

## Study of Weaning Practices in Children between 6 Months to 2 Years Attending OPD

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### Abstract

*Background:* During 2006-10, more than 16 per cent of the world's children under the age of 5 years were underweight for their age. The proportion ranged from 1.0 per cent of children in developed countries to 25 per cent in developing countries. In India, the national family health survey (NFHS) 2005-06 included survey of the nutritional status of young children. Both chronic and acute under nutrition were found to be high in all 7 states for which reports have been received, namely, Haryana, Karnataka, Maharashtra, Orissa, Tamil Nadu, Uttar Pradesh and Goa. Poverty, unsanitary conditions, lack of education and poor rearing practices are some of the major contributory factors. Optimal infant and young child feeding mean that mothers should start to breastfeed within half an hour of birth and continue exclusively for the first six months till two years, together with nutritionally adequate, safe and age appropriate complementary feeding. Improving infant and young child feeding practices in children 0-23 months of age is critical to improved nutrition, health and development of children. One of the ways to effectively reduce the growing under-five mortality rate is the timely introduction of complementary feeding. *Objectives:* To determine various weaning practices in Raichur. To determine the effect of weaning on growth. To determine the effect of weaning on various systemic illnesses. To determine effect of weaning on nutritional status of children. *Methodology:* It is a prospective study comparing the various weaning practices and their effect on growth of the children of age 6 months to 2 years visiting pediatric OPD in Navodaya medical college hospital during the period of November 2014 to December 2015. A total of 300 children were included in the study by simple random sampling. The need for the study has been explained to the parents and prior consent has been taken. Ethical committee clearance has been obtained before performing the study. A detailed history taking with a pre-structured questionnaire on feeding habits of children has been taken. Anthropometric parameters such as height, weight and mid arm circumference have been measured for all the children to determine the growth parameters in children based on the weaning practices. Complete Systemic examination has been performed to rule out any systemic illness. Investigations such as a complete blood examination, urine examination, stool examination and chest x-ray to rule out systemic infections associated with malnutrition. *Results:* It is found that the prevalence of malnutrition and systemic illness were more in 12months to 24 months when compared to younger age group. The growth parameters are hindered more in the elder age group when compared to younger age group. Coming to weaning practices the most common feeds were annaganji and jowahar roti in younger age group and elder age group respectively. Most of the children of the younger age group are still being breast fed frequently compared to the older age group. *Interpretation and Conclusion:* As discussed earlier weaning is not new to India, as the history suggests that there was literature regarding weaning since the times of Charaka; Shrusutha and Kashyapa which advice exclusive breast feeding for first 6 months and complimentary feeding from 6 months with continuation of breast feeds up to 2 years. Our study shows that there is high prevalence of under nutrition and childhood illness in children of age group 12 to 24 months as compared to children of age 12 to 24 months. As age increases energy density of breastfeeds decreases and frequency of breastfeeding decreases and the nutrition

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is mainly from the weaned foods. Hence, in a setting of inadequate weaning the prevalence of malnutrition and childhood illnesses increase with age.

**Keywords:** Weaning; Malnutrition; Breastfeeding; Nutrition; Complementary Feeding; Anthropometry; Childhood Illness.

## Introduction

Infant feeding practices comprises of breast feeding and complimentary feeding which directly affects the nutritional status of children under two years of age and ultimately has an impact on child survival.

During 2006-10, more than 16 per cent of the world's children under the age of 5 years were underweight for their age. The proportion ranged from 1.0 per cent of children in developed countries to 25 per cent in developing countries [1]. In India, the national family health survey (NFHS) 2005-06 included survey of the nutritional status of young children. Both chronic and acute under nutrition were found to be high in all 7 states for which reports have been received, namely, Haryana, Karnataka, Maharashtra, Orissa, Tamil Nadu, Uttar Pradesh and Goa [2]. Poverty, unsanitary conditions, lack of education and poor rearing practices are some of the major contributory factors. Optimal infant and young child feeding mean that mothers should start to breastfeed within half an hour of birth and continue exclusively for the first six months till two years, together with nutritionally adequate, safe and age appropriate complementary feeding. Improving infant and young child feeding practices in children 0-23 months of age is critical to improved nutrition, health and development of children. One of the ways to effectively reduce the growing under-five mortality rate is the timely introduction of complementary feeding [3]

In Gujarat a community based study of feeding and weaning practices in under five children has been done. This study concludes that, false beliefs and myths attached to child's feeding, deeply rooted in all strata of community, need to be replaced by sound and scientific messages [4].

Hence, it is essential to study the various weaning practices and their effect on growth parameters of children to establish scientifically sound and economical feeding practices.

## Materials and Methods

Children of age 6 months to 2 years visiting

pediatric OPD in Navodaya Medical College Hospital during the period of November 2014 to December 2015.

### *Inclusion Criteria*

1. Age 6 months to 2 years
2. Children who are exclusively breast fed for first 6 months
3. Children without any congenital anomalies
4. Children without any peri-natal insult

### *Exclusion Criteria*

1. Children who are not exclusively breast fed for first 6 months
2. Children with congenital anomalies
3. Children with perinatal insult
4. Children who are not staying with mother for any reason
5. Upper and Upper middle class children according to Kuppuswamy classification

## Sampling Method

Simple Random Sampling

Size of the sample: 300

## Method of Collection of Data

A detailed history taking with a pre-structured questionnaire on feeding habits of children was performed.

Measuring height, weight and mid upper arm circumference was done. Complete Systemic examination a complete blood examination, urine examination, stool examination, chest X-ray for Systemic infections associated with malnutrition. All the data will be collected, compiled and interpreted to establish proper weaning practices that promote growth, development and health of the children aged 6 months to 2 years.

Ethical committee clearance has been taken from the ethical committee board.

## Results

Using the 'Harvard' standard as the reference measurement based on the percentage of the median, under nutrition was classified into normal (more than 90%), mild (90-75%), moderate (75-60%) and severe (below 60%) Gomez et al. (1956).

The diagnosis of under nutrition was based on the

correlation between age and expected values of body weight, body length and arm circumference. Measurements of body weight and length were recorded for all children while the arm circumference was recorded only for children aged at least 12 months. The arm circumference of children below the age of one year was not measured because of the fact that babies have a lot of fat that makes accurate measurement difficult.

Children were categorized into three groups- normal nutrition (Group A), mild (Group B) and moderate to severe under nutrition (Groups C). These

**Table 1:** Distribution of children by age, body weight and their nutritional status

Age in Months	Normal (A)	Mild (B)	Moderate to Severe (C)
6to11	58(50.8)	27(23.6)	29(25.4)
12to 24	66(35.4)	50(26.8)	70(37.6)
Total	124(41.4)	77(25.6)	99(33)
P value	>0.003	>0.05	<0.015

categories were examined separately for those aged 6 to 11 months and for those aged 12 or more months.

The results are summarized in Table 1-2.

There was a significant difference between underweight among children 6-11 months (25.4%) and that of children aged 12-23 months (37.6%).

### *Body Weight and Body Length*

Overall, 40-44% of children were well nourished; 25-30% suffered from mild under nutrition while 27-33% were moderately to severely under nourished. Comparison between the two age groupings showed that while there was no

**Table 2:** Distribution of children by age and body length and their nutritional status

Age in Months	Normal(A)	Mild (B)	Moderate to Severe (C)
6-11	64(56.1)	33(28.9)	17(15)
12-24	67(36)	55(29.5)	64(34.5)
Total	131(43.6)	88(29.3)	81(27)
P value	<0.001	>0.05	<0.001

significant difference in the proportions of children with mild under nutrition, the prevalence of normal nutrition was higher and of moderate to severe under nutrition lower in the 6-11 age group as compared to those 12 months or older.

Only 15% of children aged 6 to 11 months were stunted (chronic malnutrition) while stunting was two times more i.e. 34.5% among children aged 12 to 24 months.

### *Weaning Practices*

#### *Breastfeeding and the Introduction of Water and Semisolid Food*

Overall, 92.8% of children were breastfed. Most of the children aged 6-11 months (99.3%) and 88.8% of those aged 12 months or more were being breastfed. The difference in the proportions in the two groups was significant. In both groups of children water

had been introduced in 97-99% and semisolid food in 90-96% by the age of 6 months. There was no significant difference between the groups in these aspects.

#### *Food Sources and Variety*

The child's source of nourishment, apart from breast milk, depends on the food variety readily available in the community, food prepared separately for the child or for the family and those bought from food vendors. In some communities children may be denied certain types of food. The data collected showed that meals were prepared separately for children less than 12 months much more frequently than for older kids (83.1% as against 63.8%;  $P < 0.001$ ) while vendor food was bought more frequently for older kids than for those less than 12 months (67.9% vs 41.2%). The main food items prepared for kids less than 12 months were plain "annaganji" (64.6%), i.e.

rice starch “roti” (14.9%), made from jowar and commercial packed cereals (10.6%).

The main food items prepared for the older kids

were plain “annaganji” (19%) bread (13.4%) and (47.4%) “roti” made of jowar. Bread is usually taken with tea. The children less than 12 months had relatively

**Table 3:** Various weaning foods

Food Items	6to11months	12to24 months	P value
Jowar roti	17.2%(57)	36.8%(238)	<0.001
Bread	4.2%(14)	14.4%(93)	<0.001
Breast	5.1%(17)	2.9%(19)	>0.05
Biscuits	1.5%(5)	2.8%(18)	>0.05
Annaganji or cooked rice	65%(215)	34.2%(221)	<0.001
Tea	2.7%(9)	4.2%(27)	>0.05
Commercial cereals	1.2%(4)	0.5%(3)	<0.03
Others	3%(10)	4.3%(28)	>0.05
Total	100%(331)	100%(647)	

more “annaganji” and less bread while the reverse was true of the older children. Jowar roti was consumed more frequently by the children of older age group compared to that of younger age group. Similar comments apply to the main foods bought for the two age groups.

The various weaning foods given to children of the two age groups had been summarized below (table 3) which was collected by 24 hour recall method.

Note: the number in the bracket indicates the total number of servings of each food time in a day and hence the number of servings for the study group of 300 was found to be 978 of various types of foods.

The results shown in the above table indicate that the staple food of the community were jowar roti and cooked rice. The consumption of roti is more in the older age group compared to increased consumption of rice based diet in the younger age group as the mothers felt that the younger children had difficulty

Illness	6 to 11 months n=114	12 to 24 months n=186	Total n=300	P value
Diarrhea	58.8% (67)	71.5%(133)	66.7%(200)	<0.014%
Fevers	72.8%(83)	87.1%(162)	81.7%(245)	<0.001%
Respiratory infections	70.1%(80)	72.5%(135)	71.6%(215)	>0.05%

in consumption of roti and were given less frequently were as for older children they were given more frequently because of the easy preparation and longer duration of storage.

#### Childhood Illness

Those examined include diarrhea, frequent fevers and respiratory tract infections. The results are summarized in Table 4.

Among the 300 children 200 presented with diarrhea of which 67 were of younger age group and 133 were of older age group and the difference was statistically significant. Of the 300 children 245 had frequent fevers and the prevalence in younger age group was 72.8% and older age group was 87.1% the difference was again statistically significant. Coming to the respiratory tract infections there wasn't any significant difference in both the age groups.

Diarrhea and frequent fevers occurred in a significantly higher proportion of children aged 12

or more months than in the younger age group. The number of episodes of diarrhea ranged from 1 to 10, with a median of 4. There was however no significant difference in the number of attacks between the two groups. Upper respiratory tract infections also occurred with similar frequency. Fevers were treated mainly with antimalarials and antipyretics.

Antibiotics were given to less than 8% of children. Antibiotics were used more for respiratory tract infections than for diarrhea. In about 10-12% of cases no treatment was given.

## Discussion

#### Prevalence of Under Nutrition

Using the 'Harvard' standard as the reference measurement based on the percentage of the median, under nutrition was classified into normal (more than 90%), mild (90-75%), moderate (75-60%) and severe (below 60%) Gomez et al. (1956) [4].

The number of children who were under nourished in the current study based on weight of the child was found to be 66 i.e. 49.2% of age group 6 months to 11 months while that among the older age group were 120 i.e. 64.6%. Among them the prevalence of moderate to severe malnutrition was found to be statistically significant in both the age groups i.e. 25.4% in younger age group, while in older age group it was 37.6% and the p value was found to be <0.015%.

Coming to the length the percentage of children falling within the normal range were more in the age group 6 to 11 months when compared to that in 12 to 24 months i.e. 56.1% and 36% and the difference was statistically significant.

Coming to stunting only 15% of children aged 6 to 11 months were stunted (chronic malnutrition) while stunting was two times more i.e. 34.5% among children aged 12 to 24 months. The difference was statistically significant.

The percentage of malnourished children in study area was more than reported by A Mittal et al [11] (26.76%) and Arshad Farooq et al [12] (24.14%). It was observed that majority of the malnourished children were between the age of 12 months to 24 months. The proportion malnutrition was observed to be increasing as age was increasing. Similar trend was also reported by K.D. Bhalani et al. [13] Deterioration of nutritional status with increasing age may be because of poor weaning practices. During weaning process child is exposed to deleterious synergistic action of malnutrition and infection. Once the child becomes malnourished due to weakened immune system, child becomes prone to infection and may fall in vicious cycle of malnutrition and infection, which increases with age.

The first year of an infant's life is the period of most rapid growth and an important nutrition transition, when infants are given various types of complementary foods along with breast milk. Our results suggest that recommended IFPs of the prior periods were important for the gain in weight of the subsequent periods during infancy. In particular, feeding practices during the first quarter and the first half of infancy were significant for the subsequent gain in weight during infancy. A 10% increase in the feeding scale of 1-3 mo and 1-6 mo would increase gain in weight by 90 g and 70 g, respectively. Because weight is more sensitive than length to short-term dietary changes (30) and also to childhood illnesses (31-35), our results of the positive association between IFPs and weight gain during infancy corroborates the importance of following infant feeding recommendations.

Although the associations between IFPs and gain in length during 1-12 mo of life were statistically significant, they were not biologically important. A 10% increase in the feeding scale would cause only a 0.05-cm gain in length during infancy. The small effect of following the infant feeding recommendations on length may result because these infant feeding scales were relatively crude. They did not capture the multidimensional nature of IFPs that might contribute to better linear growth.

### ***Weaning Practices***

#### ***Breastfeeding and the introduction of water and semisolid food***

Overall, 92.8% of children were breastfed. Most of the children aged 6-11 months (99.3%) and 88.8% of those aged 12 months or more were being breastfed. The difference in the proportions in the two groups was significant. In both groups of children water had been introduced in 97-99% and semisolid food in 90-96% by the age of 6 months. There was no significant difference between the groups in these aspects. From the age of 6 months, an infant's need for energy and nutrients starts to exceed what is provided by breast milk, and complementary feeding becomes necessary to fill the energy and nutrient gap (57). If complementary foods are not introduced at this age or if they are given inappropriately, an infant's growth may falter. In many countries, the period of complementary feeding from 6-23 months is the time of peak incidence of growth faltering, micronutrient deficiencies and infectious illnesses (58). (Infant and Young Child Feeding: Model Chapter for Textbooks for Medical Students and Allied Health Professionals).

Even after complementary foods have been introduced, breastfeeding remains a critical source of nutrients for the young infant and child. It provides about one half of an infant's energy needs up to the age of one year, and up to one third during the second year of life. Breast milk continues to supply higher quality nutrients than complementary foods, and also protective factors. It is therefore recommended that breastfeeding on demand continues with adequate complementary feeding up to 2 years or beyond (13).

Complementary foods need to be nutritionally adequate, safe, and appropriately fed in order to meet the young child's energy and nutrient needs. However, complementary feeding is often fraught with problems, with foods being too dilute, not fed often enough or in too small amounts, or replacing breast milk while being of an inferior quality. Both food and feeding practices influence the quality of

complementary feeding, and mothers and families need support to practice good complementary feeding (13).

#### *Childhood Illness*

Diarrhea and frequent fevers occurred in a significantly higher proportion of children aged 12 or more months than in the younger age group. The number of episodes of diarrhea ranged from 1 to 10, with a median of 4. There was however no significant difference in the number of attacks between the two groups. Upper respiratory tract infections also occurred with similar frequency. Fevers were treated mainly with antimalarials and antipyretics.

In the current study it has been observed there is a significant increase in the childhood illness which might be due to the increase in the percentage of malnourished children which age. There was a similar association noted with malnutrition and childhood illness in the studies conducted by Bhatia V et al in Chandigarh and Awasthi S et al in Uttar Pradesh respectively.

#### **Conclusion**

Our study shows that there is high prevalence of under nutrition and childhood illness in children of age group 12 to 24 months as compared to children of age 12 to 24 months.

There was higher intake of annaganji in 6 months to 11 months children and jowar roti in 12 to 24 months. The frequency of breast feeding has gradually decreased with increasing age.

As age increases energy density of breastfeeds decreases and frequency of breastfeeding decreases and the nutrition is mainly from the weaned foods. Hence, in a setting of inadequate weaning, the prevalence of malnutrition and childhood illnesses increases with age.

#### *Recommendations*

1. Weaning should be initiated at 6 months of age with appropriate food sources commonly available.

2. Proper hygiene to be maintained in handling and feeding the child.
3. Simple hand washing before feeding the child can bring down major illness.
4. Breastfeeding to be continued along with the weaning feeds.
5. All children to be adequately immunized to prevent the vaccine preventable diseases.
6. Maternal education has no role in weaning practices, hence it needs to be stressed that all the mothers to be adequately enlightened regarding breastfeeding, weaning, immunization and hygiene.

#### **References**

1. UNICEF-WHO Joint Committee On Health Policy.
2. Parks's textbook of preventive and social medicine, edition 22, p.508.
3. World health organization, the international code of marketing of breast milk. Substitutes: frequently asked questions W.H.O, 2008.
4. Dinesh Bhandari<sup>1</sup>, Sushilkumar Choudhary<sup>2</sup>, A community based study of feeding and weaning practices in under five children in semi urban community of Gujarat; National Journal of Community Medicine. 2011 Jul-Sep; 2.
5. Kuntal K Saha, Edward A Frongillo, Dewan S Alam, Shams E Arifeen, La Rake Persson, And Kathleen M Rasmussen. A appropriate infant feeding practices results in better growth of infants and young children in rural Bangladesh. Am J Clin Nutr 2008; 87:1852-9.
6. Anita Khokhar, S Singh, R Talwar, SK Rasania, SR Badhan, M Mehra. A study of malnutrition among children aged 6 months to 2 years from resettlement colony of Delhi. Indian Journal of Medical Science 2003; 57:286-9.
7. Amir Moroof Khan, Priscilla Kayina, Paras Agrawal, Anita Gupta, Anjur Tupil Kannan. A study on infant and young children feeding practices among AXPASR41fwquh attending an urban health center in east Delhi. Indian Journal of Public Health 2012; 56
8. Anjali Khanna, Deepti M. Kadeangadi, Shri MD Mullapur. Infant and young child feeding practices in rural Belgaum: A descriptive study 2014; 3(2).