

# Trend of breastfeeding and its impact on morbidity in children in a tertiary care hospital in Kathmandu

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## ABSTRACT:

**Introduction:** WHO advocates for exclusive breastfeeding in infants till 6 months of age. Exclusive breastfeeding has been estimated to reduce 70% of infection related mortality in children. This study aims to elaborate the current trend of breastfeeding and its impact on common infectious morbidities in children. **Method:** This study was a prospective longitudinal study done at Kathmandu Medical College Teaching Hospital with a sample size of 103 infants. Detailed proforma including sociodemographic data, breastfeeding related data and morbidities were collected at one and half months of life. The patients were followed up at 6 months of age again and the same proforma was again filled up. Statistical analysis was done with SPSS 20.0 and various associations were elucidated. **Results:** A total of 103 infants were analyzed. Males were 58 in numbers with mean birth weight of the infants being 3048±537 grams. Breast feeding was initiated within an hour in around 37%. At one and half months of age, 63% reported of exclusive breastfeeding which decreased to 23% at 6 months of age. Breastfeeding for at least 45 days decreased the incidence of Acute Respiratory Infections(ARI), Acute Otitis Media (AOM) and diarrheal diseases although statistically significant difference was found with only ARIs. **Conclusion:** Prevalence of exclusive breastfeeding is low in the study. The study has also shown that breastfeeding significantly reduces incidence of common infectious morbidities in infants.

**Keywords:** Breastfeeding, Acute Respiratory Infections, Acute Otitis Media, Acute Diarrheal Episodes

## INTRODUCTION:

Breast milk is the first nutrition as well as immunization of a child. Breast feeding has been regarded globally as an effective and inexpensive intervention to reduce childhood morbidity and mortality.[1] World Health Organization (WHO) and United Nations International Children's Emergency Fund (UNICEF) recommend initiation of breast feeding within an hour of birth and that breast feeding be continued for at least six months of life with no other foods and liquids. After six months of life, the child should be continued on breastfeeding along with age appropriate complementary feeding.[2] The different biological components of breast milk,

such as secretory IgA and IgG, play a supporting role in developing immune system to fight infections. [3] Furthermore, breast milk is the perfect nutrient providing all the nutrition the newly born requires for optimal growth and development.

WHO states that five leading causes of death in children below five years include preterm birth complications, pneumonia, birth asphyxia, diarrhea and malaria.[4] Approximately 47% of these deaths have been attributable to malnutrition.[4] A simple and effective intervention like optimal breast feeding till 2 years of age, can prevent potentially over 13% deaths which amounts to around 900,000 deaths per year.[5] Nearly half of all diarrheal episodes and one-third of respiratory ailments in children under five years of age can be prevented with proper breastfeeding practices in low and middle income countries.[6]

**Submitted:** 13 September, 2018

**Accepted:** 14 January, 2019

**Published:** 24 April, 2019

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## How to cite this article:

Bhatta A, Basnet R. Trend of breastfeeding and its impact on morbidity in children in a tertiary care hospital in Kathmandu. Journal of Lumbini Medical College. 2019;7(1):5 pages. DOI: 10.22502/jlmc.v7i1.262. Epub: 2019 Apr 26.



Given the high number of deaths that can be prevented by mere optimal breastfeeding, this research intends to elucidate the current trend of breastfeeding and its impact on some common morbidity in children.

## METHODS:

This study was a prospective longitudinal study done over a period of six months at Kathmandu Medical College and Teaching Hospital, Sinamangal, Kathmandu. The study was carried out between August 2017 and January 2018.

Inclusion criteria included all children presenting to the immunization clinic of Kathmandu Medical College at one-and half months of life. These children were followed up at six months of age and the same questionnaire was filled up again.

Ethical clearance was obtained from Institutional Review committee (IRC) of Kathmandu Medical College prior to data collection. Written informed consent was taken from the parents/ caregivers allowing the child to be enrolled in the study.

Taking prevalence of breastfeeding as 55% [7] and precision of 5% and error of 10%, sample size was calculated to be 97. With a 20% margin for loss to follow up, a total of 120 samples were enrolled in the study.

Purposive sampling method was used to collect data and there was an attrition of 17 subjects. Hence, the final sample size was 103 infants.

The parents/caregivers sat for a face to face interview and a detailed proforma was filled up. The proforma was prepared by the researcher himself after extensive study on the subject matter and inputs from esteemed professionals on the subject matter. It took 8-10 minutes to fill up the proforma and included sociodemographic details of the child and mother, birth weight of the baby, type of delivery etc. The proforma also included details about the breastfeeding like initiation of breast feeding and duration of breast feeding and it was grouped as one of the following: exclusive, predominant, mixed feeding or no breast feeding. Exclusive breastfeeding and predominant breastfeeding were defined as per WHO.[8]

- Exclusive breastfeeding: the infant has received only breast milk from his/her mother or a wet

nurse, or expressed breastmilk and not other liquids or solids with exception of drops or syrup consisting of vitamins, mineral supplements or medicines.

- Predominant breastfeeding: the infant's predominant source of nourishment has been breastmilk. However, the infant may also have received water and water based drinks.
- Mixed feeding: the infant has received breast milk but it is not the predominant source of nourishment.
- No breastfeeding: the infant has not received breast milk.

WHO groups exclusive and predominant breastfeeding as full breastfeeding.[8]

Early initiation of breastfeeding implied when the baby was started on breast milk within an hour of birth.

The proforma also included details about any prelacteal feeds and other feedings that were given if exclusive breastfeeding was not done. The parents/ caregivers were then asked about Acute Respiratory Infections (ARI), Acute Otitis Media (AOM) and diarrheal episodes in their children. Acute respiratory infections and acute otitis media needed to be physician diagnosed to be considered. Diarrheal episodes were reported on the basis of history given by the parents. The patient was followed up again at six months of age and the same set of questions were asked and recorded. Weight of the infant was taken with the same weighing machine in both the visits with minimal clothing on the child's body.

All the variables were checked and entered into Statistical Package for Social Sciences (SPSS) version 20.0 and analysis was done. The collected data was analyzed using descriptive statistics like frequency, percentage, mean, median and standard deviation. Data was also analyzed using inferential statistics like Chi square and Mann Whitney U test.

## RESULT:

A total of 103 infants were analyzed. The infants had visited the immunization clinic for their vaccination at one and half months and were again followed up at six months.

The mean age of the infants was  $47.52 \pm 2.52$  days. Males were 58 in number (56.3%) while

females were 45(43.7%). The mean birth weight of the infants was 3048±537 grams. The mode of deliveries of these babies included lower segment caesarean section in 53 (51.46%) cases while normal vaginal delivery was done in 48 cases (46.6%). Two babies (1.94%) were born via operative vaginal delivery (forceps/vacuum).

The mean maternal age was found to be 27.37±3.78 years. The education level of the mothers varied. Most of the mothers (52.4%, n=54, N=103) had completed at least bachelor level of education while few of them had completed primary schooling. Ten years of formal education resulted in significantly longer duration of breastfeeding as compared to mothers who had not had at least ten years of formal education (Mann Whitney U test=534.5, p=0.023). The study also revealed that most of the mothers were housewives (62.1%, n=64, N=103) while rest used to work at government or private institutions.

Most of the parents/caregivers reported that their family was a nuclear one (61.2%, n=63, N=103) while rest reported to hail from joint family.

After the delivery of the babies, breast feeding was initiated within an hour in around 37% (n=38, N=103) of subjects while in 45 subjects; the initiation was only after 24 hours of birth. In 58 babies who were initiated breast feeding after 4 hours of life, the major reason for delay was the fact that their baby was kept for observation following caesarean delivery away from the mother. It was astounding that out of 53 caesarean deliveries, 50 of the babies were taken away from the mother just for observation while three of them needed supportive treatment for other morbidities. On analysis of impact of education in early initiation of breastfeeding, completion of at least secondary level of education in mother resulted in early initiation of breastfeeding in their babies. This association was found to be

statistically significant (Chi square=4.414, df=1, p=0.036). Other reasons for delay in initiation of breastfeeding included mother being too ill to feed or the mother was lacking milk secretion. Prelacteal feed was given in six cases.

Regarding current feeding at one and a half months of life, 63% (n=65, N=103) reported of exclusive breast feeding while 14.6% (n=15, N=103) reported of predominant breast feeding. Mixed feeding and no breastfeeding were reported in 17.5% (n=18, N=103) and 5% (n=5, N=103) respectively. Formula feed was the major food being given to subjects not on exclusive breastfeeding while subjects were also given cattle milk and cereals in some cases. The median weight at one and a half months was found to be 4500gm with IQR of 1000gm.

During the follow up at six months of age, it was found that only 24 subjects were exclusively breastfed till six months of age which amounts to 23.3% (n=24, N=103) of all enrolled subjects. In the remaining 79 subjects, formula feeding was the most prevalent feed given in 80% (n=63, N=79). Similarly, 31.6% (n=25, N=79) of the babies received cattle milk as well while 42% (n=33, N=79) received cereals too. The median weight at six months of age was found to be 7000 gm with IQR of 1500 gm.

The mean weight gain between birth and one and half month of life was 1479.41±451.67gm while the mean weight gain between birth and six months of life was 4081.35±818.06gm. The weight gain in subjects receiving exclusive breast feeding vs non-exclusive breast feeding were not found to be significant at both one and half months and six months of age (Mann Whitney U test=1095.5, p=0.339).

In the study, the incidence of ARI, AOM and diarrheal episodes were found to be 48.5% (n=50,

Table 1. Incidence of Acute Respiratory infection in differently breastfed infants

Variables		Acute Respiratory Infection		Statistics
		Present	Absent	
Exclusive Breastfeeding for 45 days	Yes	24	41	X <sup>2</sup> =9.525,p=0.002,df=1
	No	26	12	
Exclusive Breastfeeding for 6 months	Yes	6	18	X <sup>2</sup> =6.944,p=0.008,df=1
	No	44	35	
Full Breastfeeding for 6 months	Yes	31	49	X <sup>2</sup> =13.757,p=0.001,df=1
	No	19	4	

Table 2: Incidence of Acute Otitis Media in children differently breastfed

Variables	Acute Otitis Media		Statistics
	Present	Absent	
Exclusive Breastfeeding for 45 days	Yes	1	X <sup>2</sup> =1.177,p=0.278,df=1
	No	2	
Exclusive Breastfeeding for 6 months	Yes	0	X <sup>2</sup> =0.076,p=0.783,df=1
	No	3	
Full Breastfeeding for 6 months	Yes	2	X <sup>2</sup> =0.216,p=0.642,df=1
	No	1	

N=103), 2.9% (n=3, N=103) and 8.7% (n=9, N=103) respectively.

Regarding the incidence of acute respiratory infections in exclusive vs non-exclusive breastfeeding, there was found to be statistically significant protection of exclusive breastfeeding against ARIs. In fact, children who were exclusively breastfed for just the first one and half months of life were also conferred significant protection against ARIs even till six months of age.(Table 1) The protection against ARI continued to be significant in children breastfed exclusively till six months of age (X<sup>2</sup>=6.944, p=0.008, df=1). Moreover, not just exclusively breastfed but, fully breastfed children were also offered the protection against ARI which was statistically significant(X<sup>2</sup>=13.757,p=0.001,df=1). Thus, breastfeeding babies, even for as short duration as one and a half months offered significant protection against ARIs in children.

In the study, breastfeeding and its impact on incidence of acute otitis media and diarrheal

episodes was also analyzed. It was found that babies who were exclusively breastfed had lower incidence of acute otitis media but the difference was not statistically significant. (Table 2) Breastfeeding till 45 days of life also reduced the incidence of acute diarrheal episodes in children, but the reduction was not statistically significant (Table 3). Exclusive breastfeeding for six months also did not show any significant association on the incidence of both these conditions.

Analysis was also carried out regarding the benefit of early initiation of breastfeeding against other morbidities. However, it was found that there was no significant difference in incidence of ARI, AOM or diarrheal episodes due to early initiation of breastfeeding.

## DISCUSSION:

This study was done to elucidate the current trend of breastfeeding in one of the tertiary medical

Table 3: Incidence of acute diarrheal episodes in differently breastfed infants

Variables	Acute diarrheal disease		Statistics
	Present	Absent	
Exclusive Breastfeeding for 45 days	Yes	3	X <sup>2</sup> =2.484,p=0.115,df=1
	No	6	
Exclusive Breastfeeding for 6 months	Yes	0	X <sup>2</sup> =1.738,p=0.187,df=1
	No	9	
Full Breastfeeding for 6 months	Yes	5	X <sup>2</sup> =1.559,p=0.212,df=1
	No	4	

college and teaching hospital situated in the capital of the country.

Of the 103 babies who were enrolled in the study, 53 babies (51.4%) were born via LSCS as compared to 50 via vaginal deliveries (spontaneous and instrumental). This rate of Caesarean section was very high when compare to global rate (18.6%).[9] Moreover, the CS rates in Nepal is much higher than the global rate and has been reported to be anywhere from 15% to an astounding 81%.[10,11] Since most of the enrolled patients in this study were born at Kathmandu Medical College and Teaching Hospital, the 51% LSCS rate is similar to the reported 46% as of 2017.[10]

The mean age of mothers in the study was found to be  $27.37 \pm 3.78$  years. Since the research did not include parity of the mother, this result could not be generalized. However, this data is in line with the NDHS data which mentions that the age specific fertility rate of urban women is highest for age 20-29 years.[12]

In the study, we found that around 52% of mothers had completed at least their bachelor's degree of education. This figure is much higher than the NDHS data which showed that women who have passed secondary education stands at mere 24%.[12] In the study, we also found that at least 10 years of formal education, i.e. completed secondary education, made mothers breastfeed their children for longer duration than mothers who did not complete the 10 year formal education. This variability in the data may be due to the fact that the current research was carried out in the heart of urban Nepal- Kathmandu. The research reported 62% of mothers to be housewives which was very similar to the 61% reported by the World Bank.[13]

In the current study, it was found that 37% of babies were breastfed within an hour of birth. This is lower than 55% babies being breastfed within an hour of birth as reported in NDHS 2016.[12] The lower figure reported in the current study may have been due to high number of LSCS deliveries which caused delayed initiation of breastfeeding.

The study revealed that at one and half months of life, 63% of babies were being exclusively breastfed. This data is lower than the national data of 79.6% babies being exclusively breastfed at that age. [12] In the study, it was found that 5% of babies had not received breast milk at all during the first one

and half months of life which at national level stands at 0%.[12] Similarly, only 23.3% of the enrolled babies were exclusively breastfed for 6 months. This figure too, is much below the national figure of 66%. This discrepancy in figure may reflect the urban population of our study which curtails employed mothers to exclusively breastfeed their children for optimum period.

Of the subjects enrolled in the study, 48.5% have had at least one episode of ARI in the first six months of life. This figure is lower than the reported incidence of ARI in children under five years at national level which was 765 per 1000 children. [14] Similarly, diarrhea was found to be in 8.7% of enrolled subjects which is also lower than the national figure of 502 per 1000 under five children. These findings of lower morbidities in our study may be explained by the better health service and hygiene in the urban part of the country as compared to rural parts.

Breastfeeding for even first one and half months of life conferred protection against ARIs at least till six months of age. Studies have shown that breastfeeding conferred the highest protection for children against respiratory infections.[3] Admission in hospitals in low and middle income countries (LMIC) following respiratory tract infection was 57% lower in children who were breastfed.[6] In developed countries, the protection was much higher, and as high as 72% reduction in admissions during the first year of life occurred in babies who were breastfed for at least 4 months. [15] Similarly, the risk of severe bronchiolitis was reduced by 74% in babies who were breastfed for at least 4 months.[16] Breastfeeding has been shown to reduce the chance of mortality from respiratory tract infections.[17] The result of this study also concur with the conclusions from various meta-analysis and systematic reviews done around the world in both low income as well as developed countries.[6,18] Although most of the studies have shown the benefit of breastfeeding if done exclusively for at least four months, this study infact establishes the protective role of full breastfeeding if only done for as short as 45 days.

In the current study, breastfeeding was not found to alter the incidence of acute otitis media in children. However multiple studies done around the world have shown significant protection offered by breast milk against otitis media in infants and

children. In a large systematic review and meta-analysis, breastfeeding has been shown to confer protection against acute otitis media till two years of age. The protection is even greater in children who are exclusively breastfed and for a longer duration of time.[19] Similarly in another study, incidence of acute otitis media was found to be significantly low in infants exclusively breastfed as compared to ones who were given formula feed.[20] The current study was not able to establish this relation perhaps because of shorter duration of the study wherein subjects were followed up for just six months of life during which otitis media is not a common morbidity.

This study also tried to assess the protective efficacy of breastfeeding against diarrheal episodes in infants. Breastfeeding was not found to affect the incidence of diarrheal episodes in children. However, to the contrary, multiple studies have shown breastfeeding to confer significant protection against diarrheal episodes during infancy. About half of all cases of diarrhea could be reduced with breastfeeding.[6] About 72% of hospital admissions for diarrheal diseases could be avoided with breastfeeding.[6] Horta et al has also shown the beneficial effect of breastfeeding in children under five years of age with larger protection at smaller age. [3] Longer duration of breast feeding was associated with greater protection against diarrheal episode. [20] In the 2003 Lancet Child Survival series, breastfeeding promotion was identified as one of the most cost-effective interventions against under-five deaths in general, and against diarrhea in particular. [5] Lamberti et al has concluded that the risk of dying from diarrhea in children less than 6 years of age was 10.5 times higher in infants who were not breastfed as compared to ones who were breastfed.[21] This study however did not show significant reduction in diarrheal episodes with breastfeeding perhaps due to low incidence of diarrhea in this study due to small sample size. Also, urban population with better hygienic care may have contributed to low incidence of diarrhea in this study.

This study was able to establish the benefit of breastfeeding on some common morbidities in children. However, the study was done for a relatively short period of six months and benefit of breastfeeding for a prolonged time could not be elucidated. This study has not taken the number of episodes of ARI and diarrheal illness into account

which would have given a better insight on the significance of breastfeeding on these morbidities. Also, the study needs to be carried out for longer than 6 months duration to better elucidate the effect of breastmilk on these morbidities.

### **CONCLUSION:**

The study has shown that exclusive breastfeeding for a duration of six months was much less as compared to the national average. Similarly, the breastfeeding has positive impact on reduction of incidence of common morbidities in children like acute respiratory infections, acute otitis media and acute diarrheal diseases.

### **Conflict of interest:**

The authors declare that no competing interests exist.

### **Source of funds:**

No funds were available.

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