

## **A study of nutritional status of infants in relation to their complementary feeding practices.**

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### **Abstract**

**Infant and Young Child Feeding (IYCF) practices are the most important determinants of nutritional status of children. The objective of this study was to find out the prevailing complementary feeding practices and analyze their impact on infant growth in an urban slum community. The study was conducted in an urban slum community of central Karnataka. The IYCF practices were recorded using a semi-structured questionnaire. The nutritional status was assessed using WHO growth charts. The relationship between feeding practices and nutritional status was analyzed. Results: Prevalence of Exclusive breastfeeding for 6 months was 68%. Complementary foods were introduced at appropriate age in 55% of infants. 72% of infants were receiving thick (energy dense) complementary foods. 61% were fed adequate amount of complementary foods. The prevalence of wasting at one year was 34% and stunting was 32%. Higher prevalence of malnutrition was noticed in infants in whom complementary feeding was initiated before six months and in whom complementary feeding was inadequate, or inappropriate.**

**Keywords:** IYCF; Complementary feeding; Exclusive breastfeeding; Urban slums, Malnutrition.

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### **Introduction**

Adequate nutrition is important during the critical period from birth to two years for the promotion of optimal growth, health and behavioral development of children<sup>1</sup>. Infant and young child feeding practices are an important determinant of nutritional status. As a global health policy for both developing and developed countries, WHO recommends exclusive breastfeeding for six months, followed by a combination of continued breastfeeding and safe, appropriate and adequate feeding with other foods [1]. Very few mothers (46.3 %) in our country are practicing exclusive breastfeeding for first 6 months. Only 23 % of newborns received breast milk within first hour of life and the proportion of infants between 6-9 months receiving solid or semi-solid food and breast milk is only 55.8 % [2]. The nutritional status of children in the community is also alarming. Prevalence of stunting and wasting in children aged less than 3 years is 44.9 % and 22.9 % respectively [2]. Appropriate feeding practices in the community can substantially im-

prove the nutritional status of children and bring down morbidity [3]. Globally, interventions in feeding practices can reduce the childhood mortality significantly [4]. The objective of the study was to find out the prevailing complementary feeding practices and analyze their impact on infant growth in an urban slum community.

### **Methodology**

The study was conducted in five urban slum areas in central Karnataka, with a total population of 23,061. A total of hundred infants, between nine months to one year, were studied. Infants with Low birth weight (< 2.5 kg), born out of multiple gestations pregnancy, born premature or those with significant congenital malformations and chronic illness were excluded. Data on feeding practices was collected by interviewing mothers using a pre-tested semi-structured schedule. The nutritional status of infants was assessed by anthropometry. Height and length of the children at one year was plotted on WHO growth charts. The children were divided into different groups based on the complementary feeding practices. Prevalence of wast-

ing (weight for length below 3<sup>rd</sup> percentile) and stunting (length below 3<sup>rd</sup> percentile) were calculated for different groups. The relationship between feeding practices and nutritional status was analyzed.

## Results

Amongst the infants studied, 43 % were females and 57 % were males, 88 % were hospital born and 12 % were home born. Prevalence of Exclusive breastfeeding for six

months was 68%. 72% of infants at one year were receiving thick complementary foods. 61% of infants at one year were fed adequate amount of complementary foods. Breastfeeding rate at one year was 100% and prevalence of bottle-feeding was 2%. The prevalence of wasting at one year was 34% and stunting was 32%.

Higher prevalence of malnutrition was noticed in infants in whom complementary feeding was initiated before six months ( $P < 0.001$ ), in whom complementary feeding was inadequate ( $P = 0.001$ ) or inappropriate ( $P < 0.001$ ).

**Table 1.** Relationship between complementary-feeding practices and nutritional status

Characteristic	Wasting		Chi square, p value	Stunting		Chi square, p value
	Present	Absent		Present	Absent	
<i>Introduction of complementary feeding</i>			$X^2$ : 35.26 p value: <0.001			$X^2$ : 26.02 p value: <0.001
Less than 6 months	24	08		21	11	
7 to 9 months	8	47		7	48	
After 10 months	2	11		4	9	
<i>Nature of complementary food</i>			$X^2$ : 19.72 p value: <0.001			$X^2$ : 24.28 p value: <0.001
Liquid	18	10		20	8	
Semi solid	14	32		9	37	
Solid	2	24		5	21	
<i>Frequency of complementary feeding</i>			$X^2$ : 16.78 p value: 0.001			$X^2$ : 29.7 p value: 0.001
<3 times	15	6		17	04	
3-5 times	16	53		14	55	
>5 times	03	07		01	09	

## Discussion

The present study throws light on complementary feeding practices and their effect on nutritional status of infants. For optimal growth and development of children, complementary foods should be started at 6 months of age and the quantity and consistency gradually increased, as the child gets older, while maintaining frequent breast-feeding [1]. In the study 55 % of the infants were given complementary foods between seven and nine months of age compared to national average of 59.4 % as per NFHS 3 data. In a study done by Banapurmath CR et al, the timely complementary feeding rate was 57.3% [5].

For the average healthy breastfed infant, meals of complementary foods should be provided two to three times per day at six to eight months of age and three to four times per day at nine to eleven months and twelve to twenty four months of age, with additional nutritious snacks (such as a piece of fruit or bread or chapatti with nut paste) offered one to two times per day, as desired. In the study, 29 % of infants were given complementary feeding less than three times a day, 61 % were fed three to five times per day and 5% were fed more than five times per day. Amongst the infants studied, 28 % were given

thin complementary foods (less energy dense), 46 % were given semisolid and 26 % were given solid complementary foods. In a study done by Agarwal et al. at Delhi, 39.3% of mothers were giving three or more feeds per day to children between six months to two years and majority were giving thin feeds 62% [6].

Time and again, the need for timely introduction of complementary feeds has been demonstrated, still many mothers initiate complementary foods early or later than what is recommended. Also the study demonstrates that, complementary foods fed to many infants are both inappropriate (less energy dense) and inadequate.

In the study population 34 % were wasted and 32 % were stunted. According to NFHS 3, Children under 3 years who are stunted are 44.9 %. Prevalence of wasting in children aged less than 3 years is 22.9 % and prevalence of underweight is 40.4 % [2]. Similar results were obtained in a study on children living in 2 urban slums of Delhi where the prevalence of malnutrition was found to be 26 % [7].

Prevalence of malnutrition at the magnitude demonstrated by the present study and various other studies is alarming

and hence appropriate steps taken to reduce it are the need of the hour.

The study shows that the prevalence of malnutrition (wasting or stunting) in non exclusively breastfed infants was more compared to exclusively breastfed infants  $P (<0.001)$ . In a study conducted in a resettlement colony in Delhi, prevalence of malnutrition was significantly high in babies given complementary foods before completion of 6 months [8]. A comparative prospective study has shown that infants who were exclusively breastfed for 6 months had median weights above the 50th percentile of the WHO/NCHS reference; furthermore, the mean weight of these babies at 6 months was above those babies who started complementary feeding before 6 months [9]. The study shows that, the risk of malnutrition is increased by improper complementary feeding practices. The same is demonstrated by several other studies [8,9,10,11].

In conclusion, the complementary feeding practices in the study community were poor. Steps must be taken to improve the feeding practices in this community. The correlation of poor feeding practices with poor nutritional status further justifies this measure. Further large community based studies are required to determine if measures such as health education can change existing infant feeding practices and bring down prevalence of malnutrition.

## References

1. PAHO/WHO. Guiding principles for complementary feeding of the breastfed child. Washington, DC/Geneva, Switzerland: PAHO/WHO, 2004.
2. International Institute for Population Sciences (IIPS) and Macro International. 2007. National Family Health Survey (NFHS-3), 2005–06: India: Volume I. Mumbai: IIPS.
3. Bhandari N, Mazumder S, Bahl R, Martines J, Black R E, Bhan M K et al. An educational intervention to promote appropriate complementary feeding practices and physical growth in infants and young children in rural Haryana India. *J Nutr* 2004; 134: 2342-48.
4. Jones G, Steketee R W, Black R E, Bhutta Z A, Morris S S. How many child deaths can we prevent this year? *The Lancet* 2003; 362:65-71.
5. Banapurmath CR, Nagaraj MC, Banapurmath S, Kesaree N. Breastfeeding practices in villages of central Karnataka. *Indian Pediatr* 1996; 33:477-479.
6. Aggarwal A, Verma S, Faridi MMA, Dayachand. Complementary feeding - Reasons for inappropriateness in timing, quantity and consistency. *Indian J Pediatr* 2008; 75:49-53.
7. Aneja B, Singh P, Tandon M, Pathak P, Singh C, Kapil U. *Indian Pediatrics* 2001 Feb;38(2):160-165.
8. Tarozzi A Growth reference charts and the nutritional status of Indian children. *Econ Hum Biol* 2008; 6(3): 455-68. Epub 2008 Jul 26. Khokhar A, Singh S, Talwar R, Rasania SK, Badhan SR, Mehra M. A study of malnutrition among children aged 6 months to 2 years from a resettlement colony of Delhi. *Indian J Med Sci* 2003; 57:286.
9. Onayade AA, Abiona TC, Abayomi IO, Makanjuola RO. The first six month growth and illness of exclusively and non exclusively breastfed infants in Nigeria. *East Afr Med J* 2004; 81(3): 146-53
10. Kumar D, Goel N K, Poonam C. Mittal and Misra P. Influence of Infant-feeding Practices on Nutritional Status of Under-five Children. *Indian J Pediatr* 2006; 73 (5): 417-421.
11. Aashima Garg and Ravinder Chadha. Complementary Feeding-A Challenge to Be Addressed in Rural Uttar Pradesh, India. *Pak. J. Nutr*, 8 (4): 505-506, 2009.

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