



FACTORS INFLUENCING COMPLEMENTARY FEEDING IN CHILDREN AGED 6MONTHS TO 24 MONTHS- A CROSS SECTIONAL STUDY

Paediatrics

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ABSTRACT

Background: India is facing malnutrition for a long time, which threatens children survival, growth, and development. Complementary-feeding is a subject of little research. This study was conducted to assess the factors influencing complementary feeding in children between 6months and 24months age. **Material & Method:** A cross-sectional study was conducted among children of age 6 months to 24 months visiting the Paediatric Outpatient department. After obtaining consent, 380 children fulfilling Inclusion-criteria were enrolled. Validated Questionnaire was filled by interviewing. Data-analysis is done by entering them in Microsoft excel and SPSS version22. **Result:** Three hundred and eighty children's mothers were interviewed. Of these 210(55.3%)male and 170(44.7%)female. The total number of babies with known birthweight was 380. The Low-birth-weight was 58 (15.2%) and Normal-birth-weight was 322 (84.3%). The Complementary-feed Initiation of <6months was 47(12.4%) and at 6months was 207(54.5%) and >6months was 126(33.2%). The Frequency of Complementary-Feeding of ≤ 3 was 204(53.7%) and >3 was 176(46.3%). In 59.70% family pot feeding was the most common Complementary-feed was given. Education of mothers influences the birth weight which was significant P-value 0.037($p<0.05$). Mother's Education, Occupational status, Birth interval and Socioeconomic-class influences the frequency of complementary-feeding with P-value 0.030($p<0.05$), 0.010($p<0.05$), 0.036($p<0.05$) and 0.014($p<0.05$) respectively. Occupational status of mothers influences frequency of complementary-feeding with p-value0.010($p<0.05$). Birth-interval affects the frequency of complementary-feeding with p-value0.036($p<0.05$). Socioeconomic-class is influencing the time at which complementary-feeding is initiated with p-value0.0001($p<0.05$). **Conclusion:** There was association of appropriate feeding practices with mother's education and socio-economic status. The findings highlight the importance of the mother's education, profession and young child feeding. This knowledge can be utilized to improve the infant and young child feeding practices and bring down the child morbidity and mortality in the country.

KEYWORDS

Complementary-feeding, Socioeconomic status, Education, Birth-interval.

INTRODUCTION

Complementary feeding refers to the process of providing infants with additional foods and liquids when breast milk no longer meets their nutritional needs. A child is generally considered eligible for complementary feeding when their age is between 6 and 24 months, even though breastfeeding can continue beyond two years⁽¹⁾. It has been suggested that inadequate complementary feeding practices are partially responsible for this unsatisfactory improvement in nutritional status of children⁽²⁾. To identify the gaps in attaining the goals of the appropriate Complementary Feeding practices, this study assesses the factors influencing complementary feeding in children between the ages of six months and 24 months.

MATERIAL&METHOD:

A cross-sectional study was conducted among children of age group 6 months to 24 months visiting the Paediatric Outpatient department, through Nonprobability convenient sampling. After obtaining informed consent from parents, 380 children fulfilling inclusion criteria were enrolled in this study. Validated Questionnaire is filled by interviewing the patient's parent/care giver. All the data collected were coded and entered in Microsoft Excel sheet which was re-checked and data analysis is done by SPSS software version22. Quantitative variables were summarized using mean and standard deviation(SD). Categorical variables were represented using frequency and percentage.

The data were represented using the tables and figures. Independent sample t-test was used to test statistical significance of difference between means of variables among two independent groups. Pearson Chi-square test and Fisher's exact test were used for comparing categorical variables between groups. A p-value of <0.05 was considered statistically significant.

RESULT:

Out of 380 children, males were 55.30%(210) and females were 44.70%(170). The LBW birth weight was 15%(57) and NBW birth weight was 85%(323). The Complementary feed Initiation before 6

months was 12.4% and at 6 months was 54.5% and after 6 months was 33.2%. Among the children who had siblings, the birth interval of ≤ 2 years babies were 47.3% and >2 years babies were 52.7%. The Frequency of complementary feeding of ≤ 3 times was 53.7% and >3 times was 46.3%. The Breastmilk and semisolid diet were found with 38.70% and Semi-solid and solid was found to be 61.30%. The family pot feeding 59.70% was the most common complementary feed was given.

Mother's educational status and birth-weight of the baby was compared and showed significant association with a Chi-square test value has the value of 13.24 and (P-value 0.037($p>0.05$)) as mentioned in **Table 1**. The Educational status of the mothers and frequency of complementary feeding were compared in **Table 2** and were found that the Chi-square test value has 10.725 and the P-value has 0.030($p<0.05$) which is Significant.

The working mothers were 16.8%, Not working mothers were 83.2%. The frequency of complementary feeding who were working mothers of ≤ 3 has 6.6% and >3 has 10.3%. The frequency of complementary feeding and the occupational status of the mother was compared and the chi-square analysis revealed that there was a significant association between the groups with the chi-square value of 6.618 and the p-value of 0.010($p<0.05$) as mentioned in **Table 2**.

The babies born with birth interval of ≤ 2 yr had frequency of complementary feeding ≤ 3 was 6.6% and >3 was 2.6%. The birth interval and frequency of complementary feeding showed significant association between the groups with the chi-square value of 6.645 and the p-value of 0.036($p<0.05$) as mentioned in **Table 2**.

In our study, the frequency of upper class (>26) has 14.7%(56), upper middle (16-25) has 51.3%(195), lower middle (11-15) has 25.8%(98), upper lower (5-10) has 7.65%(29) and lower (<5) has 0.5%(2). The chi-square analysis revealed that there was a significant association between Socioeconomic class and initiation of breastfeeding with the chi-square value of 12.493 and the p-value of 0.014($p<0.05$) as mentioned in **Table 3**.

The frequency of Complementary feeding and Socioeconomic status were compared and the chi-square analysis revealed that there was significant association between the groups with the chi-square value of 12.493 and the p-value of 0.014 ($p < 0.05$) as mentioned in **Table 2**.

The frequency of complementary feeding was compared to all the study variables. The odds-ratio of age was 1.289 (0.86 – 1.94), the odds ratio of gender was 1.102 (0.73 – 1.65). The odds-ratio of birth interval was 1.50 (0.57 – 3.97). The odds ratio of weight at initiation available was 1.602 (0.96 – 2.67). The odds-ratio of birth Weight was 2.59 (1.29 – 5.17) as mentioned in **Table 2**.

The Odds-ratio of Initiation of complementary feeding were compared to all the variables in **Table 3**. The Odds-ratio of age was 0.6. the odds-ratio of Gender was 1.107 which is significant. In socioeconomic status and initiation was compared, the Odds-ratio of Upper middle and upper lower was significant with the value of 3.58 and 1.16 respectively. The odds-ratio of upper class was 0.828, Lower middle was 0.31 and that of lower class was 1. The odds-ratio of birth interval was 0.374. the Odds-ratio of weight at initiation was 0.53. The odds-ratio of birthweight was 0.427.

Table 1: Mother's education with Birthweight

Education	Birthweight				Total
	LBW	%	NBW	%	
Primary education	0	0	14	3.68	14(3.68%)
Secondary education	57	15	128	33.68	185(48.6%)
Higher Secondary & Diploma	0	0	90	23.68	90(23.68%)
Undergraduate	0	0	88	23.15	88(23.15%)
Postgraduate	0	0	3	0.78	3(0.7%)
Total	57	15	323	85	380(100%)
Chi-square test value	13.24	P-value		0.037 ($p < 0.05$)	Sig

Table 2: Frequency of Complementary Feeding

Variable		N	Frequency of Complementary Feeding		Odds-Ratio (95% CI)	Chi-square test value	P-value
			≤3	>3			
Age-	≤1yr	166 (43.7%)	95(25.0%)	71(18.7%)	1.289(0.86 – 1.94)	-	
	>1yr	214 (56.3%)	109(28.7%)	105(27.6%)			
Gender	Male	210 (55.3%)	115(30.3%)	95(25.0%)	1.102(0.73 – 1.65)	0.219	0.640
	Female	170 (44.7%)	89(23.4%)	81(21.3%)			
SES	Upper Class (>26)	56 (14.7%)	25(6.6%)	31(8.2%)	0.79(0.44 – 1.45)	12.493	0.014
	Upper middle (16 – 25)	195 (51.3%)	98(25.8%)	97(25.5%)	0.67(0.41 – 1.09)		
	Lower middle (11 – 15)	98 (25.8%)	59(15.5%)	39(10.3%)	0.48(0.19 – 1.23)		
	Upper Lower (5 – 10)	29 (7.6%)	22(5.8%)	7(1.8%)	0.24(0.13 – 0.46)		
	Lower (<5)	2(0.5%)	0(0.0%)	2(0.5%)	1		
Birth Interval	≤2yrs	35(46.7%)	25(33.3%)	10(13.3%)	1.50(0.57 – 3.97)	6.645	0.036
	>2yrs	40(53.3%)	25(33.3%)	15(20.0%)			
Weight at Initiation available	Yes	78(20.5%)	49(12.9%)	29(7.6%)	1.602(0.96 – 2.67)	4.004	0.405
	No	302(79.5%)	155(40.8%)	147(38.7%)			
Birth Wt.	LBW	57 (15%)	38(10.5%)	19(4.5%)	2.59(1.29 – 5.17)	-	-
	NBW	323(85%)	118(40.7%)	128(44.1%)			

Mother's Education	Primary Edu	14 (3.7%)	7(1.8%)	7(1.8%)	-	10.725	0.030
	Secondary Edu	185 (48.7%)	112(29.5%)	73(19.2%)			
	Higher Secondary & Diploma	95 (25.0%)	39(10.3%)	56(14.7%)			
	Undergraduate	80 (21.1%)	44(11.6%)	36(9.5%)			
	Postgraduate	6(1.6%)	2(0.5%)	4(1.1%)			
Mother's Occupation	Working	64(16.8%)	25(6.6%)	39(10.3%)	-	6.618	0.010
	Not working	316 (83.2%)	179(47.1%)	137(36.1%)			

Table 3: Comparison of Initiation of Complementary Feeding with all variables

Variable		N	Initiation of Complementary Feeding		Odds Ratio (95% CI)	Chi square test	P value
			<6 months	≥6 months			
Age	≤1yr	166 (43.7%)	15 (3.9%)	151 (39.7%)	0.565(0.295 – 1.082)	-	-
	>1yr	214 (56.3%)	32 (8.4%)	182 (47.9%)			
Gender	Male	210 (55.3%)	27 (7.1%)	183 (48.2%)	1.107(0.597 – 2.051)	0.219	0.640
	Female	170 (44.7%)	20 (5.3%)	150 (39.5%)			
SES	Upper Class(>26)	56 (14.7%)	6(1.6%)	50(13.2%)	0.828(0.33 – 2.05)	12.493	0.014
	Upper middle(16 – 25)	195 (51.3%)	36(9.5%)	159(41.8%)	3.58(1.76 – 7.27)		
	Lower middle(11 – 15)	98 (25.8%)	5(1.3%)	93(24.5%)	0.31(0.12 – 0.80)		
	Upper Lower(5 – 10)	29 (7.6%)	0(0.0%)	29 (7.6%)	1.16(0.11 – 1.20)		
	Lower(<5)	2 (0.5%)	0 (0.0%)	2(0.5%)	1		
Birth Interval	≤2yrs	35 (47.3%)	4(5.4%)	31(41.9%)	0.374(0.11 – 1.33)	-	-
	>2yrs	39 (52.7%)	10 (13.5%)	29(39.2%)			
Weight at Initiation available	Yes	78 (20.5%)	6(1.6%)	72(18.9%)	0.530(0.22 – 1.29)	-	-
	No	302 (79.5%)	41(10.8%)	261(68.7%)			
Birth Wt.	LBW	44 (15.2%)	3(1.0%)	41(14.1%)	0.427(0.12 – 1.45)	-	-
	NBW	246 (84.8%)	36(12.4%)	210(72.4%)			
Mother's Education	Primary Edu	14 (3.7%)	7(1.8%)	7(1.8%)		13.734	0.089
	Secondary Edu	185 (48.7%)	112(29.5%)	73(19.2%)			
	Higher Secondary & Diploma	95 (25.0%)	39(10.3%)	56(14.7%)			
	Undergraduate	80 (21.1%)	44(11.6%)	36(9.5%)			
	Postgraduate	6(1.6%)	2(0.5%)	4(1.1%)			

DISCUSSION

Infant and young child feeding (IYCF) practices include timely introduction of semi-solid/ solid foods from the age of six months increasing in amount and frequency over time along with breast feeding as demanded by child⁽³⁾.

This study was conducted among 380 young children aged between 6 months to 24 months, attending the Paediatric outpatient Department of Aarupadai Veedu Medical College and Hospital. This study was carried out to assess the knowledge of mothers regarding complementary feeding, to evaluate the practices of complementary feeding in terms of quality, quantity and timing, and to determine the factors influencing the inappropriateness of complementary feeding.

In our study, out of 380 patients, males were 210 (55.30%) and females were 170 (44.70%). The frequency of ≤ 1 year babies were 166 (43.7%) and > 1 year were 214 (56.3%). The Complementary feed Initiation before 6 months was 47 (12.4%), at 6 months was 207 (54.5%) and after 6 months was 126 (33.2%).

A study done by Akram DS et al.⁽⁴⁾, on effect of intervention on promotion of breastfeeding showed that the percentage of the children given complementary feeds was significantly higher in the control group (37.8%) before 6 months when compared to the intervention group (1.6%). The study done by Dewey KG et al.⁽⁵⁾, showed that 39 infants were given complementary feeds at 6 months in the intervention group (34%) whereas only 12 after 6 months (8.2%).

In our study, out of 380 babies, the Frequency of complementary Feeding of ≤ 3 was 204 (53.7%) and > 3 was 176 (46.3%). WHO recommends that infants start receiving complementary foods at 6 months of age in addition to breast milk. Initially, they should receive complementary foods 2–3 times a day between 6–8 months and increase to 3–4 times daily between 9–11 months and 12–24 months.

A study done by Amir et al.⁽⁶⁾ in New Delhi, found that adequate frequency of CF was practiced in 48.8% mothers. Swathi et al in their study found that only 32% of mothers were giving an adequate quantity of complementary feeds. Aggarwal et al⁽⁷⁾, found that only 25% mothers gave adequate quantity of complementary feeding and adequate consistency was practiced by 38% mothers. Shivani et al⁽⁸⁾, found that only 41% of the mothers gave complementary foods with adequate consistency.

Fatemeh et al⁽⁹⁾, in their study conducted in Iran found that about 54% mothers fed their children with appropriate frequency and 49% with appropriate consistency of CF. The practice of appropriate complementary feeding was 9.5 % similar to our study (15.8%). The breast milk and semi-solid diet was given for 147 (38.70%) and Semi solid and solid was given for 233 (61.30%) children.

In Mangala belur et al⁽¹⁰⁾ study, majority of mothers were giving ragi sari in (65%), followed by rice dhal (64%) in semisolid form. In this study most common complementary feed given was Sathumaavu kanji by 7 (1.8%) mothers, Porridge was 26 (6.8%), Idle with milk was to 98 (25.80%), Family pot feeding was to 227 (59.70%), Dal rice with milk was to 1 (0.30%), Dal rice with ghee was to 64 (16.80%) and Cerelac was to 12 (3.20%) and 1 (0.3%) was not feeding with complementary food. The family pot feeding 59.70% was the most common Complementary feed was given. Duggal MN et al study⁽¹¹⁾, majority of the mothers (66.4%, n=332) offered ragi sari as first complementary food, followed by cow's/ buffalo milk, commercial products like cerelac etc., rice ganji and fruits.

Mother's education with frequency of complementary Feeding was analyzed. Around 14 (3.7%) mothers who completed primary education fed ≤ 3 times with 7 (1.8%) and > 3 times of 7 (1.8%), Secondary education 185 (48.7%) with ≤ 3 of 112 (29.5%) and > 3 of 73 (19.2%), Higher Secondary & Diploma 95 (25.0%) with ≤ 3 of 39 (10.3%) and > 3 of 56 (14.7%), Under Graduate 80 (21.1%) with ≤ 3 of 44 (11.6%) and > 3 of 36 (9.5%), and Post Graduate 6 (1.6%) with ≤ 3 of 2 (0.5%) and > 3 of 4 (1.1%). The Chi square test value has 10.725 and the P value has 0.030 ($p < 0.05$) Sig.

Our results showed that, educational status had a statistically significant association with the initiation of complementary feeding. Same results were obtained by many of the previous authors. Joshi H.⁽¹²⁾ et al indicated that mother's education and employment is

significantly associated with age at which complimentary feed was introduced. Majority of the mothers (55%) who started complementary feeding at 6 months were unemployed, whereas a smaller number of employed mothers (38.5%) started complimentary feeding at 6 months. So, it shows that maternal place of work positively influences the adoption of appropriate infant feeding practice.

In our study, the frequency of upper class (> 26) has 56 (14.7%), upper middle (16–25) has 195 (51.3%), lower middle (11–15) has 98 (25.8%), upper lower (5–10) has 29 (7.65) and lower (< 5) has 2 (0.5%). The table 18 shows the lower 0.5% which was lesser than the others. The chi square analysis revealed that there was a significant difference between the groups with the chi square value of 12.493 and the p-value of 0.014. Pradeep et al.⁽¹³⁾, reported that, 60% of the mothers were living in nuclear family and most of them belonging to class 3 (53.4%) and class 4 (40.7%) socio-economic class and no one in class 1 and class 5. Some studies have shown that there is highly significant association with malnutrition and mothers' educational status, family socio economic status and family structure.

In our study, the working mothers were 64 (16.8%), home making mothers were 316 (83.2%). The frequency of complementary feeders who were working mothers of ≤ 3 times has 25 (6.6%) and > 3 times has 39 (10.3%). The mothers who frequency of complementary feeding ≤ 3 times who were not working was 179 (47.1%) and > 3 has 137 (36.1%). The chi square analysis revealed that there was a significant difference between the groups with the chi square value of 6.618 and the p-value of 0.010 which is significant.

This brings to light the need for alternative caregivers. A study in Guatemala by Hallman K et al.⁽¹⁴⁾ showed that urban mothers were significantly less likely to report all day childcare as their work hours increased and required alternative care arrangements. Often mothers cook food in morning and these prepared foods are feed to baby by caregivers throughout the day. Women in Focused Group Discussions mentioned they understand the important hygiene, time and frequency of feeding, but that is very challenging to follow when they are at work. Carina Venter et al⁽¹⁵⁾ showed that increased infant Dietary Diversity, as measured by 4 different methods, decreased the likelihood of developing Food allergies.

CONCLUSION:

There was an association of appropriate feeding practices with mother's education, and socio-economic status. The findings highlight the importance of the mother's education, profession and young child feeding.

More such studies regarding knowledge and practices of complementary feeding on a large scale are required to improve the knowledge regarding the infant and young child feeding practices in the community. This knowledge can be utilized to improve the infant and young child feeding practices and bring down the child morbidity and mortality in the country.

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