenatal visits to health care facilities and assistance during delivery have an impact on time of initiation of breastfeeding. Furthermore, educational level, economic status and belonging to a caste or a tribe are important factors influencing time of initiation of breastfeeding. The study also shows the influence of partner behaviour on initiation of breastfeeding where partners with jealous and controlling behaviour have a negative influence on time of initiation. Overall, a minority of the respondents followed WHO guidelines of initiating breastfeeding within the first hour after birth considering only 31.1% of the 35,795 women reported doing so.

The present study demonstrates several demographic factors contributing to time of initiation of breastfeeding. Expectedly, educational level is an important factor influencing time of initiation. The present study demonstrated that women with no education are almost 50% less likely to start breastfeeding compared to women with higher education. Previous studies have also indicated that educational level has an important influence on breastfeeding initiation [34-38]. Although there were similarities regarding economic status in percentage of early initiation it was demonstrated that poorer women (but not poorest) and middle-income women were most likely to initiate breastfeeding within the first hour. Similar results are shown elsewhere; women with high and very low economic status tend to be less prone to breastfeed [39,40]. However, different country and cultural context describe different trend of breastfeeding initiation. Therefore, more country and culture dependent studies are warranted.

Although colostrum is beneficial and protects the infant against infections, there are beliefs among some older women in India that colostrum is bad for the child. This may delay initiation among Indian women. Recently, a study in Ethiopia found that 35% of the women in their study discarded the colostrum due to belief it was bad for the child [41].

Doctors demonstrated a positive effect on initiation of breastfeeding. Surprisingly, assistance by nurses and midwives and traditional birth attendants (TBA) did not demonstrate any effectiveness on breastfeeding initiation. Dennis [42] noted in her literature review that health professionals might have a negative influence on breastfeeding if their knowledge or advice is inaccurate or inconsistent. Unfortunately, this demonstrates noncompliance with the ten steps of successful breastfeeding where it is stated that hospital staff should support mothers to initiate breastfeeding within the first half hour of birth [43]. This finding has strong policy implication. Apart from the physicians all other health care staff in India and other low income countries must be instructed to advice their expecting-patients on benefits of early initiation of breastfeeding.

The study demonstrates a difference between place of delivery and time of initiation of breastfeeding. Women giving birth in a public hospital are more likely to early initiate breastfeeding compared to women giving birth in a private hospital. This is consistent with a study in Guatemala reporting the same finding [44]. The present study does not provide any answers as to why this was the case but it could be partly attributed to the fact that caesarean section is more common and asked for in the private hospital [45] which in turn is associated with a reduced likelihood of early initiation of breastfeeding [46,47]. For example, in Brazil there has been a rapid increase in the

rate of caesarean sections where the rate is around 30% however the number is as much as 70% in some private hospitals [48]. To be compared to WHO recommendations of a rate of 10% - 15% [49]. In contrast to this, a study in US found that women giving birth in a private hospital were more likely to initiate breastfeeding [50]. Therefore, to explore the exact situation further studies are warranted in the Indian context.

Not surprisingly, women who did not experience controlling behaviour from their partner were more likely to initiate early breastfeeding compared to their peers who did experience such control. Husband's controlling behaviour is a significant risk factor for violence against women [25]. Violence has many negative health effects such as contraceptive use, sanity, reproductive health issues and neonatal care [24,25]. Therefore the current study has deduced that partners controlling behaviour may induce family violence, which has strong influence on early initiation of breastfeeding. Furthermore, women who are or have been exposed to controlling behaviour from a partner usually experience a sense of insecurity which in turn may influence their confidence to initiate early breastfeeding, or breastfeeding at all for that matter. This is also stated by Silverman [26] who reports that women who experience intimate partner violence are at higher risk of not initiating breastfeeding and should therefore be acknowledged and receive appropriate care and support due to this. Moreover, partner support is seen as an important facilitating factor for breastfeeding initiation [51] which one may assume is not present in the case of a controlling partner. However, research on controlling behaviour and intimate partner violence and specifically early initiation of breastfeeding is needed. Fundamentally, it is necessary to increase women's empowerment and gender equality. One important element is to prioritize girls' and women's opportunity of receiving education. It is necessary for policy makers to intensify their efforts to provide girls and women with this fundamental human right that is education.

5. LIMITATIONS

Due to the nature of the study being a cross-sectional design it is not possible to yield causal inference. To establish causal relationships it is necessary to undertake a longitudinal study. There is also the risk of recall bias from the responding women as they need to remember past occurrences and for example may not be able to remember the exact time of initiation of breastfeeding. Nevertheless, the study has undergone rigorous scrutiny and provides a nationally representative sample and conclusions may therefore be generalized to the entire country.

6. RECOMMENDATIONS

It is important for policy makers to increase women's possibilities of delivering in hospitals and other health-care facilities to secure a safe delivery and also increase opportunities for women to initiate early breastfeeding. It is necessary to make sure that all health professionals provide support and promote early breastfeeding initiation. For example, the ten steps to successful breastfeeding should be implemented in hospitals regardless if they are public or private. It is also evident that policy makers need to increase their efforts in providing girls and women with sufficient education. This is one of many components that are needed to progress women's empowerment and improve gender equality. Furthermore, research is warranted on partners' controlling behaviour and violence and early initiation of breastfeeding.

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