Breastfeeding Practices and Nutritional Status of Preschool Children among the Shabar Tribal Community in Orissa, India

Suman Chakrabarty, Rohini Ghosh, Premananda Bharati

Abstract

A cross sectional study on 101 mothers and their last child (58 males and 43 females) aged upto 5 years was undertaken among Shabar tribal community in Khurda and Cuttack districts of Orissa. The study aimed to determine the association and effect of breastfeeding practices on child undernutrition along with some socio-economic and socio-demographic variables. Weight & mid upper arm circumference (MUAC) of children and height and weight of mother were measured by standard techniques. Weight for age and MUAC for age (z-scores) were calculated for assessing child nutritional status using WHO standard (2006), whereas body mass index (BMI) was computed and used for mother's nutritional status. Below two standard deviation of weight for age and MUAC for age were considered as underweight and undernutrition among children. Results revealed that 50% children were underweight (weight for age) and 36% percent were undernourished (MUAC for age). About 50% children were given breastfeeding after 24 hours and exclusive breastfeeding were discontinued in 51% children before attaining 6 months of age. The prevalence of underweight were significantly ($p<0.05$) associated with age of children and undernourished mothers. Initiation of breastfeeding after 24 hours was found to be significantly ($P<0.05$) associated with male children and mother's occupation. Result also revealed that high percentage of mothers (51.7%) with primary level of education stopped exclusive breastfeeding before 6 months ($P<0.05$). Estimation of odd ratio (OR) suggested that exclusive breastfeeding less than 6 months is a risk factor for underweight children.

Introduction

Breastfeeding is considered as the first four strategies promoted by UNICEF for improving infant and child survival as reported by Grant (1984). This may enhance child survival up to 3 years of age even in undernourished children (Brined et al, 1988). Black et al in 2003 found that malnutrition in the form of undernutrition is the underlying cause of a substantial proportion of all child deaths particularly in developing countries like India which has strong association with improper infant feeding practices among preschool children (Kumar et al, 2006). It is well known that both developed (Hediger et al, 2000) and non-developed countries (Adair et al, 1993), breastfeeding provides adequate and appropriate nutrients for infant's growth and development (Dewey et al, 1995), reduction in infant mortality and morbidity (Booth, 2001), protects infants against infections and promotes their survival (Ramachandran, 2004). In 2001, World Health Assembly resolved that exclusive breastfeeding for the 6 months is the most appropriate infant feeding practice (WHO, 2001). On the basis of this resolution the traditional practices of breastfeeding was promoted but exclusive breastfeeding up to 6 months and energy dense semi solid supplements are still problematic in South Asian countries like India (Ramachandran, 2004) and tribal communities are not the exception and probably they are the most vulnerable groups of India.

In consideration of the improper breastfeeding practices, there are several socioeconomic factors affecting the way of breastfeeding practices, which varies from community to community and that includes low parental education (Hasan et al, 1991; Mikiel- Kostyra et al, 2005), specially low level of mother's education (Bertini et al, 2003), mother employment (Dearden et al, 2002; Mahgoub et al, 2002) and other poor socioeconomic status (Yadava et al, 1999) etc. Poor socioeconomic condition results not only shorter duration of breastfeeding but also those women with higher education with high economic level have lower duration of breastfeeding according to the findings observed by Giashuddin and Kabir (2004).

The tribal populations are practicing extended breastfeeding (Sharma and Sharma, 1991) but they have high level of malnutrition among preschool children and were significantly related with improper way of feeding practices (Chirmulay and Nisal, 1993). Some of the major obstacles to the practice of breastfeeding among tribal communities are ignorance and taboos concerning food and feeding according to Vimala and Ratnaprabha (1987); Sinha and Panda, (1998) as well as high prevalence of undernourished mothers (Taneja and Saxena, 1998) along with their poor socioeconomic condition (Panpanich et al, 2000).

The present study has been carried out to explore the nutritional status of preschool children along with some socioeconomic and demographic factors and also mother's nutritional status to assess the association and effect of breastfeeding practices with undernourished children among the Shabar tribal community in Khurda and Cuttack district of Orissa.

Material and Methods

1. Study population: Shabar is widely populated tribal community in Orissa. They speak regional Oriya language and practicing some Hindu way of religious life. They are settled in different geographical location like urban, rural and forest areas (Patanaik, 1990). This may force them to adopt different ecological conditions, which is reflected through potential differences in socioeconomic and demographic conditions. This situation provides an excellent opportunity to study how these different socioeconomic scenario affect the breastfeeding practices among the Shabar tribal community.

2. Data: The sample of the present study was collected from nine settlements (complete enumeration) of urban (Baragad, Nayapalli, and Siripur), rural (Jamujhari, Bindhagiri and Chattabar) and forest (Dahan Gadia, Nuakua and Behentashai) areas on the basis of their socioeconomic as well as settlement conditions in Khurda and Cuttack districts of Orissa, inhabited by the Shabar tribal population. The present sample was drawn from 101 mothers and their respective last child (58 males and 43 females) aged up to 5 years. The data was collected during January 2005. Though no statistical sampling method was applied but sample was selected as per the objective of the study and willing participants.

3. Data collection: Socioeconomic and demographic information such as age of the child and mother, birth order, mother's education and occupation as well as breast feeding practices like initiation of breastfeeding and exclusive breastfeeding duration was collected using of proper prestructured schedule. Height, weight and mid upper arm circumference (MUAC) were measured following IBP recommendation (Weiner and Lourie, 1981).

4. Methodology: In case of children, weight and mid upper arm circumference (MUAC) measurements were converted into indices of nutritional status like weight for age and MUAC for age using WHO standards (WHO, 1995, 2006). Weight for age and MUAC for age were classified as underweight (<-2.00 SD of weight for age) and undernutrition (<-2.00 SD of MUAC for age). On the other hand, height and weight of the respective mother were converted in to body mass index (BMI) (kg/m^2) and classified according to thinness of mother (WHO, 1995). Children breastfeeding practices were classified as initiation of breastfeeding within 24 hours of birth and after 24 hours and exclusive breastfeeding duration less than 6 months and above. Chi- square test was performed for testing the association between different attributes of breastfeeding practices and other socioeconomic and demographic variables. Risk factor analysis was carried out using odds ratios (OR) along with their respective 95% confidence intervals (CI) for finding risk factor for undernourished preschool children.

5. Age estimation: Assessment of exact age is very much important for a nutritional study. It is a general experience of field workers that exact age assessment of children in the rural area especially from the tribal communities is very difficult due to ignorance, illiteracy and lack of any written records. The ages of the children were ascertained from the *Anganwadi* admission register book. Ages of most of the children were also estimated and cross checked from the reference to the events remembered such as some important festivals, visiting of some eminent personalities, sibling in the family, horoscopes, storm, flood etc. The aged members of the households along with the ward member and the clan chief also confirmed the ages of the children. The age of the child was recorded in complete years.

Results

Table 1 shows nutritional status and breastfeeding practices among the Shabar tribal children in relation to their different socioeconomic and demographic characteristics and also mother's nutritional status. In all studied children, 50.5 percent were underweight (weight for age) and 35.6 percent were undernourished (MUAC for age). While 49.5 percent of children were initiated to consume breast milk after 24 hours of their birth and 51.3 percent discontinued exclusive breastfeeding before 6 months of their age.

There were increasing trends in the prevalence of underweight according to their age. Maximum prevalence of underweight (71.4 %) was noticed in 48-60 months age group. In the same age group, 64.3 percent of children were initiated to consume breast milk after 24 hours of birth and 42.9 percent were completed exclusive breastfeeding within the duration of six months. Though the higher percentage of discontinuation of exclusive breastfeeding before 6 months (63.2%) was noticed in infancy (0-12 months age group). Male children showed higher prevalence of underweight (58.6%) than female children (39.5%). Compared to female children, higher percentage of male children were initiated breast milk after 24 hours of birth (male 58.6% and Female 37.2%) and vice versa in case of discontinuation of exclusive breastfeeding before 6 months (Male 50% and Female 55.8%). However under nutrition on the basis of MUAC for age, female children (37.2%) were observed more undernourished than male children (34.5%).

Maximum prevalence of underweight (57.9%) as well as under nutrition (39.5%) was found among rural preschool children along with highest percentages of delayed initiation of breast milk (57.9%) and exclusive breastfeeding less than 6 months (55.3 %). Prevalence of underweight and under nutrition was more or less same according to mother age during childbirth below or above 25 years of age.

Table 1: Nutritional status and breast-feeding practices of children in relation to socio-demographic characteristics and mother nutritional status

Characteristics	n	Nutritional status		Breast-feeding practices	
		Underweight (<-2.00 SD Weight for age)	Undernutrition (<-2.00 SD MUAC for age)	Initiation of BF >24 hours	Exclusive BF < 6 months
Children age (months)					
0-12	19	4 (21.1)	3 (15.8)	8 (42.1)	12 (63.2)
13-24	19	10 (52.6)	10 (52.6)	11 (57.9)	8 (50.0)
25-36	22	12 (54.5)	6 (27.3)	10 (45.5)	11 (50.0)
37-48	27	15 (55.6)	11 (40.7)	12 (44.4)	14 (51.9)
48-60	14	10 (71.4)	6 (42.9)	9 (64.3)	8 (57.1)
Sex of child					
Male	58	34 (58.6)	20 (34.5)	34 (58.6)	29 (50.0)
Female	43	17 (39.5)	16 (37.2)	16 (37.2)	24 (55.8)
Habitation					
Urban	34	16 (47.1)	10 (29.4)	19 (55.9)	16 (47.1)
Rural	38	22 (57.9)	15 (39.5)	22 (57.9)	21 (55.3)
Forest	29	13 (44.8)	11 (37.9)	9 (31.0)	16 (55.1)
Mother age during child birth (years)					
? 25	37	19 (51.4)	15 (40.5)	20 (54.1)	17 (45.9)
>25	64	32 (50.0)	21 (32.8)	30 (46.9)	36 (56.3)
Birth order of children					
1-2	38	21 (55.3)	15 (38.5)	19 (50.0)	23 (60.5)
3-4	36	16 (44.4)	10 (27.7)	14 (38.9)	14 (38.9)
? 5	27	14 (51.9)	11 (40.7)	17 (63.0)	16 (59.3)
Mother's education					
Illiterate	56	24 (42.9)	19 (33.9)	30 (53.6)	23 (41.1)
Primary (Class I-IV)	29	20 (68.9)	10 (34.5)	15 (51.7)	21 (72.4)
Above primary (Class V-X)	16	7 (43.8)	7 (43.8)	5 (31.3)	9 (56.3)
Mother's occupation					
Agriculture	29	12 (41.4)	10 (34.5)	9 (31.0)	15 (51.7)
Housewife	33	16 (48.5)	9 (27.3)	15 (45.5)	16 (48.5)
Daily labour	39	23 (58.9)	17 (43.6)	26 (66.7)	22 (56.4)
Mother's nutritional status (BMI)					
<16.00 (Severe thinness)	15	6 (40.0)	5 (33.3)	9 (60.0)	5 (33.3)
16.00 - 16.99 (Moderate thinness)	12	11 (91.7)	10 (83.3)	6 (50.0)	8 (66.7)
17.00 - 18.49 (Mild thinness)	35	16 (45.7)	9 (25.7)	20 (57.1)	20 (57.1)
? 18.50 (Normal and above)	39	18 (46.2)	12 (30.8)	15 (38.5)	20 (52.6)
Overall	101	51 (50.5)	36 (35.6)	50 (49.5)	53 (51.3)

Note : Figures in parentheses show the percentage

Though the prevalence of underweight (55.3%) was found to be higher among 1-2 birth order of children, but high prevalence of underweight (51.9%) as well as undernutrition (40.7%) was also observed among 5th or higher order children. In the same group, 63 percent children received first breast milk after 24 hours of their birth and 59.3 percent stop exclusive breastfeeding before 6 months.

In case of primary educated mothers, the prevalence of underweight (68.9%) was highest along with 72.4 percent of them stop their exclusive breast feeding before 6 months. Both underweight and undernutrition were highly prevalent among children whose mothers were daily labour (58.9% underweight and 43.6 % undernutrition) compared to those of housewives and women engaged in agricultural activity. Similarly, the initiation of breast milk after 24 hours (66.7%) and discontinuation of exclusive breast feeding before 6 months (56.4%) among daily labour mothers was also higher. The highest percentages of underweight (91.7%) and undernutrition (83.3%) were observed among children of moderate thinness of mother and 66.7 percent of them stop their exclusive breastfeeding before 6 months.

Table 2 shows that underweight was significantly associated with children age and with mother nutritional status. On the other hand, child sex and mother's occupation had significant relation ($p<0.05$) with initiation of breast feeding after 24 hours and exclusive breast feeding less than 6 months with mother's education.

Table 2: Associations (Chi- Square test) of nutritional status and breast-feeding practices of children in relation to socio-demographic characteristics and mother nutritional status

Characteristics	Nutritional status		Breast-feeding practice	
	Underweight (<-2.00 SD Weight for age)	Undernutrition (<-2.00 SD MUAC for age)	Initiation of BF > 24 hours	Exclusive BF < 6 months
Children age (months)	9.50*	6.95	2.60	1.87
Sex of child	3.60	0.08	4.53*	0.34
Habitation	1.37	0.89	5.58	0.60
Mother age during child birth	0.02	0.61	0.48	0.99
Birth order of children	0.89	1.52	3.58	4.15
Mother's education	5.56	0.55	2.56	7.63*
Mother's occupation	2.14	2.09	8.77*	0.46
Mother's nutritional status	10.28*	14.26**	3.99	4.58

(* $p<0.05$, ** $p<0.01$)

Breast feeding practices were analyzed for their effects on underweight (weight for age) and undernutrition (MUAC for age) using odds ratios along with their respective 95% confidence intervals (Table 3). The proportions of underweight among children who had exclusive breastfeed for less than 6 months were significantly higher ($p<0.01$) than those who were breastfed more than 6 months. The prevalence of underweight was found to be higher among children (58.0%), who were initiated breast milk after 24 hours of birth than those who received within 24 hours of birth (43.1%) but the difference was not significant.

Table 3: Breast-feeding practices and nutritional status of children

Feeding practice	n	Nutritional status			
		Underweight (<-2.00 SD Weight for age)		Undernutrition (<-2.00 SD MUAC for age)	
		N (%)	OR (CI)	N (%)	OR (CI)
Initiation of BF					
Within 24 hours	51	22 (43.1)	1.00	18 (35.3)	1.00
After 24 hours	50	29 (58.0)	1.85 (0.80-4.25)	18 (36.0)	1.05 (0.46-2.39)
Exclusive BF					
6 months and above	48	17 (35.4)	1.00	16 (33.3)	1.00
Less than 6 months	53	34 (64.2)	2.97* (1.29-6.84)	20 (37.7)	1.13 (0.49-2.60)
Overall	101	51 (50.5)		36 (35.6)	

* $p<0.01$

Discussion

The present study showed that preschool children of the Shabar tribal community in Orissa were suffering from underweight (<-2 SD weight for age), which is an essential and rapid indicator to assess nutritional status in children (Tewari et al., 2005) as well as undernutrition (<-2.00 SD MUAC for age), and also a potential indicator of child malnutrition (Roy, 2000). WHO (2001) considered that exclusive breast feeding for the first 6 months was the most appropriate infant feeding practice but in most of the studied children breast milk was initiated after 24 hours of birth and exclusive breastfeeding stopped before completion of 6 months of age. Therefore, these may be the major causes for high prevalence of malnutrition among preschool children. The high prevalence of malnutrition among tribal children of Ahmadnagar was also significantly related with poor feeding practice (Chirmulay and Nisal, 1993). There was a significant increase in proportion of underweight with increase of age of children, and initiation of delayed breastfeeding (after 24 hours of birth) and lower duration of exclusive breastfeeding (less than 6 months) along with their improper complementary food consumption. Other studies have also reported maximum prevalence of underweight in 13-24 months of age (similar to the present study) on the basis of <-2.00 SD MUAC for age) which decreases with increase in age of children (Kumar et al., 2006). There was a clear gender difference ($p<0.05$) observed in initiation of breast feeding as well as in exclusive breastfeeding duration. The prevalence of underweight and undernutrition was high in rural children than urban and forest living children, which may due to more mothers engagement in agricultural and daily labour activities or it may be due to introduction of early and also extended (Sharma and Sharma, 1991) traditional mode of giving breast feeding by forest mothers. Primary level educated mothers were not able to give optimal level of exclusive breast feeding, it may be due to ignorance (Vimala and Ratnaprabha, 1987) and insufficient knowledge of mothers regarding breast feeding pattern. Besides these, the prevalence of underweight and undernutrition were significantly higher among thin

mother than normal mother. It may be due to the fact that undernourished mothers were not able to give optimal breastfeeding to their children. Exclusive breastfeeding for less than 6 months may be a significant risk factor for high prevalence of underweight among Shabar preschool children. It is felt that there is an urgent need to inform women about the importance of early and extended breastfeeding among the Shabar tribal community.

References

Adair L, Popkin BM, VanDerslice J, Akin J, Guilkey D, Black R, Briscoe J, Flieger W 1993. Growth dynamics during the first two years of life: a prospective study in the Philippines. Eur. J. Clin. Nutr. Vol.47. pp.42- 51.

Bertini G, Perugi S, Dani C, Pezzati M, Tronchin M, Rubaltelli FF. 2003. Maternal education and the incidence and duration of breastfeeding: a prospective study. Pediatr. Gastroenterol. Nutr. Vol.37. pp.447- 452.

Black RE, Morris SS, Bryce J. 2003. Where and why are 10 million children dying every year. Lancet. Vol. 361. pp.2226- 2234.

Booth I .2001. Does the duration if breast feeding matter? B.M.J.Vol. 322. pp.625- 626.

Briend A et al. 1988. Breastfeeding, nutritional state and child survival in rural Bangladesh. B.M.J. Vol. 296. pp.879–882.

Chirmulay D , Nisal R 1993. Nutritional status of tribal underfive children in Ahmadnagar district, Maharashtra in relation to weaning/ feeding practices. Indian Pediatr. Vol.30.pp. 215- 222.

Dearden K, Altave M, De Maza I, De Oliva M, Stone- Jimenez M, Morrow AL, Burkhalter BR. 2002. Determinants of optimal breast feeding in peri- urban Guatemala City, Guatemala. Rev. Panam. Salud Publica. Vol. 12. pp.185- 192.

Dewey KG, Peerson J, Brown K, Krebs N, Michaelson K, Persson L, Salmenpera L, Whitehead R, Yeung D. 1995. Growth of breast fed infants deviates from current reference data: a pooled analysis of US, Canadian and European data sets. Pediatr. Vol. 96. pp.495- 503.

Giashuddin MS, Kabir M. 2004. Duration of Breast feeding in Bangladesh, Indian J. Med. Res. Vol. 119. pp.267- 272.

Grant JP. 1984. The state of the world's children. Oxford University Press: Oxford.

Hasan J, Khan Z, Sinha SN. 1991. Socio- cultural factors influencing nutritional status of infants – a longitudinal study. Indian J. Matern. Child Health. Vol. 2. pp.84- 86.

Hediger ML, Overpeck MD, Ruan WJ, Troendle JF. 2000. Early infant feeding and growth status of US born infants and children aged 4- 71 mo: analyses from the third National Health and nutrition examination survey, 1988- 1994. Am. J. Clin. Nutr. Vol. 72. pp.159- 167.

Kumar D, Goel N, Mittal PC, Misra P. 2006. Influence of infant-feeding practices on nutritional status of underfive children. Indian J. Pediatr. Vol. 73. pp.417- 421.

Mahgoub SE, Bandeke T, Nnvepi M. 2002. Breast feeding in Botswana: practices, attitudes, patterns and the socio- cultural factors affecting them. J. Trop. Pediatr. Vol. 48. pp.195-199.

Mikiel- Kostyra K, Mazur J, Wojdan- Godek E. 2005. Factors affecting exclusive breastfeeding in Poland: cross- sectional survey of population based samples. Soz. Praventivmed. Vol. 50. pp.52- 59.

Panpanich R, Vitsupakorn K, Chareonporn S .2000. Nutritional problems in children aged 1- 24 months: comparison of hill- tribe and Thai children. J. Med. Assoc. Thai. Vol. 83. pp.1375- 1379.

Patnaik T .1990. Shabar. In: RM Senapati (ed.): Tribes of Orissa. Harijan and Tribal Welfare Published: Orissa.

Ramachandran P .2004. Breast feeding practices in South Asia. Indian J. Med. Res. Vol.119 .pp.13-15.

Roy NK .2000. Use of mid upper arm circumference for evaluation of nutritional status of children and for identification of high-risk groups for malnutrition in rural Bangladesh. J. Health Popul. Nutr. Vol. 18. pp.171-180.

Sharma V, Sharma A .1991. Family planning practices among tribals of South Rajasthan, India. J. Res. Educ. Indian Med. Vol. 10. pp.5-9.

Sinha A, Panday H .1998. Maternal and infant feeding practices of Ho tribe women in Bihar. Ind. J. Nutr. Dietet. Vol. 35. pp.325- 328.

Taneja PV, Saxena M. 1998. Nutritional anthropometry of Bhil women in Jhabua district of Madhya Pradesh. Ind. J. Nutr. Dietet. Vol. 35. pp.98-102.

Tewari P, Shekhawat N, Choudhary S. 2005. Use of nutritional anthropometry and clinical examination in the assessment of nutritional status of children. Man In India. Vol. 85.pp. 49-60.

Vimala V , Ratnaprabha C. 1987. Infant feeding practices among tribal communities of Andhra Pradesh. Indian Pediatr. Vol. 24. pp.907-910.

Weiner, JS , Lourie, JA. 1981. Practical Human Biology, Academic Press: Oxford.

World Health Organization. 1995. Physical Status. The Use and Interpretation of Anthropometry. WHO technical report No. 854. Geneva : WHO.

World Health Organization. 2001. Infant and young child nutrition resolution 54.2 of the world health assembly. Resolution and decisions of the 54th world health Assembly, 14-22 May, 2001.

World Health Organization. 2006. WHO Child Growth Standards. Methods and Development. Geneva : WHO.

Yadava KN, Jain SK, Kumar A. 1999. Breastfeeding in rural northern India: levels and differentials. Warasan Prachakon Lae Sangkhom. 8. pp.107- 141.