



## Clinical Research

**“EVALUATION OF MATERNAL KNOWLEDGE AND ITS EFFECT ON COMPLEMENTARY FEEDING PRACTICES IN INFANTS AND YOUNG CHILDREN: A CROSS-SECTIONAL STUDY.”**

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**ABSTRACT**

**AIM:** The study was conducted to assess the practice of complementary feeding in children between 6 months to 5 years of age and to assess the knowledge of mothers regarding complementary feeding, reasons for inappropriate feeding practices and age at which complementary feeding started.

**MATERIALS AND METHODS:** The study was a cross-sectional study. The study participants were 230 mothers of children aged 6 months to 5 years who responded to a maternal knowledge on oral health questionnaire. The questionnaire was distributed to the mothers. The study assessed the mother's knowledge about feeding practices.

**RESULTS:** A total of 230 children were included in the study. The mean age of the children was 3.1 ( $\pm 1.2$ ) years. Out of 230 mothers, 42.2% initiated complementary feeding at 6 months of age of child, 32.1% mothers initiated at 7 months-1 year of age of child and 21.8% mothers at 1-2 year of child. Along with this, 43.5% mothers gave marketed weaning food to their child, 51.3% mothers gave two feedings in a day, and 30.9% mothers gave three or more feedings in a day. A total of 46.5% mothers fed thin consistency of complementary food to their child, 30.9% and 22.6% fed thick and appropriate consistency respectively. Mothers relying on health personnel for information on complementary feeding, initiated the same at 6 months of age in comparison to mothers having previous experience or relying on friends/family. However, the results were statistically insignificant.

**CONCLUSION:** In the present study it was found that mother's knowledge regarding complementary feeding time was insufficient and practices were inapt.

**CLINICAL SIGNIFICANCE:** Having good complementary feeding knowledge and practices among mothers will prevent the consequences of under-nutrition thereby enabling children to receive appropriate nutrition and consequently achieve their full human potential.

**KEYWORDS :** Complementary feeding, Feeding practices, Maternal Knowledge, Malnutrition

**INTRODUCTION**

Ample nutrition during infancy and early childhood is critical for the growth, health, and development of children to their full potential.<sup>[1]</sup> Breastfeeding is unanimously known as an ideal food for the healthy growth and development of infants. Several medical experts, including the American Academy of Pediatrics (AAP) and the American College of Obstetricians and Gynecologists, strongly recommend breastfeeding exclusively (no formula, juice, or water) for first 6 months. After the introduction of other food, it recommends continuation of breastfeed through the baby's first year of life.<sup>[2]</sup> It has a nearly perfect mix of **vitamins**, protein, and fat. Mother's milk contains antibodies that help infant to fight off viruses and bacteria. Nearly all mothers can breastfeed provided they have proper guidance, and support within their families and from the health care system.<sup>[3]</sup> But when breast milk is no longer enough to meet the nutritional needs of the infant, complementary feeding should be started. Introduction of semisolid food in an infant who is on liquid diet is known as complementary feeding.

The aspect of Infant and Young Child Feeding Practices, which are significant in the first 2 years of life comprise timely commencement of breastfeeding, exclusive breastfeeding and safe beginning of complementary feeding with continued breastfeeding up to two years of age or beyond.<sup>[4]</sup> Appropriate feeding practices add 17 percent reduction in the prevalence of stunting of growth at 24 months of age and could prevent 6 percent of under-five deaths each year. Suboptimal breastfeeding practices and infectious diseases are the main immediate causes of undernutrition in the first two years of life.<sup>[5]</sup>

Hence, for the first half-year of life, the World Health Organization

recommendations for infant feeding are concise: initiation of breastfeeding within 1 hour after birth and exclusive breastfeeding for 6 months. In contrast, the period of transition from exclusive breastfeeding to family foods, from 6 to 23 months, includes a series of complex feeding behaviors making this a nutritionally vulnerable period.<sup>[6]</sup>

**Complementary food should be:**

- **timely** – meaning that they should be introduced when the need for energy and nutrients exceeds beyond breastfeeding.
- **adequate** – meaning that they provide sufficient energy and nutrition required for the growth of the child.
- **safe** – meaning that they are hygienically stored, prepared and fed.
- **properly fed** – meaning that they are given consistent with a child's signals of appetite and satiety, even during illness, to consume sufficient food.<sup>[3]</sup>

Complementary food bridges the energy gap, vitamin A gap and iron gap which arises in breastfed infants at 6 month. In areas with poor food or water hygiene, introduction of complementary foods is often coupled with increased morbidity for diarrheal diseases and development of malnutrition. Delay in introducing proper complementary foods may, however, lead to nutritional deficiencies of iron, zinc, calcium and sometimes vitamin A and riboflavin.<sup>[7]</sup> Appropriate complementary feeding depends on precise information and skilled support from the family, community and health care system. Inadequate knowledge about appropriate foods and feeding practices is often a greater determinant of malnutrition than the lack of food.<sup>[3]</sup>

Knowledge and understanding are essential prerequisites for changes in behavior, including practices related to health and disease prevention. The knowledge, attitudes, and cultural practices of parents especially mothers seem to play an active role in the oral health of the preschool children who are totally dependent on them. Hence, this study was conducted to assess the practice of complementary feeding in children between 6 months to 5 years of age and to assess the knowledge of mothers regarding complementary feeding, reasons for inappropriate feeding practices and age at which complementary feeding started.

## MATERIALS AND METHODS

The study was a cross-sectional study. The study participants were 230 mothers of children aged 6 months to 5 years who responded to a maternal knowledge on oral health questionnaire. The questionnaire was distributed to the mothers. The study assessed the mother's knowledge about feeding practices.

The study was conducted in the Department of Paediatric and Preventive Dentistry in the college. The study was approved by institutional human ethics committee. Informed written consent was taken from the parents of all the study participants. Confidentiality of the study participants was maintained throughout the study.

The data were collected in a structured proforma, which has documented details regarding the sociodemographic parameters, knowledge - and attitude-related parameters, and information regarding complementary feeding.

### Study Procedure (The Questionnaire)

After obtaining the informed written consent, mothers were administered the questionnaire to elicit all the relevant information mentioned above. *Part 1* consisted of items that pertained to general demographics, such as the children age, parents' education and occupation, the child's gender and residence. Also queried was the mother's main source of information about complementary feeding (dentist, media or friends). *Part 2* was a 09-item questionnaire pertaining to pediatric KOH. *Part 3* included complementary feeding practices of mothers.

### INCLUSION CRITERIA

- Children of age between 6 months to 5-years old
- Full-term children were selected to ensure a healthy sample selection
- Presence of normal number, size, and shape of teeth
- Absence of any local/systemic condition

### EXCLUSION CRITERIA

- Mother's refusal to give the informed consent
- Children with missing/malformed/supernumerary teeth
- Children with large restorations and extensive carious lesions

### STATISTICAL ANALYSIS

The association between the explanatory and outcome variables was done by cross tabulation and comparison of proportions using chi-square test. A  $p$  value of  $<0.05$  was considered as statistically significant. IBM SPSS version 22 software was used for the statistical analysis.

### RESULTS

A total of 230 children were included in the study. The mean age of the children was  $3.1 (\pm 1.2)$  years. There were 51.7% male children and 48.3% were female children. Out of 230 mothers, 51.7% were literate, 50% of the mothers were working and 52.6% belong to urban residence. (Table 1).

As given in Table 2, the 40% of the mothers relied on their previous experiences for the information on complementary feeding, while 30.9% mothers relied on health personnel and 29.1% on family and friends. Out of 230 mothers, 42.2% initiated complementary feeding at 6 months of age of child, 32.1% mothers initiated at 7 months-1 year of age of child and 21.8% mothers at 1-2 year of child. Out of 127 mothers who delayed the complementary feeding of their child, stated the reasons such as- their milk was sufficient (28.4%), they didn't know when to start (22.8%), told by family to wait till 1 year of child (17.3%), they didn't try as child has no teeth then (14.2%) or their child vomited on eating (13.4%). Along with this, 43.5% mothers gave marketed weaning food to their child, 51.3% mothers gave two feedings in a day, and 30.9% mothers gave three or more feedings in a

day. A total of 46.5% mothers fed thin consistency of complementary food to their child, 30.9% and 22.6% fed thick and appropriate consistency respectively.

As shown in Table 3, in comparison to literate mothers, more proportion of illiterate numbers started complementary feeding before the age of 6 months while more proportion of literate mothers initiated complementary feeding between 7 months-1 years of their child's age. In comparison to mothers belonging to rural area, mothers from urban residence initiated complementary feeding of their child at 6 months of age and working mothers also initiated at the same time when compared to housewives. Also, mothers relying on health personnel for information on complementary feeding, initiated the same at 6 months of age in comparison to mothers having previous experience or relying on friends/family. However, the results were statistically insignificant.

### DISCUSSION

According to WHO, complementary feeding is the period wherein there is a transition from exclusive breastfeeding to family foods although breastfeeding is still continued.<sup>[8]</sup> In the current study knowledge, attitude and practices of complementary feeding were assessed among 230 mothers with children aged between 6-month to 5 years of age. The mean age of the children was  $3.1 (\pm 1.2)$  years. There were 51.7% male children and 48.3% were female children. The mean age of children was  $7.99 \pm 2.48$  months in a study done by Venugopal S who had undertaken 4-20 months children under study.<sup>[4]</sup>

This study used prospectively collected data to assess the association between maternal knowledge and attitudes regarding complementary feeding practices and the timing of complementary feeding initiation in Lucknow, Uttar Pradesh. Out of 230 mothers, 97 (42.2%) initiated complementary feeding at 6 months of age of child, 74 (32.1%) mothers initiated at 7 months -1 year of age of child and 50 (21.8%) mothers at 1-2 year of child. 133 (57.8%) had delayed complementary feeding while 6 (2.6%) of them started complementary feeding early. In contrast; a study done in South India, only 8% of mothers had proper knowledge of all aspects of complementary feeding. Further study, by Aggarwal *et. al.* showed only 17.5% of mothers started complementary feeding at recommended time *i.e.*, at 6 month of age. 77% had delayed complementary feeding while 5.5% of them started complementary feeding early.<sup>[7]</sup>

Malawi *et. al.* had stated early introduction of complementary feeding leads to tribulations of infections and malnutrition. In contrast commonest reason for delayed complementary feeding was an unsuccessful attempt at feeding, *i.e.*, "the child used to vomit everything". Mothers should be educated that child has to develop the taste of food and if they attempt and keep the food on child's tongue, the child slowly will like it and start swallowing. Practice of starting and delaying complementary feeding are detrimental and deplorable practiced in developing countries including India.<sup>[9]</sup>

After 6 months of age, feeding becomes progressively more intricate for infants to meet their nutrient needs from human milk alone. Besides most infants are developmentally ready for other foods at about 6 months. In places where environmental sanitation is very poor, waiting until even later than 6 months to introduce complementary foods might reduce exposure to food-borne diseases. However, because infants are beginning to actively explore their environment at this age, they will be exposed to microbial contaminants through soil and objects even if they are not given complementary foods. Thus, 6 months is the recommended appropriate age at which to introduce complementary foods.<sup>[10]</sup>

In contrast to current study, a study done by Hasnain S., Mohsin SS and Gyampoh S. knowledge of timing of complementary feeding was higher in Lahore city in Pakistan (54%), Karachi (57.2%) and Ghana (60.0%) respectively.<sup>[11,12,13]</sup> In the present study, out of 127 mothers who delayed the complementary feeding of their child, stated the reasons such as - their milk was sufficient (28.4%), they didn't know when to start (22.8%), told by family to wait till 1 year of child (17.3%), they didn't try as child has no teeth then (14.2%) or their child vomited on eating (13.4%). One formative research by Patrice L. Engle stated that beliefs can influence the timing of the introduction of complementary foods. Although there are many reasons for this delay, including income level and education, one study of poor families in five states reported that mothers delayed because they perceived that

the child is not interested.<sup>[14]</sup> Mothers and grandmothers reported that one should wait until the child shows hunger before giving any kinds of foods, suggesting that the perception of a child's hunger can play a major role.<sup>[14]</sup>

In the present study 40% of the mothers relied on their previous experiences for the information on complementary feeding, while 30.9% mothers relied on health personnel and 29.1% on family and friends. In the study done by *Sandhya Rani et al.* mothers (35.2%) started complementary feeds before 6 months of age as advised by their family members/ friends, followed by 51 (35.6%) of them believed that breast milk alone may not be sufficient for the child. Among mothers (19.2%) who initiated complementary feeding beyond 6 months, most common reason was that the mother thought breast milk is enough to meet the child needs.<sup>[15]</sup> Similar findings were found by *Hasnain S. et al.* who stated that the advice regarding complementary feeding was given by family members to 78% of mothers while in 23% mothers by doctors.

About 43.5% mothers gave marketed weaning food to their child, 51.3% mothers gave two feedings in a day, and 30.9% mothers gave three or more feedings in a day. A total of 46.5% mothers fed thin consistency of complementary food to their child, 30.9% and 22.6% fed thick and appropriate consistency respectively. In their study of 6-month to 2 year children, *Aggarwal et al.* stated that there was a lack of knowledge about complementary feeding among mothers. About one fourth *i.e.*, 25.5% of the mothers knew about the proper consistency, 46.55% knew about proper quantity of feed, and 54% about recommended time for starting complementary feeds.<sup>[7]</sup> These findings are in contrast with the current study.

As shown in Table 3, in comparison to literate mothers, more proportion of illiterate numbers started complementary feeding at 6 months of age while more proportion of literate mothers initiated complementary feeding between 7 months-1 years of their child's age. *S. Rao et al.* in their study found that approximately 96% of mothers was literate. The association of literacy and initiation of complementary feeds at the recommended time was statistically significant ( $p = 0.038$ ) which was not similar to the current study. However the association of the practice of a giving adequate quantity of complementary feeds and literacy was not statistically significant.<sup>[16]</sup>

In comparison to mothers belonging to rural area, mothers from urban residence initiated complementary feeding of their child at 6 months of age and working mothers also initiated at the same time when compared to housewives. Also, mothers relying on health personnel for information on complementary feeding, initiated the same at 6 months of age in comparison to mothers having previous experience or relying on friends/family. However, the results were statistically insignificant. In parallel to the current study; a prospective study done by *Sandhya Rani et al.*, as many as 186 (45.3%), 129/186 (69.3%) mothers in the rural area and 57/186 (30.6%) mothers in urban area started complementary feeds at the age of 6 months.<sup>[15]</sup>

In the present study almost half of the population (42.2%) started complementary feeding on time. Majority of complementary feeds were less in quantity and thin in consistency. Knowledge regarding time, consistency and quantity of complementary feeding was poor among these mothers. Mothers should opt appropriate complementary feeding practices in order to provide adequate nutrition to the child to make it healthy and well nourished. Little is known about current patterns of feeding among Indian infants during their first year of life. A community based, cross-sectional study conducted by *Parashar et al.* revealed maximum mothers provided minimal dietary diversity in food and initiated complementary food at 6 months of age.<sup>[17]</sup> Similar study done by *Ashwini S et al.* revealed that complementary feeds were initiated when the infant was less than 6 months old and the type of food given were inappropriate and the amount and frequency of feeding were inadequate.<sup>[18]</sup> The importance of the proper introduction of complementary feeding in infancy should be emphasized, and public relations and education for maternal care and breastfeeding should be provided through health care institutions.

## CONCLUSION

In the present study it was found that mother's knowledge regarding complementary feeding time was insufficient and practices were inapt. Most of them are not aware of the current recommendations and proper way of doing it. Because of age old beliefs, customs and attitude of the mother tend to wean the child late where the babies are landing up in

severe problem. Poor breastfeeding and inappropriate complementary feeding practices are the principal proximate causes of malnutrition during the first two years of life. Hence it is essential, that accurate information and education should be given to mothers and caregivers. This paper will like to put light on the fact that having good complementary feeding knowledge and practices among mothers of under-five children will prevent the consequences of under-nutrition thereby enabling children to receive appropriate nutrition and consequently achieve their full human potential.

## REFERENCES

1. World Health Organization. Infant and young child feeding: model chapter for textbooks for medical students and allied health professionals. World Health Organization; 2009.
2. Gartner LM, Morton J, Lawrence RA, Naylor AJ, O'Hare D, Schanler RJ, Eidelman AI. Breastfeeding and the use of human milk. *Pediatrics*. 2005 Feb 1;115(2):496-506.
3. World Health Organization. Implementing the Global Strategy for Infant and Young Child Feeding: Geneva, 3-5 February 2003: meeting report. World Health Organization; 2003.
4. Venugopal S, Chandrashekar. Knowledge of complementary feed and its effect on the child nutrition. *Int J Pediatr Res*. 2016;3(1):24-31.
5. Masuke R, Msuya SE, Mahande JM, Diarz EJ, Stray-Pedersen B, Jahanpour O, Mgongo M. Effect of inappropriate complementary feeding practices on the nutritional status of children aged 6-24 months in urban Moshi, Northern Tanzania: Cohort study. *PLoS one*. 2021 May 13;16(5):e0250562.
6. Vossenaar M, Doak CM, Solomons NW. Challenges in the elaboration of a field interview instrument to capture information for the evaluation of adherence to the WHO/PAHO Guiding Principles for Complementary Feeding of the Breastfed Child. *Food and nutrition bulletin*. 2014 Sep;35(3):338-50.
7. Aggarwal A, Verma S, Faridi MM. Complementary feeding—reasons for inappropriateness in timing, quantity and consistency. *The Indian Journal of Pediatrics*. 2008 Jan;75(1):49-53.
8. Kassa T, Meshesha B, Haji Y, Ebrahim J. Appropriate complementary feeding practices and associated factors among mothers of children age 6–23 months in Southern Ethiopia, 2015. *BMC pediatrics*. 2016 Dec;16(1):1-0.
9. Vaahtera M, Kulmala T, Hietanen A, Ndekha M, Cullinan T, Salin ML, Ashorn P. Breastfeeding and complementary feeding practices in rural Malawi. *Acta Paediatrica*. 2001 Mar;90(3):328-32.
10. WHO B. Infant and young child feeding: Model chapter for textbooks for medical students and allied health professionals. World Health Organization Press. 2009 May 11;14:45.
11. Hasnain S, Majrooh MA, Anjum R. Knowledge and practices of mothers for complementary feeding in babies visiting pediatrics outpatient department of Jinnah hospital, Lahore. *Biomedical Journal*. 2013;29:221–230.
12. Mohsin SS, Shaikh AS, Shaikh R, Haider N, Parkash A. Knowledge attitude and practice of mothers regarding complementary feeding. *Journal of the Dow University of Health Sciences*. 2014;8(1):21–25.
13. Gyampoh S, Otoo GE, Aryeetey RN. Child feeding knowledge and practices among women participating in growth monitoring and promotion in Accra, Ghana. *BMC Pregnancy Childbirth*. 2014;14:180.
14. Engle PL. Infant feeding styles: barriers and opportunities for good nutrition in India. *Nutrition reviews*. 2002 May 1;60(suppl\_5):S109-14.
15. Javalkar SR, Aras RY. A study on complementary feeding practices among mothers in urban and rural areas. *International Journal of Community Medicine and Public Health*. 2018 Mar;5(3):1162-6.
16. Rao S, Swathi PM, Unnikrishnan B, Hegde A. Study of complementary feeding practices among mothers of children aged six months to two years-A study from coastal south India. *The Australasian medical journal*. 2011;4(5):252.
17. Parashar A, Sharma D, Thakur A, Mazta SR. Infant and young child feeding practices-insights from a cross-sectional study in a hilly state of North India. *International Journal of Nutrition, Pharmacology, Neurological Diseases*. 2015 Jul 1;5(3):103.
18. Katti SM, Mallapur MD, Ashwini S. Comparison of complementary feeding practices among urban and rural mothers-a cross sectional study.