



HEALTH PROMOTION

A study on parental awareness of feeding practices in children in the age-group 12-24 months

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Keywords

Breastfeeding • Colostrum • Complementary feeding • Malnutrition

Summary

Introduction. Nutrition plays an integral part in growth and development of a child. Age-appropriate feeding is known to improve the child's well-being and reduce the risk of specific diseases. The present study aimed to assess the awareness of parents regarding breastfeeding and complementary feeding practices.

Methodology. This health-based prospective observational study was conducted in a tertiary care hospital enrolling 95 parents with children in the age group 1-2 years. The data was analyzed using SPSS version 26 and Microsoft excel.

Results. In the present study, the prevalence of exclusive breastfeeding was 73.68%. Eighty-six (90.53%) parents initiated complementary feeds at 6 months. However, only 45.26% of children

were consuming adequate quantity of complementary foods. The association of child's calorie consumption with maternal age and occupation was found to be statistically significant.

Conclusion. Adequate nutrition during childhood and infancy is a key factor influencing growth and development. In the present study, the overall breastfeeding and complimentary feeding practices were satisfactory. However, the quantity of complementary feeding was inadequate. Counselling the mothers on appropriate breastfeeding and complementary feeding practices during antenatal and postnatal visits may have a positive impact on infant feeding practices.

Introduction

At the fundamental level for supporting health and development, the right balance of nutrients along with taste and texture are necessary in appropriate quantities to cater the needs of the growing infant. Adequate nutrition is essential during infancy and early childhood to ensure optimal health, growth and development [1]. Across the developing countries with high population growth rate and low per capita income, triple burden of malnutrition (undernutrition, micronutrient deficiency and overnutrition) is becoming a major issue of concern [2]. The triple burden of malnutrition is a great threat for the development of the economy and nation [3]. The World Health Organization (WHO) and United Nations Children's Fund (UNICEF) jointly developed the global strategy for infant and young child feeding practices (IYCF). This strategy recommends initiation of breastfeeding within 1 hour of birth, exclusive breastfeeding for the first 6 months of life, with the addition of nutritiously appropriate complementary feeds at 6 months with continued breastfeeding at least until 2 years of age. Adherence to these recommended practices has proven to reduce the risk of undernutrition and overnutrition with added long-term physical and psychological health benefits [4].

According to National Family Health Survey 4 (NFHS 4), only 42% of Indian newborns are fed with breastmilk within 1 hour of birth and only 55% of children under 6 months

of age are exclusively breastfed, as recommended [5]. Infants and young children are at increased risk of malnutrition during the period of changeover of baby's diet from breastmilk to solid food, i.e, 6 months to 2 years of age. Introducing complementary feeds earlier or later than recommended can lead to malnutrition. Almost, 2 in 3 children between 6 months and 2 years of age across the globe are not fed food that supports their rapidly growing brain and body [6]. Inadequate complementary feeding practices drive malnutrition in early childhood leading to weight loss, muscle wasting, stunting, difficulty concentration in the initial phase, which gradually progresses to kwashiorkor, marasmus, poor brain development, reduced learning ability, increased risk of infections due to poor immunity and in many cases death. Studies and reported evidences have shown that meticulous compliance to the recommended feeding practices (IYCF) can reduce infant mortalities up to 19% in developing countries like India [7-9]. Therefore, optimal IYCF practices can have the most significant impact on child mortality among all preventive interventions.

In India, food consumption patterns reveal that child diets are largely starved of proteins and essential micronutrients, and are influenced by adult (family) food choices. Around 38% and 21% of children under the age of 5 still suffer from stunting and wasting, respectively [6]. This is attributed mainly to inadequate knowledge about appropriate feeding practices among parents rather than the lack of food due to poverty [9-12].

The co-occurrence of undernutrition and obesity is often perceived as paradoxical, but there are a few elucidations for this paradox. Due to existence of household food insecurities, children tend to consume unhealthy and highly energy-dense foods, such choices lead to the coexistence of overweight and undernutrition at the same time. Overnutrition is also a form of malnutrition arising from excessive intake of imbalanced nutrients leading to impairment of physical and psychosocial functioning of the child. Overweight and obesity can cause long-term health consequences such as diabetes mellitus, hypertension, fatty liver disease, kidney disease, cardiovascular diseases, stroke and orthopedic morbidities. India has the second highest number of obese children in the world, translating to 14.4 million in the year 2015 [13].

There are only a few studies in South India to assess the feeding practices of young children. It is necessary that parents are aware of the proper feeding practices for the benefit of their child's health status and immunity. Thus, time to time assessment should be done to find out the awareness of the parents at the given time and scenario so that necessary interventions can be carried out to educate the parents regarding healthy feeding practices. The present study aims to gain information about the feeding practices currently undertaken by the parents of children aged 12 to 24 months and therefore help health professionals gain an understanding of the child's food habits and any related risk factors to suggest modifications to the parents in their feeding practices.

Malnutrition is a multi-dimensional problem encompassing social, cultural, economic, educational and nutritional aspects, in India. Children and adolescents form the backbone of the nation's future, and their nutrition and health play a critical role in human resource development of the country. Thus, meeting the nutritional needs of the younger generations is essential to bridge the gap in the nation's growth milestones.

Aims and objectives

- To find out the feeding practices undertaken by the parents with children in the age group 12 to 24 months, taking into consideration the breastfeeding and complementary feedings.
- To find out the relationship between the feeding habits of the child and the sociodemographic characteristics of the family.

Materials and methods

This is a prospective health-based observational study. It was conducted in an urban based tertiary care hospital in South India. The study was carried out after approval from Institutional Ethics Committee (CSP/20/FEB/84/88). Parents of children in the age group of 12 - 24 months attending out-patient pediatric department or admitted in this center were the participants of this study.

This study was conducted over a period of 2 months (1st October 2020-30th November 2020) with the study population of 95 parents. The simple random sampling technique was adopted to determine the participants of the study. Questionnaires were employed to collect information from the participants. The questionnaire has been validated by three expert Pediatricians to enhance its clarity and comprehension. Questionnaire was translated into the regional language which was reviewed and back translated by Pediatrician to check the accuracy of the terms used. Any discrepancies in the translated version were resolved. Final version was prepared after a pilot study. Written informed consent form was obtained from the parents who gave consent to participate after explaining to them the objectives of this study in the participant's own language. Parents who did not give consent to participate and parents of children with co-morbidities such as congenital abnormalities, metabolic and endocrine disorders and chronic disease involving cardiac, kidney, gastro-intestinal, neurological and blood related disorders were excluded from the study. Predesigned and pretested questionnaires were used to collect the data on socio-demographic profile (age, residence, educational qualification, occupation and income) and initiation of breastfeeding, exclusive breastfeeding and complementary feeding practices.

Data entry and statistical analysis was carried out using SPSS software version 26 and Microsoft excel. Descriptive statistics like mean, standard deviation and frequency were calculated, where necessary. In addition, bivariate and multivariate logistic regression along with chi-square test was also carried out to see the associations. Crude and Adjusted Odds ratios (COR, AOR) were computed for each explanatory variable to determine the degree of association and to control the confounders. Statistical test of significance is defined as confidence interval of 95% and p value less than 0.05. All results were expressed as percentage and numbers.

According to WHO, the following terms were used in this study to describe infant feeding practices [1]:

Early initiation of breastfeeding: infants should be breastfed within the first hour of birth

Exclusive breastfeeding: breastfeeding the infant for first 6 months of life – meaning no other foods or liquids are provided, including water

Optimal complementary feeding: complementary food should be introduced at six months of age (180 days) while continuing to breastfeed up to 2 years. The food should contain all macronutrients and micronutrients in the right proportion

Minimum meal frequency: feeding solid/semisolid foods 2 times per day for breastfed infants aged 6–8 months, 3 times per day for breastfed children aged 9–24 months and 4 times per day for non-breastfed children aged 6-24 months

Minimum dietary diversity: dietary diversity is present when the diet contains four or more of the following seven food groups - grains, roots and tubers, legumes and nuts, dairy products, flesh foods, eggs, vitamin A-rich fruits and vegetables, other fruits and vegetables

Results

Among 95 participants, the mean age of children, mothers and fathers were 17.90 (\pm 3.10 Standard Deviation [SD]) months, 27.88 (\pm 4.19 SD) years and 33.09 (\pm 4.98 SD) years, respectively. Of the 95 children, 55 (57.89%) were

males and 40 (42.12%) were females. More than half, 68 (71.58%) children lived in urban households. Most of the mothers, i.e, 84 (88.42%) were housewives. Majority of the fathers (95.79%) were employed, among which 67.37% were professional workers. Table I shows the socio-demographic characteristics of the study population.

Tab. I. Socio-demographic characteristics of participants of the study (N = 95).

Variable	Frequency (N = 95)	Percentage (%)
Characteristics of the child		
Age of child (mean \pm SD)	17.903 \pm 3.100	
Gender of the child		
Female	55	57.89%
Male	40	42.12%
Birth weight		
Low birth weight (< 2.5 kg)	23	24.21%
Normal weight (\geq 2.5 kg)	72	75.78%
Period of gestation		
Preterm	16	16.84%
Term	79	83.16%
Birth defects		
Yes	13	13.68%
No	82	86.32%
Sibling		
Yes	46	48.42%
No	54	51.58%
Characteristics of the family		
Residence		
Urban	68	71.58%
Rural	32	28.42%
Age of mother (mean \pm SD)	27.88421 \pm 4.187	
Maternal education		
Primary	4	4.21%
Secondary	26	27.36%
Graduate	65	68.42%
Maternal occupation		
Housewife	84	88.42%
Employed	11	11.58%
Age of father (mean \pm SD)	33.094 \pm 4.976	
Paternal education		
Primary	14	14.74%
Secondary	19	20%
Graduate	62	65.26%
Paternal occupation		
Unskilled	4	4.21%
Skilled	27	28.42%
Professional	64	67.37%
Type of family		
Nuclear	47	49.47%
Joint	48	50.53%
Socio-economic class		
Upper	20	21.05%
Upper-middle	45	47.37%
Lower-middle	22	23.16%
Upper-lower	8	8.42%
Lower-lower	0	0%

BREASTFEEDING PRACTICES

From the total of 95 children, 64 (67.37%) were initiated on breastfeeding within 1 hour of birth, 70 (73.68%) were exclusively breastfed until 6 months of age and 70 (73.68%) had continued breastfeeding until 1 year of age (Tab. II). At the time of interview, 42 (44.21%) mothers were breastfeeding their children, among which 35 (59.32%) children were in the age group 12-18 months and 7 (19.44%) children were in the age group 18-24 months. The most common reasons given by mothers for stopping breastfeeding were “trouble in milk flow to start” in 31 (60.78%) and “mother became pregnant” in 11 (21.57%). Other reasons for stoppage of breastfeeding are mentioned in Table III.

The timely initiation of breastfeeding significantly correlated to maternal age at marriage ($p = 0.048$), birth weight of the child ($p = 0.046$), mode of delivery ($p = 0.04$), birth defects ($p = 0.0002$) and period of gestation (0.027), but not with maternal education, maternal occupation and socioeconomic status of the family. Common birth defects observed in this study population were cleft lip/palate (6 out of 13 children) and imperforate anus (4 out of 13 children). Univariate

Tab. II. Breastfeeding and complementary feeding practices of participants (N = 95).

Variable	Frequency (N = 95)	Percentage (%)
Initiation of breastfeeding within 1 hour		
Yes	64	67.37%
No	31	32.63%
Exclusive breastfeeding for 6 months		
Yes	70	73.68%
No	25	26.32%
Continued breastfeeding at 1 year		
Yes	70	73.68%
No	25	26.32%
Initiation of complementary feed at 6 months		
Yes	86	90.53%
No	9	9.47%
Supplements		
Yes	29	30.53%
No	66	69.47%
Salt in complementary feeds		
Yes	89	93.68%
No	6	6.32%
Sugar in complementary feeds		
Yes	77	81.05%
No	18	18.95%
Expressed breast milk		
Yes	11	11.58%
No	84	88.42%
Formula feeding		
Yes	26	27.37%
No	69	72.63%
Cow milk		
Yes	68	71.58%
No	27	28.42%

Tab. III. Reasons for stopping breastfeeding.

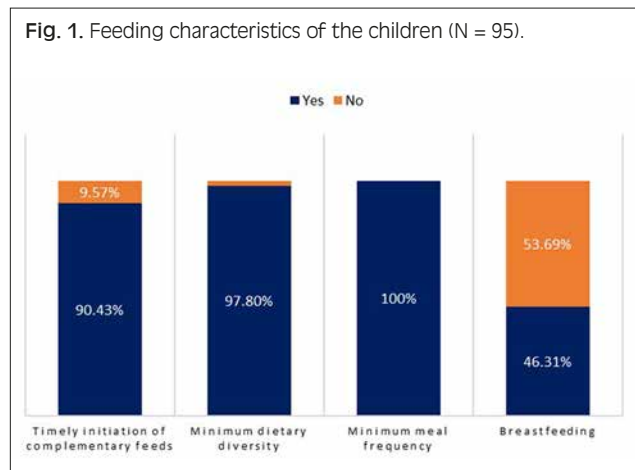
Reasons for stopping breastfeeding	Response (N = 51)
Trouble in milk flow to start	60.78% (31)
Breastfeeding was painful	9.80% (5)
Mother was sick	5.88% (3)
Mother had to leave the baby for long hours	13.73% (7)
Mother wanted to go back to her usual diet	0% (0)
Mother did not want to breastfeed in public	0% (0)
Mother became pregnant	21.57% (11)

analysis using chi square also revealed that practice of exclusive breastfeeding feeding did not vary significantly with residence, type of family, educational status, occupation and age of parents, birth order or weight of the child ($p > 0.05$) (Tab. IV). Using fisher's exact test, the practice of expressed breastmilk was found to have a significant association with birth weight of the child ($p = 0.019$), period of gestation ($p = 0.045$) and birth defects ($p = 0.034$).

COMPLEMENTARY FEEDING PRACTICES

Overall, 86 (90.43%) mothers had initiated timely complementary feeds as per the pediatrician's advice (Tabs. II, V). In addition, all children received the minimum meal frequency and the majority (97.8%) met the criteria of minimum dietary diversity (Fig. 1). However, only 43 (45.26%) children consumed adequate quantity of complementary feeds (Fig 2). The bivariate logistic regression analysis showed that present weight of the child, birth order, type of family and socioeconomic status were statistically associated with appropriate complementary feeding practice. In the multivariate logistic regression analysis, present weight of the child, educational status of the mother and father, type of family and socioeconomic status were independent predictors for appropriate complementary feeding practice. Univariate analysis using chi square found that the optimal complementary feeding was significantly associated with maternal age ($p = 0.029$) and maternal employment status ($p = 0.049$) but not with gender of

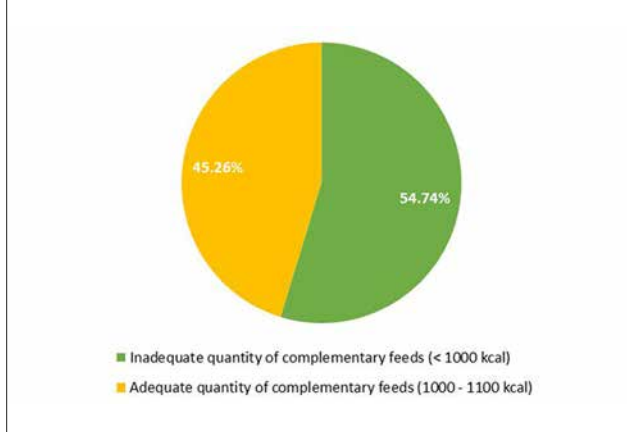
Fig. 1. Feeding characteristics of the children (N = 95).



Tab. IV. Bivariate and multivariate logistic regression for the predictors associated with exclusive breastfeeding (N = 95).

Population characteristics		Exclusively breastfed (N = 70)	Not exclusively breastfed (N = 25)	Crude odds ratio	Adjusted odds ratio	95% CI	p-value
Age	< 18 months	14 (93.33%)	1 (6.67%)	1.022	0.891	0.293 – 3.559	0.047
	≥18 months	56 (70%)	24 (30%)				
Gender	Female	27 (67.50%)	13 (32.50%)	0.889	1.013	0.351 – 2.252	0.243
	Male	43 (78.18%)	12 (21.82%)				
Place	Urban	51 (75%)	17 (25%)	1.833	2.360	0.609 – 5.520	0.644
	Rural	19 (70.37%)	8 (29.63%)				
Sibling	Yes	33 (71.74%)	13 (28.26%)	0.958	0.414	0.346 – 2.656	0.677
	No	37 (75.51%)	12 (24.49%)				
Present weight	Normal	52 (75.36%)	17 (24.64%)	0.630	1.158	0.249 – 1.592	0.366
	Underweight	18 (69.23%)	8 (30.77%)				
Mother's age	< 30 years	50 (78.13%)	14 (21.88%)	4.889	4.471	1.336 – 17.896	0.158
	≥30 years	20 (64.52%)	11 (35.48%)				
Mother's education	Primary	3 (75%)	1 (25%)	0.845	1.501	0.364 – 1.960	0.528
	Secondary	17 (65.38%)	9 (34.62%)				
	Graduate	50 (76.92%)	15 (23.08%)				
Mother's occupation	Housewife	62 (75.61%)	20 (24.39%)	0.516	0.452	0.152 – 1.758	0.284
	Employed	8 (61.54%)	5 (38.46%)				
Father's age	< 35 years	48 (76.19%)	15 (23.81%)	3.5	1.359	1.085 – 11.292	0.436
	≥35 years	22 (68.75%)	10 (31.25%)				
Father's education	Primary	9 (64.29%)	5 (35.71%)	0.611	0.542	0.300 – 1.246	0.508
	Secondary	13 (68.42%)	6 (31.58%)				
	Graduate	48 (77.42%)	14 (22.58%)				
Father's occupation	Unskilled	2 (50%)	2 (50%)	0.664	1.470	0.274 – 1.607	0.287
	Skilled	18 (66.67%)	9 (33.33%)				
	Professional	50 (78.13%)	14 (21.88%)				
Type of family	Nuclear	32 (68.09%)	15 (31.91%)	0.473	0.380	0.185 – 1.215	0.220
	Joint	38 (79.17%)	10 (20.83%)				
Socioeconomic class	Upper	12 (60%)	8 (40%)	1.562	1.596	0.882 – 2.766	0.588
	Upper-middle	21 (46.67%)	24 (53.33%)				
	Lower-middle	6 (27.27%)	16 (72.73%)				
	Upper-lower	4 (50%)	4 (50%)				
	Lower-lower	0 (0%)	0 (0%)				

Fig. 2. Quantity of complementary feeds among the children (N = 95).



Tab. V. Reasons for starting complementary feeds.

Reasons for starting complementary feeds	Response
Baby started consuming too much milk	16.48% (16)
Baby was hungry most of the time	38.94% (37)
Mother did not have enough milk	37.89% (36)
Baby not gaining weight	23.16% (22)
Mother wanted to feed something in addition to milk	63.16% (60)
Baby sleeps well at night	44.21% (42)
Baby was old enough to take solid food	72.63% (69)
Doctor recommended to give	78.95% (75)
Family members asked to give	72.63% (69)

the child, birth order, residence, maternal education, socioeconomic status, type of family, paternal age, paternal education and paternal occupation (Tab. VI).

Discussion

Breastmilk is the most nutrient-rich and safest food for infants up to 6 months of age. It is easily digested and thereby reducing the risk of constipation, upset stomach or diarrhea. Optimal feeding practices during the first 24 months of life is of utmost importance, as this time-period is the “critical window” for the promotion of good growth, health, cognitive and behavioral development. In addition, breastfeeding protects the neonate from common childhood illnesses like pneumonia, and also offers long-term health benefits, such as minimizing the risk of obesity in childhood and adolescence [14]. Feeding the mother’s breastmilk to infants within 1 hour of birth is termed as “early initiation of breastfeeding” and this ensures that the baby receives the colostrum,

which is abundant in protective factors. In the present study, 64 (67.37%) mothers had initiated breastfeeding within 1 hour of birth. A similar finding was found in the study conducted by Liaquathali et al. in which only 44% infants were initiated breastfeeding within 1 hour of birth [15]. Reddy et al. and Asare et al. reported that 59% and 60.5% of children were initiated breastfeeding within 1 hour of birth, respectively which were coherent with the present study [16, 17]. In our study, we were able to find significant association between timely initiation of breastfeeding and birth weight of the child ($p = 0.046$), mode of delivery ($p = 0.04$), period of gestation ($p = 0.027$) and birth defects ($p = 0.0002$). Data from this study showed that rates of timely initiation of breastfeeding were lower among babies delivered through caesarean section. Similar findings were highlighted in a systematic review and meta-analysis, which showed that rates of early initiation of breastfeeding following caesarean deliveries were significantly lower compared to vaginal deliveries [18]. In addition, pre-mature infants with low birth weight and children with birth defects

Tab. VI. Bivariate and multivariate logistic regression for the predictors associated with calorie consumption (N = 95).

Population characteristics		Sufficient calories (N = 43)	Deficient calories (N = 52)	Crude odds ratio	Adjusted odds ratio	95% Confidence Interval	p-value
Child's age	< 18 months	5 (33.33%)	10 (66.67%)	0.553	0.445	0.173 -1.762	0.312
	≥18 months	38 (47.50%)	42 (52.50%)				
Gender of the child	Female	16 (40%)	24 (60%)	0.691	0.730	0.303 -1.577	0.379
	Male	27 (49.09%)	28 (50.91%)				
Residence	Urban	30 (44.12%)	38 (55.88%)	0.850	0.643	0.348 -2.078	0.722
	Rural	13 (48.15%)	14 (51.85%)				
Present weight	Normal	32 (46.38%)	37 (53.62%)	1.179	1.333	0.474 -2.932	0.722
	Malnourished	11 (42.31%)	15 (57.69%)				
Sibling	Yes	21 (45.65%)	25 (54.35%)	1.031	0.944	0.459 -2.314	0.941
	No	22 (44.90%)	27 (55.10%)				
Mother's age	< 30 years	24 (37.50%)	40 (62.50%)	0.379	0.389	0.157 -0.916	0.029
	≥30 years	19 (61.29%)	12 (38.71%)				
Mother's education	Primary	1 (25%)	3 (75%)	0.827	1.735	0.399 -1.715	0.707
	Secondary	12 (46.15%)	14 (53.85%)				
	Graduate	30 (46.15%)	35 (53.85%)				
Mother's occupation	Housewife	34 (41.46%)	48 (58.54%)	0.315	0.298	0.090 -1.107	0.049
	Employed	9 (69.23%)	4 (30.77%)				
Father's age	< 35 years	25 (39.68%)	38 (60.32%)	0.512	0.710	0.216 -1.211	0.125
	≥35 years	18 (56.25%)	14 (43.75%)				
Father's education	Primary	6 (42.86%)	8 (57.14%)	0.771	1.115	0.440 -1.350	0.362
	Secondary	6 (31.58%)	13 (68.42%)				
	Graduate	31 (50%)	31 (50%)				
Father's occupation	Unskilled	2 (50%)	2 (50%)	0.676	0.619	0.322 -1.420	0.338
	Skilled	9 (33.33%)	18 (66.67%)				
	Professional	32 (50%)	32 (50%)				
Type of family	Nuclear	25 (53.19%)	22 (46.81%)	1.894	1.454	0.836 -4.293	0.124
	Joint	18 (37.50%)	30 (62.50%)				
Socioeconomic class	Upper	12 (60%)	8 (40%)	1.434	1.356	0.882 -2.332	0.192
	Upper-middle	21 (46.67%)	24 (53.33%)				
	Lower-middle	6 (27.27%)	16 (72.73%)				
	Upper-lower	4 (50%)	4 (50%)				
	Lower-lower	0 (0%)	0 (0%)				

also had delayed initiation of breastfeeding which can be attributed to the need for Neonatal Intensive Care Unit (NICU) admission and/or difficulty breastfeeding in these children.

Seventy (73.68%) mothers continued to exclusively breastfeed their children until 6 months of age, which was comparable to 70.2% reported in the study by Kulkarni et al. [19]. However, in the study conducted by Karmee et al. only 44.35% infants were exclusively breastfed until 6 months of age. Continuance of breastfeeding among children (12-24 months) were seen in 44.21%, which was lower compared to 72.36% reported by Karmee et al. [14]. This variance in breastfeeding practices among young infants may be explained by the literacy rate of the respondents, and diverse cultural and traditional practices prevalent in different topographical areas. In our study population, expressed breastmilk (EBM) was given only to 11 (11.58%) children, which was markedly lower compared to studies from developed countries [20]. There was a significant relationship ($p < 0.05$) between EBM and the period of gestation, birth weight, and birth defects of the child in the present study. Five out of 13 working mothers were not able to exclusively breastfeed their children for 6 months. If the duration of exclusive breastfeeding is to be extended among working women in the era of increasing employment of mothers, practice of expressed breastmilk has a crucial role to play [21]. In our study, duration of breastfeeding had a positive impact on the nutritional status of the child (Figs. 3, 4). When exclusive breastfeeding is no longer adequate to meet the nutritional needs of the growing infant, complementary foods must be added to the diet of the child. Complementary feeding ought to be timely, meaning that all children should be initiated on solid/semi-solid foods in addition to breastmilk from 6 months of age. It should also be adequate, meaning that the weaning foods must be given in recommended frequency, quantity and consistency to meet the nutritional needs of the growing infant while continuing breastfeeding [1, 9]. Eighty-six (90.53%) children were introduced complementary feeds at 6 months of age, which was comparable to the results of a study conducted in Ethiopia [22]. Studies conducted by Sethi et al. and Aggarwal et al. reported that only 16.5% and 17.5% children were initiated on timely complementary feeds, which were significantly lower compared to the present study [23, 24]. In the present study, almost all (100%) children consumed cereal-based foods, 94.74% children consumed fruits and vegetables, and 90.53% children consumed dairy products as a part of their daily diet. However, percentage of children consuming nuts, and flesh foods like meat, fish and eggs were comparatively lower in our study population (Fig. 5). Overall, all children received minimum meal frequency and majority (97.8%) satisfied the criteria of minimum dietary diversity. High rates of timely initiation of complementary feeds and optimal complementary feeding practices may be attributed to high maternal literacy rates and better socioeconomic status of the study population (Fig. 6). Although most of the children

Fig. 3. Relationship between duration of breastfeeding and nourishment of the child (N = 95).

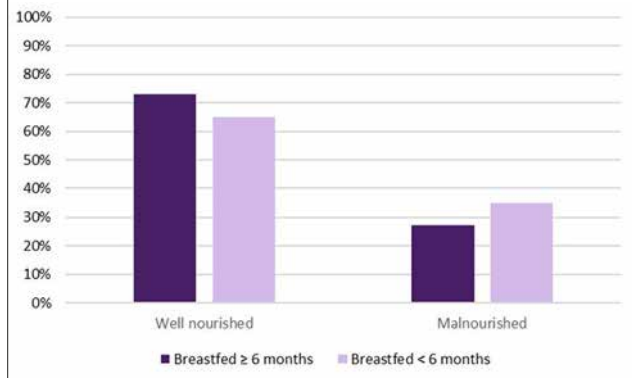


Fig. 4. Relationship between breastfeeding and nutritional status of the child (N = 95).

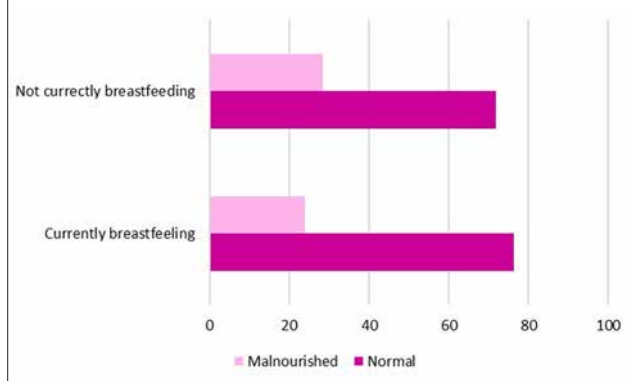
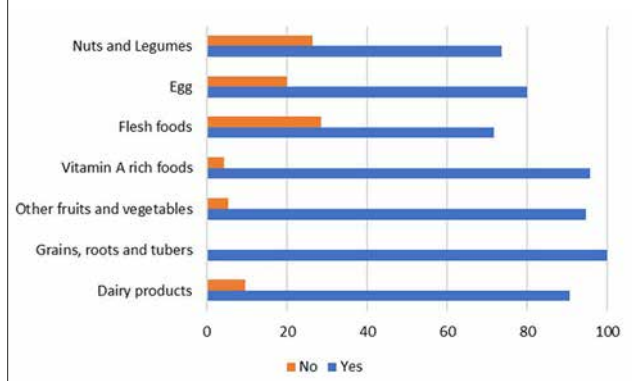
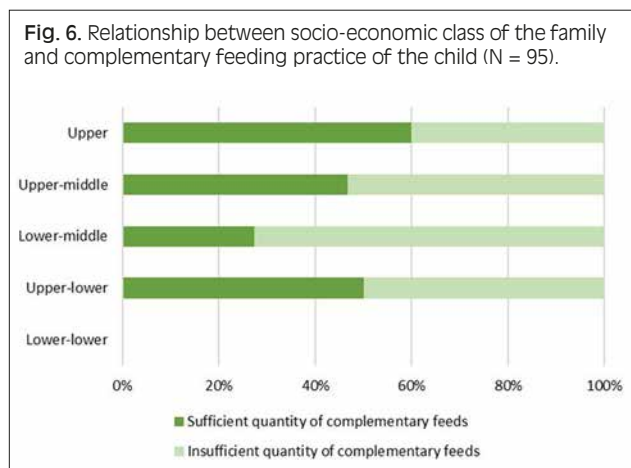


Fig. 5. Consumption of different food groups among the children (N = 95).



satisfied minimum meal frequency and minimum dietary diversity, only 43 (45.26%) consumed adequate quantity of complementary feeds (i.e, 1000-1100 kcal). This was similar to the finding of Rao et al, where only 32% mothers fed their children with adequate quantity of complementary feeds (8). In the present study, the quantity of complementary feeds significantly correlated with the maternal age ($p = 0.029$) and maternal occupation ($p = 0.049$). Higher knowledge



on adequate feeding was seen in older mothers, this may be ascribed to the fact that most of these children were 2nd born. Higher proportion of children (69.23%) of working mothers consumed adequate quantity of complementary feeds which could be explained by the financial self-reliance of the mother.

Using validated questionnaires and direct interview of the caregivers by the investigators could be stated as the strengths; however, the recall method could result in overestimation or underestimation of the measure of the child's dietary consumption due to recall and social desirability biases, which may be the limitations of this study. As this was a hospital-based prospective study, selection bias might have also affected the result. Community-based studies are required to represent the values in the general population. Another limitation of this study was the short timescale over which the study was undertaken.

Conclusion

Age-appropriate complementary feeding ensuring growing infants are fed nutritionally rich complementary foods is a major challenge in developing countries like India. Studies conducted in India have shown that proper utilization of existing health services can bring about drastic improvements in infant and young child feeding practices. Attention should be directed towards socio-economic empowerment especially education of female children, regular health-care visits and access to a community-based IYCF counselling support system to implement knowledge about optimal feeding practices. It is also imperative to create public awareness to stop the spread of misconceptions and to provide authentic information about appropriate infant feeding practices.

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Conflict of interest statement

The authors declare no conflict of interest.

Authors' contributions

Study concept and design: SG, JJ, SG and MR. Analysis and interpretation of data SG, JJ, SG: drafting the manuscript: SG, JJ and SG; critical revision of the manuscript for important intellectual content: SG and SG.

Patient consent for publication

Parental/guardian consent obtained.

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