

Research Article

Breastfeeding Knowledge and Practices in New Delhi, India

Priya Shankar¹, Stephen R Kodish², Farah Meraj Khanam³, Sheila Isanaka⁴

¹Fogarty NIH Fellowship in Global Health, ³WHO Collaborating Centre for Adolescent Health, Kalawati Saran Children's Hospital, New Delhi, India.

²Pennsylvania State University, Departments of Nutritional Sciences and Biobehavioral Health, College of Health and Human Development, United States.

⁴Harvard TH Chan School of Public Health, United States.

I N F O

Corresponding Author:

Priya Shankar, Fogarty NIH Fellowship in Global Health, WHO Collaborating Centre for Adolescent Health, Kalawati Saran Children's Hospital, New Delhi, India.

E-mail Id:

prs561@mail.harvard.edu

Orcid Id:

<https://orcid.org/0000-0001-7900-1126>

How to cite this article:

Shankar P, Kodish SR, Khanam FM, Isanaka S. Breastfeeding Knowledge and Practices in New Delhi, India. Postgrad J Pediatr Adol Med. 2022;1(1):6-15.

Date of Submission: 2021-11-30

Date of Acceptance: 2022-01-06

A B S T R A C T

Introduction: Appropriate breastfeeding practices are important for decreasing low birthweight and infant mortality. Despite significant media and community efforts by various organisations, India continues to have sub-optimal rates of breastfeeding.

Research Aim: This study aimed at describing breastfeeding knowledge and practices in a low-income urban community of Dabri village, New Delhi.

Methods: This cross-sectional study was conducted between December 2013 and January 2014 among 157 mothers with children aged 0 through 5 years of age receiving paediatric care at the Dabri Women and Children's Government Hospital. The participants were asked 21 semi-structured questions to understand breastfeeding knowledge and practices during the first six months of their child's life.

Results: While awareness and uptake of exclusive breastfeeding in Dabri, New Delhi was high (72.6%), mothers exhibited variability whether feeding their child on-demand or with a routine as well as in terms of duration. Less than half (49.6%) of women breastfed in the first hour of their delivery, with delays in initiation of breastfeeding associated with C-sections and lower educational attainment. Nearly 17% of women reported introducing solid foods or liquids into their child's diet prior to 6 months of age. Principal channels through which breastfeeding information was received included their mother/ family member (38.9%), doctor (35.0%), as well as television and online media (19%).

Conclusion: Future campaigns to promote breastfeeding should build knowledge of health workers, utilise media-based campaigns, help mothers overcome key barriers to best breastfeeding practices, and introduce tools to support greater maternal self-efficacy for improved practices.

Keywords: Breastfeeding, Maternal, Child Health, Nutrition, South Asia

Background

Appropriate breastfeeding practices are important for decreasing low birthweight and infant mortality. According to the World Health Organization (WHO), optimal breastfeeding could save approximately 800,000 lives of children under five (U5) years of age every year.¹ Exclusive breastfeeding from 0 to 6 months has positive effects on the health of infants and young children through the provision of not only energy and nutrients, but also immune factors that help protect children from major contributors to U5 mortality including respiratory and gastrointestinal illnesses.¹ Breastfeeding is also important for the health of mothers, increasing uterine contraction postpartum, providing a natural form of birth control, and decreasing rates of ovarian and breast cancer.¹

Despite its positive effects, optimal breastfeeding, as recommended by the WHO, is not always the norm, especially in low-income, resource-constrained settings. For example, in India, the National Family Health Survey (NFHS-4) showed that only 41.6% of neonates in India were breastfed within the first hour of life, an improvement from previous indicators such as NFHS-3 which suggested that 23.4% of newborns were breastfed within the first hour of life.² Additionally, less than 70% of mothers reported exclusive breastfeeding up to 6 months as is recommended by the WHO.³ In urban New Delhi, only 34.5% of women exclusively breastfed their children until 6 months of age, the second-lowest urban rate in India.⁴

Studies from both India and other countries have found that low rates of breastfeeding can be attributed to a number of common factors, including unemployment, misperceptions about breastfeeding, low education and literacy levels, and a lack of behaviour-specific knowledge.^{5,6,7} Other contributing factors may also include a lack of skilled support and limited reinforcement from health workers.⁸

The Breastfeeding Promotion Network of India (BPNI), a national network of non-governmental organisations and individuals, was established in 1991 to advocate for optimal breastfeeding practices at national, state, local, and grassroots levels. BPNI has used various covenants, such as the International Code of Marketing of Breastmilk Substitutes, Innocenti Declarations, the Global Strategy for Infant and Young Child Feeding, and Convention on the Rights of the Child to frame political and media campaigns promoting optimal breastfeeding practices. It has also formed global alliances with the International Baby Food Action Network and World Alliance of Breastfeeding Action to promote breastfeeding, particularly in the New Delhi region.⁹ In addition to these advocacy-related efforts, BPNI has also worked at the community level, training health care workers, conducting annual social mobilisation campaigns during World Breastfeeding Week, and increasing maternal health counselling efforts.⁹

Despite the widespread promotional efforts of BPNI to improve breastfeeding practices, little information has been published to describe breastfeeding practices in BPNI programme areas. This study was conducted in order to analyse breastfeeding knowledge and practices among mothers in Dabri, New Delhi where BPNI and other non-governmental and governmental initiatives have worked to promote optimal breastfeeding practices. Given that minimal research related to breastfeeding practices has been conducted in this region, this information is expected to provide a greater understanding of the breastfeeding awareness and practices in Dabri, New Delhi and inform future programming and initiatives.

Method

Study Setting and Population

This cross-sectional study was conducted between December 2013 and January 2014 among a convenience sample of 157 mothers receiving paediatric care at the Dabri Women and Children's Government Hospital to understand the after-effects of various breastfeeding promotion initiatives in Dabri, New Delhi. Inclusion criteria included all caregivers of children aged 59 months or younger who were residents of Dabri village presenting for routine paediatric care visits to the Dabri Women and Children's Government Hospital during the study period. Exclusion criteria included caregivers with infants older than 59 months and who were non-residents of Dabri village. If a mother had more than one child, then the youngest child was included as the "index child." Dabri, New Delhi was selected as a study site given that many breastfeeding organisations had aimed to spread breastfeeding awareness in this locality and that there had been minimal research conducted in this community at the time of the study.

Statistical Analysis

The survey data were analysed with STATA v14.0 (StataCorp, 2015).¹⁰ Means for continuous variables and proportions for categorical variables were used to calculate descriptive statistics. Proportions were compared using chi-square test.

Detailed Methodology

A semi-structured quantitative study questionnaire was developed with the support of paediatricians at the Boston University School of Medicine adapted from the WHO guidelines related to breastfeeding after a literature review and pre-test among a small group of participants in the target community.

The standard definition used for exclusive breastfeeding was based on the WHO definition as follows, "feeding without supplementation for the first 6 months of their child's life."¹¹ The final instrument included 21 semi-structured survey questions assessing breastfeeding knowledge and practices.

Questionnaires were translated to Hindi. Explanations for questions were given if there was confusion about the meaning of any of the words within the questionnaire.

Ethical Approval

Ethical approval was obtained from the Boston University School of Medicine Institutional Review Board H-33545 and from the Women’s and Children’s Government Hospital in Dabri, New Delhi. Written informed consent was obtained from all the participants prior to their participation.

Results

Demographics

The demographic information of study participants is

given in Table 1. The majority (86.6%) of participants were younger than 30 years of age and had the first child as the index child.

Breastfeeding Knowledge

Table 2 depicts the breastfeeding knowledge and practices of participants. The majority of participants (n = 114, 72.6%) defined the duration of optimal exclusive breastfeeding practices correctly as 6 months. The alternative responses included a range of answers, namely, “I do not know” (n = 13), “1 year of feeding without supplementation” (n = 1), “2 years” (n = 1), “3 months” (n = 24), “as long as possible” (n = 2), “greater than a year” (n = 1), and “as long as the baby wanted” (n = 1).

Table 1. Demographic Information

Demographic Variables	N (%)
(n = 157)	
Age (years)	
< 30	136 (86.6)
≥ 30	21 (13.4)
Marital status	
Married	157 (100)
Not married	0 (0)
Parity	
1st child	148 (94.3)
2nd child	9 (5.7)
Education	
< 6th	50 (31.9)
≥ 6th to ≤ 12th	77 (49.0)
> 12th	30 (19.1)
Employment	
Employed	19 (11.8)
Unemployed - housewife	138 (87.9)
Age of child	
< 6 mo	18 (11.5)
≥ 6 mo to < 1 year	5 (3.2)
≥ 1 year to < 2 years	11 (7.0)
≥ 2 years to ≤ 5 years	123 (78.3)
Delivery type	
C-section	42 (26.8)
Vaginal	115 (73.3)
Delivery location	
Home	28 (17.8)
Government hospital	104 (66.2)
Private hospital	25 (15.9)

Table 2. Breastfeeding Knowledge and Practices of Participants

Number of Participants	N (%)	Maternal Age (Years)			Delivery Type			Parity			Education			
		< 30	≥ 30		C- section	Vaginal delivery		1st child	2nd child		< 6th	≥ 6th to ≤ 12th	> 12th	
Definition + practice of exclusive breastfeeding														
Feeding without supplementation in first 6 months	114 (72.6)	97 (71.3)	17 (81.0)	p = 0.37	34 (81)	80 (70.0)	p = 0.157	107 (72.3)	7 (77.8)	p = 0.72	25 (50)	63 (81.8)	26 (86.7)	p = 0.00
Others	43 (27.4)	39 (28.7)	4 (19.1)		8 (19.1)	35 (30.4)		41 (27.7)	2 (22.2)		25 (50)	14 (18.2)	4 (13.3)	
Source of breastfeeding information (multiple)														
Traditional birth attendant	2 (1.3)	2 (1.5)	0 (0)	p = 0.52	0 (0)	2 (1.74)	p = 0.36	2 (1.35)	0 (0)	p = 0.39	0 (0)	1 (1.3)	1 (3.3)	p = 0.47
Mother/ family	61 (38.9)	53 (39.0)	8 (38.1)		20 (47.6)	41 (35.7)		58 (39.2)	3 (33.3)		17 (34)	30 (39.0)	14 (46.7)	
Doctor	55 (35)	43 (31.7)	5 (23.8)		14 (33.3)	34 (29.6)		48 (31.8)	1 (11.1)		15 (30)	28 (36.4)	5 (16.7)	
Friend	4 (2.5)	1 (0.7)	1 (4.8)		0 (0)	2 (1.7)		2 (1.4)	0 (0)		1 (2)	1 (1.3)	0 (0)	
Others (television / online)	64 (40.7)	37 (27.2)	7 (33.3)		9 (19.1)	36 (31.3)		39 (26.4)	5 (55.6)		17 (34)	17 (22.1)	10 (33.3)	
Breastfeeding practice														
Breastmilk	124 (78.9)	108 (79.4)	16 (76.2)	p = 0.94	35 (83.3)	89 (77.4)	p = 0.32	117 (79.1)	7 (77.8)	p = 0.84	36 (72)	67 (87)	21 (70)	p = 0.07
Breastmilk via pump or expressed	1 (0.6)	1 (0.7)	0 (0)		0 (0)	1 (0.87)		1 (0.7)	0 (0)		0 (0)	0 (0)	1 (3.3)	
Formula only	8 (5.1)	7 (5.2)	1 (4.8)		0 (0)	8 (7.0)		8 (5.4)	0 (0)		5 (10)	2 (2.6)	1 (3.3)	
Formula and breastmilk	24 (15.3)	20 (14.7)	4 (19.1)		7 (16.7)	17 (14.8)		22 (14.9)	2 (22.2)		9 (18)	9 (10.4)	7 (23.3)	

Reasons for breastfeeding														
Child health	124 (83.2)	108 (83.7)	16 (80)	p = 0.08	36 (85.7)	88 (82.2)	p = 0.33	116 (82.9)	8 (88.9)	p = 0.97	35 (77.8)	63 (84)	26 (89.7)	p = 0.58
Monetary reasons	1 (0.7)	1 (0.8)	0 (0)		1 (2.4)	0 (0)		1 (0.7)	0 (0)		0 (0)	1 (1.3)	0 (0)	
Personal health	1 (0.7)	0 (0)	1 (5)		0 (0)	1 (0.93)		1 (0.7)	0 (0)		1 (2.2)	0 (0)	0 (0)	
Others	23 (15.4)	20 (15.5)	3 (15)		5 (11.9)	18 (16.8)		22 (15.7)	1 (11.1)		9 (20)	11 (14.7)	3 (10.3)	
Early introduction of solid and liquid food														
Yes	25 (16.8)	23 (17.8)	2 (10)	p = 0.38	10 (23.8)	15 (14.0)	p = 0.15	25 (17.9)	0 (0)	p = 0.17	11 (24.4)	12 (16)	2 (6.9)	p = 0.14
No	124 (83.2)	106 (82.2)	18 (90)		32 (76.2)	92 (86.0)		115 (82.1)	9 (100)		34 (75.6)	63 (84)	27 (93)	
Breastfeeding initiation timing (hours)														
≤ 1	74 (49.6)	63 (48.4)	11 (55)	p = 0.18	10 (23.8)	64 (60.0)	p = 0.000	69 (49.3)	5 (55.6)	p = 0.95	27 (60)	35 (46.7)	12 (41.4)	p = 0.039
> 1 to < 24	50 (33.6)	42 (32.6)	8 (40)		23 (54.8)	27 (25.2)		47 (33.6)	3 (33.3)		9 (20)	26 (34.7)	15 (51.7)	
≥ 24	22 (14.7)	22 (17.1)	0 (0)		9 (21.3)	13 (12.2)		21 (15)	1 (11.1)		9 (15.6)	14 (18.7)	1 (3.5)	
Do not remember	3 (2.0)	2 (1.6)	1 (5)		0 (0)	3 (2.8)		3 (2.1)	0 (0)		2 (4.4)	0 (0)	1 (3.5)	
Length of breastfeeding														
1 month to < 6 months	29 (19.5)	22 (17.1)	7 (35)	p = 0.34	8 (21.4)	20 (18.7)	p = 0.54	26 (18.6)	3 (33.3)	p = 0.73	8 (17.8)	14 (18.7)	7 (24.1)	p = 0.99
≥ 6 months to < 1 year	51 (34.2)	47 (36.4)	4 (20)		12 (28.6)	39 (36.5)		49 (35)	2 (22.2)		15 (33.3)	26 (34.7)	10 (34.5)	
≥ 1 year to < 2 years	38 (25.5)	33 (25.6)	5 (25)		14 (33.3)	24 (22.4)		35 (25)	3 (33.3)		11 (24.4)	19 (25.3)	8 (27.6)	
≥ 2 years	29 (19.5)	25 (19.4)	4 (20)		7 (16.7)	22 (20.6)		28 (20)	1 (11.1)		10 (22.2)	15 (20)	4 (13.8)	

Do not remember	2 (1.3)	2 (1.6)	0 (0)		0 (0)	2 (1.8)		2 (1.43)	0 (0)		1 (2.2)	1 (1.3)	0 (0)	
Feeding timings														
Feed on demand	35 (23.5)	28 (21.7)	7 (35)	p = 0.37	12 (28.6)	23 (21.5)	p = 0.59	32 (22.9)	3 (33.3)	p = 0.87	11 (24.4)	20 (26.7)	4 (13.8)	p = 0.16
Follow a routine	61 (40.9)	52 (40.3)	9 (45)		16 (38.1)	45 (42.1)		58 (41.4)	3 (33.3)		14 (31.1)	30 (40)	17 (58.6)	
Both	50 (33.6)	46 (35.7)	4 (20)		14 (33.3)	36 (33.6)		47 (33.6)	3 (33.3)		18 (40)	25 (33.3)	7 (24.1)	
Do not remember	3 (2.0)	3 (2.3)	0 (0)		0 (0)	3 (2.8)		3 (2.14)	0 (0)		2 (4.4)	0 (0)	1 (3.5)	
Number of feeds in one day														
0 to < 2	0 (0)	0 (0)	0 (0)	p = 0.56	0 (0)	0 (0)	p = 0.41	0 (0)	0 (0)	p = 0.07	0 (0)	0 (0)	0 (0)	p = 0.40
≥ 2 to < 4	9 (6.0)	9 (7.0)	0 (0)		1 (2.4)	8 (7.5)		8 (5.7)	1 (11.1)		6 (13.3)	3 (4)	0 (0)	
≥ 4 to < 6	25 (16.8)	20 (15.5)	5 (25)		8 (19.1)	17 (15.9)		21 (15)	4 (44.4)		6 (13.3)	13 (17.3)	6 (20.7)	
≥ 6 to < 8	18 (12.1)	15 (11.6)	3 (15)		7 (16.7)	11 (10.3)		16 (11.4)	2 (22.2)		6 (13.3)	9 (12)	3 (10.3)	
≥ 8	72 (48.3)	64 (49.6)	8 (40)		17 (40.5)	55 (51.4)		71 (50.7)	1 (11.1)		18 (40)	38 (50.7)	16 (55.2)	
Do not remember	25 (16.8)	21 (16.3)	4 (20)		9 (21.4)	16 (15.0)		24 (17.1)	1 (11.1)		9 (20)	12 (16)	4 (13.8)	
Daily breastfeeding														
Yes	145 (97.3)	125 (97.0)	20 (100)	p = 0.43	42 (100)	103 (96.3)	p = 0.20	137 (97.9)	8 (88.9)	p = 0.11	44 (97.8)	73 (97.3)	28 (96.5)	p = 0.95
No	4 (2.7)	4 (3.1)	0 (0)		0 (0)	4 (3.7)		3 (2.1)	1 (11.1)		1 (2.2)	2 (2.7)	1 (3.5)	

Higher educational attainment (i.e. greater than 6th grade education), but not maternal age, parity, or delivery type, was associated with a more accurate definition of exclusive breastfeeding ($p = 0.000$). As maternal education increased, there was an increasing proportion of participants who gave correct definitions for exclusive breastfeeding, i.e. 25% correct (6th grade); 81.8% correct (6-12th grade); 86.7% correct (12th grade). The participants cited multiple channels through which they received information about breastfeeding. Principal channels included their mother/family member (38.9%) and doctor (35.0%), while friend (2.5%) and traditional birth assistant (1.3%) were less frequently cited. "Other" channels mentioned ($n = 64$, 40.7%) were television and online media ($n = 30$, 19%), and to a lesser extent self ($n = 5$, < 1%), school ($n = 12$, < 1%), books ($n = 13$, < 1%), and Accredited Social Health Activists (ASHA) ($n = 4$, < 1%).

Breastfeeding Practices

The majority of mothers (78.9%) reported providing milk directly from the breast as the sole feeding strategy. Some mothers reported using alternative feeding styles, providing a combination of both formula and breastmilk (15.3%), formula only (5.1%), or breast milk via pump or expressed milk only (0.6%). The majority of women (83.2%) pointed to their child's health as their primary reason for breastfeeding. Other reasons (15.4%) mentioned were "habit" ($n = 4$), "being told breastmilk was better" ($n = 5$), "baby wanted breastmilk" ($n = 4$), "family advice" ($n = 6$), and "too much production of breastmilk" ($n = 4$). Less than 17% of mothers reported introducing solids or liquids before 6 months.

Half of the total participants ($n = 74$, 49.6%) began breastfeeding within 1 hour of delivery, out of which, 23.8% of those who delivered by C-section and 60% of those who delivered via vaginal delivery initiated feeding in the first hour. One third of participants ($n = 50$, 33.6%) began breastfeeding within 24 hours, and 14.7% began breastfeeding only after 24 hours. Vaginal delivery ($p = 0.000$) and level of education ($p = 0.039$) were positively associated with initiating breastfeeding in the first hour.

72.6% of participants reported exclusive breastfeeding for the first six months of their child's life. While nearly all participants who breastfed ($n = 145$, 97.3%) reported breastfeeding on a daily basis, less than 20.0% of mothers reported continuing breastfeeding for up to 2 years, and less than 25.0% described feeding on demand. A greater proportion of participants ($n = 61$, 40.9%) stated that they followed a feeding routine or did a combination of both ($n = 50$, 33.6%). While exclusively breastfeeding, 48.3% of the participants recalled typically feeding 8 times or more each day.

Problems Experienced while Breastfeeding

While nearly half of the mothers reported no challenges

faced while breastfeeding (42.3%), participants who recalled certain challenges faced while breastfeeding cited (Figure 1) breast engorgement (10%), back pain (10%), inadequate quantity of milk (10.7%), inadequate knowledge regarding how to feed (10.7%), and other reasons (42.3%), including fatigue (20%), nipple soreness (15%), maternal and child infection or other sicknesses (3%), child's failure to latch (2%), scorpion bite (1%), pain due to stitches (1%), and household chores (< 1%).

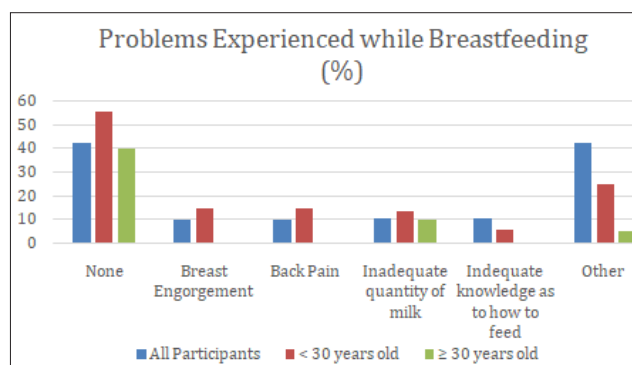


Figure 1. Problems Experienced by the Participants while Breastfeeding

Discussion

This cross-sectional study aimed to assess breastfeeding knowledge and practices amongst a low-income urban community in New Delhi. We found that nearly three-fourths of participants could define 'exclusive breastfeeding' correctly, according to the current global recommendations,¹¹ and that information about breastfeeding came from a variety of sources.

While knowledge was overall high, reported breastfeeding practices were varied, highlighting both positive practices and those that could be improved. Similar to the findings of a descriptive study undertaken at a tertiary care hospital in South India, we also found that educational attainment was a factor positively associated with an accurate definition of exclusive breastfeeding.¹² This is not surprising considering the positive association of higher education with most maternal and child health outcomes.^{13,14} Additionally, similar to the findings of a study conducted in India by Pandey et al., we also found that maternal age was not a predictive factor for appropriate knowledge.¹⁵ This suggests that attitudes and awareness regarding breastfeeding amongst women of different generations may not differ significantly in spite of the potential influence of India's educational, technological, and economic progress.

Information about Breastfeeding

The participants in our study reported getting information about breastfeeding from both interpersonal (e.g., doctors and family members) and mass media sources, in particular television. Few studies in New Delhi and India have critically

analysed the impact of media campaigns for raising awareness of breastfeeding and subsequently adjusted media messaging, despite the steps that BPNI, civil society, non-governmental and governmental organisations have taken to introduce media-based campaigns for women in India.^{16,9} A study conducted in Jordan found that mass media campaigns combined with an integrated hospital and midwife counselling programme can improve breastfeeding initiation behaviours and practices amongst mothers.¹⁷ Similarly, a study by Menon et al. involving a randomised controlled trial in Bangladesh and Vietnam found the impact of breastfeeding campaigns as particularly high when combining mass media, effective counselling and community mobilisation.⁹ Our study further finds that doctors/ healthcare workers appear to play a significant role in a mother's knowledge related to breastfeeding. An article by Rollins et al. from the Lancet Breastfeeding series similarly describes the prominent role of healthcare providers in "[influencing] and [supporting] feeding decisions at key moments before and after birth and later," while also shedding light on the significant gaps in knowledge and skills of healthcare staff at all levels related to breastfeeding.⁷ These studies suggest the importance of an integrated approach to information dissemination in which BPNI and other civil society organisations engage both mass media and healthcare workers in coordinated education and information dissemination as a way of encouraging optimal breastfeeding practices and honing media messages to focus on suboptimal areas.

Nearly all women in our study reported breastfeeding because of the health benefits to the child, however, very few mentioned maternal benefits. Often non-governmental and governmental communications have not traditionally cited the maternal health benefits of breastfeeding, but global education campaigns have been successful in encouraging breastfeeding by citing not only the health benefits for the child but also those for the mother as central to messaging.⁷ As such, BPNI, other civil societies, and government agencies may consider increased communication surrounding personal health benefits from breastfeeding as a way of increasing breastfeeding uptake.

Breastfeeding Practices

Similar to national statistics, we found that only about half (49.6%) of women breastfed in the first hour of their delivery.⁴ Numerous studies have shown the importance of early initiation of breastfeeding and the many negative consequences for both mother and baby as a result of delays.¹⁸ In fact, 41% of newborns that die in the first month of life could be saved if breastfed in the first hour of their lives.¹⁸ Other significant benefits of feeding colostrum in the first hour include the likelihood that babies continue to be breastfed longer, along with the additional maternal

benefits such as improved feeding and decreased blood loss during recovery.¹⁸

In this study, mothers with caesarean section and lower educational attainment reported a delay in the initiation of breastfeeding. This is not surprising, given several studies which link caesarean section and delayed initiation of breastfeeding. However, according to a systematic review conducted by Rollins et al. that was published in the Lancet Breastfeeding series, "in the presence of adequate support, a caesarean section is not necessarily a barrier to timely breastfeeding to exclusive breastfeeding."⁷ As such, hospital environments, healthcare providers, BPNI and other civil society organisations can provide increased support to women delivering via caesarean section, and in particular, may harness successful strategies, such as individual counselling, group education, and immediate lactation counselling and breastfeeding support at delivery as a way of ensuring timely initiation of breastfeeding.⁷

While our findings indicate that the majority of mothers exclusively breastfed until 6 months and all mothers breastfed on a daily basis, only 20% continued breastfeeding through 2 years. These overall positive findings stand in contrast to national statistics which suggested low overall rates of exclusive breastfeeding, low rates of breastfeeding amongst low-income communities in New Delhi, and declining urban breastfeeding trends.¹⁴ Even so, our findings are similar to the majority of other studies not only in India but also in other low- and middle-income countries that find many difficulties associated with continuing to breastfeed through 2 years of life, and subsequent low continued breastfeeding rates after 12 or 18 months.⁷ In particular, our study found that nearly 58% of women experienced some array of difficulties related to breastfeeding including breast engorgement, inadequate quantity of milk, and inadequate knowledge as to how to breastfeed, amongst others. Studies show that many of these complications or difficulties limit women's likelihood of continuing breastfeeding over time and it has been shown that mothers who are unable to breastfeed successfully are less likely to try it in subsequent pregnancies.⁷ As a result, it is critical that healthcare workers, BPNI and other civil society organisations warn mothers of these complications and provide strategies to mitigate them.

Additionally, our study finds that nearly 17% of mothers introduced solids and liquids other than breastmilk or formula prior to 6 months of age. Introducing foods and liquids other than breastmilk prior to 6 months has consistently been shown to increase an infant's risk of infectious disease, diarrhoea, and malnutrition.¹ As such, it is essential that future efforts and messaging focus on discouraging this practice.

Finally, our survey revealed that most women did not

feed their children on demand, which stands in contrast to WHO guidelines which suggest feeding as many times as a child wants or needs, during the night and day.¹¹ Strictly following the best practices of breastfeeding may have been hampered by commonly-reported challenges faced by mothers, such as not having adequate knowledge about ways to feed or perceiving not having enough milk. Research suggests that factors that contribute to inadequate milk production could be lack of feeding on demand and failure to initiate breastfeeding within the first hour,¹⁹ which we also found in our study sample and which could help explain aetiologies of perceived insufficient breast milk supply. Feeding on demand tends to result in shorter and more frequent feeds, allowing the breasts to produce a greater quantity of milk.²⁰ Efforts to improve these two specific behaviours among our sample could possibly help improve the confidence and ability of women to feed on demand with fewer barriers.

This study had some important strengths and limitations. One of the key strengths of this study is that it focused on a population that has not been previously studied, providing new information on their breastfeeding knowledge and practices. Some of the limitations of this study include the cross-sectional nature of this survey, which did not allow us to see any causal relationships between campaign efforts and breastfeeding outcomes. A limitation of this work is that a large majority of mothers were asked to report on their breastfeeding practices several years after their occurrence.²⁰ Another limitation is the potential for social desirability bias, such that mothers may have provided the most socially acceptable answers to questions, rather than reporting their true practices.²¹ During data collection, we tried to minimise socially acceptable responses by explaining to mothers that the information from this study was aimed at gaining insight into the practices in their community and honest responses, whether correct or incorrect, were aimed at enlightening future breastfeeding promotion activities. Additionally, another limitation of this study is that 90% of women were not formally employed, which limits generalisability of the data set as employment has consistently been shown to pose barriers to breastfeeding globally.⁷

Areas of future research in this area should include further evaluation of message content along with development and reinforcement of various channels of information for message delivery, including counsellors and health workers often used in this setting. In addition, qualitative studies on other influencers of breastfeeding practices may serve to provide a greater understanding of other socio-cultural factors facilitating or hindering optimal breastfeeding practices and help inform barrier-specific strategies to help women overcome the commonly reported challenges such as those we found from conducting this survey.

Conclusion

In summary, while this survey mostly found a high awareness of exclusive breastfeeding, it revealed many breastfeeding practices that still need improvement in Dabri, New Delhi. Future campaigns for maternal and child health focusing on breastfeeding promotion should understand that knowledge is a critical component of behaviour change, but not the only factor involved in enabling breastfeeding as was found in this survey. This research should serve as a stepping stone for continued work in this area and should serve as a stimulus for more enhanced and targeted promotional efforts to create enabling environments for mothers to breastfeed successfully in Dabri, New Delhi.

Acknowledgements

The authors would like to acknowledge the participants in this study for their time and involvement, the Dabri Women and Children's Hospital staff, Ms Madhulika Narasimhan for her support in this effort, as well as Dr. Alan Meyers of Boston University School of Medicine for his support and guidance on this article.

Disclosure: The authors disclose no conflict of interest.

Funding Statement: None

References

1. Victora CG, Bahl R, Barros AJ, França GV, Horton S, Krasevec J, Murch S, Sankar MJ, Walker N, Rollins NC; Lancet Breastfeeding Series Group. Breastfeeding in the 21st century: epidemiology, mechanisms, and lifelong effect. *Lancet*. 2016;387(10017):475-90. [PubMed] [Google Scholar]
2. Jain K, Dudeja S, Suri V, Kumar P. Improving first-hour breastfeeding initiation rate after cesarean deliveries: a quality improvement study. *Indian Pediatrics*; 2018.
3. Koya S, Babu GR, Deepa R, Iyer V, Yamuna A, Lobo E, Prafulla S, Kinra S, Murthy GV. Determinants of breastfeeding practices and its association with infant anthropometry: results from a prospective cohort study in South India. *Front Public Health*. 2020;8:492596. [PubMed] [Google Scholar]
4. Arnold F, Parasuraman S, Arokiasamy P, Kothari M. National Family Health Survey (Nfhs-3) India 2005-06 Nutrition in India. Mumbai: International Institute for Population Sciences; 2009. 1422 p.
5. Gupta A, Holla R, Dadhich JP, Suri S, Trejos M, Chanetsa J. The status of policy and programmes on infant and young child feeding in 40 countries. *Health Policy Plan*. 2013;28(3):279-98. [PubMed] [Google Scholar]
6. Subbiah N. A study to assess the knowledge, attitude, practice and problems of postnatal mothers regarding breastfeeding. *Nurs J India*. 2003;94(8):177-9. [PubMed] [Google Scholar]

7. Rollins NC, Bhandari N, Hajeebhoy N, Horton S, Lutter CK, Martines JC, Piwoz EG, Richter LM, Victora CG; Lancet Breastfeeding Series Group. Why invest, and what it will take to improve breastfeeding practices? *Lancet*. 2016;387(10017):491-504. [PubMed] [Google Scholar]
8. Tiwari V, Singh A. Knowledge, attitude and practice regarding breastfeeding in an urban area of Fazidabad district (UP). *Indian J Prev Social Med*. 2007;38(1&2):18-22.
9. Breastfeeding Promotion Network of India [Internet]. About BPNI. 2005-2021; 2021 [cited 2021 Jan 22]. Available from: <https://www.bpni.org/>
10. StataCorp. Software Reviews. *Eco J*. 1992;102(415):1581-6.
11. UNICEF. Global strategy for infant and young child feeding. World Health Organization; 2003. [Google Scholar]
12. Ekambaram M, Bhat VB, Ahamed MA. Knowledge, attitude and practice of breastfeeding among postnatal mothers. *Curr Ped Res*. 2010;14(2):119-24. [Google Scholar]
13. Vikram K, Vanneman R, Desai S. Linkages between maternal education and childhood immunization in India. *Soc Sci Med*. 2012;75(2):331-9. [PubMed] [Google Scholar]
14. Baker DP, Leon J, Greenaway EG, Collins J, Movit M. The education effect on population health: a reassessment. *Popul Dev Rev*. 2011;37(2): 307-32. [PubMed] [Google Scholar]
15. Pandey D, Sardana P, Saxena A, Dogra L, Coondoo A, Kamath A. Awareness and attitude towards breastfeeding among two generations of Indian women: a comparative study. *PLoS One*. 2015;10(5). [PubMed] [Google Scholar]
16. Breastfeeding Promotion Network of India (BPNI); International Baby Food Action Network (IBFAN). The "4 in 1" Training Programme. 2015.
17. McDivitt JA, Zimicki S, Hornik R, Abulaban A. The impact of the Healthcom mass media campaign on timely initiation of breastfeeding in Jordan. *Stud Fam Plann*. 1993;24(5):295-309. [PubMed] [Google Scholar]
18. Edmond KM, Zandoh C, Quigley MA, Amenga-Etego S, Owusu-Agyei S, Kirkwood BR. Delayed breastfeeding initiation increases risk of neonatal mortality. *Pediatrics*. 2006;117(3):380-6. [PubMed] [Google Scholar]
19. Sandor M, Dalal K. Influencing factors on time of breastfeeding initiation among a national representative sample of women in India. *Health*. 2013;5(12):2169-80. [Google Scholar]
20. The physiological basis of breastfeeding. In: *Infant and young child feeding: model chapter for textbooks for medical students and allied health professionals*. Geneva: World Health Organization; 2009. [Google Scholar].
21. Hassan E. Recall bias can be a threat to retrospective and prospective research designs. *Internet J Epidem*. 2005;3(2).
22. Fisher RJ. Social desirability bias and the validity of indirect questioning. *J Cons Res*. 1993;20(2):303-15. [Google Scholar]