International Journal of Nutrition Sciences

ORIGINAL ARTICLE

Infant and Young Feeding Practices Regarding Under-Nutrition Prevalence in Shamirpet Mandal, Hyderabad, India

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ARTICLE INFO

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ABSTRACT

Background: Poor feeding practices during infancy and early childhood can result in malnutrition. The present study aimed to determine infant and young child feeding practices among children <36 months and to assess the association between infant and young child feeding practices and under-nutrition.

Methods: A total of 327 infants and children below 3 years were enrolled in the study. Data on various socio-economic, demographic variables and feeding practices were collected from mothers using the questionnaire. Anthropometric measurements such as weight, height/length was done to all the study population using standard equipment and procedures. The scoring system on infants and young children feeding practices developed by World Health Organization (WHO) and Infant and Young Child Feeding (IYCF) scoring were applied for comparison.

Results: The initiation of breastfeeding within an hour was found in 42.81% of children. Pre-lacteal feed was given in 31.19% and complementary feeding beyond 7 months in 39.76%. Under-nutrition in terms of underweight, stunting, and wasting was noticed in 37.61%, 43.73%, and 29.66% of children, respectively. There was a significant association between IYCF scoring with stunting, age, and birth interval. The newborns devoided colostrum and were underweight and the newborns initiated breast-feeding after one hour showed stunting with a significant association.

Conclusion: Mother's knowledge on infants and young children feeding practices is needed to be promoted to prevent malnutrition among children. These findings can help the health authorities in future plans for infant and young feeding practices in Shamirpet Mandal, Hyderabad, India.

Introduction

Nutrition of a community is the cornerstone of socio-economic development, and nutritional problems are not only medical problems, they also involve other sectors such as education, social welfare, agriculture and rural development. Nutritional factors like improper breast feeding and weaning practices, pre-lacteal feeds, and diet during illness influence the growth and development (1, 2). About 60% of all deaths among children <5 years of age are directly or indirectly, attributed to malnutrition and approximately, two-thirds of these deaths are associated with inappropriate feeding practices and occur during the first year of life. Poor feeding practices during infancy and early childhood result in reduced productivity in later life (3, 4).

According to global United Nations Children's Fund (UNICEF) report, prevalence of early initiation of breast-feeding is 43%. Exclusive breastfeeding for <6 months has been noticed in 38%, and introduction of solid, semi-solid or soft foods at appropriate time of 6-8 months was observed in 55% of children (5). According to UNICEF report (2008-2012), anthropometric findings revealed early initiation of breast-feeding in 41%, exclusive breastfeeding up to 6 months in 49%, and introduction to semi-solid food in 57% of infants in South Asia (6). The National Nutrition Monitoring Beaureu (NNMB) has shown that 25% of newborns received the pre-lacteal feeds and 86% of mothers fed colustrum to newborns and 36% of infants were breastfed until one year of age and 34% received complementary feeds after 6 months (7).

According to the National Family Health Survey 5 (NFHS-5) data in India, 41.8% of children less than 3 years were breastfed within one hour of birth. Exclusively, breast fed children until 6 months of age were 63.7% and 45.9% of children of 6-8 months old received semisolid food along with breast milk (8). In Telangana, children under 3 years breastfed within one hour of birth were reported 37.1% and breastfed children up to 6 months of age were 68.2%. Also, 51.3% of children of 6-8 months old received semisolid food along with breast milk (9). There are few studies conducted in the area and there is a need to understand the role of infant and child feeding practices on under-nutrition. Therefore, this study was undertaken to determine infant and young child feeding practices among children <36 months residing in a rural area of Telangana and to assess its determining factors. Also, the association between infant and young child feeding practices and under-nutrition is evaluated.

Materials and Methods

The study design was a community based cross-sectional study. The total duration of study included 2 years from 2013 to 2015 comprising data collection, analysis and report writing. The study population enrolled children in the age group less than 36 months. The study was carried out in a rural area of Telangana, India. In the study, early initiation of breastfeeding practices to complementary feeding was according to UNICEF data with a range from 41 to 57% (5). Considering the prevalence of 50% and using the formula 4PQ/L*L, the enrolled sample size was considered 266 participants, while in calculating proportion P=Prevalence, Q=100-P in percentage terms, and L=The precision of the estimate (5-20% of P). A pilot study was done using 25% of the sample size and later added to the main study. So a total of 327 infants and children below 3 years were enrolled as the study sample size.

The sampling was done from Shamirpet Mandal, India. All the 13 villages under Shamirpet Mandal were sampled using probability proportionate to size sampling technique, and proportionally sampled according to size of the population. Each of the village children <36 months were included according to systematic random sampling until required number was achieved from each village. Children below 3 years residing in the study area and parents who were able to communicate in either Telugu, Hindi and English were selected in the study and children above 3 years and extremely ill were excluded from the study.

An ethical clearance from institutional ethics committee was taken prior to the study. Informed written consent was taken from parents of all children, nature of scope of the study was also explained to them. Prior to initiation of the study, 25% of the sample size was pre-tested to augment the validity of the questionnaire. The study was commenced after the pre-test corrections were made. Data on various socio-economic, demographic variables and feeding practices were collected from mothers using the questionnaire. Anthropometric measurements such as weight, height/length was done to all the study population using standard equipment and procedures. Height was measured with stadiometer in standing position, and in case of infants, reclining length was measured with an infantometer, weight was measured with SECA weighing scale without footwear and with minimal clothes with an accuracy of 0.1 kg. Height was measured up to the nearest millimeter, using stadiometer.

In case of children of less than 2 years of age, recumbent length was measured by using infantometer. Anthropometric measurements (weight up to nearest 100 g and height up to nearest 1 mm) was taken as per guidelines issued by National Institute of

Nutrition (NIN) of Hyderabad (10, 11). Children who were below two standard deviation (SD) values of the reference median (<median–2SD) from Z scores of World Health Organization (WHO) on the basis of 'weight-for-age', 'height-for-age' and 'weight-for-height' indices were classified as under-weight, stunting and wasting, respectively. The feeding practices of infants and children about pre-lacteal feeds, exclusive breast feeding and complementary feeding were assessed. The mothers were asked if pre-lacteal feeds like glucose water, honey, castor oil, animal milk, or powdered milk were given to the newborns before initiating breast-feeding. Regarding exclusive breast feeding, the babies received only breast milk from his/her mother or a wet nurse, or expressed breast milk was considered. Weaning or complementary feeding was a gradual and systematic process of introduction of suitable food at the right time in addition to mother's milk in order to provide needed nutrient to baby, while complementary feeding was started after 6 months (12).

The scoring system on infants and young children feeding practices developed by WHO has been modified slightly to the present study settings. The scoring was given based on the infant and child feeding practices. The scoring for below 6 months infants did not include dietary diversity and number of meals. Hence the first five components were taken to calculate the score. Proper Infant and Young Child Feeding (IYCF) scoring was given, if score was >6 and improper, when scoring was ≤6 (Table 1) (13). Data were entered to excel and analyzed using SPSS software (Version 24, Chicago, IL, USA). Univariate analysis was done by student t-test and Chi-Square to find association of IYCF scoring with breastfeeding, under-nutrition and socio-demographic details. Multilogistic regression analysis was done for IYCF scoring and socio-demographic details. A p value less than 0.05 was considered statistically significant.

Results

The mean age of children was 20 months (SD=12

months). The gender distribution of the children was almost equal (50.15% males and 49.85% females). The majority belonged to joint families (55.35%). According to BG Prasad scale, majority of families belonged to upper lower class (48.32%) and almost, 23% of mothers were illiterate and 80% were housewives. The components included under the infant and young children field practices were summarised in Table 1. Initiation of breastfeeding within an hour was seen in 42.81% of children and pre-lacteal feeding was seen in 31.19% and complementary feeding beyond 7 months was observed in 39.76%. Underweight, stunting and wasting were calculated for the children according to WHO growth standards. The present study showed under-nutrition in terms of underweight, stunting and wasting as 37.61%, 43.73% and 29.66%, respectively (Figure 1).

The IYCF scoring system with proper feeding practices was observed in age group of 1-3 years children and when compared to the infants, a statistical significant association was visible. Totally, 163 children (64.68%) in the age group of 1-3 had proper IYCF scoring (>6) (p=0.001). Birth interval revealed a significant association with IYCF (p=0.003), with proper feeding practices (51.19%) noted in families who maintained a minimum of 3 years birth interval. The other factors like gender, birth order, literacy of mother, per capital income were analyzed and found to be not statistically significant (p<0.05) (Table 2).

By using students t test to find the association between IYCF scores with presence or absence of underweight, stunting and wasting, stunting was found to have statistically significant association with IYCF scores (p=0.04). The children who were stunted had lower mean IYCF scores compared to the normal children (Table 3). When Chi-Square test was done to find the association between each component of IYCF and nutritional status, infants who were fed colostrum (190, 93.14%) had less chance of being underweight when compared to those who were not

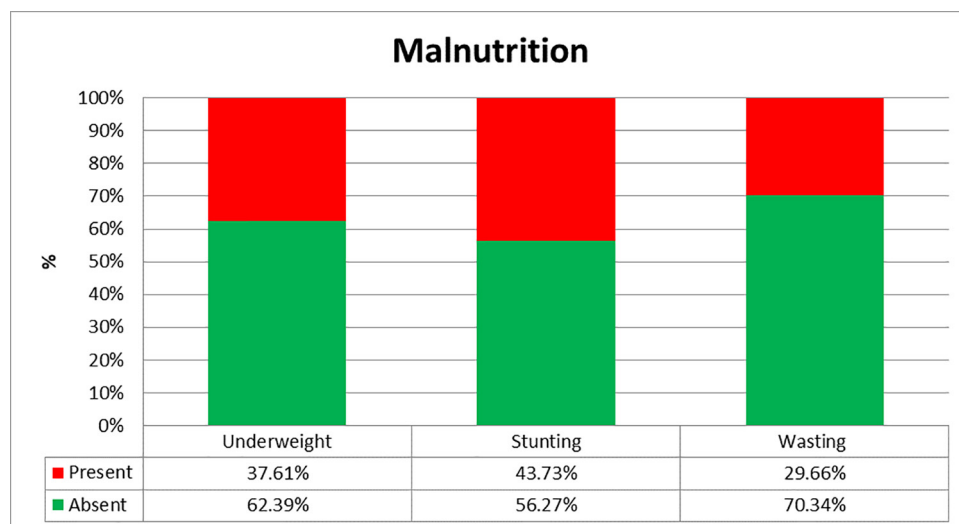| Table 1: Infant and young children feeding practices.			
Variable	**Category**	**Number**	**Percentage (%)**
Colostrum	Yes	291	88.99
	No	36	11.01
Pre lacteal feeding	Yes	102	31.19
	No	225	68.81
Initiation of breast-feeding	≤1 hour	140	42.81
	>1 hour	187	57.19
Dietary diversity	Yes	189	57.8
	No	138	42.2
Number of meals/day	≤1 meal	41	12.54
	>1 meal	286	87.46

Figure 1: Malnutrition among the study population.

Table 2: IYCF scoring in relation to socio-demographic details.

Variable	Category	IYCF score Improper	IYVF score Proper	Chi-Square	p value
Age	0-1 years	46 (61.33)	89 (35.32)	16.138	0.001
	1-3 years	29 (38.67)	163 (64.68)		
Gender	Female	31 (41.33)	132 (52.38)	2.82	0.09
	Male	44 (58.67)	120(47.62)		
Birth order	1	39 (52)	110 (43.65)	1.97	0.37
	2	27 (36)	99 (39.29)		
	3 and above	9 (12)	43 (17.06)		
Birth interval	Less than 1 year	24 (32)	41 (16.27)	11.8	0.003
	2 years	26 (34.67)	82 (32.54)		
	3 years	25 (33.33)	129 (51.19)		
Literacy of mother	Illiterate	11 (14.67)	63 (25)	4.37	0.11
	Schooling	47 (62.67)	149 (59.13)		
	Inter and above	17 (22.67)	40 (15.87)		
Per-capita income	Upper	58(77.33)	173 (68.65)	2.908	0.2
	Middle	13 (17.33)	68 (26.98)		
	Lower	4 (5.33)	11 (4.37)		

IYCF: Infant and Young Child Feeding

Table 3: Association between IYCF scoring and nutritional status.

Variable	Status	Number (%)	Mean	SD	p value
Underweight	Present	123 (37.61)	7.40	1.35	0.927
	Absent	204 (62.39)	7.39	1.40	
Stunting	Present	143 (43.73)	7.26	1.38	0.04
	Absent	184 (56.27)	7.57	1.35	
Wasting	Present	97 (29.66)	7.37	1.33	082
	Absent	230 (70.34)	7.40	140	

IYCF: Infant and Young Child Feeding

given colostrum, which was statistically significant (*p*=0.002). Similarly, statistically significant association was found among infants with initiation of breast feeding within an hour. Those children who initiated breast feeding within an hour (114, 61.96%) were found not to be stunted in comparison to others. The other components of IYCF like pre-lacteal

feeding, dietary diversity and number of meals/day were not found to have statistically significant association with nutrition status (Table 4).

Multilogistic regression analysis was done with the socio-demographic details and the IYCF score (Table 5). Age, gender, birth order, birth interval, literacy of mother and per capita income were taken

Table 4: Components of IYCF practices in relation to nutritional status.

Variable	Categories	Underweight	Normal	Stunting	Normal	Wasting	Normal
Colostrum	Given	101 (82.11)	190 (93.14)	122 (85.31)	161 (91.85)	83 (85.51)	248 (90.43)
	Not given	22 (17.89)	14 (6.86)	21 (14.69)	15 (8.15)	14 (14.43)	22 (9.57)
		x²-9.517, *p*=0.002*, OR=0.33		x²-3.50, *p*=0.06, OR=0.51		x²-1.65, *p*=0.19, OR=0.62	
Pre-lacteal feeds	No	89 (72.36)	136 (66.67)	104 (72.73)	121 (65.76)	71 (73.2)	154 (66.96)
	Yes	34 (27.64)	68 (33.33)	39 (27.27)	63 (34.24)	26 (26.8)	76 (33.04)
		x²-1.15, *p*=0.28, OR=1.3		x²-1.81, *p*=0.17, OR=1.38		x²-1.23, *p*=0.26, OR=1.34	
Initiation of breast-feeding within an hour	No	63 (51.22)	124 (60.78)	73 (51.05)	114 (61.96)	48 (49.48)	139 (60.43)
	Yes	60 (48.78)	80 (39.22)	70 (48.95)	70 (38.04)	49 (50.52)	91 (39.57)
		x²-2.86, *p*=0.09, OR=0.67		x²-3.91, *p*=0.04*, OR=0.64		x²-3.34, *p*=0.06, OR=0.64	
Dietary diversity	No	29 (29)	40 (25.16)	23 (20.91)	46 (30.87)	25 (31.25)	44 (24.56)
	Yes	71 (71)	118 (74.84)	87 (79.09)	103 (60.13)	55 (68.75)	135 (75.42)
		x²-0.42, *p*=0.51, OR=1.2		x²-3.06, *p*=0.07, OR=0.59		x²-1.20, *p*=0.27, OR=1.38	
Meals per day	1 meal	14 (14)	27 (16.98)	14 (12.73)	27 (18.12)	14 (14)	27 (16.98)
	2 meals	86 (86)	132 (83.02)	96 (87.27)	122 (81.88)	86 (86)	132 (83.02)
		x²-0.40, *p*=0.52, OR=0.79		x²-1.38, *p*=0.23, OR=0.65		x²-0.40, *p*=0.52, OR=0.79	

IYCF: Infant and Young Child Feeding, OR: Odds ratio

Table 5: Multilogistic regression analysis for IYCF scoring and socio-demographic details.

Variable	Category	Odds Ratio	Lower CI	Upper CI	*p* value
Age (years)	1-3	Reference:1.0	-	-	-
	<1	2.959	1.676	5.224	0.0001
Gender	Female	Reference:1.0	-	-	-
	Male	1.682	0.963	2.937	0.067
Birth order	1	Reference:1.0	-	-	0.686
	2	0.879	0.474	1.628	0.681
	3	0.681	0.284	1.636	0.391
Per capita income	Upper	Reference:1.0	-	-	-
	Middle	0.543	0.270	1.091	0.086
	Lower	0.486	0.126	1.872	0.295
Literacy of mother	Illiterate	Reference:1.0	-	-	0.440
	Schooling	0.677	0.316	1.453	0.317
	Inter and above	1.240	0.603	2.550	0.558
Birth interval	>2	Reference:1.0	-	-	0.04
	<1	2.418	1.199	4.878	0.014
	2	1.164	0.603	2.247	0.651
	Constant	0.141	-	-	0.000

CI: Confidence interval

into account. When logistic regression analysis was conducted, only age and birth intervals have shown statistical significance. Infants demonstrated 2.9 times more risk when compared to older children and similarly those who were with less than 1 year birth interval that illustrated 2.4 times more risk in comparison to >2 year birth interval regarding improper IYCF scores.

Discussion

In the present study, the initiation of breastfeeding within an hour was seen in 42.81% of children. The findings of the study are similar to UNICEF (6) findings of 41% and NFHS-5 (8) data of 41.8%. The findings of NFHS-5 in Telangana State (9) under 3 years breastfed within one hour of birth were 37.1%. A study by Meshram II et al. has shown that 26% received breast-feeding within an hour (14). Pre-lacteal feeding was given in 31.19% in the current study while another study showed that 25% of newborns received the pre-lacteal feeds (7). The complementary feeding beyond 7 months was observed in 39.76% in the present study, which is similar to 34% according to a previous study (7),

while 57% was reported by UNICEF (6).

A delay to start complementary feed was observed among 24% in a study by Shruthi Seghal *et al.* (15). The present study demonstrated under-nutrition in terms of underweight, stunting and wasting as 37.61%, 43.73% and 29.66%, respectively. The proportion of children who were underweight, stunted and wasted were 32.1, 35.5 and 19.3%, respectively according to NFHS-5 (8). The proportion of children who were underweight, stunted and wasted were 31.8, 33.1 and 21.7%, respectively in Telangana State (9). Moderate and severe underweight were seen in 32% of children, severe underweight in 15%, moderate and severe stunting in 38%, moderate and severe wasting in 16% of children (6). The National Nutrition Monitoring Beaureu (NNMB) has shown the children under 5 years of age having underweight, stunting and wasting with a prevalence of 25, 29 and 16%, respectively (7).

In the present study, children who were breast-fed within an hour did not have stunting and it was statistically significant. Stunting indicated to the long term absence of proper nutrition among infants and children requiring correction. Similar to our study, Chaudhary *et al.* (16) Satapathy *et al.* (17), Petrikova *et al.* (18), and Mya *et al.* reported identical findings (19); but studies done by Campbell *et al.* (20), and Purnima Menon *et al.* (21) did not have any statistical association between initiation of breast-feeding within one hour and stunting.

Colostrum which is a dense nutrient and the first formed breast milk given to newborns can protect them via formation of antibodies. The present study has shown that newborns, who were fed with colostrum had less chance of being underweight and it was statistically significant. These findings are similar to the study done by Chaudhary *et al.* (16) and Dinesh Kumar *et al.* (22), while no association was noticed between consumption of colostrum by newborns and underweight that was also reported by Campbell *et al.* (20), and Meshram *et al.* (23).

The IYCF scoring system with proper feeding practices was observed in age group of 1-3 years children when compared to the infants, while a statistical significant association was visible. This finding is similar to the study conducted by Chaudhary *et al.* (16) and Purnima Menon *et al.* (21); but no significant association was reported in studies carried out by Meshram *et al.* (23) and Campbell *et al.* (20). IYCF scoring in relation to stunting was statistically significant in the present study with similar findings reported by Chaudhary *et al.* (16), Moursi *et al.* (24), Tahmina Katoon *et al.* (25) and Neha Lohia *et al.* (26); while no significant association of scoring with nutritional status was reported by Reinbott *et al.* (27) and Palanichamy *et al.* (28). Age interval was shown to have a statistical association with the IYCF scoring that implies the child's nutrition should be focused by the mother when such birth interval was maintained.

Conclusion

Mother's knowledge on infants and young children feeding practices is needed to be promoted. The infant and young feeding practices are poor and are needed to be improved by timely education of mother about exclusive breastfeeding, early initiation of breast feeding, avoiding pre-lacteal feeds, timely introduction of complementary feeds along with concept of food diversity to ensure proper nutrition of the child and to prevent malnutrition among children. So empowering women about proper nutrition is vital, as it can reduce malnutrition to a great extent. These findings can help the health authorities in future plans for infant and young feeding practices in Shamirpet Mandal, Hyderabad, India.

Acknowledgement

Conflicts of Interest

None declared.

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