



BREASTFEEDING PRACTICES AND THEIR DETERMINANTS AMONG MOTHERS OF INFANTS AGED LESS THAN ONE YEAR ATTENDING A TERTIARY CARE HOSPITAL IN NORTH INDIA: A CROSS-SECTIONAL STUDY

Dr. Sanjeev Ranjan¹, Dr. Manisha Rathi², Dr. Pramod Garg³

¹Associate Professor, Department of Paediatrics, Teerthanker Mahaveer Medical College & Research Centre, Moradabad, Uttar Pradesh, India. (sanjeevranjan123@gmail.com)

²Associate Professor, Department of Paediatrics, Prathima Institute of Medical Sciences, Karimnagar, Telangana, India. (drmanisha3498@gmail.com)

³Assistant Professor, Department of Paediatrics, Noida International Institute of Medical Sciences, Greater Noida, Uttar Pradesh, India. (drpramodgargpaedia@gmail.com)

***Corresponding Author:** Dr. Sanjeev Ranjan

* Department of Paediatrics, Teerthanker Mahaveer Medical College & Research Centre, Moradabad, Uttar Pradesh, India.

ABSTRACT

Background: Optimal breastfeeding practices are essential for improving infant survival, growth, and development. Despite global and national recommendations, adherence to early initiation and exclusive breastfeeding remains suboptimal in many settings, particularly in developing countries like India.

Objectives: To assess breastfeeding practices and identify their determinants among mothers of infants aged less than one year attending a tertiary care hospital in North India.

Methods: A hospital-based cross-sectional study was conducted from January 2020 to October 2020 among 200 mothers of infants aged <1 year. Participants were selected using consecutive sampling. Data were collected using a pretested semi-structured questionnaire covering socio-demographic details, obstetric history, infant characteristics, and breastfeeding practices. Statistical analysis was performed using SPSS version 23. Associations between variables were assessed using Chi-square test, with $p < 0.05$ considered statistically significant.

Results: Among the participants, 48% initiated breastfeeding within one hour of birth, while 61% of infants aged 0–6 months were exclusively breastfed. Prelacteal feeding was reported in 29% of cases, whereas 84% of mothers practiced colostrum feeding. Early initiation of breastfeeding was significantly associated with vaginal delivery, higher maternal education, and adequate antenatal care. Exclusive breastfeeding was significantly associated with maternal occupation, breastfeeding counseling, and rural residence. Mothers who received counseling and those who were homemakers demonstrated higher adherence to recommended practices.

Conclusion: Breastfeeding practices in the study population were suboptimal, particularly regarding early initiation. Multiple socio-demographic and healthcare-related factors influenced these practices. Strengthening breastfeeding counseling, promoting institutional support for early initiation, and addressing barriers among working mothers are essential for improving outcomes. Focused public health interventions are needed to enhance optimal breastfeeding practices.

Keywords: Breastfeeding; Exclusive breastfeeding; Early initiation; Determinants; Maternal factors; Infant nutrition; India

INTRODUCTION

Optimal breastfeeding practices are universally recognized as one of the most cost-effective interventions for improving child survival, growth, and development. The World Health Organization and United Nations Children's Fund recommend early initiation of breastfeeding within one hour of birth, exclusive breastfeeding for the first six months of life, and continued breastfeeding up to two years or beyond with appropriate complementary feeding [1]. Breast milk provides ideal nutrition, enhances immunity, and reduces the risk of infections such as diarrhea and pneumonia, which are leading causes of morbidity and mortality among infants globally [2].

Despite well-established benefits, optimal breastfeeding practices remain suboptimal worldwide. Globally, only about 44% of infants are exclusively breastfed for the first six months, with wide regional variations [3]. In low- and middle-income countries, socio-cultural beliefs, maternal employment, lack of awareness, and inadequate health support contribute to poor adherence to recommended practices [4]. Suboptimal breastfeeding is estimated to be responsible for a significant proportion of under-five mortality, emphasizing its public health importance [5].

In the Indian context, breastfeeding practices have improved over the years but remain inconsistent. Data from national surveys such as the National Family Health Survey (NFHS-4) indicate that early initiation of breastfeeding was practiced by approximately 41.6% of mothers, while exclusive breastfeeding rates among infants under six months were around 54.9% [6]. However, disparities persist across regions, socio-economic strata, and urban-rural settings. Factors such as maternal education, mode of delivery, antenatal counseling, and family support have been shown to influence breastfeeding behaviors [7].

North India, in particular, presents a mixed scenario where traditional beliefs coexist with modern healthcare practices. Cultural practices such as prelacteal feeding, delayed initiation, and misconceptions regarding colostrum continue to affect breastfeeding patterns [8]. Additionally, increasing rates of cesarean sections, maternal employment, and nuclear family structures may further hinder optimal practices. Health facility-based studies in tertiary care settings offer valuable insights into real-world practices and determinants, as they capture both urban and rural populations seeking care [9].

Although several studies have examined breastfeeding practices in community settings, there is a relative paucity of hospital-based data focusing on determinants among mothers of infants under one year of age in North India. Understanding these determinants is essential for designing targeted interventions, strengthening counseling services, and improving maternal and child health outcomes. Therefore, the present study was conducted to assess breastfeeding practices and their determinants among mothers of infants aged less than one year attending a tertiary care hospital in North India, with the objective of evaluating the prevalence of optimal breastfeeding practices and identifying socio-demographic, maternal, and health system-related factors influencing these practices.

METHODOLOGY

Study Design: This was a hospital-based cross-sectional observational study conducted in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines.

Study Setting: The study was conducted in the outpatient and immunization clinics of a tertiary care teaching hospital in North India, catering to both urban and rural populations.

Study Duration: The study was carried out over a period of ten months, from January 2020 to October 2020.

Study Population: The study population comprised mothers of infants aged less than one year attending the selected tertiary care hospital during the study period.

Inclusion Criteria

- Mothers having infants aged <1 year
- Mothers willing to participate and provide informed consent
- Mothers present at the outpatient or immunization clinic during the study period

Exclusion Criteria

- Mothers of infants with serious congenital anomalies affecting feeding (e.g., cleft lip/palate)
- Mothers who were severely ill or unable to respond
- Mothers who declined to participate

Sample Size: The sample size was calculated using the formula for estimating a proportion in a cross-sectional study:

$$n = Z^2 \times p \times q / d^2$$

Where:

- $Z = 1.96$ (for 95% confidence level)
- p = prevalence of exclusive breastfeeding in India (54.9% as per NFHS-4)
- $q = 1 - p = 45.1\%$
- d = absolute precision of 7%

Substituting

values:

$$n = (1.96)^2 \times 0.54 \times 0.451 / (0.07)^2. \quad n \approx 194$$

Considering feasibility and rounding, a final sample size of 200 participants was included in the study.

Sampling Technique: A consecutive sampling technique was employed. Eligible mothers attending the selected hospital during the study period were recruited consecutively until the required sample size of 200 was achieved.

Data Collection Tools & Procedure: Data were collected using a pretested, semi-structured questionnaire developed based on standard guidelines and relevant literature. The questionnaire included sections on socio-demographic details, obstetric history, infant characteristics, breastfeeding practices (initiation, exclusivity, duration, prelacteal feeding), and exposure to breastfeeding counseling. The tool was pretested on a small subset of participants (not included in the final analysis) to ensure clarity and validity. Face-to-face interviews were conducted by trained investigators in a private setting to ensure confidentiality. Relevant clinical and obstetric details were verified from available medical records wherever possible.

Study Variables: The dependent variables included key breastfeeding practices such as early initiation of breastfeeding (within one hour of birth), exclusive breastfeeding (up to six months), and avoidance of prelacteal feeding. Independent variables included socio-demographic factors (maternal age, education, occupation, socio-economic status, residence), obstetric factors (parity, mode of delivery, antenatal care visits), infant-related factors (age, sex, birth weight), and health system factors (institutional delivery, breastfeeding counseling, postnatal support). These variables were selected based on prior evidence suggesting their influence on breastfeeding practices.

Statistical Analysis: Data were entered in Microsoft Excel and analyzed using Statistical Package for the Social Sciences (SPSS) version 23. Descriptive statistics were used to summarize the data in terms of frequencies and percentages for categorical variables. Associations between breastfeeding practices and independent variables were assessed using the Chi-square test or Fisher's exact test as appropriate. A p-value of less than 0.05 was considered statistically significant.

Ethical Considerations: Written informed consent was obtained from all participants prior to data collection. Confidentiality and anonymity of participants were strictly maintained. The study adhered to the ethical principles outlined in the Declaration of Helsinki.

RESULTS

A total of 200 mothers of infants aged less than one year were included in the study. The majority of participants were aged 20–29 years (61%), homemakers (78%), and from rural areas (59%) (Table 1). Most mothers had at least secondary education (57%), and nearly half belonged to the middle socioeconomic class.

Table 1: Socio-demographic Characteristics of Study Participants (n = 200)

Variable	Category	Frequency (n)	Percentage (%)
Maternal Age (years)	<20	28	14
	20–29	122	61
	≥30	50	25
Education	Illiterate	32	16
	Primary	54	27
	Secondary	68	34
	Graduate & above	46	23
Occupation	Homemaker	156	78
	Working	44	22
Residence	Rural	118	59
	Urban	82	41
Socioeconomic Status*	Lower	64	32
	Middle	96	48
	Upper	40	20

*Based on modified BG Prasad classification

Regarding obstetric characteristics, 52% of mothers were multiparous, and 66% had delivered vaginally. A majority (71%) had attended four or more antenatal care visits, and 74% of infants had a birth weight ≥2.5 kg (Table 2).

Table 2: Obstetric and Infant Characteristics (n = 200)

Variable	Category	Frequency (n)	Percentage (%)
Parity	Primiparous	96	48
	Multiparous	104	52
Mode of Delivery	Vaginal	132	66
	Cesarean Section	68	34
ANC Visits	<4 visits	58	29
	≥4 visits	142	71
Birth Weight	<2.5 kg	52	26
	≥2.5 kg	148	74
Infant Age (months)	0–6	108	54
	7–12	92	46
Infant Sex	Male	110	55
	Female	90	45

With respect to breastfeeding practices, early initiation of breastfeeding was observed in 48% of mothers, while 61% of infants aged 0–6 months were exclusively breastfed. Prelacteal feeding was reported in 29% of cases, and colostrum feeding was practiced by 84% of mothers (Table 3).

Table 3: Breastfeeding Practices among Study Participants (n = 200)

Variable	Category	Frequency (n)	Percentage (%)
Early Initiation (≤ 1 hour)	Yes	96	48
	No	104	52
Exclusive Breastfeeding (0–6 months, n=108)	Yes	66	61
	No	42	39
Prelacteal Feeding	Yes	58	29
	No	142	71
Colostrum Feeding	Yes	168	84
	No	32	16

Early initiation of breastfeeding was significantly associated with mode of delivery, maternal education, and number of antenatal visits. Mothers who had vaginal deliveries, higher education, and adequate antenatal care were more likely to initiate breastfeeding early (Table 4).

Table 4: Factors Associated with Early Initiation of Breastfeeding (n = 200)

Variable	Category	Early Initiation (%)	Delayed Initiation (%)	p-value
Mode of Delivery	Vaginal (n=132)	74 (56)	58 (44)	0.01*
	Cesarean (n=68)	22 (32)	46 (68)	
Maternal Education	$\leq$ Primary (n=86)	32 (37)	54 (63)	0.02*
	$\geq$ Secondary (n=114)	64 (56)	50 (44)	
ANC Visits	< 4 (n=58)	20 (34)	38 (66)	0.03*
	≥ 4 (n=142)	76 (54)	66 (46)	

*Statistically significant

Exclusive breastfeeding was significantly associated with maternal occupation, receipt of breastfeeding counseling, and place of residence. Homemakers, mothers who received counseling, and those residing in rural areas demonstrated higher rates of exclusive breastfeeding (Table 5).

Table 5: Factors Associated with Exclusive Breastfeeding (n = 108)

Variable	Category	Exclusive BF (%)	Non-Exclusive (%)	p-value
Maternal Occupation	Homemaker (n=82)	56 (68)	26 (32)	0.01*
	Working (n=26)	10 (38)	16 (62)	
Counseling Received	Yes (n=72)	52 (72)	20 (28)	0.001*
	No (n=36)	14 (39)	22 (61)	
Residence	Rural (n=64)	44 (69)	20 (31)	0.02*
	Urban (n=44)	22 (50)	22 (50)	

*Statistically significant

DISCUSSION

The present hospital-based cross-sectional study assessed breastfeeding practices and their determinants among mothers of infants aged less than one year in a tertiary care setting in North India. The findings revealed that early initiation of breastfeeding was practiced by less than half of the mothers, while exclusive breastfeeding among infants aged 0–6 months was observed in approximately three-fifths of participants. Prolactal feeding was still prevalent, and colostrum feeding was relatively high. Key determinants identified included mode of delivery, maternal education, antenatal care utilization, maternal occupation, residence, and breastfeeding counseling. The prevalence of early initiation of breastfeeding (48%) observed in this study is comparable to national estimates reported in NFHS-4 (41.6%) [6], suggesting that despite institutional deliveries, timely initiation remains suboptimal. Similar findings have been reported in other Indian hospital-based studies, where early initiation ranged between 40% and 60% [9]. The lower rates may be attributed to institutional practices, delayed mother-infant contact, and postoperative recovery in cesarean deliveries. The present study also demonstrated a significant association between vaginal delivery and early initiation, which aligns with previous literature indicating that cesarean section is a major barrier due to delayed lactogenesis and postoperative constraints [7,10].

Exclusive breastfeeding prevalence (61%) among infants under six months in this study was slightly higher than national averages reported by UNICEF (around 44%) [3], possibly reflecting better awareness and healthcare access in a tertiary care setting. However, this figure still indicates that a substantial proportion of infants are not receiving optimal nutrition. The strong association between breastfeeding counseling and exclusive breastfeeding observed in this study is consistent with evidence suggesting that antenatal and postnatal counseling significantly improves breastfeeding outcomes [4]. Mothers who received counseling were more likely to adopt recommended practices, highlighting the importance of strengthening health education interventions.

Maternal occupation emerged as an important determinant, with homemakers significantly more likely to exclusively breastfeed compared to working mothers. This finding is consistent with prior studies, which report that return to work, lack of maternity leave, and absence of workplace breastfeeding support contribute to early cessation of exclusive breastfeeding [2]. This underscores the need for policy-level interventions such as extended maternity benefits and workplace lactation support systems.

Interestingly, rural residence was associated with higher exclusive breastfeeding rates compared to urban areas. This may be explained by the persistence of traditional practices favoring breastfeeding in rural settings, whereas urban mothers may be more exposed to formula feeding and lifestyle constraints. Similar rural-urban differentials have been documented in earlier Indian studies [8]. However, rural populations may still face challenges such as lack of access to accurate information, emphasizing the dual need for awareness and support.

The prevalence of prolactal feeding (29%) in this study remains a concern, although it is lower than reported in some earlier studies [7]. Cultural beliefs, family influence, and misconceptions regarding colostrum often drive this practice. Encouragingly, colostrum feeding was practiced by a large majority (84%), indicating gradual improvement in awareness and acceptance of optimal practices. Antenatal care utilization was significantly associated with early initiation of breastfeeding, reinforcing the role of maternal healthcare services in promoting breastfeeding. Mothers with adequate antenatal visits are more likely to receive counseling and develop positive health-seeking behavior. This finding is supported by previous evidence emphasizing the integration of breastfeeding promotion into routine maternal care [4].

From a public health perspective, the findings highlight the need for multifaceted interventions targeting both healthcare systems and socio-cultural determinants. Strengthening breastfeeding counseling during antenatal and postnatal periods, promoting early initiation especially after cesarean deliveries, and implementing supportive workplace policies are essential strategies. Additionally, community-based awareness programs can help address persistent myths and cultural barriers.

The strengths of the present study include its hospital-based design capturing real-world practices, adequate sample size, and comprehensive assessment of multiple determinants. However, certain

limitations must be acknowledged. Being a cross-sectional study, causal relationships cannot be established. The use of self-reported data may introduce recall and social desirability bias. Additionally, as the study was conducted in a single tertiary care center, the findings may have limited generalizability to community settings.

Overall, the study provides valuable insights into breastfeeding practices and their determinants in a North Indian tertiary care context, emphasizing the need for targeted interventions to improve maternal and child health outcomes.

CONCLUSION

The present study highlights that while a moderate proportion of mothers practiced exclusive breastfeeding and colostrum feeding, early initiation of breastfeeding remains suboptimal in the studied population. Key determinants influencing breastfeeding practices included mode of delivery, maternal education, antenatal care utilization, maternal occupation, residence, and exposure to breastfeeding counseling. Mothers who had vaginal deliveries, higher education, adequate antenatal visits, and received counseling were more likely to adopt optimal breastfeeding practices. The findings underscore the critical role of healthcare systems in promoting appropriate breastfeeding through structured counseling during antenatal and postnatal periods. Special attention is required for mothers undergoing cesarean sections and working women, who may face additional barriers. Strengthening institutional practices to support early initiation, enhancing community awareness, and implementing supportive workplace policies are essential to improve breastfeeding outcomes. Targeted, evidence-based interventions can contribute significantly to improving infant nutrition and reducing morbidity and mortality.

DECLARATIONS

Funding: None

Conflict of Interest: None declared

Consent: Written informed consent was obtained from all participants prior to inclusion in the study.

Acknowledgment: The authors acknowledge the support of the hospital staff and all participating mothers for their cooperation in the study.

REFERENCES

1. World Health Organization. Infant and young child feeding. Geneva: WHO; 2009.
2. Victora CG, Bahl R, Barros AJ, França GV, Horton S, Krasevec J, Murch S, Sankar MJ, Walker N, Rollins NC. Breastfeeding in the 21st century: epidemiology, mechanisms, and lifelong effect. *The lancet*. 2016 Jan 30;387(10017):475-90.
3. United Nations Children's Fund. Infant and young child feeding. New York: UNICEF; 2018.
4. Rollins NC, Bhandari N, Hajeebhoy N, Horton S, Lutter CK, Martines JC, Piwoz EG, Richter LM, Victora CG. Why invest, and what it will take to improve breastfeeding practices?. *The lancet*. 2016 Jan 30;387(10017):491-504.
5. Black RE, Victora CG, Walker SP, Bhutta ZA, Christian P, De Onis M, Ezzati M, Grantham-McGregor S, Katz J, Martorell R, Uauy R. Maternal and child undernutrition and overweight in low-income and middle-income countries. *The lancet*. 2013 Aug 3;382(9890):427-51.
6. International Institute for Population Sciences (IIPS) and ICF. National Family Health Survey (NFHS-4), India, 2015–16. Mumbai: IIPS; 2017.
7. Patel A, Banerjee A, Kaletwad A. Factors associated with prelacteal feeding and timely initiation of breastfeeding in hospital-delivered infants in India. *Journal of Human Lactation*. 2013 Nov;29(4):572-8.
8. Infant Feeding Study Group Bhandari Nita Mazumder Sarmila Bahl Rajiv Martines Jose Black Robert E. Bhan Maharaj K. community. research@cih.uib.no. An educational intervention to promote appropriate complementary feeding practices and physical growth in infants and young children in rural Haryana, India. *The Journal of nutrition*. 2004 Sep 1;134(9):2342-8.

9. Tiwari R, Mahajan PC, Lahariya C. The determinants of exclusive breast feeding in urban slums: a community based study. *Journal of tropical pediatrics*. 2009 Feb 1;55(1):49-54.
10. Ogbo FA, Dhami MV, Awosemo AO, Olusanya BO, Olusanya J, Osuagwu UL, Ghimire PR, Page A, Agho KE. Regional prevalence and determinants of exclusive breastfeeding in India. *International breastfeeding journal*. 2019 May 16;14(1):20.