

## A Study of Complementary Feeding Practices among 6 To 23 Months Old Children Visiting In Pediatric Outdoor Clinic of a Tertiary Care Centre In Lucknow

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### ABSTRACT:-

**Background:** Infant and child mortality in India, levels trends and determinants the under 5 mortality rates (UFMR) of India is facing a steady decline but at this rate India could not meet its target of millennium development goal-4 (MDG-4), which aimed to reduced UFMR by 2/3rds between 1990 and 2015.Improving infant and child feeding practices in children 6 – 23 months of age is critical to improved nutrition, health and development of children.

**Objective** of the current study was to assess complementary feeding practices and its various effects among 6 months to 23 months old children visiting in pediatric outdoor clinic in VPIMS, Lucknow. **Methods:** In this observational cross sectional study 544 mothers were interviewed over a period of 6 months at a tertiary care centre in Lucknow. Children of age groups 6-11 months, 12-17 months and 18-23 months attending the Paediatric OPD were included in the study. Informations of feeding practices and various particulars of the study from the children were taken into account and the WHO Indicators for assessing infant and young child feeding practices were calculated. Complementary feeding index CFI was calculated using these WHO indicators. WHO anthropometric indices of nutritional status: weight-for-age, length-for-age and weight-for-length were co-related with CFI. **Results:** In the study group 23.7% of the children were stunted, 31.8% were underweight and 32.1% were wasted. The CFI was seen to be low only in 5.7%, medium in 64.7% and high in 29.6% children. It was found that parental education and socio-economic status had significant correlation with CFI ( $p<0.001$ ). Weight for age, height for age and weight for height were significantly associated with CFI ( $p<0.001$ ). In our study we had seen that individual WHO indicators were also had significant co-relation with CFI. Along this we also seen that prolonged bottle feeding and late introduction of complementary foods were associated with constipation, anemia, PICA, frequent infections and decrease chewing habits in

children. These are associated with low CFI. Although these results were not significant.

**Conclusion:** CFI is an important tool to target the lacunae in complementary feeding practices. The CFI scores directly correlate with the nutrition status of children thus targeting the determinants of CFI will bring a positive change in infant and young child feeding practices and As such we had not used any standardized tools to define various effects of feeding practices and we relied on the basis of certain questionnaire and parental perception. So further studies are needed with standardized tools to see the effects of prolonged breast feeding and faulty complementary feeding practices to educate parents and to improve nutritional status of the children.

### I. INTRODUCTION:-

The age of 6–23 months old is the longest period in the “first 1,000 days” of life. This period is called the window of opportunity and is the important stage to optimize child growth and development in order to prevent malnutrition, including wasting, underweight and stunting, as well as the negative consequences in adulthood<sup>1</sup>. Infant and child mortality in India, levels trends and determinants the under 5 mortality rates (UFMR) of India is facing a steady decline but at this rate India could not meet its target of millennium development goal-4 (MDG-4), which aimed to reduced UFMR by 2/3rds between 1990 and 2015.The World Health Organization (WHO) recommended exclusive breast feeding for 6 months,<sup>4,5</sup>Improving infant and child feeding practices in children 6 – 23 months of age is critical to improved nutrition, health and development of children.From a nutritional point of view, premature introduction of complementary foods can be disadvantageous because it reduces the duration of breast feeding, interferes with absorption of important nutrients from breast milk and it increases the risks of contamination and allergic reactions. On the other hand, late introduction of complementary foods is also disadvantageous because children’s

energy requirements will not be met, resulting in deceleration in growth and increased risk of malnutrition and micronutrients deficiencies.<sup>7</sup> Infant feeding practices are influenced by the family environment, by information provided by health professionals and also by the media, through advertising by food manufacturers.<sup>6,8</sup>

**II. MATERIAL AND METHODS:-**

The study was an observational, cross sectional case study to assess feeding practices among 6-23months age group children visiting in pediatric outdoor clinic in Vivekananda Polyclinic Institute of Medical Sciences, Lucknow. In this observational cross sectional study 544 mothers were interviewed over a period of 6 months at a tertiary

care centre in Lucknow. Children of age groups 6-8 months, 9-16 months and 17-23 months attending the Paediatric OPD were included in the study. A written informed consent was taken and pre-designed proforma along with standard dietary recall forms were filled up. Detailed anthropometry was done and data on weight and length were used for calculating the following three summary indices of nutritional status: weight-for-age length-for-age and weight-for-length, expressed in standard deviation (SD) units (z-scores) as per the child growth standards of WHO.<sup>5</sup> Children with congenital anomalies, syndromes, chronic neurological illness, chronic medical and surgical diseases affecting their nutritional/ health status were excluded.

• **WHO indicators for assessing infant and child feeding practices:-**

<p><b>Continued breastfeeding at one year:</b> Proportion of children 12-15 months of age who are fed breast milk</p> <p><b>Introduction of solid, semi-solid or soft foods</b> Proportion of infants 6-8 months of age who receive solid, semi-solid or soft foods.</p> <p><b>Minimum dietary diversity</b> Proportion of children 6-23 months of age who receive foods from four or more out of seven food groups.</p> <p><b>Minimum meal frequency</b> Proportion of breastfed and non-breastfed children 6-23 months of age who receive solid, semi-solid or soft foods (including milk feeds for non-breastfed children) the minimum number of times or more.</p> <p><b>Minimum acceptable diet</b> Proportion of children 6-23 months of age who receive a minimum acceptable diet (apart from breast milk)</p>	<p><b>Children ever breastfed:</b> Proportion of children born in the last 24 months who were ever breastfed</p> <p><b>Continued breastfeeding at two years</b> Proportion of children 20-23 months of age who are fed breast milk</p> <p><b>Age-appropriate breastfeeding</b> Proportion of children 0-23 months of age who are appropriately breastfed</p> <p><b>Bottle feeding</b> Proportion of children 0-23 months of age who are fed with a bottle.</p> <p><b>Milk feeding frequency for non-breastfed children</b> Proportion of non-breastfed children 6-23 months of age who receive at least two milk feeding (infant formula, cow's milk or another animal milk).</p>
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• **Complementary feeding index (CFI):**  
 The practices have been considered positive or negative based on the complementary feeding guidelines of the World Health Organization (WHO) for breastfed children.<sup>11</sup> The scoring of the complementary feeding index CFI was done by assigning a score of '0' for a harmful practice and a

score of '2' for a positive practice. Those practices in between these two were given a score of '1'. Complementary feeding index CFI was calculated using these WHO indicators.<sup>8, 9</sup> CFI score were assigned to three categories of complementary feeding practices:- low, medium, and high.

### III. RESULTS AND DISCUSSION:-

Out of total 544 children, maximum number of children (n=225; 41.4%) were aged 6-11months followed by those aged 12-17months (n=211; 38.8%) and 18-23months (n=108; 19.9%) respectively. For calculations of WHO indicators individually these children were divided in different age groups.

In our study we have seen there is higher percentage (77.4%) of lower CFI in age group 6-11months as compared to age group 12-17 months (0.0%) and 18-23 months (22.6%). This difference is significant. Because this is the critical period to initiate complementary feeding. So to avoid malnutrition and other nutrient deficiencies need to initiate complementary feeding practices at the age of 6 months along with breast feeding, as in table-1. In our study we find that parents education is

directly related to CFI. As we can see mothers educated up to high school was significantly higher in medium CFI (80.1%) as compared to low CFI (25.8%) groups. Proportion of fathers educated beyond high school was significantly higher in medium CFI (15.6%) and high CFI (34.1%) groups as compared to lower in low CFI (9.7%).

And also we find that there is no any significant correlation between parents occupation and CFI which is differ from other studies. The reason of this difference is not very clear. And in terms of SES we can see the similar result. As proportion of those with medium and high SES showed an increasing trend with increasing CFI. It explains inadequate complementary feeds and unhygienic conditions are associated with low SES, probably this was the reason for low CF in low SES group.

**Table-1:- Association of Complementary Feeding practice category with demographic and general profile of children**

SN	Characteristic	Low CFI (n=31)		Medium CFI (n=352)		High CFI (n=161)		Statistical significance	
		No.	%	No.	%	No.	%	$\chi^2$	'p'
1.	Age								
	6-11 months	24	77.4	155	44.0	46	28.6	36.17	<0.001
	12-17 months	0	0.0	128	36.4	83	51.6		
	18-23 months	7	22.6	69	19.6	32	19.9		
2.	Sex								
	Male	17	54.8	171	48.6	92	57.1	3.392	0.183
	Female	14	45.2	181	51.4	69	42.9		
3.	Mean maternal age $\pm$ SD	25.26 $\pm$ 1.95		25.55 $\pm$ 1.60		25.53 $\pm$ 1.66		F=0.442; p=0.643	
4.	Maternal education								
	Upto class 8	18	58.1	19	5.4	67	41.6	141.74	<0.001
	High school	8	25.8	282	80.1	69	42.9		
	Intermediate	3	9.7	42	11.9	14	8.7		
	Graduation	1	3.2	8	2.3	8	5.0		
	Postgraduation	1	3.2	1	0.3	3	1.9		
5.	Maternal occupation								
	Working	9	29.0	166	47.2	71	44.1	3.895	0.143
	Non-working	22	71.0	186	52.8	90	55.9		
6.	Father's education								
	Upto class 8	4	12.9	91	25.9	56	34.8	56.51	<0.001
	High school	24	77.4	206	58.5	50	31.1		
	Intermediate	3	9.7	49	13.9	38	23.6		
	Graduation	0	0.0	6	1.7	14	8.7		
	Postgraduation	0	0.0	0	0.0	3	1.9		

Father's occupation									
Working	29	93.5	279	79.3	129	80.1	3.687	0.158	
Non-working	2	6.5	73	20.7	32	19.9			
Family type									
Joint	19	61.3	222	63.1	99	61.5	0.138	0.933	
Nuclear	12	38.7	130	36.9	62	38.5			
Socioeconomic status									
Low	16	51.6	24	6.8	2	1.2	120.89	<0.001	
Medium	13	41.9	325	92.3	142	88.2			
High	2	6.5	3	0.9	17	10.6			

As in table-2, In our study group 23.7% of children were found to be stunted, 31.8% were underweight and 32.4% were wasted.

**Table 2:- Association between CFI category and mode of delivery and anthropometric parameters**

SN	Characteristic	Low CFI (n=31)		Medium CFI (n=352)		High CFI (n=161)		Statistical significance	
		No.	%	No.	%	No.	%	$\chi^2$	'p'
1.	Mode of delivery								
	Vaginal	19	61.3	185	52.6	97	60.2	3.117	0.210
	Caesarean	12	38.7	167	47.4	64	39.8		
2.	Mean body weight±SD (kg)	7.14±2.05		8.59±1.69		10.42±1.67		F=83.866; p<0.001	
3.	Mean height±SD in cm	70.79±7.64		74.95±6.24		77.62±6.41		F=18.696; p<0.001	
4.	Mean MAC±SD in cm	11.73±0.13		12.26±0.76		12.84±0.58		F=52.993; p<0.001	
5.	Weight for age category								
	Underweight	25	80.6	139	39.5	9	5.6	102.21	<0.001
	Normal weight	6	19.4	208	59.1	140	87.0		
Overweight	0	0.0	5	1.4	12	7.5			
6.	Height for age category								
	Stunting	17	54.8	91	25.9	21	13.0	27.624	<0.001
	Normal	14	45.2	261	74.1	140	87.0		
7.	Weight for height category								
	Wasting	21	67.7	142	40.3	13	8.1	71.363	<0.001
	Normal	10	32.3	210	59.7	148	91.9		

In all studies showed faulty complementary feeding practices cause malnutrition. Although percentage of malnutrition matched with some studies to our study but some are not. The difference of these percentage are not very clear. So timely initiation and appropriate complementary feeding practices are very important to improve in health and for prevention of malnutrition in children.

Along with in our study also 7.5% overweighted children also had high CFI but it is not useful for those children because overweight can responsible for multiple future diseases in those

children. So need some studies to improve feeding practices in overweighted children in society.

In our study individual WHO indicators also had significant relation with CFI, like MDD,MMF, MAD and other had direct co-relation with CFI, as these increasing along with CFI.WHO Indicators for assessing infant and young child feeding practices were calculated (Table 3).(6)

**Table-3Prevalence of different feeding habits/practices among different CFI categories**

SN	Habit/ Practice	Low CFI (n=31)		Medium CFI (n=352)		High CFI (n=161)		Statistical significance	
		No.	%	No.	%	No.	%	$\chi^2$	'p'
1.	Continued breastfeeding at 1 year*	4	12.9	213/349	61.0	155/160	96.9	113.86	<0.001
2.	Introduced complementary feeding at age 6-8 months	8	25.8	245	69.6	161	100.0	101.86	<0.001
3.	Minimum dietary diversity	3	9.7	240	68.2	160	100.0	129.77	<0.001
4.	Minimum meal frequency	3	9.7	238	67.6	161	100.0	130.36	<0.001
5.	Minimum acceptable diet	3	9.7	240	68.2	160	99.4	127.01	<0.001
6.	Children ever breastfed	5	16.1	227	64.5	152	94.4	94.60	<0.001
7.	Continued breastfeeding at 2 years*	5/24	20.8	115/155	74.2	36/46	78.3	29.998	<0.001
8.	Age appropriate breastfeeding	3	9.7	229	65.1	160	99.4	128.17	<0.001
9.	Milk feeding frequency								
	<4 times	6	19.4	53	15.1	44	27.3	49.755	<0.001
	4 times	10	32.3	66	18.8	20	12.4		
	>4 times	9	29.0	63	17.9	3	1.9		
Never BF	6	19.4	170	48.3	94	58.4			
10.	Iron rich feed	3	9.7	152	43.2	157	97.5	163.88	<0.001
11.	Bottle feeding	24	77.4	178	50.6	66	41.0	14.48	<0.001
12.	PICA	27	87.1	130	36.9	8	5.0	103.54	<0.001

The CFI was seen to be low only in 5.7%, medium in 64.7% and high in 29.6% children. In our study we have seen that prolonged bottle feeding and late introduction of complementary foods are associated with constipation, anemia, PICA, frequent infections and decrease chewing habits in children. These are associated with low CFI. Although these results are not significant. As such we have not used any standardized tools to define all these effects and we relied on the basis of certain questionnaire and parental perception.

#### IV. CONCLUSION:-

CFI is an important tool to target the lacunae in complementary feeding practices. The CFI scores directly correlate with the nutrition status of children thus targeting the determinants of CFI will bring a positive change in infant and

young child feeding practices and As such we had not used any standardized tools to define various effects of feeding practices and we relied on the basis of certain questionnaire and parental perception. So further studies are needed with standardized tools to see the effects of prolonged breast feeding and faulty complementary feeding practices to educate parents and to improve nutritional status of the children.

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