

# An assessment of age-appropriate infant and young child feeding practices among children in Kancheepuram district, Tamil Nadu, India

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## ABSTRACT

**Background:** Appropriate Infant and Young Child Feeding (IYCF) practices are a cornerstone to reduce child morbidity and mortality. Assessment of IYCF practices among the mother of young children is the need of the hour to find the breaches in their performance and to find out the influencing factors for these gaps. The study was undertaken with the objectives to assess the IYCF practices and the factors influencing among the children of age 7-24 months. **Methodology:** A cross-sectional study was undertaken in the rural area of Kancheepuram district, Tamilnadu from June 2019 to December 2019. One hundred forty-three children of age less than 2 years were selected by two-stage random sampling method. Data was collected house-to-house using the pretested questionnaire and WHO Infant and Young Child feeding questionnaire. Proportions were calculated and Chi-square test was applied. **Results:** The mean age of the children was  $14 \pm 5$  months. Among the study participants, only 10.2% were exclusively breastfed for 6 months. 58.6% of children were introduced on soft/solid/semisolid food at the end of 6-8 months. The minimum acceptable diet of breastfeeding children was 31.5% and nonbreastfeeding children was 14%. Age of mother, educational qualification of mother, working status of mother, and mode of delivery were statistically associated with appropriate Infant and Young Children feeding practices. **Conclusion:** The results revealed that there is only improvement in early infant practices and there are indigent practices of complementary feeding among the mothers.

**Keywords:** Community participation, IYCF practices, malnutrition, minimum acceptable diet, undernutrition

## Introduction

According to the “Convention on the Rights of the Child,” every infant and child has the right to good nutrition.<sup>[1]</sup> Undernutrition has attributed to 45% of child death worldwide. About

149 million under five children were stunted and 49 million were wasted due to poor nutrition.<sup>[1]</sup> Appropriate Infant and Young children feeding (IYCF) practices from birth to 2 years can improve their chance of survival during this crucial period. In 2002, World Health Organization (WHO) and United Nations Children’s Fund (UNICEF) jointly issued a global strategy for IYCF which emphasized—An infant should be breastfed within 1 h of birth, breastfed exclusively for the first 6 months, and continued up to 2 years of age.<sup>[2]</sup> Starting at 6 months, breastfeeding should be combined with safe, age-appropriate feeding of solid, semisolid, and soft foods.<sup>[3]</sup> This 2 years of life in any child life is important because optimal nutrition during

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Received: 20-04-2020

Revised: 10-06-2020

Accepted: 01-07-2020

Published: 30-09-2020

### Access this article online

#### Quick Response Code:



**Website:**  
www.jfmpc.com

**DOI:**  
10.4103/jfmpc.jfmpc\_668\_20

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**How to cite this article:** Liaquathali F, Maruthupandian J, Govindasamy R. An assessment of age-appropriate infant and young child feeding practices among children in Kancheepuram district, Tamil Nadu, India. J Family Med Prim Care 2020;9:4692-8.

**Table 1: Sociodemographic profile of the mothers of the study participants**

Variables	Frequency (n=143)	Percentage (%)
Age of the mother		
15-20 years	2	1.4
21-30 years	128	89.5
31-40 years	13	9.1
>40 years	0	0
Educational qualification		
Postgraduate	0	0
Graduate	3	0.2
Higher secondary	4	0.3
High school	32	27.3
Middle school	30	21
Primary school	52	36.4
Illiterate	22	15.4
Working status of the mother		
Yes	20	14
No	123	86
Type of family		
Nuclear	70	49
Joint	73	51
Socioeconomic classification*		
Upper class	7	4.9
Upper middle	2	1.4
Middle class	20	14
Lower middle class	65	45.5
Lower class	49	34.3

\*Modified BG Prasad classification 2019

**Table 2: Distribution of antenatal and postnatal details of the mothers of the study participants**

Variables	Frequency (n=143)	Percentage (%)
Antenatal visits		
No visits	1	7
<3 visits	19	13.3
3-7 visits	88	61.5
>7 visits	35	24.5
Birth interval		
No previous birth	69	48.3
6-15 months	7	4.9
15-24 months	14	9.8
>24 months	53	37.1
Place of delivery		
Home	2	1.4
Health institution	141	98.6
Mode of delivery		
Vaginal	59	41
Assisted delivery	16	11
Cesarean section	68	48
Postnatal visits		
No visits	10	7
1 visit	87	60.8
1-3 visits	39	27.3
> 3 visits	7	4.9

this period can reduce morbidity and mortality and fosters their physical and mental development.

In 2004, IYCF practices were reassessed using the WHO protocol and rated fair to poor. Only 36% of infants received exclusive

breastfeeding for 6 months. The complementary feeding indicator was also rated as poor since only 57.9% of 6–9 months children received complementary foods while continuing to breastfeed.<sup>[3]</sup> India which has the largest number of under five children showed only a remarkable change in Exclusive breast feeding (EBF) rates from 41.2% to 53.2% (1988–2016). The early breastfeeding rate was only 24.5% and 53% of children in 6–8 months of age received complementary feeding.<sup>[4]</sup> Overall, only 21% of breastfeeding and nonbreastfeeding children received optimal IYCF as per recommendations in India.<sup>[5]</sup>

Most of the studies in India were focused on the breastfeeding practices and there is a lack of evidence on overall complementary practices. The need for assessment of dietary diversity and dietary frequency among 7–24 months which is the crucial period for child nutrition after which suboptimal growth is hard to reverse. Many issues still conquer the rural and remote areas which hinder India to achieve the sustainable development goals in child health. In order to address this concern, the practice of infant and young child feeding was chosen for the study.

## Objectives

1. To assess the infant and young child feeding practices of children aged 7–24 months.
2. To analyze the factors influencing infant and young child practices of children aged 7–24 months.

## Materials and Methods

### Study design

This study was a cross-sectional study conducted in the rural areas of Kancheepuram district, Tamilnadu.

### Study duration

The study was conducted for a period of 6 months from June 2019 to December 2019.

### Study population

The children in the age group between 7 and 24 months, who were the residents of villages listed under rural health and training center of a tertiary care hospital, Kancheepuram district, Tamilnadu.

### Sample size estimation

Considering the prevalence for practice of exclusive breastfeeding from previous study, i.e., 63.4%,<sup>[6]</sup> 3% error, and 20% nonresponse rate, the calculated sample size was 143.

### Sampling method

Two-stage random sampling was adopted to achieve the sample size.

### Stage 1

The Rural Health and Training Center of a tertiary care hospital

**Table 3: Infant and Young children feeding practices of children aged 7–24 months**

Variables	Frequency (n=143)	Percentage (%)
Colostrum feeding		
Yes	126	88.1
No	16	11.2
Do not know	1	0.7
Prelacteal feeding		
Yes	51	35.7
No	92	64.3
Early initiation of breastfeeding		
Immediately after birth	63	44
Within 1 h of birth	55	38.4
After 1 h of birth	25	17.6
Exclusive breastfeeding		
Yes	25	10.2
No	118	47.8
Frequency of breastfeeding in last 24 h		
Not on breastfeeding	42	29.4
< 5 times	47	32.9
5-7 times	21	14.7
>7 times	33	23.1
Timely introduction of soft/semisolid/solid food		
Before 6 months	58	40.6
End of 6 to 8 months	84	58.7
After 8 months	1	0.7
Minimum dietary diversity in last 24 h		
Less than 4 groups of food received	30	21
4 or more groups of food received	112	78.3
No groups of food received	1	0.7
Minimum meal frequency in last 24 h		
7-8 months		
1 time	8	5.4
2 times	9	6.12
3 or more than 3 times	1	0.68
9-24 months		
1 time	8	5.4
2 times	34	23.1
3 times	31	21
4 or more times	7	4.7
Nonbreastfeeding children		
2 times	1	0.6
3 times	23	15.6
4 times	19	12.9
5 or more times	2	1.3
Continued breastfeeding up to 12 months in children above 1 year		
Yes	81	87
No	11	11.8
Do not know	1	1.20
Feeding of lipid-based food		
Yes	45	31.5
No	97	67.8
Do not know	1	0.7
Feeding iron or iron fortified foods		
Yes	20	14
No	122	85.3
Do not know	1	0.7

**Table 3: Contd...**

Variables	Frequency (n=143)	Percentage (%)
Bottle feeding		
Yes	90	36.4
No	156	63.2
Do not know	1	0.4

covers 12 villages: Mamallapuram, Kokilamedu, Poonjeri, Kadambadi, Manamai, Kunnathur, Nallur, Perumaleri, Karanai, Kunnappattu, Kuzhipanthandalam, and Paiyanoor. The total population of 12 villages obtained from the Household family register maintained in RHTC were 39545. Out of twelve villages, four villages—Kadambadi, Kunnappattu, Kuzhipanthandalam, and Manamai—were selected by simple random sampling method (lottery method).

### Stage 2

The population of under 5 children in the four villages were 1456 which is obtained from the respective ICDS centers of the villages. A total of 394 children in the age between 7 and 24 months were enumerated from the above population. Systematic random sampling was adopted to select every third child until the required sample size of 143 was achieved.

### Inclusion criteria

The children of age between 7 and 24 months who were the resident of the village for more than 1 year were included in the study.

### Exclusion criteria

(i) Children whose parents were not present at the time of study. (ii) Children who were sick/ill during the time of study. (iii) The study participants who were not able to contact even after 3 visits.

### Study tools

It comprises two sections. (i) Sociodemographic details, and antenatal and postnatal details of the mother and the child. (ii) WHO Infant and Young child feeding practice questionnaire which includes early initiation of breastfeeding, colostrum feeding, prelacteal feeding, exclusive breastfeeding, timely introduction of solid, semisolid, or soft foods, minimum dietary diversity, minimum meal frequency, minimum acceptable diet, continued breastfeeding for 12 months, and bottle-feeding practices.

## Operational Definitions<sup>[5]</sup>

### Early initiation of breastfeeding

The newborns who were put into the breastfeeding within 1 h of the birth.

### Exclusive breastfeeding for 6 months

No other food/drink, not even water, except breast milk (including

*Contd...*

**Table 4: Sociodemographic profile and infant and young child feeding practices among children**

Variables	Appropriate IYCF practices				P
	Yes	Percentage	No	Percentage	
Age of mother					
15-20 years	2	100	0	0	0.261
21-30 years	64	50	64	50	
31-40 years	5	38.5	8	61.5	
Education					
Higher secondary	0	0	0	0	0.002*
High school	12	54.6	10	45.4	
Middle school	33	63.5	19	36.5	
Primary school	24	80	6	20	
Illiterate	17	43.6	22	56.4	
Working status of the mother					
Yes	5	25	15	75	0.015*
No	66	53.6	57	46.4	
Socioeconomic status					
Upper class	2	28.5	5	71.5	0.308
Upper middle	1	50	1	50	
Middle class	14	70	6	30	
Lower middle class	31	62	19	38	
Lower class	23	46.9	26	53.1	

\*Chi-square test was applied.  $P < 0.05$  was considered significant**Table 5: Antenatal and postnatal details of mothers and infant and young children feeding practice among children**

Variables	Appropriate IYCF practices				P
	Yes	Percentage	No	Percentage	
Antenatal visits					
No visits	0	0	1	100	0.261
<3 visits	8	57.9	11	42.1	
3-7 visits	34	43.5	44	56.5	
>7 visits	14	40	21	60	
Birth interval of the child					
No previous birth	51	84	10	16	0.049*
6-15 months	3	75	1	25	
15-24 months	14	100	0	0	
>24 months	49	91	5	9	
Place of delivery					
Home	0	0	2	100	0.025*
Health institution	132	92.2	9	7.8	
Mode of delivery					
Vaginal delivery	37	62.7	22	32.3	0.000*
Assisted delivery	10	62.5	6	37.5	
Caesarean section	46	67.5	22	32.5	
Postnatal visits					
No visits	1	70	9	30	0.013*
1 visit	42	48.2	45	51.9	
1-3 visits	21	53.8	18	46.1	
> 3 visits	7	100	0	0	

\*Chi-square test was applied.  $P < 0.05$  was considered significant

milk expressed or from a wet nurse) for 6 months of life but allows the infant to receive ORS, drops, and syrups (vitamins, minerals and medicines).

### Minimum dietary diversity

The children of 6–24 months of age who receive foods from 4 or more food groups (grains, roots and tuber, legumes and nuts, dairy products, flesh foods, eggs, vitamin A rich fruits and vegetables, other fruits and vegetables) during last 24 h.

### Minimum meal frequency

The breastfed and nonbreastfed children of 6–24 months of age who received solid, semisolid, or soft solids food in minimum number or more (6–8 months-2 times/9–24 months-3 times/ Nonbreast feeding children-4 times a day) during last 24 h.

### Minimum acceptable diet

The children of age 6–24 months who received adequate

minimum diet diversity and minimum meal frequency during the last 24 h.

### Consumption of iron rich-iron fortified foods

The children of age 6–24 months who received a locally available iron-rich food or iron-fortified food during the last 24 h.

### Appropriate IYCF practices

Those mothers of children 7–24 months with appropriate IYCF practice were given a score as 1 and inappropriate practice as score 0. The overall Infant and Young Child Feeding practices' prevalence more than 65% was considered as having appropriate feeding practices.

### Data collection

Institutional Ethical Committee approval (70/IHEC/9-16) was obtained before starting the study. Informed written consent and assent was obtained from the mother. The confidentiality of the data collected from the enrolled participants was maintained in all the phases of the study.

### Statistical analysis

The entered data was analyzed using Statistical Package for Social Sciences (SPSS IBM) 21. The quantitative data was expressed in frequency and proportions. Chi-square test was applied in which  $P$  value  $<0.05$  was taken as significant.

## Results and Analysis

The mean age of the children was  $14 \pm 5$  months. Ninety (62.9%) were male children and fifty-three (37.1%) were female children.

In Table 1, among 143 mothers, 128 (89.5%) mothers belong to 21–30 years of age group. 1.4% belong to 15–20 years and 9.1% belong to 31–40 years of age group. Majority of the mothers had completed primary school followed high school education. 15.4% of mothers were found illiterate. 86% of mothers were not working during and after pregnancy and 51% belong to a joint family. 45.5% and 34.3% belong to lower middle and lower socioeconomic class, respectively.

In Table 2, majority of the mother (61.5%) had three to seven antenatal visits. 48.3% had no previous birth and only 37.1% of mothers had 24 months of spacing after the first delivery. 98.6% of mothers delivered in health institution. 52% of mothers were delivered by vaginal including instrumental delivery. 60.8% of mother had at least one postnatal delivery.

88.1% of mothers have given colostrum to their children after birth. 35.7% of children were given prelacteal feeding before breastfeeding. 44% of the children were put on breast immediately after birth. Only 10.2% of the children were given exclusive breastfeeding for 6 months. 58.7% of children were started on soft/semisolid foods at the end of 6–8 months and only 32.9% were breastfed more than 5 times along with

complementary foods. 78.3% of the children received 4 or more groups of food. Only children of 0.7% in 7–8 months age group, 23.1% in 9–24 months, and 12.9% in nonbreastfeeding children received adequate minimum meal frequency. Majority of the breastfeeding (57.1%) and nonbreastfeeding children (56%) did not receive a minimum acceptable diet. 67.8% and 85.3% of children did not receive recommended lipid-based and iron or iron-fortified foods, respectively [Table 3].

In the Table 4, the infant and young children practices were higher among the mothers with higher educational qualifications than mothers who are illiterates which was statistically significant. The mothers who were not working had higher infant and young children practices than working mothers which was statistically significant.

Table 5 depicts, Among the mothers of study participants of age 7–24 months, the mothers with more than seven antenatal visits had a higher prevalence of inappropriate infant and young children feeding practices when compared to other groups which was not statistically significant. Infant and young children feeding practices were higher among the mothers delivered by cesarean section when compared to other groups and it was statistically significant.

## Discussion

The breastfeeding was initiated immediately among 44% of the children and 17.6% were initiated after 1 h of birth. A similar finding was relevant to the study conducted by Asare *et al.* in which the prevalence of early initiation of breastfeeding was 63.4%.<sup>[7]</sup> Kuberan *et al.* reported that 55.4% were initiated breastfeeding within 1 h of birth.<sup>[8]</sup> Radhakrishnan and Balamuruga reported that 60.5% were initiated breastfeeding immediately after birth which was coherent with the present study.<sup>[8]</sup> Only 10.2% of children were exclusively breastfed for 6 months of age which was much lesser compared with the study of Manyeh *et al.*<sup>[9]</sup> Maternal perception that only breastfeeding is not sufficient to fulfill the need and growth of infant was found to be strong factor in early cessation of exclusive breastfeeding. Quality of antenatal and postnatal advice on breastfeeding practice has a positive effect on exclusive breastfeeding for first 6 months.<sup>[10]</sup>

58.7% of children were introduced on complementary feeding at 6–8 months. The similar results were explored in Ethiopia where the timely introduction of complementary feeding was increased from 50.3% to 59.5% ( $P = 0.051$ ).<sup>[11]</sup> The minimum dietary diversity was 78.3% which was found to be higher compared to the studies conducted by Dasgupta *et al.* who reported that the minimum dietary diversity was 46% among 6–23 months of children.<sup>[12]</sup> Majority of mothers preferred liquid foods for weaning assuming it is well digested and accepted by the infants which hampered infants from receiving balanced diet.<sup>[10]</sup> The number of antenatal visits was significantly associated with breastfeeding practice and complementary feeding. However, it was not associated with other dietary indicators.



The adequate frequency of food received by children in 6–8 months (2 times) was 6.12% and in 9–24 months (3 times) was 21%, and in nonbreastfeeding children (4 times) was 12.9% which was lesser than the study conducted by Saleh *et al.*<sup>[13]</sup> Similarly, higher prevalence (78%) of MMF was observed by Dasgupta *et al.* in Urban slum of Kolkata<sup>[12]</sup> and Khan *et al.* in east Delhi.<sup>[14]</sup> Similarly, the study conducted by Khan *et al.* showed 43% and 19.7% of the children receives Minimum meal frequency and minimum acceptable diet respectively.

Among children of 6–24 months, 14% of children were fed with iron or iron-fortified foods and 31.5% of children were fed with lipid-based foods which were not explored in other studies on Infant and Young child feeding practices. The maternal knowledge, local availability of iron or lipid foods, and child acceptance of the food were the main reasons for avoiding the iron or lipid based foods.<sup>[10]</sup> The educational status of the mothers has significant influence on IYCF practices in the present study. The illiterate mothers were practicing inappropriate IYCF when compared to literate mothers. It is evident from the previous works of literature that the mothers with informative educations have better insight in child care which influences their child development.<sup>[15]</sup> The occupational status of the mother has imperative influence of the feeding practices of the child. The mothers were indulged in their occupation earlier followed postpartum period and household responsibilities which poorly influences the appropriate feeding practices of their children.<sup>[16]</sup>

97.2% of mothers preferred health institution for delivery and 2.8% delivered at home in the study and there was a significant association between cesarean section and early infant feeding like early initiation of breastfeeding, colostrum feeding, and prelacteal feeding when compared to complementary feeding in the study and it is evidenced by the results of Nguyen *et al.* and Kakati.<sup>[17,18]</sup>

The inappropriate IYCF practices among mothers with lesser birth interval were due to early interruption of breastfeeding to other children and nutritional deprivation of mother which in turn effects the child nutrient which was explored in similar studies.<sup>[10]</sup> The mothers with more no of postnatal visits have significant influences on the appropriate feeding practices which is similar with studies of Ali where it is evident that antenatal and postnatal visits have a chance to impregnate the knowledge of child feeding and rearing practices.<sup>[15]</sup> Since the appropriate feeding practice process starts from the hospitals, the adoption and appreciation of such practices up to 2 years is not only depended on the mothers but it includes stronger community-level commitment from the family members, community health workers, and political support.<sup>[19]</sup>

Primary physicians have an important role in not only promoting IYCF practices but also in ensuring IYCF practices are followed by providing essential information, counselling, and support to mothers/caregivers on breastfeeding and complementary feeding

as well as assisting in solving common feeding problems. It is, therefore, important that their capacity is augmented through in-service or pre-service training and/or through special training on counselling for IYCF.

## Conclusion

The study examined all the eight core indicators of Infant and Young Children Feeding Practices as recommended by WHO. The results revealed that there is only improvement in early infant practices and there is indigent practice of complementary feeding. The study explored the practice of iron and lipid rich food feeding among the young children which was not studied exclusively so far. It is essential to set standards for primary health care workers in antenatal care, immunization clinics, and sick baby clinic to monitor appropriate infant feeding for up to 2 years. In-service training of health-care workers, frontline workers, and supervisions is also essential in strengthening breastfeeding at health institutions and the community level.

## Acknowledgement

Nil

## Declaration of patient consent

The authors certify that they have obtained all appropriate participant consent forms. In the form, the participants/parents have given their consent for participant images and other clinical information to be reported in the journal. The participants/parents understand that participant names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

## Financial support and sponsorship

Nil.

## Conflicts of interest

There are no conflicts of interest.

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