

Study on factors affecting complementary feeding practices in infants and young children in a rural area of Bihar

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Introduction: Proper infant and young child feeding practices are essential for the prevention of childhood morbidity and mortality. NFHS-4 reported that about half of the children in Bihar are not receiving complementary foods timely. The present study was conducted to assess the factors affecting the complementary feeding of infants and young children. **Methods:** The present cross-sectional study was conducted upon mothers/ caretakers of 400 children age 6-24 months. Sociodemographic details and complementary feeding practices were noted. **Results:** The mean age of initiation of complementary feeding was 5.2 months. Cereals were the most common complementary food given while only 19% of children received food from all the food groups. Half of the children (50.8%) were given food of appropriate consistency and 41% were given the proper amount. 53.8% were given marketed foods. A significant association was seen between ideal practices and type of family ($p=0.002$), mother's education ($p=0.000$), socioeconomic status ($p=0.000$) and IYCF related advice given during immunization sessions ($p=0.000$). **Conclusion:** Appropriate feeding practice is very low and effort should be made to increase the appropriate feeding practices.

Keywords: Complementary feeding, Cross-sectional study, Factors

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Introduction

Different reports have repeatedly emphasized the role of proper infant and young child feeding practices for prevention of childhood morbidity and mortality and ensuring adequate nutrition. Globally, one-third of the estimated 9.5 million deaths that occurred in 2006 in children less than five years of age were attributed directly or indirectly to undernutrition [1]. Infant and young child feeding (IYCF) practices recommend exclusive breastfeeding up to the age of six months; timely initiation of feeding solid, semisolid foods after six months onwards. It also recommends feeding small amounts, increasing the number of foods and frequency of feeding as the child gets older while maintaining breastfeeding as demanded by the child. In Bihar, the percentage of children who received complimentary food at 6-7 months of age increased from 31% in the NFHS-3 to 54% in the NFHS-4. Still, about half of the children are not receiving complementary foods timely [2]. Knowledge on feeding practices of infants and young children is crucial for undertaking or improving health and nutrition programs in the country. Different studies have tried to explore the reasons behind improper complementary practices. Such studies have not been done in this area. Hence, this study was conducted.

Aims and objectives

The present study was conducted to assess the factors affecting complementary feeding of infant and young children, attending OPD of RHTC Kalyanpur attached to Darbhanga Medical College.

Material and Methods

Study setting: The present study was conducted at the Darbhanga Medical College, Darbhanga, Bihar. The rural training center of this institute covers a population of 3,27,653 population with 3 additional PHC and 38 sub-centers under its jurisdiction. Large numbers of mothers with children from the PHC area attend OPD for immunization and treatment of illness. The staff nurse posted at this center has already been trained for IYCF.

Duration and type of study: The present study was conducted between Dec 2014 to Nov 2016. Data collection was done between March 2016 to Aug 2016.

Study subjects: Children of 6 to 24 months of age

Who attended the outpatient department of Primary health center, Kalyanpur were included. Mothers/caretakers of children were interviewed.

Inclusion criteria: Children aged 6 months to 24 months attending the OPD of Primary Health Centre, Kalyanpur were included in the present study.

Exclusion criteria: Children with known anomalies and who were very sick needing emergency care were excluded.

Sampling: The sample size was determined by using the formula: $(Za)2pq/D2$. 57.0% of children are fed according to a recommendation by IYCF in terms of foods from recommended food groups and are fed at least the recommended minimum number of times. Considering allowable error to be 5%. Size of sample = $(1.96)2 \times 0.57 \times 0.43 / (0.05)2 = 376$. A total of 400 study subjects were included. Systematic random sampling was used for data collection amongst the cases attending OPD.

Data collection procedure: A semi-structured questionnaire was used to collect the data with the mother. Before the data collection process, permission was taken from the hospital authority for the study. Mothers of consecutive children fulfilling the inclusion criteria were enrolled in the study until the required sample size was reached. Mothers were informed about the study and consent was taken. Then, data were collected by personal interview. Intern, staff-nurse and medical social worker (MSW) helped in data collection.

Data analysis: Data was entered in Microsoft Excel and Data was entered and analyzed using Medcalc software. Percentage, proportions, and contingency tables were used for the description of the data. Association of inappropriate feeding practices with socio-demographic characteristics was analyzed using the chi-square test. P-value <0.05 was considered as statistically significant.

Ethical consideration and permission: Approval from the Institutional Ethics Committee was obtained. Informed consent was taken from the patients. The confidentiality of records was maintained.

Results

A total of 400 mothers/ caretakers were interviewed in the present study. Table-1 shows the background characteristics of the study population. 62.5% of children were males, 63.3% of them belonged to the nuclear family, 93% of them were Hindus. The

Mean age of children was 12.9 months. 19% of mothers were illiterate and 70% of them were housewives.

Table-1: showing background characteristics of the study population

Background characteristics	Values	Frequency	%
Age (in months)	-	12.9±5.2	
Sex	Male	250	62.5
	Female	150	37.5
Type of family	Nuclear	253	63.3
	Joint	147	36.7
Mother's education	Illiterate	76	19
	Primary	60	15
	Secondary	124	31
	Intermediate	100	25
	Bachelor and above	40	10
Mother's occupation	Housewife	280	70
	Agriculture	60	15
	Business	24	6
	Service	24	6
	Skilled work	12	3
Socioeconomic status	A	68	16.5
	B	25	6.3
	C	179	44.8
	D	112	28
	E	16	4
Religion	Hindu	372	93
	Muslim	28	7

Table-2 shows awareness of mothers regarding complementary feeding. 88% of mothers knew when to start complementary feeding, 87.8% knew what foods to give but only 36.8% were aware of the correct frequency.

Table-2: showing awareness of mothers regarding complementary feeding

Characteristics	Values	Frequency	%
When to start complementary feeding	Yes	352	88
	No	48	12
What foods to be given	Yes	351	87.8
	No	49	12.2
Correct frequency	Yes	147	36.8
	No	253	63.2

Table-3 shows the complementary feeding practices. The mean age of initiation of complementary feeding was 5.2 months. Cereals were the most common complementary food given while only 19% of children received food from all the food groups. Half of the children (50.8%) were given food of appropriate consistency and 41% were given the proper amount. 53.8% were given

Table-3: Showing complementary feeding practices

Characteristics	Values	Frequency	%
Age at initiation of complementary feeding (in months)		5.2±1.6	
Types of complementary foods given	Cereals	112	28
	Milk product	28	7
	Cerelac	32	8
	Vegetables and fruits	100	25
	Egg, meat or fish	20	5
	Pulses	32	8
	All	76	19
Amount of complementary foods given	Inappropriate	236	59
	Appropriate	164	41
Consistency of complementary foods given	Thick	124	31
	Thin	73	18.2
	Appropriate	203	50.8
Separate container used	Yes	268	67
	No	132	33
Use of marketed foods	Yes	215	53.8
	No	185	46.2

Table-4: Showing association between background factors and complementary feeding

Characteristics	Values	Not ideal practice	Ideal practice	Significance
Type of family	Nuclear	222	31	X ² =9.9843 p=0.00157
	Joint	111	36	
Mother's education	Illiterate	69	7	X ² =39.1685 p=0.00001
	Primary	52	8	
	Secondary	111	13	
	Intermediate	81	19	
	Bachelor and above	20	20	
Mother's occupation	Housewife	232	48	X ² =5.5416 p= 0.23609
	Agriculture	54	6	
	Business	19	5	
	Service	11	1	
	Skilled work	17	7	
Socio-economic status	A	59	9	X ² = 43.980 p=0.00001
	B	21	4	
	C	168	11	
	D	72	40	
	E	13	3	
Advice received during immunization	Yes	106	56	X ² =61.9886 p<0.00001
	No	227	11	

Table-4 shows the association between background

Factors and complementary feeding. A significant association was seen between ideal practices and type of family ($p=0.002$), mother's education ($p=0.000$), socioeconomic status ($p=0.000$) and IYCF related advice given during immunization sessions ($p=0.000$).

Discussion

Infant and young child feeding practices include early initiation of breastfeeding within one hour of life, no bottle feeding and exclusive breastfeeding thereafter up-to 6 months and timely introduction of solid/semi-solid foods from the age of six months increasing in amount and frequency over time along with breastfeeding as demanded by the child [3,4]. The National family health survey 2015-16 has shown that IYCF practices are still low in India.

Only 30.7% of the children are fed according to the IYCF practices; that is feeding milk and milk products and food items from the recommended food groups and at the minimum recommended frequency [2]. Hence, the present study explored the factors influencing the appropriateness of complementary feeding, to assess the knowledge of mothers regarding complementary feeding and to evaluate the practices of complementary feeding in terms of quantity, quality, and timing.

A total of 400 mothers/ caretakers were interviewed in the present study. The mean age of children was 12.9 months. 62.5% of them were males, 63.3% belonged to the nuclear family and 93% were Hindus. 19% of mothers were illiterate and 70% of them were housewives. Javalkar et al found that 49.5% of mothers were Hindus, 43.4% were Muslims and 7.1% belonged to Christian and other religions. There were 35.1% of women educated till secondary school, with only 5.1% illiterate. The majority of the women (78.2%) were housewives and only 21.8% of them were employed and contributing to the family income among them.

A majority (83.8%) of them belonged to socio-economic classes II and III, according to Modified BG Prasad's Socioeconomic Classification. The majority of the mothers (66.9%) belonged to nuclear families, 18.4% belonged to joint families, and only 4.5% belonging to Three generation family [5]. Rao et al observed that the majority of children (41%) belonged to the 6-12 months age group, 56.5% were male children and 52% belonged to a joint family. Most of the mothers (81%) were homemakers [6].

88% of mothers knew when to start complementary feeding, 87.8% knew what foods to give but only 36.8% were aware of the correct frequency. The mean age of initiation of complementary feeding was 5.2 months. Cereals were the most common complementary food given while only 19% of children received food from all the food groups. Half of the children (50.8%) were given food of appropriate consistency and 41% were given the proper amount. 53.8% were given marketed foods. Javalkar et al reported that 69.3% of mothers in the rural area and 30.6% of mothers in the urban area started complementary feeds at the age of 6 months. 35.2% started complementary feeds before 6 months of age; the most common reason for starting the complementary feeds before 6 months of age was advice by family members/friends followed by the belief that breast milk alone is not sufficient for the child. The most common complementary food given first was rice and dal cooked together by 29.2% mothers followed by readymade baby feeds (20%). The number of meals per day given to the child varied from 2-4/day, both in an urban and rural area [5].

Yadav et al found in the urban and rural areas of Bihar that 17.70% urban and 13.10% rural mothers started complementary foods before 6 months of age, the reason for early weaning being mothers felt that breast milk was not sufficient. The most common food given first as weaning food both in urban as well as rural areas was rice [7]. Rao et al found that 77.5% of mothers had started complementary feeding at the recommended time and 12% of children had delayed complementary feeding. The most common reason given for the delayed introduction of complementary feed was that mothers felt their milk was enough for baby. Only 32% of mothers practiced the adequate quantity of complementary feeds. The majority (82%) mothers had initiated weaning with home-made food. Around 22% of children were bottle-fed. Ragi, wheat, and rice were the most common home-made complementary food used [6].

A significant association was seen between ideal practices and type of family ($p=0.002$), mother's education ($p=0.000$), socioeconomic status ($p=0.000$) and IYCF related advice given during immunization sessions ($p=0.000$). Javalkar et al reported that statistical association between socio-demographic variables and initiation of complementary feeding was not significant in the rural area. However, in the urban area,

Socioeconomic status had a significant association ($p < 0.05$) [5]. Rao et al also found in the univariate analysis that the practice of complementary feeding at the recommended time of six months was significantly associated with socioeconomic status ($p = 0.036$), birth order ($p = 0.013$), place of delivery (0.033), maternal education ($p = 0.038$) but not with the gender of the child, maternal age, maternal employment status, type of family and advice about complementary feeding during immunization [6].

Dhami et al analyzed NFHS-4 data and observed a wide variation in the prevalence of introduction of solid, semi-solid or soft foods (complementary foods) among infants aged 6–8 months in regional India; highest in the South (61%) and lowest in the Central and Northern regions (38%). Minimum dietary diversity (MDD) was highest in the South (33%) and lowest in the Central region (12%). The factors associated with complementary feeding practices also differed across Indian regions.

Significant modifiable factors associated with complementary feeding practices included higher household wealth index for the introduction of complementary foods in the North and Eastern India; higher maternal education for MMF and MDD in the North and Central regions; and frequent antenatal care visits (≥ 4 visits) for all indicators but for different regions [6,8].

Limitations

The present study was descriptive in nature and generates hypotheses only. An analytical study is needed to test the hypothesis and calculate the risk. It covered a population of rural centers of DMCH, Darbhanga. Studies covering a larger area are needed to generalize the findings.

Conclusion

It is seen in the present study that ideal feeding was practiced only in a minority of children. Some of the mothers used cereals as a weaning food but a few mothers knew the proper method of its preparation. The frequency of complementary feeding given to children was good in the majority of the children but its consistency and amount were found to be not appropriate as per recommendation by IYCF Guidelines in more than half of the children.

There was an association of appropriate feeding practices with mother's education, type of family, family income (SES) and feeding advice during

immunization. The findings highlight the importance of the mother's education, profession and giving education in the immunization clinic for the infant and young child feeding.

Appropriate feeding practice is very low and effort should be made to increase the appropriate feeding practices by putting more effort inconsistency of food and timing of feeding. The immunization clinic is the best place and vaccination time is the ideal time for educating mothers about appropriate feeding practices.

What does the study add to the existing knowledge

This study gives insight into the factors associated with complementary feeding practices in infants and young children of Bihar.

Author's contribution

Dr. Akhilesh Kumar is the principal author and conducted this study. **Dr. Laxman Kumar** and **Dr. Tushar Kumar** reviewed the literature and assisted in finalizing the study design. This study was conducted under the supervision of **Dr. Chittaranjan Roy** who was the study guide. **Dr. Hem Kant Jha** edited this article and **Dr. Prabhat Kumar Lal** assisted in data analysis.

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