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Complementary Feeding Practices Among Children 1-2 Year of Age Attending Outpatient Department at Tertiary Care Centre in Central India: A Cross Sectional Study

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ABSTRACT
Initiating complementary feeding is important step in life of infant in terms of growth and development. Faulty practices during this period is associated with malnutrition. Thus understanding the factors that contributes towards faulty practices and timely correcting them is the objective of the study. Present study is a cross sectional study conducted at outpatient pediatric department at tertiary care center in central India. Lactating mothers were included in the study that covered complementary feeding practices from 6 months of age till the 2 year. The pre-tested questionnaire on domains-breast feeding, minimum meal diversity, minimum meal frequency, initiation and adequacy of complementary feeding practices were assessed according to recommendation of WHO. The initiation of complementary feeding at recommended time of six month was seen in 35.48% of children, which has scope to improve. Also, quantity of adequate amount of complementary feeding was found in few participants i.e. 17.51%. Educational status of mother was not associated with breast feeding or complementary feeding practices. However, being home-maker improves chances of continuation of breastfeeding.

INTRODUCTION

Complementary feeding (CF) is the process starting when breast milk alone is no longer sufficient to meet the growing nutritional requirement of infant[1]. Exclusive breastfeeding beyond 6 month of age causes growth faltering and malnutrition in infant[1,2]. CF typically covers the period from 6-24 month, even though breastfeeding continues upto 2 years of age and beyond[3]. The first 1000 days of life, from conception until 2 years of age are the most important stages of person's life in terms of growth and brain development[4].

Poor nutritional practice during this period, such as an early introduction of solid foods before 6 month, can lead to lifelong health consequences such as obesity and various non communicable disease including diabetes and cardiovascular disease[5]. Exclusive breastfeeding up to 6 months protects infants against infection[6,7]. Introduction of solid foods later than 6 months result in growth faltering and decreased rates of infant growth[8]. The first two year of life, an appropriate diet is considered as the "critical window" for the optimum growth and development of child[9]. Therefore, complementary feeding which is recommended by WHO to be initiated at six months of age along with continued breast feeding until at least the age of two years, is a major determinant of short and long health outcomes in individual[10].

The National family health survey (NFHS) data brings our focus on the decline in timely complementary feeding rates, from 52.6% (2005-2006) to 42.7% (2015-2016) in the backdrop of increase in exclusive breastfeeding 46.4% (NFHS-3) to 54.9% (NFHS-4) and decreased in underweight and stunting level[11]. More than 2.4 million child deaths occurs in India each year and two third deaths related to inappropriate feeding practices[12]. In India as per NFHS-4 (2015-2016) reported that merely 9.6% children aged 6-23 month receive an adequate diet this include 14.3% of non-breastfed children and 8.7% of breastfeeding children[13]. In Maharashtra as per NFHS 5 survey reported that infant child feeding practices aged 6-23 months receiving an adequate diet intake improve from 6.5 % (2015-16) to 9%(2019-20)[14,15]. The World health organization (WHO) has developed infant and young child feeding (IYCF) indicator to monitor and to guide the feeding practice of young children[16].

The present study aims to assess the complementary feeding practices among 1-2 years aged children and the reason behind faulty complementary feeding practices in community. Further, correcting the faulty practices would help in improving the growth and development and preventing the malnutrition among children.

METHOD

The study is a cross sectional study. It was conducted at outpatient pediatric department at tertiary care center in central India. Lactating mothers were included in the study that covered complementary feeding practices from 6 months of age till the 2 year. The age group of study subjects were selected based on WHO recommendation on complementary feeding[2]. However children with congenital malformation affecting feeding, e.g. cleft lip, cerebral palsy, known chronic systematic disease, sick children requiring admission or immediate care were excluded from the study.

Data was captured from all enrolled mothers attending pediatric clinic with the help of Pre-designed questionnaire. In total 217 participants were enrolled as per statistical calculation. The pre-tested questionnaire consisted of 25 items of various aspect. It elicited information about breast feeding, minimum meal diversity, minimum meal frequency, initiation and adequacy of complementary feeding practices were assessed according to recommendation of WHO. Quantity of food was assessed by showing a standard 50 mL katori to get the near exact dietary details of the child.

WHO guidelines were taken as standard complementary feeding practices and were used to define the correctness of those feeding practices. As per WHO recommendation the following operational definition were used[17,18]. Recommended time of initiation of complementary feed. Introduce complementary food at six months of age (180 day) while continuing to breastfeed.

Minimum meal diversity: Minimum meal diversity is the consumption of four or more food groups from the seven food groups grain, root and tubers, legumes and nuts, Dairy product (milk, yogurt, chees) eggs vit A rich fruit and vegetables, other fruit and vegetables.

Minimum meal frequency:

- 2-3 times per day for breastfed infants 6-8 months
- 3-4 times per day for breastfed children 9-23 months
- 4 times per day for non-breastfed children 6-23 months

Amount of complementary food: Start at six months of age with small amount of food and increase the quantity as the child gets older, while maintaining frequent breastfeeding. The energy needed from complementary foods for infants of developing countries are approximately 200 Kcal per day at 6-8

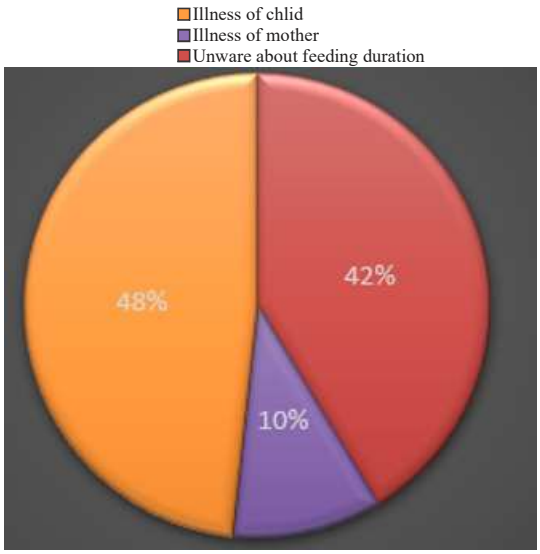

Fig.1: Reasons for discontinuation of Breast Feeding before 6 months of age

month of age, 300 Kcal per day at 9-11 months of age, and 550 Kcal per day at 12-23 months of age.

Sample size: 217 sample size was calculated by EPI Info version 7 and 99% confident interval using following formula.

Sample size:

$$n = [DEFF*Np(1-p)]/ [(d^2/Z^{21-\alpha/2}*(N-1)+p*(1-p)]$$

Data entry and analysis: This was be done with the help of statistical software SPSS version 20.0 and the collected data will be expressed in the form of percentage and frequency with the help of Microsoft excel version 10.0.

Ethical consideration: Ethical approval was taken from institutional ethics committee before the initiation of study. A written consent was taken from the mother before giving them questionnaire. Health education on correct the complementary feeding practices was the integral part of this study.

RESULTS

In total, out of 217 participants 107 (49.30%) were males and 110 (50.70%) were females. Mean age of the participants was 17.75 (~18) months. Socio-demographic characteristics of the participants are noted in Table 1. Mean educational status of mothers of participants was calculated to be class 12.3 (~12). Education of mother was not associated with exclusive breastfeeding status, initiation of complementary feeding and continued feeding. The results are depicted in Table 2.

No statistically significant difference was noted for exclusive breastfeeding and initiation of complementary feeding status. However, working status of mother was found to be statistically significant (p = 0.03) with breastfeeding continuation practice. In other word, if mother is home maker there are increased chances of continued breastfeeding beyond 6 months. The results are depicted in Table 3. Further, gender of child was not associated with exclusive breastfeeding status, initiation of complementary feeding and continued feeding. The results are depicted in Table 4. Education of mother was not associated with minimal meal diversity, adequacy of meal frequency and amount of food. The results are depicted in Table 5.

Working of mother was cross tabulated with feeding practices relates variables-adequacy of minimal meal diversity, adequacy of meal frequency and amount of food. No statistically significant difference was noted. Thus, education of mother was not associated with minimal meal diversity, adequacy of meal frequency and amount of food. The results are depicted in Table 6.

Gender status of participants was not associated with minimal meal diversity, adequacy of meal frequency and amount of food. The results are depicted in Table 7. Mothers who discontinued practice of exclusive breastfeeding before 6 months of child's birth. We could capture reason from our study questionnaire as child's illness (48%) mother's illness (10%) and mother's lack of awareness (42%) about duration of exclusive breast feeding.

DISCUSSIONS

In the present study 77 (35.48%) of mothers had started complementary feeding at the recommended time i.e. at six month. In an interventional study of 35 parents in Delhi only 16.5% of mothers had started complementary feeding at the recommended time, which is high when compared to the present study[19]. Similar study conducted at an Urban Health Center in Delhi in 2012 had 72.2% children aged between 6 and 9 months receiving complementary feeding[20] A prospective interview study of 200 parents by agrwal *et al*. showed that only 17.5% of mothers had started complementary feeding at the recommended time[9]. In Maharashtra as per NFHS 5 survey reported that infant child feeding practices aged 6-23 months receiving an adequate diet intake improve from 6.5% (2015-16) to 9%(2019- 20)[14,15]. The (19.8) rate of reasons of mothers who discontinued practice of exclusive breastfeeding before 6 months of child's

Table No. 1: Socio-demographic characteristics of the participants

Age groups	6-8 mths	9-11 mths	12-17 mths	18-24 mths
Sex				
Male	5 (71.42%)	10 (66.67%)	34 (46.57%)	58 (47.54%)
Female	2 (28.58%)	5 (33.33%)	39 (53.43%)	64 (52.46%)
Religion				
Hindu	6 (85.71%)	14 (93.33%)	63 (86.30%)	113 (92.62%)
Buddhisth	0	1 (6.67%)	6 (8.21%)	6 (4.92%)
Muslim	1 (14.29%)	0	4 (5.47%)	3 (2.46%)
Education of mother				
Primary	0	0	1(1.36%)	3 (2.46%)
Secondary	0	5 (33.33%)	28 (38.37%)	33 (27.05%)
Higher secondary	3 (42.85%)	4 (26.67%)	17 (23.29%)	33 (27.05%)
Graduate	4 (57.15%)	6 (40%)	27 (36.98%)	53 (43.44%)
Working status of mother				
Homemaker	7 (100%)	13 (86.67%)	68 (93.15%)	117 (95.9%)
Working	0	2 (13.33%)	5 (6.85%)	5 (4.1%)

Table No.2: Educational status of mother with duration of breast-feeding

Feeding status educational status of mother	Initiation of complementary feeding on completed 6 month	Exclusive breast-feeding for 6 months	Continued breast Feeding
Primary	1 (25%)	3 (75%)	2 (50%)
Secondary	17 (25.8%)	49 (74.2%)	57 (86.4%)
Higher secondary	21 (36.8%)	46 (80.7%)	52 (91.2%)
Graduate and above	38 (42.2%)	76 (84.4%)	77 (85.6%)
Chi^2 test (p-value)	0.19	0.46	0.12

Table No. 3: Working status of mother with duration of breast-feeding

Feeding status working status of Mother	Initiation of complementary feeding on completed 6 month	Exclusive Breast-feeding for 6 months	Continued Breast Feeding
Home Maker	71 (34.3%)	167 (80.7%)	182 (87.9%)
Working	6 (60%)	7 (70%)	6 (60%)
Chi^2 test p-value	0.17	0.41	0.03

Table No. 4: Gender with duration of breast-feeding

Feeding status gender of child	Initiation of complementary feeding on completed 6 month	Exclusive Breast-feeding for 6 months	Continued Breast Feeding
Male	42(54.5%)	85 (79.4%)	91 (85%)
Female	34 (44.2%)	89 (80.9%)	97 (88.2%)
Chi^2 p-value	0.18	0.78	0.55

Table No.5: Educational status of mother with feeding practices

Feeding status educational status of mother	Adequacy of Minimal meal diversity	Adequacy of meal frequency	Adequacy of amount of food
Primary	2 (1.6%)	1 (1.2%)	1 (2.6%)
Secondary	35 (27.6%)	21 (26.2%)	12 (31.6%)
Higher secondary	33 (26%)	22 (27.5%)	11 (28.9%)
Graduate and above	57 (44.9%)	36 (45%)	14 (36.8%)
p-value	0.61	0.70	0.91

Table No.6: Working status of mother with feeding practices

Feeding status working status of mother	Adequacy minimal meal diversity	Adequacy meal frequency	Adequate amount of food
Home Maker	119 (57.5%)	76 (36.7%)	37 (17.1%)
Working	8 (80%)	4 (40%)	1 (10%)
p-value	0.20	0.53	0.45

Table No.7: Gender with feeding practices

Feeding status/gender	Minimal meal diversity	Meal frequency	Amount of food
Male	67 (62.6%)	38 (35.5%)	23 (21.5%)
Female	60 (54.5%)	42 (38.2%)	15 (13.6%)
p-value	0.27	0.78	0.15

birth. child's illness (48%) mother's illness (10%) and mother's lack of awareness (42%) about duration of exclusive breast feeding. The most common reason given for late initiation was unsuccessful attempt of breast feeding at 6 month at feeding by child illness and lack of knowledge of mother about complementary feeding start at 6 month of age of child and duration of breast feeding. Minimum meal diversity (MMD) was 62.6% in male and 54.5% in female in the present study while it is 12% in India as per WHO and at 57% in Jains Bhan Bhatt Central India[21]. MMD was observed in 32.6% of the children in Delhi study. Which is high proportion of MMD when compared to this present study. Meal diversity is determined based on 24 hrs recall. MMD was proportion of children 6-23 month of age who receive foods from 4 or more out of 7 food groups as recommended by WHO (2008) for this age group. The food groups used for tabulation of the indicator are a grain roots and tubers b legumes and nuts c dairy product (milk, chees, chees-buiscuit). D eggs e other fruit and vegetables. Consumption of any amount of

food from each food group was only used as a condiment. To determine minimum meal diversity a cut off the above listed 7 group was selected (FANTA and FAQ 2007)[22]. Cereals based foods alone are not sufficient in oder to prevent micronutrient deficiencies, dairy product and egg fruit vegetables should be integral part of the complementary food of children. breast feeding should also be continued up till two years in orders to further support their growth. Almost 91 (85%) male and 97 (88.2%) female children consumed other foods other than breast milk and only 79.4 male children and 80.9% female children aged 6 months are on breastfeeding only. Which is higher than research finding at Abyi Adi town, Tigray, Northern Ethupia (10.75%)[23] Ethupian national prevalence (40.5%)[24] and India (17.5)[9]. And smaller than a study in mekele (62.8%)[24]. but it is consistent with a study done in Harar (54.4%)[25].

Minimum meal frequency (MMF) is 36.86% in this present study while it was 44% in country profile for WHO[12]. This show that although lower proportion of children are fed the minimum number of times but they are not fed the right diversity of food. Adequcy of amount of food is only 17.51% in the present study while only 7.4% of children in the age group receiving adequate amount of food 2019-2020, reveals is the district wise sheet of NFHS-5[15]. IN 2015-2016 under NFHS-4 only 13.9% of children age group 6 month to 23 month had receiving adequate amount of food[11].

CONCLUSION

In the present study the initiation of complementary feeding at recommended time of six month was seen in 35.48% of children, which has scope to improve. Also, quantity of adequate amount of complementary feeding was found in few participants 17.51%. Educational status of mother was not associated with breastfeeding or complementary feeding practices. However being home-maker improves chances of continuation of breastfeeding. Focus may be given to working mothers awareness, availability of leaves, development of feeding friendly corners at working places should be advocated.

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