



Original Research Article

Maternal knowledge on dietary diversity, child feeding and sanitation practices – A cross-sectional study in north Karnataka

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ABSTRACT

Background: For improving nutrition status and decreasing infant mortality in all countries, the Global Strategy for Infant and Young Child Feeding (IYCF) recognizes appropriate infant feeding practices to be crucial.

Objectives: To evaluate the nutritional status of children residing in urban slums and to correlate their feeding and sanitary practices of children with child's nutritional health status.

Methodology: A cross-sectional study was done by interviewing mothers of 120 apparently healthy children aged 1-5 years availing primary care. The day to day practices related to feeding, sanitary practices and child health were enquired. Dietary pattern of the child was collected by 24 hr recall and dietary score was calculated Using Individual Dietary Diversity Score (IDDS).

Results: 78.3% mothers breastfed their children. 10% prematurely initiated and 31% delayed the initiation of complementary foods. The meal frequency of the children is 3 times per day in 55% households, 2 times and 4 times per day in 25% household each. 71.7% families had good dietary diversity. However diet of the child deteriorated drastically during bouts of illness. The practice of washing hands with soap and water before eating and after defecation was routinely practiced by only 57.5% children. The anthropometric measurements of the children revealed that 58.3% of them were underweight (30.8% severely), 40% of them were wasted (21.6% severely) and 59.1% were stunted (29% severely).

Conclusion: Improvement in child care and feeding practices positively impact nutritional status of children. However these interventions need to be implemented at the household level using positive deviance approach and behavioural change communication strategies.

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1. Introduction

The field of nutrition is gaining increasing recognition as a global development priority and as an investment opportunity with high social and economic returns. This has stimulated political commitment and increased the need to identify targeted actions to end childhood undernutrition. The latest global figures indicate that ~23% of children under age 5 months (i.e., 155 million) still have stunted growth because of chronic nutrition deprivation. It was noted that most of the stunting occurs during the first thousand days, during which complementary feeding plays

a major nutritional determinant role. Thus it is of vital importance to improve the quality of complementary foods and feeding practices for children aged 6–23 months.¹⁻³

In order to improve child nutrition, World Health Organization (WHO) and UNICEF have jointly developed the Global Strategy for Infant and Young Child Feeding (IYCF), which recognizes appropriate infant feeding practices which are of crucial importance for improving nutrition status and decreasing infant mortality in all countries. WHO offers three recommendations for optimal IYCF practices for children aged 6–23 months.

1. Continued breastfeeding for upto 2 years or feeding with appropriate calcium-rich foods if not breastfed;

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2. Feeding solid or semi-solid foods for a minimum number of times per day according to age and breastfeeding status; and

3. Including foods from a minimum number of food groups per day according to age and breastfeeding status.⁴

A lancet study has estimated that 6% of under-five deaths can be prevented by ensuring optimal complementary feeding. Among which dietary diversity and meal frequency are the most important and often overseen ones. Attention to these components, can significantly contributing to the realization of Millennium Development Goal 4.⁵

Most of the studies conducted in India have focused mainly on the breastfeeding aspects and not the dietary diversity and diet frequency aspects, which are important in IYCF. Children in slum are more vulnerable in getting diseases like diarrhea, worm infestations, respiratory infections, skin diseases, dental caries, malnutrition, vitamin deficiencies etc. due to several overlapping factors such as poor living conditions, overcrowding, lack of safe water and sanitation; as well as for lack of proper practices of personal hygiene and faulty dietary habits.⁶

In such situations, children's nutritional status can deteriorate rapidly during/after illness if the additional nutrient requirements associated with illness/convalescence are not met as nutrients are then diverted from growth and development towards the immune response. Children's poor appetite induced by illness can further perpetuate the vicious cycle of infection and stunting.^{7,8}

Additionally, in low-income and middle-income countries, infant and young child feeding (IYCF) practices during and after common childhood illnesses can be particularly poor owing to harmful traditional practices and the low coverage/quality of primary health care services.^{9,10}

Thus the health and nutritional status of millions of children is determined by their feeding and sanitary practices, which influence their subsequent growth and development throughout childhood. In our study we aim to evaluate the nutritional status of children residing in urban slums and to correlate their feeding and sanitary practices of children with child's nutritional health status.

2. Methodology

Study Design and Population. A Community-based cross sectional study was undertaken. The source population were mothers who had children in age group of 1- 5 years and their index child, who were living in urban slums of Hubli, and availing health care services at UHTC. The families who were permanent resident of the study area were included in the study. Children whose mothers were suffering from chronically illnesses were excluded from the study. The children were then assessed for their nutritional status using anthropometric indicators

Sample Size. The required sample size was determined using population proportion formula. In this regard,

proportion of underweight was taken as 38% (as per NFHS-2014) with 8% error and 95% confidence limits. 120 participants were enrolled in this study using convenient sampling.

Variables and Measurements. The dependent variable of the study was the anthropometric measurements of the child and practice on minimum dietary diversity provision and sanitary practices whereas the independent variables were sociodemographic variables (age, educational level of mother, religion, family size, birth order, and socioeconomic characteristics).

Good Dietary Diversity. Children 6–23 months of age who received foods from four or more food groups of the eight food groups were assessed to have minimum dietary diversity the food groups included (1) grain, root, and tubers, (2) legumes and nuts, (3) dairy products, (4) flesh food, (5) egg, (6) vitamin A-rich fruit and vegetables, (7) other fruit and vegetables and (8) Foods cooked in oil/fat

Method of data collection: A pretested semi structured questionnaire was used for data collection. Informed consent was taken from the participant mothers' prior to enrolment. The day to day practices related to feeding, sanitary practices and child health were enquired. Dietary pattern of the child was collected by 24 hr recall and dietary score was calculated Using Individual Dietary Diversity Score (IDDS). Anthropometric measurements were taken using Salter weighing scale (up to 100g) and Infantometer (up to 1mm) following standard protocols. The data was then entered into Microsoft excel and analyzed using statistical package for social sciences, version 20.0.

Dietary diversity refers to the number of different food groups consumed over a given reference period. Individual dietary diversity score (IDDS) is used as a proxy measure to evaluate the nutritional quality of an individual's diet. IDDS includes 8 food groups (1) grain, root, and tubers, (2) legumes and nuts, (3) dairy products, (4) flesh food, (5) egg, (6) vitamin A-rich fruit and vegetables, and (7) other fruit and vegetables] (8) Foods cooked in oil/fat.¹¹ Household dietary diversity is another attractive proxy indicator of the socio-economic level of the household.

3. Results

The study included 120 mother child pairs. The mean age of the mothers was 28.2 years and the mean age of the children was 2.63 years. The study had 51 male children and 69 female children. 72% of children belonged to Muslim families and 28% to Hindu families. Most of the families' belonged socio economic class IV and V, according to Modified B.G Prasad classification. The educational status of the mothers is as follows, 15.8% were not educated, 40.8% attended school upto 7th or below, 31.6% attended higher secondary upto 10th, 9.1% attended PUC and only 2.5% received degree education. All the mothers were homemakers by occupation.

88% of the children were immunized up to date and their average birth weight was 2.81 kg. 38% of the children were having low birth weight at birth. Breastfeeding was initiated within 1 hour of birth in 78.3% of children. Prolactal feeds were given to 33% newborns and 9 mothers did not feed colostrum to their child. The mean age at which complementary foods were started was 7.24 months. 10% prematurely initiated and 31% delayed the initiation of complementary foods.

Currently 93% of the children are on routine home foods. The meal frequency of the children is 3 times per day in 55% households, 2 times and 4 times per day in 25% household each. When enquired about the individual dietary components, we found that 71.7% families had good dietary diversity and an individual dietary diversity score (IDDS) score of 4 or more and 28.3% had a poor dietary diversity score of less than 4. About a quarter of the studied children were receiving supplementary foods to boost their growth and development.

In our study it was noted that diet of the child deteriorated drastically during bouts of illness. 23.3% children were given only milk, 24.1% given milk with bread and biscuit, 35.8% were fed light home foods, 15% fed regular home foods and 1.6% not being fed anything. The practice of washing hands with soap and water before eating and after defecation was routinely practiced by only 57.5% children. 59.2% children also had a habit of walking barefoot. 62.1% children practiced open air defecation despite the presence of sanitary latrines in 88% houses.

The anthropometric measurements of the children revealed that 58.3% of them were underweight (30.8% severely), 40% of them were wasted (21.6% severely) and 59.1% were stunted (29% severely). These poor nutritional indicators reflected a poor quality and quantity of diet, with poor management of illness and bad sanitary practices. These can be attributed to the low educational status of the mothers and low standard of living.

4. Discussion

In the causal matrix of under nutrition, an important underlying determinant is care provided to the child both routine and during times of illness. There is increasing awareness that cultural and behavioural practices with regard to child rearing practices influence child nutrition. Our study shows that improvement are required in the practice of complementary feeding especially with regard to timing and quality of feeding; breast feeding also needs attention. The care of the sick child is an area which is grossly underperforming and needs improvement as most of the mothers are negligent about the increased nutritional requirements during and after bouts of illness. These factors have been shown to affect the child nutritional status significantly.

A study was conducted by Yabancı et al to determine the effects of mother's nutritional knowledge on attitudes and behaviors of children about nutrition. This study was carried out 132 boys and 170 girls, total 302 mothers of the students were enrolled in Ankara, Turkey. The results indicated that many of the mothers who had higher nutritional knowledge level, their children had normal weight, they were fed more with foods containing higher dietary diversity such as vegetable, fruit, legumes, and sugared drinks and fast foods consumption was lower in their children than the mothers who have lower level of nutritional knowledge. Also, higher nutritional knowledge level of mothers promoted avoiding foods which contains artificial substances to be given to their children. Thus the study concluded that Mothers' nutrition knowledge level positively affects children's eating habits.¹²

In Ethiopia, only 5% of children were found to be fed according to minimum standards with respect to food diversity. Hence Agize et al conducted a study with the objective to assess the level of knowledge and practice of mothers on dietary diversity practices and associated factors for children 6–23 months in Adea woreda. They undertook a Community-based cross-sectional study. Samples of 730 mothers who have children in the age group of 6–23 months were selected using systematic sampling. Their main criterion was to identify factors associated with knowledge and practice of dietary diversity practice. They found that of the total 700, 357 (51%) were knowledgeable on dietary diversity but 112 (16%) practiced appropriate dietary diversity practice for their 6–23-month-old children. Determinants such as Mothers' age, husbands' education, marital status, and knowledge of mothers were significantly associated with mothers' dietary diversity for 6–23-month-old children. This study showed that many of the mothers have good knowledge on minimum dietary diversity for children 6–23 months old. But the practical translation of this knowledge in diversified meal according to Infant and Young Child Feeding indicators was received in very few infants. It identified that a number of different factors are responsible for this discrepancy.¹³

Another attempt to assess the knowledge of mother's regarding malnutrition in under-five children was made by Miss. M. Kavitha, who adopted a descriptive research design with cross sectional survey approach to conduct a study in Vinayaka mission Hospital, Salem. Convenient sampling Technique was used to select the sample of 30 children for the present study. Over all mean score obtained were 11.4, which revealed that about 50% of the mothers had average knowledge and as high as 30% of mothers had poor nutritional knowledge. This study brings to light that most of the mothers had unacceptable level of knowledge on malnutrition and this area requires targeted efforts.¹⁴

Another cross sectional study was conducted by Khan et al to study the diet pattern of children less than 2 years

Table 1: Showing the association between feeding and sanitary practices and nutritional status using weight for age

Feeding and Sanitary Practices		Normal	Weight for Age		Total	P value
			Moderately underweight	Severely underweight		
IDDS Score	Less than 4	11	11	12	34	0.372
	More than 4	36	25	25		
	Total	47	36	37		
Times fed / day	1–2 times	4	7	22	33	0.000**
	3 times	26	28	12		
	4–5 times	17	1	3		
Timing of weaning	Premature	7	2	1	10	0.022*
	Correct	33	24	22		
	Delayed	7	10	14		
Birth weight	LBW	12	22	18	52	0.001**
	Normal	35	14	19		
Practice of open air defaecation	NO	22	13	10	45	0.174
	YES	25	23	27		

*Significant at P <0.05 **significant at P <0.001

Table 2: Showing the association between feeding and sanitary practices and nutritional status using weight for height

Feeding and Sanitary Practices		Normal	Weight for Height		Total	P Value
			Moderately wasted	Severely wasted		
IDDS Score	Less than 4	16	9	9	34	0.058*
	More than 4	56	13	17		
	Total	72	22	26		
Times fed / day	1–2 times	8	6	19	33	0.000**
	3 times	46	13	7		
	4–5 times	18	3	0		
Timing of weaning	Premature	8	2	0	10	0.273
	Correct	48	15	16		
	Delayed	16	5	10		
Birth weight	LBW	31	12	9	52	0.940
	Normal	41	10	17		
Practice of open air defaecation	NO	31	6	8	45	0.296
	YES	41	16	18		

* Significant at P <0.05 ** significant at P <0.001

Table 3: Showing the association between feeding and sanitary practices and nutritional status using height for age

Feeding and Sanitary Practices		Normal	Height for age		Total	P Value
			Moderately stunted	Severely stunted		
IDDS Score	Less than 4	12	10	12	34	0.720
	More than 4	34	29	23		
	Total	46	39	35		
Times fed / day	1–2 times	5	14	14	33	0.001**
	3 times	27	21	18		
	4–5 times	14	4	3		
Timing of weaning	Premature	3	4	3	10	0.214
	Correct	35	21	23		
	Delayed	8	14	9		
Birth weight	LBW	18	14	20	52	0.341
	Normal	28	25	15		
Practice of open air defaecation	NO	22	15	8	45	0.070
	YES	24	24	27		

* Significant at P <0.05 ** significant at P <0.001

with regard to certain infant and young child feeding (IYCF) indicators. A total of 374 children less than 24 months of age coming to the immunization clinic were enrolled. They found that exclusive breastfeeding was followed in 57.1% of children under 6 months of age. Minimum dietary diversity, minimum meal frequency, and minimum acceptable diet were adequate in 32.6%, 48.6%, and 19.7% of children between 6 months and 2 years of age, respectively.¹⁵

Samundeeswary conducted a study to assess the knowledge on micronutrient deficiencies among mothers with under-five children in Maraimalai Nagar using a Quantitative approach and descriptive survey design. Among 50 mothers selected for the study half of the mothers had inadequate knowledge and the other half had moderately adequate knowledge. None of them were found to have adequate knowledge.¹⁶

To find the prevalence of stunting among infants and young children aged 6–23 months and its association with dietary diversity, a community-based cross-sectional study was conducted by Ahmed et al. It was carried out in the registered families of the Urban Health Training Centre and Rural Health Training Centre, AMU, Aligarh. A total of 326 children aged 6–23 months were included in the study. They found that the prevalence of stunting in study population was 45.7% (95% CI -40.1%, 51.1%); moderate stunting was 33.7% (95% CI -28.8%, 39%); and severe stunting was 12% (95% CI -8.8%, 16%). The prevalence of stunting was significantly associated with dietary diversity (OR -0.17, 95% CI -0.10–0.29). The study concludes that dietary diversity is a significant predictor of stunting. Therefore, interventions aimed at improving dietary diversity should be taken to reduce the burden of stunting among infants and young children.¹⁷

Saleh et al. assessed the Complementary Feeding (CF) practices among mothers in four slums of Dhaka city. This descriptive study included 120 mother-child pairs. The mean (standard deviation) age of the children was 14.68±5.55 months. A questionnaire, based on the guidelines of WHO for CF practices, was used for collecting data. Results showed that 27 (23%) mothers exclusively breastfeeding (EBF) their children. Among non-EBF mothers, 15 (16%) started CF after the recommended time. At 6-8 months of age, 2 (40%) of the EBF and 12 (67%) of the non-EBF mothers gave complementary foods twice a day to their children. In both the groups—9-11 months of age—about 70% mothers gave complementary foods twice a day to their children. The frequency of CF was acceptable (3 times a day) in 13 (81%) of the EBF and 32 (56%) of the non-EBF children at 12-23 months of age. Complementary foods given by 24 (89%) of the EBF and 86 (93%) of the non-EBF mothers to their children were not adequate in energy contents. 2 (7%) EBF and 16 (17%) non-EBF mothers did not wash their hands after defaecation. 3 (11%) EBF and 24 (26%) non-EBF mothers did not properly clean their hands and utensils before feeding. 9 (33%) EBF

mothers did not wash their children's hands. 50 (54%) non-EBF mothers also did not do this. Adequate psychosocial care practices during feeding was not provided in either of the groups. The results showed that, Complementary feeding practices among mothers of children aged less than two years were very poor. These findings also highlight that there is a considerable gap between the recommendations of nutritional recommendations of WHO and the energy intake among this group of children.¹⁸

5. Conclusion

This study shows that improvements in dietary diversity leads to better short term nutritional improvement and times of feeding improves both short and long term nutrition as indicated by better weight for age and weight for height indicators. The knowledge about the care of sick child is poor among the mothers and needs better health education. Improvement in child care and feeding practices can positively impact nutritional status of children. Hence these interventions need to be directed at the household level using positive deviance approach and behavioural change communication strategies. Contact opportunities with children and caregivers must be used for counselling and multiple communication channels need to be used to saturate the population with consistent messages on child care and feeding.

6. Source of Funding

None.

7. Conflict of Interest

None.

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