



INFLUENCE OF BREASTFEEDING PRACTICES ON NUTRITIONAL STATUS OF CHILDREN AMONG TEA GARDEN WORKERS

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ABSTRACT

Background: Although breastfeeding is nearly universal in India, malnutrition still remains a major threat to survival, growth and development of Indian children.

Objectives: The objectives of the study were to assess nutritional status of children by anthropometry in the Tea Garden Community in Dibrugarh district of Assam and to find its association with breastfeeding practices

Methods: A community-based cross-sectional study was conducted among 390 children aged 12-24 months in six randomly selected tea gardens of Dibrugarh district from October 2011 to June 2012. Nutritional assessment was done by using weight-for-age, height-for-age and weight-for-height.

Results: Prevalence of underweight, stunting and wasting was 61.5%, 65.6% and 33.8% respectively. Delayed initiation breastfeeding, prelacteal feeding, deprivation of colostrum, not exclusively breastfeeding for six months and improper complementary feeding were significant risk factors for underweight. Stunting was significantly more among children who were not exclusively breastfed and with improper complementary feeding. Prelacteal feeding and colostrum deprivation were significant risk factors for wasting.

Conclusion: This study reflects a high prevalence of undernutrition among children of Tea Garden Community which is significantly associated with improper breastfeeding practices.

Keywords: Undernutrition; Exclusive breastfeeding; Colostrum feeding; Tea Garden Community; Dibrugarh; Assam

INTRODUCTION

Nutritional status is a major determinant of the health and well-being of children. It is well recognized that the period from birth to two years of age is a "critical window" for the promotion of optimal growth, health and behavioural development. Breast feeding is the best form of infant feeding which ensures optimum growth, enhances intellectual and emotional development and improves child survival by providing protection against infections, diseases and malnutrition for infant.¹ The Optimal infant and young child feeding prac-

tices include initiation of breastfeeding within one hour of birth, exclusive breastfeeding for the first six months of life and addition of appropriate and adequate family foods for complementary feeding after six months, together with continued breastfeeding for two years or beyond.²

Malnutrition remains a major threat to the survival, growth and development of Indian children as manifested in stunted growth, wasting and micronutrient deficiencies especially between 1-2 year age group.^{3, 4} Recent studies have also recognized the link between malnutrition and child feeding

practices.^{5,6}

For centuries, Assam is inhabited by people varying in language, social customs and traditions belonging to different caste and creed, races and ethnic groups. Approximately 23% of the total population of Assam is contributed by tea and ex-tea tribe labour groups.⁷ The main source of their livelihood is tea industry of Assam. Poor socio-economic conditions, ignorance due to illiteracy, over-crowded and unhygienic living conditions and false beliefs make them vulnerable to various infections and malnutrition leading to early morbidity and mortality.^{6,8} So taking these facts into consideration the present study was undertaken to assess the nutritional status of children by Anthropometry in the Tea Garden Community in Dibrugarh district of Assam and to find its association with breastfeeding practices.

MATERIALS AND METHODS:

A community based cross-sectional study was conducted in the tea gardens of Dibrugarh District from October 2011 to June 2012. Considering that 50.6% of children in Assam are breastfed within 1 hour of birth³ and a relative precision of 10%, the required sample size was calculated to be 390. All children aged 12-24 months and their mothers residing in these tea gardens were eligible to participate in the study.

A two stage sampling design was adopted in the study for selection of the individuals. Six tea-gardens were selected randomly in the first stage using simple random sampling technique. In the second stage, all children in the age group of 12-24 months in the selected tea gardens were included and every consecutive house was visited and data was collected till the required sample size was achieved. Ethical clearance was obtained from the Institutional Ethical Review committee and informed consent was obtained from mothers of children who participated in the study. Mothers were subjected to personal interview using a predesigned, pretested schedule. Information on socio demographic characteristics and breastfeeding practices were collected. Nutritional status of children was assessed using weight and length as per the WHO guidelines on

Anthropometry.⁹ The three anthropometric indicators: for-length were expressed in Z-scores in reference to the WHO child growth standards.⁹ The prevalence of underweight (low weight-for-age), stunting (low length-for-age) and wasting (low weight for length) were calculated at the cut-off level of < -2 SD (Z-Score < -2) and the prevalence of severe underweight, stunting and wasting were calculated at cut-off level of < -3 SD (Z-Score < -3). Modified BG Prasad's classification adjusted with current income levels was used to determine socio-economic status (SES).¹⁰

Statistical analysis was done using SPSS for Windows, trial version 16 comprising of calculating proportion, mean and standard deviation. Association was determined using chi-square test. *P*-value < 0.05 was considered significant for all tests. Risk factor analysis was done using odds ratios (OR) along with their respective 95% confidence intervals (CI) for finding risk factors of undernutrition.

RESULTS:

In the present study, out of 390 children aged 12-24 months who were sampled, 201 (51.5%) were males and 189 (48.5%) were females with mean age of 18.4 ± 4.5 months. Majority were Hindus (95.4%) and 235(60.3%) were living in joint families. 57.4% of the families belonged to Socio-economic (SE) class IV followed by 27.9% belonging to SE class V while none belonged to SE class I. The mean age of mothers was 24.9 ± 3.4 years and majority of them (82.8%) were illiterates. 43.1% mothers were involved in their household works while 56.9% worked in the tea gardens. 229(58.7%) children were born in hospital while 161(41.3%) were delivered at home. 35.6% of the mothers did not receive any advice on breastfeeding during the antenatal period.

Table 1 shows the nutritional status of the children included in the study. The prevalence of underweight, stunting and wasting was 61.5%, 65.6% and 33.8% respectively and the prevalence of severe underweight, severe stunting and severe wasting (< -3 SD) was 28.2%, 34.9% and 14.1% respectively. Mean weight of the study population was 8.16 ± 1.46 Kg and the mean length was 74.1 ± 5.07 cm.

Table 1: Nutritional status of study population:

Sex	Children	Underweight			Stunting			Wasting		
		-2to-3(%)	<-3 (%)	Total (%)	-2to-3(%)	<-3 (%)	Total (%)	-2to-3(%)	<-3 (%)	Total (%)
Male	201	75 (37.3)	61 (30.4)	136 (67.7)	66 (32.8)	83 (41.3)	149 (74.1)	41 (20.4)	28 (13.9)	69 (34.3)
Female	189	55 (29.1)	49 (25.9)	104 (55)	54 (28.6)	53 (28)	107 (56.6)	36 (19)	27 (14.3)	63 (33.3)
Total	390	130 (33.3)	110 (28.2)	240 (61.5)	120 (30.7)	136 (34.9)	256 (65.6)	77 (19.7)	55 (14.1)	132 (33.8)

Table 2- Nutritional status of children in relation to socio- demographic characteristics

Characteristics	n	Underweight (%)	Stunting (%)	Wasting (%)
Age in months				
12-14	82	40 (48.8)	45 (54.9)	24 (29.2)
14-16	45	26 (57.8)	23 (51.1)	22 (48.9)
16-18	47	32 (68.1)	33 (70.2)	22 (46.8)
18-20	42	28 (66.7)	31 (73.8)	14 (33.4)
20-22	38	29 (76.3)	30 (79)	14 (36.9)
22-24	136	85 (62.5)	94 (69.1)	36 (26.5)
Total	390	240 (61.5)	256 (65.6)	132 (33.8)
Sex				
Male	201	136 (67.7)	149 (74.1)	69 (34.3)
Female	189	104 (55)	107 (56.6)	63 (33.3)
p value		0.01*	0.000*	0.836
Caste				
General	47	32(68.1)	29(61.7)	21(44.7)
SC/ST	33	26(78.7)	25(75.7)	13(39.4)
OBC	310	182(58.7)	202(65.2)	98(31.6)
p value		0.059	0.39	0.165
Educational status of mothers				
Illiterate	323	204(63.2)	215 (66.6)	116(35.9)
Literate	67	36(53.7)	41(61.2)	16(23.88)
p value		0.149	0.40	0.058
Occupation of mothers				
Employed	222	139(62.6)	148(66.7)	81(36.5)
Unemployed	168	101(60.1)	108(64.3)	51(30.4)
p value		0.61	0.62	0.20
No. of family members				
3-6	274	157(57.3)	182(66.4)	93(33.9)
≥ 7	116	83(71.5)	74 (63.8)	39(33.6)
p value		0.008*	0.617	0.95

*Statistically significant finding

Table 3: Breastfeeding practices and nutritional status of children:

Feeding practices	n	Nutritional Status					
		Underweight (%)**	OR (95%CI)	Stunting (%)**	OR (95%CI)	Wasting (%)**	OR (95%CI)
Time of initiation of breastfeeding							
Within 1 hour	218	102(46.7)	1	144(66.1)	1	78(35.8)	1
After 1 hour	172	138(80.2)	4.61* (2.9-7.3)	112(65.1)	0.95 (0.6-1.4)	54(31.4)	0.8 (0.5-1.2)
p value		0.000*		0.846		0.364	
Prelacteal feeds							
Not given	344	203(59)	1	220(63.9)	1	100(29)	1
Given	46	37(80.4)	2.85* (1.3-6.1)	36(78.3)	2.02 (0.9-4.2)	32(69.5)	5.57* (2.8-10.8)
p value		0.005*		0.055		0.00*	
Colostrum							
Fed	315	182(57.8)	1	201(63.8)	1	97(30.8)	1
Discarded	75	58(77.3)	2.49*(1. 3-4.4)	55(73.3)	1.55 (0.8-2.7)	35(46.7)	1.96* (1.17-3.2)
p value		0.002*		0.119		0.009*	
Exclusive breastfeeding for 6 months							
Given	225	109(48.4)	1	137(60.8)	1	71(31.6)	1
Not given	165	131(79.3)	4.1* (2.5-6.4)	119(72.1)	1.66* (1.07-2.56)	61(37)	1.27 (0.8-1.9)
p value		0.000*		0.021*		0.264	
Timely complementary feeding							
Given	152	64(42.1)	1	66(43.4)	1	49(32.2)	1
Not given	238	176(73.9)	3.9* (2.5-6.01)	190(79.8)	5.15* (3.2-8.09)	83(34.8)	1.12 (0.7-1.7)
p value		0.000*		0.00*		0.591	

*Statistically significant finding; **Row percentage

Prevalence of underweight and stunting was found to be maximum in 20-22 months age group with a decline with increasing age while wasting was maximum among children in 14-16 months

age group. Sex of children was significantly associated with underweight and stunting (p<0.05). Males were more underweight (67.7%) and stunted (74.1%) than females. Caste, education and occupa-

tion of mothers had no significant association with undernutrition ($p>0.05$). However, number of family members was found to be significantly associated with underweight. Proportion of underweight was more among families having seven or more family members compared to families having 6 or fewer family members. ($p<0.05$) (Table 2)

In our study, 99% children had received breastfeeding. Early initiation of breastfeeding within one hour of birth was performed in 55.9% children. The reasons for late initiation of breast milk after birth were discomfort to the mother (44.2%), family customs and beliefs (32.6%), absence of breast milk secretion (21.5%) and caesarean section (1.7%). 11.8% had received prelacteal feeds while colostrum was discarded in 19.2% children. The common prelacteal feeds were water (47.8%); animal milk (39.2%) and sugar water (13%). Amongst the mothers who did not feed colostrum, majority (52%) were prohibited by the elderly females in the family, 22.7% were ignorant about the advantages of feeding colostrum, 20% thought that colostrum was harmful to the baby and 5.3% mothers complained of absence of milk secretion.

Total 57.7% received exclusive breastfeeding (EBF) for first six months of life while 41.3% had received breast milk with substitutes and 1% was given only breast milk substitutes. Out of the 165 children who were given breast milk substitutes, 35.8% received water and water based fluids like sugar water, tea etc and animal milk was given to 30.3% children. 47(28.5%) children were given formula milk, while 37(22.4%) of them received food based fluids as breast milk substitutes. 40(24.2%) children received breast milk substitutes by feeding bottles. Complementary feeding was started at appropriate age of six months in only 39% children. Mean age of initiation of complementary feeding was 7.3 ± 2.7 months. Complementary feeding had not been started in 7(1.8%) children during the time of survey though they had completed 12 months already. 53% mothers did not receive any advice on complementary feeding. Among the mothers who received advice for timely introduction of complementary feeding, it was obtained from the healthcare workers, guardian and peer groups.

Breast feeding practices were analyzed for their risk on undernutrition using odds ratios along with their respective 95% confidence intervals. Table 3 shows that initiation of breastfeeding after one hour of birth, prelacteal feeding, deprivation from colostrum, not exclusively breastfeeding for six months and late introduction of complementary feeding were significant risk factors for underweight at various levels of significance. Proportion of stunting was significantly more among

children who were not exclusively breastfed for six months (72.1%) and in whom complementary feeding was not started from six months onwards (79.8%).($p<0.05$) It was also observed that prelacteal feeding and deprivation from colostrum were significant risk factors for wasting. ($p<0.05$)

DISCUSSION

The present study has revealed a high prevalence of undernutrition among children of the tea garden workers with a prevalence of underweight, stunting and wasting of 61.5%, 65.6% and 33.8% respectively. In a study in tea garden population of Assam it was observed that the prevalence of underweight was 59.9% among preschool children which was almost similar to the findings of the present study.⁸ Another study reported a similar prevalence of underweight and wasting (64.6% and 39.6%) but a lower prevalence of stunting (41.7%) among children in 6-12 months age group.⁶ In another study, prevalence was found to be 45.5%, 81.8% and 9.1% respectively in 13-24 months age group which shows that underweight and wasting was much lower while stunting was much higher than our study.⁵ However, National Family Health Survey- 3 (NFHS-3) Assam reported a much lower prevalence of underweight, stunting and wasting (35.8%, 41.1% and 16.7% respectively) compared to our study which shows a grim situation of the children of the tea garden workers.³

The prevalence of underweight (67.7%) and stunting (74.1%) was found to be significantly more among males than females. However, reports from NFHS-3 Assam shows that girls and boys were equally likely to be stunted and wasted, but girls were slightly more likely than boys to be underweight.³ In another study it was observed that there were more male underweight children (37%) as compared to female children (35.4%) but stunting was more among females (63.3%) than males (44.9%).⁵

Underweight and stunting was maximum in 20-22 months age group in our study with a decline with increasing age while wasting was maximum among children in 14-16 months age group. Other studies have found that the prevalence of undernutrition is maximum among children in 1-2 year age group⁵ which signifies that children of this age group are the most vulnerable which may be related to the practice of prolonged exclusive breast feeding and delay in introduction of complementary feeding in the tea gardens; as breastmilk alone is not sufficient to satisfy nutritional needs among children beyond 6 months of age.⁶ Also higher rates of infection among them may predispose to

higher rates of undernutrition among this age group.^{6,8}

No significant association could be established between education of mothers with under nutrition in our study. However another research in the tea gardens has reported that more children were underweight whose mothers were illiterate than those whose mothers had formal schooling.⁸ Another study also found that under nutrition in terms of underweight and stunting were significantly associated with maternal education.⁵ In our study majority of the mothers were illiterates (82.8%). This shows that there is lack of awareness among the mothers irrespective of their educational status which probably adversely influences in their health seeking behavior contributing to higher rates of undernutrition. It is therefore the need of the hour to utilize every opportunity available to provide quality health and nutrition education to all the mothers of the tea garden community.

It was also observed that mother's occupation was not associated with undernutrition in our study. This may be due to the practice of breast-feeding even among working mothers as children were kept in makeshift crèche near their working site which made it possible for them to frequently breastfeed their children.⁶ Also adverse cultural practices like delay in introduction of complementary feeds with insufficient quality and quantity needed for normal growth and development of children due to widespread poverty and illiteracy may be another contributing factor for higher rates of undernutrition.

Moreover, caste was not found to be associated with undernutrition in our study. Similarly another study also could not establish any association between caste and nutritional status of children.⁵ This might be due to the fact that all the people of the tea garden community have more or less similar socio-economic status along with high rates of poverty and illiteracy along with widespread morbidities.

However, in our study the number of members in family was significantly associated with underweight as it was more prevalent among larger families with seven or more members compared to smaller families. This may be due to expected better childcare practices adopted by mothers in smaller families as they can provide more time and care for nutrition of their children. Also smaller families have a higher per capita income compared to larger families making it possible to provide higher quality of complementary feeding to their children.

Almost all children (99%) received breastfeeding in our study. Similar findings were reported by other researchers.^{3,6} Early initiation of breast feeding within one hour of birth was performed in 55.9% children. This finding supports data from NFHS-3 Assam which reported that 50.6% children were breastfed within one hour of birth.³ However another study has observed that a very low percentage of newborns were initiated breastfeeding within one hour after birth (3%).¹¹

In our study, 11.8% children were given prelacteal feeds and colostrum was discarded in 19.2% of children; the most common reason being prohibition by elderly females in the household. Thus decision of the elders in the family like mothers or mother-in-laws is vital in colostrum feeding. The practice of feeding prelacteals to newborns varied in different studies which might be due to varying cultural and religious practices prevalent in different communities.^{1,12} Also other studies have reported a highly variable prevalence of colostrum feeding of 10% and 90% respectively.^{12,13} However reports from Assam shows that nearly half of infants are deprived of the highly nutritious first milk.³

The most common breast milk substitute given during the first six months of life was water and water based fluids like sugar water, tea etc (35.8%). Another study observed that the most common breast milk substitutes given by Urban Muslims in Lucknow were water, diluted milk, toned milk, barley water, and pulse's water.¹⁴

57.7% children were exclusively breastfed during the first six months of life in our study which was lower than reports of the counterparts in Assam.^{3,6} The most common reason cited by mothers for early discontinuation of exclusive breastfeeding was insufficient breast milk production as they often felt that their babies remained hungry on exclusive breast feeding. This might be due to faulty positioning and attachment resulting in deprivation of the baby. The health workers can play a vital role in this regard by counseling and motivating the mothers, and also by demonstrating the correct positioning and attachment to ensure exclusive breastfeeding. The contact of the mothers with the health workers at the time of immunization can be utilized for this purpose. Delay in initiation of complementary feeding after six months of age was observed in majority (49.7%) of the children. The findings were almost similar to other studies.^{6,14} Majority of the mothers (53%) did not receive any advice on complementary feeding. This shows the requirement for improved counseling of mothers by the health workers on the importance of timely initiation of complementary feeding and the need for improving health seeking behavior of

mothers and family members through intensive nutrition education programmes.

In our study it was seen that delayed initiation of breastfeeding, feeding of prelacteals, deprivation from colostrum, not exclusively breastfeeding for six months and delayed introduction of complementary feeding were significant risk factors for underweight. The risk of stunting was higher among children who were not exclusively breastfed for six months and in children who were not timely given complementary feeding. Also feeding of prelacteals and deprivation from colostrum were significant risk factors for wasting. In an earlier study it was observed that delayed initiation of breastfeeding, deprivation from colostrum, and improper complementary feeding were significant risk factors of underweight. Risk of stunting was more in case of late initiation of breast-feeding and deprivation from colostrum. However they could not establish any association between any of the infant feeding practices with wasting.⁵ In another study, exclusive breast-feeding along with timing of initiation of breastfeeding and age at introduction of complementary feeding were significantly associated with nutritional status of children.¹⁵ This shows that adequate and appropriate breast feeding practices play a vital role in improving the nutritional status of children.

Limitation: Our study was cross-sectional and suffers some bias as the data on breastfeeding practices had to be collected from mothers by recall method, so limitation of these methods may occur.

CONCLUSION

The present study brings to light that there is a high prevalence of undernutrition among the study population. Delayed initiation of breastfeeding, use of prelacteal feeds, deprivation from colostrum, not exclusively breast feeding for six months and improper complementary feeding are some of the common problems which act as significant risk factors to undernutrition among the infants and young children in this community.

Education to pregnant and lactating mothers and also elderly women on protection and promotion of optimal feeding practices can prove fruitful in improving the current nutritional status among the children of the tea garden community.

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