

Original Article

Prevalence of exclusive breastfeeding and its determinants in first 6 months of life: A prospective study

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Abstract:

Background: Exclusive breastfeeding for first 6 months of life is recommended under Infant and Young Child Feeding practices in India. The objective of present study was to estimate the prevalence of exclusive breastfeeding during first 6 months of life of babies and to identify factors that interfere with the practice in the study area. **Methods:** A prospective cohort of 462 women who delivered at maternity unit of Government Medical College & Hospital, Rajkot, which is a tertiary care centre for the district, was studied. Data collection was done at hospital as well as during home visits of babies at 1, 3 and 6 months. Factors related to cessation of breastfeeding were analyzed using univariate, bivariate and multivariate analysis. **Results:** All 462 mothers reported breastfeeding their newborns. Prevalence of exclusive breastfeeding reported at 3 months was 97% which declined to 62% by 6 months of age of infants. Bivariate analysis revealed no significant association between interruption of exclusive breastfeeding before 6 months of age and various demographic, socioeconomic, maternal and infant characteristics. Multivariate analysis by logistic regression demonstrated no association between discontinuation of exclusive breastfeeding and socioeconomic status, maternal education and maternal age, number of antenatal visits, maternal employment and initiation of breastfeeding after delivery. **Conclusion:** Exclusive breastfeeding prevalence rate found higher than at national level indicating better feeding practices in these part of India. Also, factors classically considered as supportive for breastfeeding had shown no association with breastfeeding pattern in present study.

Key Words: Exclusive breastfeeding, prevalence, prospective study, maternal & child health services

Introduction:

Breastfeeding provides adequate and essential nutrients for infant's growth and development, protects infants against infections and ensures chances of survival. The benefits of breastfeeding, especially exclusive breastfeeding are well established^{1,2} particularly in poor environments where early introduction of other milk is of particular concern because of risk of pathogens contamination and over dilution of milk leading to increased risks of morbidity and undernutrition.² Based on scientific evidence, the World Health Organization (WHO) recommends the practice of exclusive breastfeeding the infants for first 6 months after their birth, in addition to its continuation with supplementary foods until 2 years or more.³ Till the beginning of this century, breastfeeding was accepted and practiced as routine. Data from last few years showed varied improvement in breastfeeding rates.⁴ Studies have proved with no doubt that children exclusively breast fed are less prone to diseases such as diarrhea⁵ and dehydration.⁶ There is also evidence that early breastfeeding reduces the rate of hospitalization due to pneumonia.⁷

Some studies⁸ reveal factors, positively associated with exclusive breastfeeding, such as higher maternal educational level, gestational age greater than 37 weeks, mothers with previous experience of breastfeeding. There are also studies that relate factors leading to interruption of exclusive breastfeeding such as low family income, low maternal age, primiparity and mothers returning to work.⁹ Several studies intended to define determinant variables in the success or failure of breastfeeding^{10,11}, which could ease the planning of promotional strategies. Nevertheless, it is always prudent to consider that, as an eating habit, breastfeeding is intrinsically related to social, cultural and traditional patterns of a given population. This fact justifies need for regional studies that allows more efficient action in regard to measures for intervention, based on knowledge of local reality. The objective of this study was to evaluate the prevalence of exclusive breastfeeding during first 6 months of life of babies in Rajkot, and to identify factors that interfere with practice.

Methods:

A prospective cohort study included women who gave birth at maternity unit of Government Medical College & Hospital, Rajkot and a tertiary care centre for the district. Tertiary care hospital implies round the clock availability of specialists like, obstetricians and gynecologists, anesthesiologists, and facilities for blood transfusion & other similar interventions. The present study was hospital based and the hospital under study mainly caters people from lower socio-economic strata. Breastfeeding found a common practice in these region of India and usually all the

mothers delivering offers breastfeeding to their infants as soon as after birth. By considering prevalence rate of exclusive breastfeeding 46% as per National Family Health Survey (NFHS) -3, present study was planned with purpose to know the prevalence rate in Rajkot.

Total 492 mothers recruited who delivered from 1st January to 19th February, 2007. The sample size calculated was 460 infants, using EPI 6 software with 39.7% children exclusive breastfed upto 6 months⁴, standard error of 5% and design effect 5. The study was planned with purposive sampling, in which mothers were included from the beginning of study period and on achieving the calculated sample size, data collection was terminated. By considering 10% lost to follow up, 492 mothers were considered for the study. Informed consent was obtained from mothers who agreed to participate in study. To minimize bias, mothers were informed that the study was on infant feeding practices rather than breastfeeding practices. Women recruited for study were from homogenous group and their socio-demographic variables did not differ from those who did not participate in the study. Mothers were interviewed by trained personnel either by home visits or telephone call at 1, 3 and 6 months after delivery. Study group was free from contraindications against breastfeeding (e.g. newborn with severe malformations or mothers seropositive for HIV). A mother who delivered infant with congenital malformations was excluded. Among 492 mothers who had given consent to participate, 462 (93.9%) mothers could be interviewed 1 month after delivery. Among these 462 mothers, 397 (85.9%) mothers were interviewed by home visits and remaining 65 (14.1%) by telephone calls. Thirty mothers were lost to follow up. Of these 30, eighteen mothers could not be traced and 12 lost their interest in study. Successive interviews were conducted at 3rd and 6th month after delivery among the 462 mothers who were still breastfeeding at 1 month by home visits (85.9%) and by telephone calls (14.1%).

The questionnaire included information regarding demographic profile and socioeconomic status of mother and her family, obstetric history and infant feeding practices. Breastfeeding was defined into following categories by World Health Organization¹²: exclusive breastfeeding as when child is fed exclusively on human milk; predominant breastfeeding when child is fed on human milk and other liquids like water, tea, juices; general breastfeeding when all kind of milk, liquid and semisolid diet is given.

Statistics

EPI 6 and Epi Info version 3.4 were used for data analysis, adhering to the hierarchical model created previously, with variables related to demography (baby's sex, maternal age) and socioeconomic factors (family income, parent's education) at first level, maternal characteristics (parity, type of delivery, place of delivery, number of

antenatal visits, maternal employment, received advice on exclusive breastfeeding during postnatal visits, inter delivery interval [birth spacing], previous duration of exclusive breastfeeding in multiparous) at second level, and at third level, infants' characteristics (birth weight, initiation of breastfeeding, any breastfeeding difficulties). The frequencies of variables were calculated and bivariate analysis was performed between individual exposure factors and the outcome, between exposure factors and other variables and between the outcome and other variables. For all data analysis, cutoff for statistical significance was set at $p \leq 0.05$. For multivariate analysis all variables whose associations with outcome had the p value ≤ 0.20 were selected in order to study possible confounding factors. Experimental research that is reported in the manuscript has

Table 1: Characteristics of mother and children

	No.	%
Infants		
Sex		
Male	253	54.8
Female	209	45.2
Birth weight (gms)		
≥ 2500	367	79.4
< 2500	95	20.6
Place of Birth		
Hospital	399	86.4
Home	63	13.6
Maternal		
Maternal age (years)		
> 30	34	7.4
21-30	364	78.7
< 20	64	13.9
Education		
Illiterate	44	9.5
Primary	122	26.5
Secondary & Higher Secondary	245	53.0
Graduation & More	51	11.0
Working status		
Housewife	399	86.4
Working	63	13.6
Socio-economic status		
Upper	15	3.2
Middle	61	13.2
Lower	386	83.6
Parity		
Primiparous	195	42.2
Multiparous	267	57.8
Type of delivery		
Normal	399	86.4
Caesarian	63	13.6

The breastfeeding initiation rate in this study was 100%. Prevalence of exclusive breastfeeding at 3 months was 97% which was reduced to 62% at the end of 6 months of infant's age. The use of water, tea, juice etc was found in remaining study sample but solids were not introduced in any infant.

been performed with approval of ethical committee of the Government Medical College, Rajkot (reference number was not provided). Research carried out on humans is in compliance with the Helsinki Declaration.

Results:

Nine out of ten participants were literate; 86% were aged more than 20 years and 84% belonged to low socioeconomic class. A little more than 2/5th of study population (43%) was primiparous and 86% had normal delivery. Majority of mothers had attended more than 3 antenatal visits. One fifth of the mothers delivered low birth weight (< 2500 grams) babies. As shown in table 1, deliveries among 86% of the study population were conducted in hospital. Fourteen percent mothers returned to usual work within 6 months of delivery.

Table 2 Bivariate analysis of factors associated with cessation of exclusive breastfeeding before the sixth month of life in Rajkot

Variable	Exclusive Breastfeeding				RR (95% CI)
	Yes		No		
	n=285	%	n=177	%	
Sex of infant					
Male	157	55.1	96	54.2	1.00
Female	128	44.9	81	45.8	0.99 (0.85-1.14)
Mother's age (years)					
> 30	16	5.6	18	10.2	1.00
21-30	228	80.0	136	76.8	1.33 (0.92-1.92)
< 20	41	14.4	23	13.0	1.36 (0.91-2.03)
Socio-economic status					
Upper	7	2.5	8	4.5	1.00
Middle	40	14.0	21	11.9	1.41 (0.79-2.49)
Lower	238	83.5	148	83.6	1.32 (0.76-2.28)
Father's education					
Graduation & more	29	10.2	22	12.4	1.00
Secondary & Higher Secondary	153	53.7	92	52.0	1.10 (0.85-1.42)
Primary	79	27.7	43	24.3	1.14 (0.87-1.50)
Illiterate	24	8.4	20	11.3	0.96 (0.67-1.38)
Mother's education					
Graduation & more	24	8.4	22	12.4	1.00
Secondary & Higher secondary	109	38.3	61	34.5	1.23 (0.91-1.66)
Primary	102	35.8	53	29.9	1.26 (0.94-1.70)
Illiterate	50	17.5	41	23.2	1.05 (0.75-1.47)
Primiparity					
No	167	58.6	100	56.5	1.00
Yes	118	41.4	77	43.5	0.97 (0.84-1.12)
Type of delivery					
Normal	250	87.7	155	87.6	1.00
Operative	35	12.3	22	12.4	0.99 (0.80-1.24)
Place of delivery					
Hospital	247	86.7	152	85.9	1.00
Home	38	13.3	25	14.1	0.97 (0.79-1.21)
No. of Antenatal visits					
> 3	242	84.9	141	79.7	1.00
< 3	43	15.1	36	20.3	0.86 (0.69-1.07)
Mother's employment					
Housewife	251	88.1	148	83.6	1.00
Working	34	11.9	29	16.4	0.86 (0.67-1.09)
Received postnatal feeding advice					
Yes	258	90.5	161	91.0	1.00
No	27	9.5	16	9.0	1.02 (0.80-1.30)

Table 2 (contd.)

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Variable	Exclusive Breastfeeding				RR (95% CI)
	Yes		No		
	n=285	%	n=177	%	
Inter delivery interval					
> 24 months	141	84.4	81	81.0	1.00
< 24 months	26	15.6	19	19.0	0.91 (0.70-1.19)
Previous EBF duration in Multiparous					
> 6 months	87	52.1	55	55.0	1.00
< 6 months	80	47.9	45	45.0	1.04 (0.87-1.26)
Birth weight (grams)					
> 2500	231	81.1	136	76.8	1.00
< 2500	54	18.9	41	23.2	0.90 (0.75-1.09)
Breast Feeding started within (hrs)					
> 6	37	13.0	30	16.9	1.00
1-6	184	64.6	120	67.8	1.10 (0.87-1.38)
< 1	64	22.4	27	15.3	1.27 (0.99-1.64)
Any initial breast feeding difficulties					
No	251	88.1	152	85.9	1.00
Yes	34	11.9	25	14.1	0.93 (0.73-1.17)

Analysis of factors like socio-economic status, parental education, maternal age, parity, type of delivery, place of delivery, number of antenatal visits, previous duration of exclusive breastfeeding in multiparous, initiation of breastfeeding, showed that none was associated with termination of exclusive breastfeeding.

Table 3: Multivariate analysis of factors associated with cessation of exclusive breastfeeding before sixth month of life in Rajkot

Variable	Odds ratio	95% CI
Socio-economic status		
Upper	1.00	
Middle	0.45	0.14-1.44
Lower	0.54	0.19-1.53
Mother education		
Graduation & more	1.00	
Secondary & Higher secondary	0.61	0.31-1.17
Primary	0.56	0.29-1.10
Illiterate	0.89	0.43-1.82
Mother`s age (years)		
> 30	1.00	
21-30	0.53	0.26-1.07
< 20	0.49	0.21-1.16
No. of Antenatal visits		
> 3	1.00	
≤ 3	1.43	0.88-2.34
Mother's employment		
Housewife	1.00	
Working	1.44	0.84-2.47
Breast Feeding started within (hrs)		
> 6	1.00	
1-6	0.80	0.47-1.37
< 1	0.52	0.26-1.01

Factors like socio-economic status, maternal education, mother`s age, number of antenatal visits and maternal employment were analyzed for multivariate analysis but none were found statistically significant.

Discussion

Exclusive breastfeeding is safe, economical and emotionally satisfying means of feeding babies. In countries where lactation support is available, six months exclusive breastfeeding has improved substantially over time.³ This study enabled to evaluate the rate of exclusive breastfeeding and to determine factors associated with cessation of exclusive breastfeeding within first 6 months of life. In present study, the prevalence rate of exclusive breastfeeding by 6 months was 62%, compared to 46% at national level.¹³ Foo LL et al¹⁴ reported prevalence rate of 21% which is very low compared to present study.

Present study showed no association between parental education, and mother's employment with exclusive breastfeeding. It differs with Agampodi SB et al¹⁵ study which associates influence of parental education and women's employment on breastfeeding practices. The reason may be because of better health services available under Integrated Management of Neonatal & Childhood Illness (IMNCI). Several studies^{16,17} recommended implementation of IMNCI in India. Present study showed no association between living conditions and cultural habits of population with breastfeeding practices during first 6 months of child birth in contrast to Mascarenhas MLW et al⁹ study. After detailed analysis by adjusted logistic regression, no significant association was found with birth weight, while comparing another study in which low birth weight was negatively associated with initiation and continuation of exclusive breastfeeding.¹⁸

No association was found between breastfeeding pattern and variables, classically considered as supportive for breastfeeding such as number of antenatal visits, mothers receiving postnatal breastfeeding advice, previous breastfeeding duration in multiparous, start of breastfeeding after birth, which was in accordance with Caldeira AP et al.¹⁹ The possible justification for such findings could be excellent execution of maternal and infant care which includes promotion of breastfeeding in health services especially after introduction of IMNCI training in Gujarat state, an Indian modification of Integrated Management of Childhood Illness (IMCI) which promotes exclusive breastfeeding for first 6 months of life. Breastfeeding is a maternal option that involves a complex interaction of socioeconomic, cultural and psychological factors and many more. However, as a socially recreated habit, the role of reproductive and child health services in promoting of breastfeeding should by no means be disregarded.

There is an intricate relation among the determinants of successful breastfeeding practice, but present study did not aim at discussing it deeply. Authors believe that while defining breastfeeding pattern in a certain region,

it is of utmost importance that all intervening variables be considered, allowing a thorough knowledge of situation, and ensuing a greater potential for planning and intervening.

Present study alerts us that in spite of prevalent practice of breastfeeding, promoting and strengthening reproductive and child health services is of paramount importance, since unsatisfactory behavior, regarding exclusive breastfeeding is still observed. Further studies are necessary to correlate the interrelations among these several variables and also other psychological and anthropological questions (not considered in this study) that are known to certainly interfere in breastfeeding practice.

There were several limitations in this study. Main clientele was from low socioeconomic strata attending a tertiary care center and hence it may not be a representative of the general population. Overestimation of proportion of exclusive breastfed is possible due to selection bias. Good numbers of subjects were from urban area and they might have more exposure to the facts of importance of breastfeeding.

Conclusion:

Exclusive breastfeeding prevalence rate found higher than at national level indicating better feeding practices in these part of India. Also, factors classically considered as supportive for breastfeeding had shown no association with breastfeeding pattern in present study, needs promotion^{20, 21} & improvement of maternal & child health services.

Recommendations:

Impact assessment of IMNCI introduction should be carried out to identify changes in knowledge, attitude and practice regarding breastfeeding over a period of time.

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Competing interests:

The authors declare that they have no competing interests

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