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INDICATORS OF COMPLEMENTARY FEEDING PRACTICES AND NUTRITIONAL STATUS IN CHILDREN OF 6 MONTHS TO 2 YEARS OF AGE

Pediatrics

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ABSTRACT

Nutrition during first 2 years of life is crucial for overall growth of the child. Inappropriate complementary feeding increases the risk of undernutrition, illness and mortality in infants and young children less than 2 years of age. WHO has introduced core indicators (2008) to assess feeding practices in children 0-23 months. Present study includes the assessment of the core indicators of feeding practices in the Indian population and their correlation with the nutritional status among infants and young children from 6 months to 2 years of age. Although majority of children in this study had initiated complementary feeding at the recommended age of 6 months, majority did not receive a meal with a minimum dietary diversity as per the Infant and young child Feeding (IYCF) standards. There was a significant association between the core indicators of infant feeding and malnutrition. In conclusion, intervention efforts to improve nutritional status of infants should emphasize on optimal feeding practices.

KEYWORDS

Complementary feeding, malnutrition, IYCF

INTRODUCTION:

The first 1000 days of life includes 270 days in utero to 730 days postnatal up to 2 years of age. By 2 years of age, the body growth becomes 20% of adult, height becomes 50% and brain growth almost 75-80%. Therefore, nutrition during this period is crucial for overall growth of the child. Inappropriate complementary feeding increases the risk of undernutrition, illness and mortality in infants and young children less than 2 years of age[1]. About 60% deaths in the under 5 age group are directly or indirectly attributed to malnutrition, and about two-thirds of these deaths are associated with inappropriate feeding practices during infancy[2]. Greatest risk of nutritional deficiency and growth retardation occurs in children between 6 and 24 months of age because of poor breastfeeding and complementary feeding practices. Food restrictions due to cultural practices, unhygienic practice in bottle feeding, food handling/preparation, lack of responsive feeding, poor nutritive value and suboptimal frequency of complementary feeds often contribute in malnutrition and micronutrient deficiencies. WHO has introduced core indicators (2008) to assess feeding practices in children 0-23 months. [3] This study aims to assess the core indicators of feeding practices in the Indian population and their correlation with the nutritional status among infants and young children from 6 months to 2 years of age.

MATERIALS AND METHODOLOGY:

A cross sectional observational study was conducted in the Department of Pediatrics of a tertiary care hospital in Ahmedabad. The study was approved by the Institutional Review Board. Total 105 patients from 6 months to 2 years of age, attending the out-patient department or admitted in the hospital were included in the study. All children who are less than 6 months and more than 2 years of age, those with failure to thrive, critically ill or moribund children, children with chronic diseases which affect the nutritional status like thalassemia, sickle cell anemia, tuberculosis, nephrotic syndrome, child with chronic kidney or chronic heart disease, endocrinal disorders, malabsorption, malignancy or chromosomal anomalies were excluded from the study. Verbal consent was taken from all mothers. After collecting the demographic information, using a 24-hour recall method, mother or caregiver was enquired regarding the frequency of complementary feeding, variety of meals to determine the dietary diversity, frequency of breastfeeding and hygiene practices. From the above information, it was determined whether the criteria for minimum meal frequency, minimum dietary diversity and minimum acceptable diet as per the WHO guidelines are fulfilled or not in every child. The anthropometric measurements of the children were compared with the WHO MGRS reference standards [4] and they were categorised as having wasting (severe or moderate acute malnutrition) and/or underweight and/or stunting. The nutritional status of the child was classified in terms of wasting as per WHO classification and underweight as per IAP and stunting as per Waterlow's classification.[5] All the data was recorded in a pre-decided proforma and analysed with appropriate statistical tools (IBM SPSS software version 27.0) Chi square test was applied to find out the association between complementary feeding practices and nutritional status of these children and conclusion was derived.

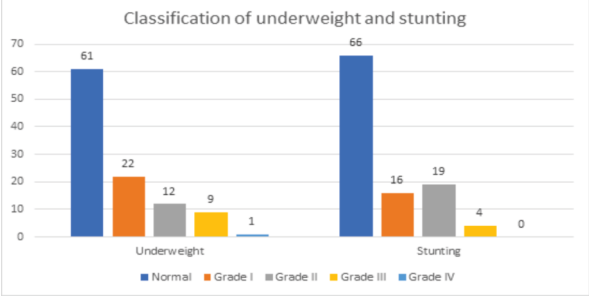
RESULTS AND DISCUSSION:

A total of 105 patients were enrolled in the study, 38% children were between 6 to 12 months of age, 37% were between 13 to 18 months of age and 25% were between 19 to 24 months of age. 56% patients were male and 46% patients were female. Out of 105 children, about one-third (35%) had delayed initiation of complementary feeding at more than 6 months of age. 75% patients were given exclusive breastfeeding and 25% patients were given top-feeding in the first 6 months of life. In 71% patients, breastfeeding was continued till date.

Out of 37 patients having late initiation of complementary feeding, most common reason in 46% was that the mother thought that her breastmilk was enough for the baby. This was similar to Rao S et al[6]. 35% mothers in the present study did not know when to start complementary feeding, while 11% thought the child might not be able to digest it.

In majority of patients (47%), grains, roots and tubers were the category of food to be initiated first, as these are mostly staple foods and readily available. Legumes and nuts were initiated first in 14% patients, followed by fruits and vegetables in 11 % patients. Bottle-feeding has been discouraged by WHO as a hygiene concern because of the difficulty in maintaining bottles that are free of any pathogens. Particularly in low-income households and in poor living conditions, it can cause a higher incidence of diarrhoea in infancy due to poor hygiene. In the present study, a reasonable percentage of children (28%) were bottle-fed. These mothers were encouraged to use spoons and cups instead. With respect to hygiene practices, handwashing was practiced by mother and child before each feed in 70% cases. In 90% cases, a separate container was used to feed the child.

On comparing with similar studies, in a similar study conducted at Mangalore in 2011[6], majority of patients (78%) had timely initiation of complementary feeding at 6 months. However, in Mesharam et al[7] and Udoh et al[8], only 25% children had timely initiation of complementary feeding.



According to the IAP classification of underweight, 58% of patients were normal and 42% were underweight. Out of them, only 10% were severely underweight. According to Waterlow's classification of stunting, 63% patients were normal, 15% had grade I stunting, 18% had grade II stunting and only 4% had grade III stunting. Finally, according to the WHO classification of wasting, 67% patients had no wasting, 20% had moderate acute malnutrition and 13% had severe acute malnutrition.

As per the 2009 WHO IYCF guidelines, 19% patients consumed a diet fulfilling the requirement of minimum dietary diversity and 67% patients consumed a diet with minimum meal frequency. However, the criterion of a minimum acceptable diet was fulfilled in only 18% patients. Poor dietary diversity is common in low-income countries as the main complementary diets are starch-based staples, with very few animal products and vegetables. This can lead to protein and micronutrient deficiency in children.

Table 1: Comparison of core indicators of infant and young child feeding practices:

Indicator	Present study (%)	WHS, India, 2010[9] (%)	Aguayo VM et al, South Asia [10] (2013) (%)	Udoh et al [8], Nigeria (2016) (%)	Srivastava G et al [11], Lucknow, India (2017) (%)
Minimum dietary diversity	19	12	35	31	60
Minimum meal frequency	67	44	41	37	64
Minimum acceptable diet	18	7	21	23	50

In comparison with similar studies, the percentage of minimum meal frequency was comparable to a similar study Srivastava et al [11] conducted at Lucknow, India. The percentage of minimum dietary diversity was low (12%) in World Health Survey 2010 [9], similar to the present study, but it was higher in other studies. Only 7% children consumed a minimum acceptable diet in 2010 WHS survey. This proportion was 18 % in the present study and higher in other studies.

Table 2: Association between core indicators of infant and young child feeding and nutritional status

Core Indicators	Nutritional status of children between 6-24 months								
	Wasting			Underweight			Stunting		
	Total	%	P value	Total	%	p value	Total	%	P value
Minimum dietary Diversity									
Met	10	10	0.002	5	5	0.07	6	6	0.63
Not met	34	32		40	38		33	31	
Minimum Meal Frequency									
Met	9	9	<0.00	18	17	<0.000	18	17	0.002
Not met	26	25	001	27	26	01	21	20	4
Minimum Acceptable Diet									
Met	1	1	0.007	4	4	0.033	5	5	0.413
Not met	35	33		41	39		34	32	

Chi-square test was used to find the association between the core indicators of infant and young child feeding and malnutrition. All 3 core indicators had statistically significant association with wasting (*p value <0.05).* Minimum meal frequency had significant association with all 3 indicators of malnutrition; wasting, underweight and stunting. (*p value <0.05).* There was no significant association between minimum dietary diversity and underweight (*p* value 0.07) and stunting (*p* value 0.63) respectively. Minimum acceptable diet had significant association with wasting and underweight but not with stunting (*p* value 0.413).

In a similar study Udoh et al [8], statistically significant association was found between underweight and minimum dietary diversity as well as underweight and minimum acceptable diet. Stunting had statistically significant association only with minimum meal frequency in the present study, while it was significantly associated with all three core indicators in the study Udoh et al [8].

The limitation of this study included recall bias, which is commonly observed in cross-sectional studies and a small sample size. The problem of recall bias was limited as much as possible by probing respondents to give further details about their responses.

CONCLUSION:

In the present study, majority of children had initiated complementary feeding at the recommended age of 6 months and most of them received meals at a minimum recommended frequency. However, majority of the children did not receive a meal with a minimum dietary diversity as per the IYCF standards. This led to only a small proportion of children receiving a minimum acceptable diet. There was a significant association between the core indicators of infant feeding and malnutrition. Thus, not only the introduction of complementary foods at the recommended time, but feeding at a proper frequency and a diverse meal containing grains, roots, tubers, legumes, fruits, vegetables, dairy products as well as animal products is important for optimal growth of the child.

In conclusion, intervention efforts to improve nutritional status of infants should emphasize on optimal feeding practices, which includes initiation of complementary feeding at 6 months of age, continuation of breastfeeding, improvement in hygiene practices, optimal frequency and diversity of the meals, and discouraging practices like bottle-feeding.

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