

Original Research Article

Impact of maternal factors and socio-demographic determinants on early initiation of breastfeeding practices in Alwar district, Rajasthan, India

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ABSTRACT

Background: The SDG-3 goal suggests to reduce the neonatal mortality to below 12 per 1000 live births. New-born who are breastfed after 1 hour of birth are at 33% greater risk of neonatal mortality. To ascertain early initiation of breastfeeding (EIBF) knowledge, practices and its underlying determinants, a cross-sectional study was conducted with mothers of children below 3 years of age.

Methods: Sample of 400 mothers of children under 3 years of age was collected. The data was analysed using statistical software SPSS version 23.0. All characteristics were summarized descriptively. Chi-square (χ^2) test was performed to study the association between two categorical variables. Multivariable analysis was done using logistic regression model to determine the association of EIBF with socio-demographic and maternal factors.

Results: 75.8% mothers initiated early breastfeeding within 1 hour of birth whereas only 34.3% mothers had knowledge on early initiation of breastfeeding. 95% mothers fed colostrum to the new-born. Mothers with 25 years of age or more (AOR 1, 95% CI 0.52, 1.57; p value <0.73) were less likely to breastfeed new-born within 1 hour of birth as compared to the mothers who were <25 years of age.

Conclusions: Timely initiation of breastfeeding within 1 hour of birth is a critical intervention to avert a considerable number of neonatal deaths to achieve SDG-3 goal, which to reduce neonatal mortality rate <12 per 1000 livebirths. after delivery could sustain the breastfeeding practice for lo. Intensifying home visits in 3rd trimester to disseminate messages on EIBF and colostrum feeding may improve the coverage of EIBF.

Keywords: Early initiation, Breastfeeding, Knowledge, Practice, Colostrum

INTRODUCTION

World Health Organization (WHO) recommends early initiation of breastfeeding (EIBF) within one hour of birth and exclusive breastfeeding (EBF) for first 6 months.¹ Early initiation of breastfeeding triggers milk production and produces antibody for new born and establishes breastfeeding for longer duration.² EIBF is very beneficial both for child and the mother and is a key predictor of exclusive breastfeeding and continued breastfeeding. EIBF helps new-born to receive colostrum,

which is rich in nutrients and antibodies to prevent infections in infants. It enables mother-child bonding which controls child's temperature and thus prevents new-born from hypothermia and hypoglycaemia that is threat for the survival of the new-born in first week of life.³

The sustainable development goal 3 (SDG-3) recommends to reduce neonatal mortality to below 12 per 1000 live births. A systematic reviews study from multiple countries reveals that if new-born is breastfed

within 1 hour of birth, about 44-45% reduction in relative risk (RR) of neonatal mortality can be achieved. The study indicates that mothers who did not initiate breastfeeding within 1 hour of birth had 2.93 times odds of neonatal death as compared to mothers who breastfed within 1 hour of birth.⁴ A meta-analysis study reveals that new-born who were breastfed after 1 hour of birth had 33% greater risk of neonatal mortality and new-born who were breastfed after 24 hours of birth were more than twice as likely to die before completing one month.⁵ Studies indicate that 22.3% of neonatal deaths could be prevented if early initiation of breastfeeding is performed within 1 hour of birth.⁶ Different studies highlight that children are more likely to develop infections, stunting, wasting and underweight who were not fed colostrum.⁷

Therefore, to curb neonatal mortality and survival of new-born, initiation of breastfeeding within 1 hour is a proven high impact intervention.⁸ Rate of early initiation of breastfeeding ranges from 17.7 to 98.4% in different countries with a mean of 57.6%.⁹ In India, EIBF nearly doubled from 23% to 42%, between 2005-2006 and 2015-2016, and India reports 41.6% as current rate of early initiation within 1 hour of birth.^{1,10} In Rajasthan, breastfeeding rates are much lower as compared with the national average with EIBF at only 13.3% in national family health survey (NFHS)-3 and increasing to 28.4% in NFHS 4 (2015-2016). The data reveals that 37.7% new-born were not breastfed within 1 hour of birth while they were delivered in the health facilities.¹¹ The studies reveal that determinants such as multi-parity, caesarean section, low birthweight, mother's low level of education, mother's occupation, and place of delivery and size of baby at birth associated with delay in early initiation of breastfeeding.¹² Breastfeeding practices vary considerably across different states and districts. India has developed a comprehensive infant and young child feeding policies and operational guidelines that are well aligned with global policies.¹ In view of IYCF guidelines and current practices of early initiation of breastfeeding, this study explores underlying causes and factors that influence breastfeeding practices, especially EIBF.

METHODS

This was a cross sectional community-based study conducted in Alwar district of Rajasthan during July to September 2018.

Study setting

52 villages from Rajgarh block (Alwar district), of Rajasthan were included in the study.

Study participants

Mother of children less than three years of age residing in the selected villages included in the study.

Sample size calculation

The census survey was conducted beforehand to determine the sampling frame (list of mothers of children <3 years of age) in the estimated 40,000 population in Rajgarh block, Alwar Rajasthan. Sample size (n=322) was calculated based on prevalence of new born breastfed within one hour after birth (29.8%) taking into consideration $\pm 5\%$ precision and 5% non-response rate the final sample size was 400 samples.¹³

Sampling technique

Samples were drawn from 52 villages of Rajgarh block of Alwar district, Rajasthan. All mothers of children less than three years old from each village were included to attain the required sample size.

Questionnaire and data collection

A structured questionnaire had been used to assess knowledge and attitudes and practices towards breastfeeding. Questions pertaining to attitude were adapted from food and agriculture organization's manual, guidelines for assessing nutrition-related knowledge, attitude and practices.¹⁴ The questionnaire comprised of two sections; section A included socio-demographic characteristics such as the age of mother, birth order, type of family, educational qualification, monthly household income, and obstetric history i.e. age of child, last delivery conducted, number of antenatal care visits in the last pregnancy. Section B comprised of questions pertaining to knowledge and practices pertaining to early initiation of breastfeeding up to 3 years of age. There were 5 items to measure knowledge of the participants towards breastfeeding. Each item in questionnaire had possible responses either correct practices or incorrect practices. One mark was awarded for every correct response, zero otherwise. Hence, the score in the knowledge section ranged from 0-5. The questionnaire was structured reasonably beginning with practice and knowledge to ensure knowledge questionnaire does not influence practice section.

The questionnaire was translated into the Hindi language and pre-tested before the data collection. Pre-testing was conducted on 10 non-sample mothers from different socio-economic and education settings in Rajgarh block and tool was finalized accordingly. Field data collectors were trained by research team members on the process of data collection and the way questions to be administered.

Data collection process

All mothers were given an explanation of purpose of the study. Oral/written informed consent was obtained from the mothers who were willing to participate in the study. Data were collected by the field data collectors through face-to-face interview during house to house survey. It

took approximately 25-30 minutes to complete the questionnaire.

Statistical analysis and interpretation

The survey responses were coded and entered into MS excel spreadsheets by a trained data entry operator. Correct skipping in the responses, probability distribution of the data, and range of variables in the data were checked in this process. The data were then analysed using statistical software SPSS version 23.0. Data visualizations were done using MS excel 2007. Mothers who had children under three years of age were considered for analysis of early initiation. Mothers of children up to 6 months were included in analysis of exclusive breastfeeding.

Mothers who scored 5 points for knowledge and 3 points for practice pertaining to early initiation of breastfeeding were considered of having a positive knowledge and practice towards early initiation of breastfeeding.

All characteristics were summarized descriptively. For continuous variables, the summary statistics of mean \pm SD (standard deviation) were used. For categorical data, the number and percentage were used in the data summaries and diagrammatic presentation. Chi-square (χ^2) test was used for association between two categorical variables.

To analyse the association of EIBF with socio-demographic and maternal factors, multivariable analysis was done using logistic regression model which was constructed after adjusting for those factors which had an association as per previous literature. Pre and post estimation checks have been done on the model. Finally, adjusted odds ratio and 95 percent confidence interval were reported.

Ethical approval

The study was approved by ethic committee of world vision India. Oral consent was obtained from mothers who were included in the survey.

RESULTS

As per the study design, 400 mothers of children 0-36 months with mean age 14.9 \pm 7.8 months participated in the study. The average age of mothers was 25.9 \pm 4.2 years. 84.8% mothers were from appropriate reproductive age (20-30 years) and only 12 (3%) mothers were below 20 years of age. More than a quarter (27.3%) of mothers were illiterate whereas less than a quarter (23.8%) mothers had completed higher secondary education. The majority (90.5%) of mothers live in pucca houses. Less than half (46.3%) of mothers have monthly income between Rs. 5,000-10,000, whereas 26.5% of mothers had income less than Rs. 5000 per month. Only 11.5% mothers conceived pregnancy before their last child reached 3 years. Less than a quarter (19.0%) mothers had

below poverty line card whereas less than 1% mothers had Antodaya ration card to receive subsidised ration. More than half (63.5%) mothers live in a jointly families (Table 1).

Table 1: Socio-economic and demographic characteristics of mothers (n=400).

Characteristics	Frequency (N)	Percent
Age (in years)		
<20	12	3.0
20-30	340	85.0
>30	48	12.0
Education		
Illiterate	109	27.3
Primary	56	14.0
Secondary	81	20.3
Higher secondary	95	23.8
Graduate and above	59	14.8
Types of house		
Kutcha house	38	9.5
Pucca house	362	90.5
Average monthly income (INR)		
<5000	106	26.5
5000-9999	185	46.3
>10000	109	27.3
Mother currently pregnant at the time of study		
Yes	46	11.5
No	354	88.5
Types of ration cards		
Above poverty line	322	80.5
Below poverty line	78	19.5
Types of family mother lives		
Nuclear family	146	36.5
Joint family	254	63.5

Four ANC check-ups were received by more than a third (37.3%) of mothers during pregnancy. Majority of mothers (96.5%) had delivery in health facility (78.3% in government hospitals and 18.3% in private hospitals). 68.5% mothers had 1-2 children and 3.25% mothers had more than 5 children in their families. 44.8% mothers received knowledge about breastfeeding from mother-in-law and 18.5% received from their doctor/nurse (Table 2).

The current study reveals that more than a half (66.5%) mothers heard about colostrum. The majority (97%) of the mothers knew that mother's milk is the only food that a new-born should receive after the birth, and 47% mothers knew that early initiation of breastfeeding helps child to suck milk and helps in placenta expel. Less than a half (47.9%) mothers practiced EIBF though they were not aware about the benefits of EIBF. 77.5% mothers were aware that new-born should be breastfed within 1 hour of birth however 75.8% mothers initiated early

breastfeeding within 1 hour and 24.3% mothers-initiated breastfeeding after 1 hour. 85.5% mothers feel that child will likely to have problem in suckling breast milk if early initiation of breastfeeding is delayed. 86.5% mothers practiced EIBF who had knowledge about EIBF, whereas 49.5% mothers did not practice EIBF though they had a good knowledge about it. 77.4% mothers in nuclear families practiced EIBF higher than joint families (74.8%). Mother-in-law, doctors/ANMs and other members of the family were the source of breastfeeding information to the mothers. 77.0% mothers knew that colostrum should be fed to the child whereas 95.0% mothers fed colostrum. In terms of prelacteals, 23.1% mothers gave animal milk, 5.8% mothers gave porridge and 7.7% gave biscuits to the children before reaching to 6 months of age. Table 4 represents crude (unadjusted) and adjusted odds ratios of determinants of early EIBF. Mother's age, qualification, no. of live births, family type, place of delivery, level of knowledge on breastfeeding, monthly income and source of breastfeeding knowledge within 1 hour of birth significantly associated EIBF in multivariate analysis. Mothers with 25 years of age or more (AOR 1, 95% CI 0.52, 1.57; p value <0.73) were less likely to breastfeed new-born within 1 hour of birth as compared to the mothers who were <25 years of age. Mothers who acquired breastfeeding knowledge from health workers are 4.24 times more likely to initiate breastfeeding within 1 hour as compared to mothers who received knowledge from family members (AOR: 4.24, 95% CI 2.19, 8.20; p value <0.000). Mothers who delivered in health facilities were less likely to breastfeed new-born within 1 hour of birth as compared to the mothers who delivered at home (AOR: 1, 95% CI 0.10, 2.58).

Table 2: Reproductive characteristics of mothers.

Characteristics	Frequency (N)	Percent
Number of ANC checkups		
≤3 ANC	251	62.8
4 ANC	149	37.3
Place of delivery		
At home	14	3.5
At health facility	386	96.5
Sex of child		
Male	217	54.3
Female	183	45.8
No. of live births		
No children	1	0.25
1-2 children	274	68.5
≥3 children	125	31.3
Source of knowledge on breastfeeding		
ASHA worker	32	8
Doctor/nurse	74	18.5
Household members	81	20.3
Community volunteer	16	4
Mother-in-law	179	44.8
Others	18	4.5

Chances of breastfeeding the child within 1 hour of birth are 4.44 times high in women with good knowledge as compared to the mother who have no knowledge or poor knowledge on EIBF (AOR: 4.44, 95% CI 2.34, 8.44; p value <0.00).

Table 3: Practices and knowledge among mothers related to early initiation of breastfeeding and EBF.

Description of indicators	Frequency (N)	Percent
Mothers heard about colostrum (n=400)	266	66.5
Breastmilk is first food new-born should receive (n=400)	388	97.0
EIBF helps child to suck milk quickly and expelling of placenta (n=400)	188	47.0
New-born should be breastfed within 1 hour of birth (n=400)	310	77.5
Mothers practiced EIBF who were unaware about benefits of EIBF (n=400)	145	47.9
Colostrum fed to new-born (n=400)	380	95.0
Colostrum squeezed out (n=400)	13	3.3
Breastfeeding initiated in less than 1 hour after delivery (n=400)	303	75.8
Breastfeeding initiated between 1 and 2 hours after delivery (n=400)	84	21.0
Child likely to have problem in suckling breastmilk if EIBF delayed (n=400)	341	85.5
Animal milk before 6 months (n=52)	12	23.1
Porridge before 6 months (n=52)	3	5.8
Biscuits before 6 months (n=52)	4	7.69
Some other thing given before 6 months (n=52)	22	42.3

Table 4: Crude (unadjusted) and adjusted odds ratios of determinants of EIBF (n=400).

Variables	Frequency	Unadjusted OR	95% CI	P value	Adjusted OR	95% CI	P value
(EIBF within 1 hour = 303, EIBF beyond 1 hour = 97)							
Age in years							
Less than 25	172	1	0.64, 1.61	0.94	1	0.52, 1.57	0.73
More than 25 or 25	228	1.01			0.91		
Qualification							
Literate	291	1.27	0.76, 2.09	0.35	0.96	0.53, 1.74	0.9
Illiterate	109	1					
No of live births							
Less than 2 or 2	275	1			1	0.53, 1.76	0.9
More than 3 or 3	125	0.95	0.58, 1.56	0.86	0.96		
Age in months (child)							
1 year or less	187	1			1	1.07, 2.9	0.02
More than 1 year	213	1.5	0.96, 2.40	0.07	1.8		
Gender of the child							
Male	217	1			1	0.56, 1.52	0.74
Female	183	1.07	0.68, 1.70	0.75	0.92		
Family type							
Joint	254	0.87	0.54, 1.4	0.56	0.76	0.45, 1.30	0.32
Nuclear	146	1			1		
Place of last delivery							
Home	14	1			1	0.10, 2.58	0.42
Hospital	386	0.51	0.11, 2.32	0.39	0.52		
Knowledge							
Score 5	137	4.05	2.2, 7.5	0	4.44	2.34, 8.44	0
Less than 5	273	1			1		
Monthly income in Rs.							
Less than 9999	291	1			1	0.65, 2.02	0.65
More than or equal to 10000	109	1.1	0.6, 1.8	0.7	1.14		
Source of breastfeeding knowledge							
Health worker	122	3.63	1		4.24	2.19, 8.20	0
Home	278	1	1.9, 6.8	0	1		

DISCUSSION

According to IYCF-2006 guidelines, the government of India recommends early initiation of breastfeeding within one hour of birth.¹⁵ Early initiation of breastfeeding (EIBF) within 1 hour of birth is accepted as one of the cost-effective interventions to reduce neonatal mortality.¹⁶ In our study more than two-third (75.8%) mothers had initiated early breastfeeding within 1 hour of birth. Determinants such as child's age, knowledge of mothers on EIBF and source of breastfeeding knowledge were significantly associated with breastfeeding of newborn within one hour after birth.

The prevalence of EIBF was observed 75.8% which is more than previous studies but significantly higher as compared to NFHS-4 (29.7%).^{16,17} This may be attributed to the home visits for counselling by frontline workers assigned by NGOs who were working in the survey area. The evidence suggests that individual home visit

counselling for breastfeeding increases the likelihood of early initiation of breastfeeding by 74%.¹⁸

A recent study reveals that 64% mothers received nutrition messages thorough home visits which is highest among all mediums of communications.¹⁹ Global nutrition report 2020 indicates that globally fewer than half (44.4%) new-born were breastfed within 1 hour after birth which is significantly less than our findings. The studies indicate that EIBF has increased from 24.5% to 44.6% from year 2006 and 2014 respectively with an average annual rate of increase of 10.3%. 34.3% mothers had good knowledge on EIBF which is substantially lower (67.8%) than the study conducted in Kolkata, India.²⁰ Our study reveals that more than two-third (85.7%) children, who were delivered at home, were breastfed within 1 hour of birth as compared to those who were delivered in healthy facilities (75.3%). The findings perhaps due to outcomes of NGO interventions provided at the grassroot level to improve capacity of frontline workers,

community awareness and practices of new born care. The findings highlighted that knowledge level of mothers and knowledge provided by health care workers was associated with increased likelihood of EIBF. The finding re-emphasizes role of counselling and IEC activities to empower women.

In our study, a significant gap (24.7% points) was observed between institutional births and early initiation of breastfeeding within 1 hour of birth. More than half (50.4% point) gap was observed between institutional delivery and EIBF.¹³ In contrast to the previous studies, EIBF was not significantly associated with maternal education, age, economic status and place of last delivery with our study.^{21,22}

A systematic literature review study suggests that socio-economic, health-related and individual factors and predominant association with early initiation of breastfeeding within 1 hour of birth.²³ Different maternal and newborn initiatives such as infant young child feeding (IYCF) practices, Janani Suraksha Yojana (JSY), Pradhan Mantri Surakshit Matritva Abhiyaan (PMSMA) and Pradhan Mantri Matru Vandana Yojana (PMMVY) likely to contribute in increase the overall breastfeeding practices in the country.

Colostrum is the first milk after delivery which is rich in immunoglobulins like IgA, IgM, IgG, essential amino acids and maternal antibodies. It is also rich in vitamins A, D, E, and K. It has less fats and is rich in growth factors.²⁴ Our study reveals that a majority of mothers (95%) fed colostrum to new-born. This is significantly higher than previous studies.^{25,26} More than a two-third (77%) mothers had knowledge that colostrum should be fed to the new-born. Our finding is substantially higher than previous study done by Rudrappa et al (70%).²⁷

This may be attributed to the prevalence of institutional birth (81.9%) and birth assisted by health service providers (81%) during the delivery in the district of the study.¹³ Majority of mothers (95%) had knowledge that breastmilk is the first food a new born should receive soon after birth. This may be attributed to home visits by frontline workers and NGO's health workers who are working in the area of study population. Our findings suggest that despite of having knowledge and good attitude, practice of early initiation of breastfeeding is low in health facilities. Factors/barriers that contributes to the gap between births and EIBF may be studied further. Such barriers will have to be identified at the time of counselling to the mothers and address them through behaviour change strategies which will lead to good practice of breastfeeding behaviours.

CONCLUSION

Evidences indicate that early initiation of breastfeeding can avert neonatal mortality considerably, as 33% new-

borns are at greater risk of mortality if they are delayed EIBF. By emphasising on this critical intervention, we can contribute in achieving SDG-3 goal, which to reduce neonatal mortality rate at least by <12 per 100 live births. The prevalence of early initiation of breastfeeding was observed significantly high yet less than a quarter (24.7%) children were not initiated early breastfeeding who were born in health facility. Policy level decision makers may consider to increase 2 additional counselling visits during 3rd trimester to emphasize on EIBF and EBF to increase the uptake of EIBF practice. Factors/barriers associated to the delay of EIBF may be studied further to design specific programmes to increase the practices and avert neonatal mortality and improve child health.

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