

## Original Research Article

# Prevailing pattern of feeding practices and malnutrition among infant and young children

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### ABSTRACT

**Background:** Nutritional factors like breast feeding practices, weaning practices and diet during illness influence the growth and development of children. Recurrent infections are other important factors that lead to malnutrition.

**Methods:** This was a non-randomized prospective study using pretested, predesigned questionnaires. Study was done in a single centre to determine the pattern of feeding practices and malnutrition among infant and young children. This study was carried out in the Department of Paediatrics at Sri Manakula Vinayagar Medical College and hospital, Puducherry.

**Results:** Out of the 200 babies studied, 22% of the babies were exclusively breast fed and 5% of the babies were bottle fed. The remaining 73% of the babies were on both breasts feeding and bottle feeding. A 52% of children in the age group 6-12 months, 50% children under 12-24 months and 52% of children >24 months were found to be malnourished according to WHO growth standards.

**Conclusions:** Quantity and quality of complementary feeds given is inadequate due to lack of awareness, fear and food stigmata. Hence feeding practices are far from satisfactory. Complementary feeding and weaning practice guidelines are better practiced as the age advances but their practice at a younger age would lead to a better outcome.

**Keywords:** Breast feeding, Complementary feeding, Infant, Malnutrition

### INTRODUCTION

Optimum nutrition is essential for child survival and Quality of survival. The word nutrition is derived from nutritus which means "To suckle at the breast".<sup>1</sup> Nutrition is defined as "The process by which the organism utilizes food".

It signifies the dynamic process in which the food that was consumed utilized for nourishing the body.<sup>2</sup> "Malnutrition is found to start in the womb and ends in the tomb".<sup>1</sup> Severe forms of malnutrition like marasmus and Kwashiorkor represent only a tip of the iceberg.<sup>2</sup> Many more suffer from moderate, mild (or) invisible

PEM malnutrition which increases morbidity and mortality.

Nutritional factors like breast feeding practices, weaning practices and diet during illness influence the growth and development of children. Recurrent infections are other important factors that lead to malnutrition.<sup>3</sup> The aim of the study was to assess the breast-feeding practices of children up to 6 months, to know the continued breast-feeding practices beyond 6 months, to evaluate the complementary feeding pattern in young children, to compare the same with IMNCI guidelines, to correlate the feeding practices and nutritional status in various age groups.

**METHODS**

This was a non-randomized prospective study using pretested, predesigned questionnaires. Study was done in a single centre to determine the pattern of feeding practices and malnutrition among infant and young children. Infant and young children, who were attending the out-patient, ward well-baby clinic at Department of Pediatrics were the study subject.

**Inclusion criteria**

- Infant and young children attending out-patient department/ward/well baby clinic for minor complaints, and observation.
- Children accompanying the adult visitor to the hospital were also included.

**Exclusion criteria**

- Children with moderate and severe illness were excluded from the study.

This study was carried out in the Department of Paediatrics at Sri Manakula Vinayagar Medical College and Hospital, Puducherry. A questionnaire with general background information and the feeding practices based on guidelines of IMNCI (Integrated management of neonatal and childhood illnesses) and IYCF (Infant and young child feeding) was prepared and administered. The study was explained to the care givers. Answers were recorded in pretested and predesigned performa. Initially questions printed in the performa were explained to the caregivers in local language, doubts were cleared. Absolute privacy and confidential was ensured study subjects were requested to answer without fear, prejudice (or) inhibition. They were given adequate time to answer. Literate caregivers recorded the answer in the Performa on their own. Illiterate caregivers were questioned, and their responses were recorded. The questions were explained again whenever the caregivers wanted. Care givers who were not able to respond properly were eliminated from the study group. Responses given by the caregivers were crosschecked for their understanding of the concept. Absolute care was taken to avoid other respondents being influenced by the answers of one. To assess the nutritional status which is the part of study, weight and height of each child was recorded as per WHO growth charts.

**Statistical analysis**

The results were statistically analysed using SPSS software version 24.

**RESULTS**

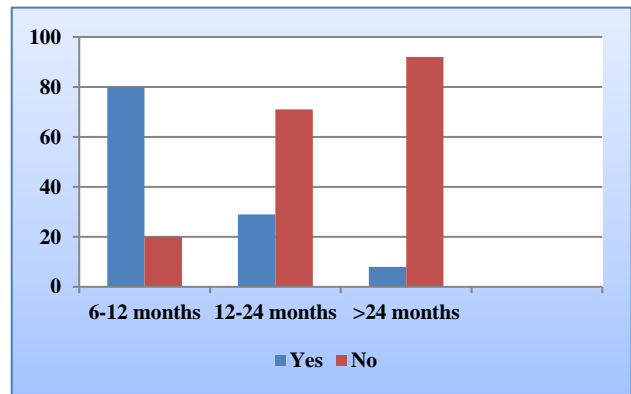
Out of the 200 babies studied, 22% of the babies were exclusively breast fed and 5 % of the babies were bottle fed. The remaining 73% of the babies were on both breast

feeding and bottle feeding, this has been depicted in Table 1. Of all the babies studied 70% of the babies were given colostrum, where as 30% of the babies were deprived of colostrum, as it was either discarded or the child was not breastfed.

**Table 1: Feeding practices of babies in the age group <6 months (n=200).**

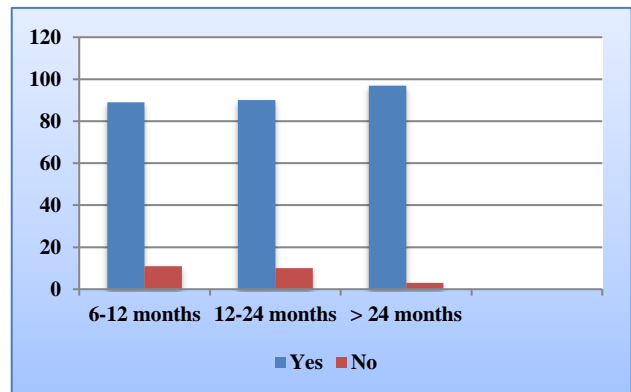
Feeding practice	Percentage
Exclusive breast feeding	22
Exclusive bottle feeding	5
Both	73

Breast feeding according to age distribution has been graphically represented in Figure 1. In the age group of 6-12 months 80% of the babies were breast fed and 20% were not on breast feeding. In the age group 12-24 months 29% of the babies were breast fed and 71% were not. 8% of the children above 2 years were breastfed and the remaining 92% were not.



**Figure 1: Babies on breast feeding according to age groups (in percentage).**

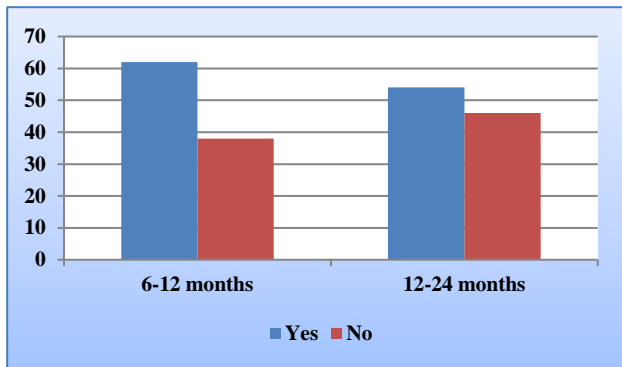
Hand hygiene practice before breastfeeding was practiced by 89%, 90%, 97% of the mothers in the age group 6-12 months, 12-24 months and >24 months respectively. This has been shown in the Figure 2.



**Figure 2: Hand washing before feeding in different age groups (in percentage).**

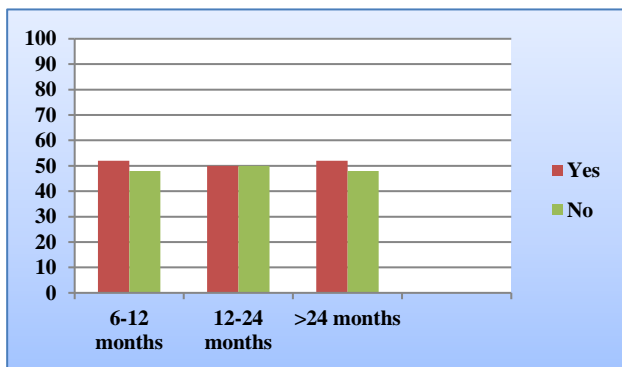
On evaluation of the feeding pattern of children in the age group >2 years, it was noted that 5% of the infants were fed twice daily and 95% of the children were fed more than 3 times a day.

During the period of weaning from breast feeding and initiation of complementary feeds, only 62% 54% of children in 6-12 months and 12-24 months respectively were on specially prepared food like porridge or mashed food (Figure 3).



**Figure 3: Percentage of children on specially prepared food (porridge/mashed food).**

52% of children in the age group 6-12 months, 50% children under 12-24 months and 52% of children >24 months were found to be malnourished according to WHO growth standards (Figure 4). 90% of the parents of children >2 years ensured that their child has consumed the food completely. 12% of the children >2 years were found to be on breastfeeding during the study period.



**Figure 4: Prevalence of malnutrition in different age groups (in percentage).**

As per the IMNCI guidelines 75 % of the children >2 years were found to be without any illness at the time of conducting the study.

**Malnutrition prevalence**

The comparison of the number of children on exclusive breastfeeding and the prevalence of malnutrition has been

shown in the Table 2.  $X^2=20.0604$ ,  $X^2$  at 0.05 level=3.841.

**Table 2: Comparison of malnutrition and breastfeeding.**

	Malnutrition	Normal	
Exclusive breast feeding	6	38	44
Exclusive bottle feeding + both	81	75	156
	87	113	n=200

Since the calculated value was much greater than the  $X^2$  table value at 0.05 level of significance. Authors concluded that, their feeding type and malnutrition are associated at significant level.

**Family pot feeding**

Table 3 depicts the number of children who were malnourished in comparison with the family pot feeding practiced at home.  $X^2=33.34$ ,  $X^2$  at 0.05 level=3.841.

**Table 3: Comparison of malnutrition according to family pot feeding.**

Family pot feeding	Malnutrition		
	Present	Absent	
Yes	20% (40)	40% (80)	60% (120)
No	30% (60)	10% (20)	40% (80)
	50% (100)	50% (100)	100% (200)

From Table 3, the value of calculated  $X^2$  is much greater than the table value at 0.05. This shows that, the association of malnutrition and family pot feeding is significant.

**Prevalence of malnutrition**

Table 4 depicts the number of children who were found to be malnourished in comparison with the number of children who were provided with specially prepared food during their period of weaning.  $X^2=49.00$ ,  $X^2$  0.05 level=3.841

**Table 4: Comparison of malnutrition according to specially prepared food during weaning.**

Specially prepared food	Malnutrition		
	Present	Absent	
Given	16	60	76
Not given	88	36	124
	104	96	200

The calculated value of chi-square value is much greater than the table value. So, we concluded that, malnutrition and specially prepared food are highly significant at 0.05 levels.

## DISCUSSION

It is a common belief that nearly all women in India breastfeed their babies. This belief is by and large true but the essence of breast feeding (i.e.) exclusive breast feeding for six months is achieved in very few mothers.<sup>2</sup> Exclusive breast feeding means that the babies should be given no other liquid (or) solids other than breast milk, not even water during this period.<sup>1</sup> Motivation regarding breast-feeding should start during pregnancy and any doubt cleared. The problems regarding breast size, shape of the nipple and its protrusion (or) otherwise have been exaggerated.<sup>2</sup> All health workers should have the necessary knowledge to be able to help these women.

### *How often to breast feed<sup>4</sup>*

Exclusive demand feeding is the ideal schedule to follow. There is no "tailor made schedule" as milk production, sucking habit, stomach capacity etc., vary from baby to baby.

### *How long to breast feed?*

Breast feeding should be continued well into the second year of life. It is advisable to breast feed till two years of life, the period of maximum brain growth and myelination.

### *Nipple confusion*

If mother is offering other feeds (or) feeding bottle in between. This preload will decrease the vigour of sucking and cause "nipple confusion".

### *Adverse effect of artificial feeding<sup>5</sup>*

- Child can develop malnutrition due to dilution and infection due to contamination
- Animal milk does not contain living white cells and antibodies to protect the baby against infection. They are more prone to diarrhea and respiratory tract infection
- It is expensive and the family may not be able to afford it and may dilute the milk
- Iron from animal milk is not absorbed as the iron from human milk. Artificial fed baby may develop anaemia
- May develop allergies during childhood
- Higher incidence of diabetes mellitus due to beta cell destruction.

J. Am Diet et al, has reported from New Zealand in 2002 that 42% mother practice exclusive breast feeding.<sup>6</sup> Aneja B et al, New Delhi has reported 20% children were exclusively breast feed till age of 6 month in two urban slums of Delhi in 2000.<sup>7</sup> In another report by HB Mallikarjuna et al, Davangre et al, 80.5% children were exclusively breast-fed. Of course, there are regional and cultural differences in exclusive breast-feeding.<sup>8</sup> The

following facts are well known, that the composition of breast milk is ideally suited to the needs of the baby and has all the nutrients that she needs for the first six month of life. The nutrients in fresh milk (or) tinned milk are not easily digested and absorbed than breast milk.<sup>9</sup> Since breast milk is the perfect food, it should be emphasized that all mother to breast feed exclusively till 6 months of age. But mother have their own fears about the quantity and quality of breast feeds, exclusiveness is not fully maintained. On Evaluating the complementary feeding practices, it was shown that 30% of mother started complementary food before 6 months of age. 56% have started only at 8 months of age. Mean age of food complementation was 9 months of age, far beyond recommended 6 months. Similar study conducted by Singh MB et al, Rajasthan, 2000 in Semiarid and rural area of Rajasthan, 8.7 month was mean age of food complementation.<sup>8,7</sup> N.C. De et al has reported in west Bengal in 1998 that 51.3 % infants were started on supplementary foods within 6 weeks of age in low- socio economic women group.<sup>10</sup> In present study conducted by Kruger R. et al, Pretoria, South Africa to explore rural feeding and weaning practices, he has found that supplementary food was introduced early at 2-3 months.<sup>11</sup>

Kulsoom U et al, from Lahore in his work found that mean age of exclusive breast feeding was 1.08 (1±1.109) month.<sup>12</sup> Mean age of initiating supplementary feeding was 4.4±0.99 month. As per UNICEF Statement, complementary feeding should be initiated by six months. Of the considerably increased risk of infection associated with consumption of this food, a two-month difference in the timing of their introduction could have important implication for global rates of diarrhea and other illnesses.

The transition from liquid to semisolid and solid food is a major developmental milestone. When food was first introduced, a small amount should be given 2-3 spoons, and gradually increased in quantity and frequency so that by the age of one year, the child is eating 4-5 times a day, while still breast feeding as well. Since hungry baby will suck the breast vigorously, thus stimulating the prolactin and the let-down reflex, which helps milk production, mother should encourage to give semisolid food after a breast feed. Hence mother should be educated regarding the importance of adding semisolid food at the appropriate time as well as continue with breast feeding to the extent possible. A 30% of mother discarded the colostrum in this study. In a study done by Singh MB et al, Jodhpur in 2000, 77% mother discards colostrum. Srivatsava Sp et al, Patna, 2003 reported colostrum was discarded by 82.9 % mother. Another report by B. Aneja et al, New Delhi 2000, colostrum was discarded by 44% of mother.<sup>7</sup> CR. Banapurmath et al, from Davanagere in 1996 has quoted colostrum was discarded by 29% of mother.<sup>13</sup> Immediately after birth, the mother should put the baby to her breast at the earliest. It is rich in whey protein and protective antibodies which protects the baby from neonatal infections. It is really like an oral vaccine,

rather a first vaccine for preventing infections. Hence, we should help the mother to overcome prejudice regarding colostrum by explaining to the mothers and their families the protective value of colostrum. In 40% of operative deliveries child receive initial feeds within 1 day of life. B. Aneja et al, reported breast feeding was initiated within 6 hours of birth by 56% mother and after 48 hours by 22% mothers.<sup>7</sup>

Another study done by Banapurmath CR et al, central Karnataka in 1996, 35% of babies were not breast feed even at 48 hours of birth 13 all the infants received pre-lacteal feeds, only 3 babies were offered breast feeding within 1 hour of birth. With increasing social media information, education and communication activities breast feeding practices have improved enormously over the decade. Baby must be put to breast within ½ an hour after normal delivery and within 4 hours after operative deliveries. Pre-lacteal feeds should not be given. This will satisfy the thirst and will reduce the vigour to suck and may lead to diarrhea and helminthic infestation. Soon after birth the baby is awake, alert and biologically ready to breast feed and initiation of breast feeding is very easy. Later on, the baby goes to prolonged sleep thereafter initiation may be difficult. If mother is offering other feeds (or) feeding bottle in between. This preload will decrease the vigour of sucking and cause “Nipple confusion” In this study most of the mothers (75%) add plain water to animal milk at a ratio of 2:1. In a study conducted by Kumar R et al, New Delhi, among resettlement colony, most of the mother adds plain water (80%) to animal milk at a ratio of 3:1. This is on par with the present study<sup>14</sup>. But Aneja B et al, has reported lesser percentage (1:1) dilution in 52% of children in his study.<sup>7</sup>

As per IMNCI statement, when the mother is unavailable, critically ill (or) no more, the baby may have to be fed on undiluted animal milk with spoon (or) paladai which has traditional background. But Elizabeth et al, has advised to give animal milk in first week of life in 1:1 dilution, in the second week 2:1 dilution, in the third week 3:1 dilution and in the fourth week onwards undiluted milk can be given if absolutely indicated.<sup>1</sup> In 46% of children (6 month-12 months) animal protein (egg) is a part of complementary food. In a report by Kumar R et al New Delhi, in 81.5% of children (6-month -12month) animal protein forms a part of the complementary food.<sup>14</sup>

Protein present in different food varies in their nutritive quality because of difference in their amino acid composition. Animal Protein contains essential amino acid in the right proportion. Protein from vegetable sources is incomplete regarding essential amino acids such as lysine, methionine etc. Hence mother should be educated regarding the importance of animal protein. A 78% of mother feed the child (6 -12 month) on their lap. This traditional way of feeding has no scientific studies (i.e.) evidence-based reports in 15 years of Indian literature combing.

A 38% of children (6-month -12 month) 54% of children (12 months-2 years) given specially prepared food like kanji / mashed food. 96% of mother practiced family pot feeding in 12month - 2 years of age. It is essential to switch over to the usual family food. It can be given in thickened and mashed form from the family pot without hot spices. Provide little extra oil (or) ghee, green leafy vegetables and seasonal fruits to the baby. Mother should be taught about family pot feeding which will be feasible and culturally acceptable.

It was a painful observation that 75% (12 month-2 years) and 12% (> 2 years) children are force-fed by the parents 78% (< 6 month), 75% (6-12 months), 50% (12 month - 2 years), 25% (> 2 years) old children are not sticking to the feeding habits, as recommended by IMNCI. An 88% of mothers (<6 month) continue breast feeding during illness, when compared to the study conducted by Kaur A et al, 1994, PGI, Chandigarh, and 85.5% of mothers continued breast feeding during illness. Breast-feeding should be continued when the baby is ill. It should be given during infections. It is the most easily digestible food for the ill baby. It will be the best pacifier to the sick baby and it often acts as a life saviour to many babies. It will satisfy the nutritional and fluid demands and will offer anti-infective and immunological factors. Caregivers and mother should be educated in this regard.

In present study 44% (< 6 month), 52% (6 -12 months), 50% (12 month - 2 years), 48% (> 2 years) old children were found to be malnourished. In a study done by Medhi GK et al, regional medical research centre, Assam, India on breast feeding weaning practices and nutritional status of infant of tea garden worker of Assam.<sup>15</sup> Prevalence of malnutrition was <6 months- 22.6% (6 month - 12 months)-64.6%. Lower prevalence of nutritional deficit in 0-6 month in comparison to those of 6-12 months could be attributed to prevailing practice of exclusive breast feeding. Adequate supply of human breast milk satisfies virtually all the nutritional needs of an infant at least for the first six months of life.

Nutritional superiority of exclusively breast fed infant 0 - 6 months age over partial (or) artificial feeding infants was also evident as the prevalence of malnutrition among exclusively breast-fed group was 7% compared to 93% in partial (or) artificial feeding group. In the study done by Medhi GK et al, as mentioned earlier malnutrition was prevalent among the exclusively breast-fed group was 11.63% compared to 47.37% of partial (or) artificial feeding group.<sup>15</sup> Malnutrition even among exclusive breast-fed group suggests that other factor might be associated with malnutrition. High prevalence of low birth weight and infectious disease in this pediatrics age group in this community could be some probable contributing factors.<sup>16</sup> Higher prevalence of malnutrition among older children (6-12 month) may be related to prolonged exclusive breast feeding, late introduction of solid foods, moreover, the quantity and quality of solid food is inadequate.



## CONCLUSION

Exclusive breast feeding and appropriate timely complementary feeding are not practised in their true sense despite awareness creation programmes. Quantity and quality of the complementary feeds given was inadequate due to lack of awareness, fear, food stigmata. Hence feeding practices are far from satisfactory. Complementary feeding and weaning practice guidelines are better practiced as the age advances but their practice at a younger age would lead to a better outcome.

## Recommendations

Exclusive breast feeding has to be protected and promoted in the community irrespective of the socioeconomic strata due to its proven beneficial effect on growth and development of infants. It is also essential to promote appropriate weaning practice, which plays a vital role in prevention of malnutrition. Empowerment of all women and family members to breast feed their children exclusively for six months. Continue breast feeding with complementary food, after 6 months. Nutritional education should be closely linked to activities like immunization, oral rehydration therapy, promotion of breast feeding, birth spacing and female education. Vertical propagation of the practice guidelines must be ensured. Nutritional education based on IYCF and IMNCI should be adequately communicated not only to doctors, staff nurses and medical students but also at the grass root level for healthcare workers involved in ICDS, MCH and other national programmers. Encouraging small family norms and adequate spacing through intensive family welfare and motivational measures. Ensuring food availability and food security to weaker section of the society. Convergence of services and strengthening the linkage between the concerned sectors like agriculture, food, health, women and child development, education.

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