



Association between Infant and young child feeding practices and nutritional status of children (6–24 months)

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Abstract

Optimal feeding practices during the first two years of life are essential for child survival, growth, and development. Inadequate Infant and Young Child Feeding (IYCF) practices contribute to malnutrition, increased susceptibility to infections, and growth retardation. A descriptive cross-sectional study was conducted in selected urban areas of Bangalore, Karnataka (2024) among 100 mothers of children aged 6–24 months. A Prevalidated structured questionnaire based on WHO IYCF indicators was used. Nutritional status was assessed using calibrated weighing scale, infantometer, and WHO Growth Charts. Chi-square test was applied for inferential analysis. 68% of children received breast milk within one hour of birth and 99% were exclusively breastfed for 5–6 months. Timely introduction of complementary feeding was observed in 87% of children. Among them, 62% met minimum dietary diversity, 70% met minimum meal frequency, and 41% of children aged 12–24 months continued breastfeeding. Prevalence of stunting, underweight, and

wasting was 7%, 22%, and 39% respectively. Most IYCF indicators showed a statistically significant association ($p < 0.05$) with under nutrition outcomes. Despite relatively high compliance with IYCF practices, malnutrition in the form of stunting, underweight, and wasting remains prevalent among young children in the studied urban community. Strengthening IYCF counseling and growth monitoring is essential to improve child nutritional outcomes.

Keywords: Infant and Young Child Feeding (IYCF), Nutritional Status, Stunting, Underweight, Wasting, Complementary Feeding, Bangalore.

Introduction

The first 1,000 days of life—encompassing the 270 days of pregnancy and the first two years after birth—is recognized as a critical window for nutritional interventions. Malnutrition during this period can lead to irreversible outcomes such as stunting and suboptimal cognitive development.

Optimal Infant and Young Child Feeding (IYCF) practices are crucial for ensuring the survival, growth,

and healthy development of children. The World Health Organization (WHO) and UNICEF (2020) recommend: (i) initiating breastfeeding within one hour of birth; (ii) exclusive breastfeeding for the first six months; (iii) introduction of nutritionally adequate and safe complementary foods at six months; and (iv) continued breastfeeding up to two years of age or beyond. According to WHO and UNICEF (2020), only 44% of infants (0–6 months) are exclusively breastfed globally. Approximately 149 million children under five are stunted and 45 million are wasted, with under nutrition contributing to an estimated 2.7 million child deaths annually - representing 45% of all under-five mortality. The National Family Health Survey-5 (NFHS-5, 2019–21) reported that in Karnataka, 49.1% of children were breastfed within one hour of birth and 61% of children under six months were exclusively breastfed. The prevalence of stunting, wasting, and underweight in Karnataka stood at 35.4%, 19.5%, and 32.9% respectively. These figures highlight the persistent burden of child malnutrition and the need for contextual research on IYCF practices in urban communities.

Methods

A quantitative, descriptive cross-sectional research design was adopted. The study was conducted in selected urban areas of Bangalore, Karnataka, India, in 2024. Data were collected from Urban Primary Health Centres in Mathikere, Bangalore. The sample comprised 100 mothers of children aged 6–24 months, selected using non-probability convenient sampling. Sample size was

calculated using the formula $n = 4pq/d^2$, based on the prevalence of exclusive breastfeeding in Karnataka (NFHS-5, $p = 0.61$), yielding $n \approx 95$, rounded to 100 to account for non-response.

Inclusion criteria: Children (6–24 months) present at the time of data collection whose parents provided informed consent. **Exclusion criteria:** Children diagnosed with nutrition-related disorders and children whose parents did not consent.

The data collection tool consisted of three sections: (A) Socio-demographic variables of parents and children; (B) Structured questionnaire for IYCF practices based on eight WHO IYCF indicators; (C) Nutritional assessment using calibrated electronic weighing scale, infantometer, and WHO Growth Charts (Z-scores).

Content validity was established by a panel of seven experts (six nursing faculty and one pediatrician). Reliability of the tool was confirmed using the test-retest method ($r = 0.9$). A pilot study was conducted among 10 children. Data were collected after obtaining formal permission from institutional and community authorities, and informed consent from participants. ASHA workers assisted in participant identification.

Data were analyzed using SPSS. Descriptive statistics (frequency, percentage, mean, standard deviation) were used for socio-demographic data, IYCF practices, and nutritional status. Chi-square test was applied to assess associations between IYCF indicators and nutritional status, and between socio-demographic variables and nutritional status. Significance was set at $p < 0.05$.

Results

A. Socio-demographic Profile

Table 1: Frequency and Percentage Distribution of Socio-demographic Variables (n=100).

Sl. No	Socio - demographic Variables	Frequency(f)	Percentage (%)
1.	Age of the Father		
	20–30years	36	36

	31–40years	64	64
2.	Age of the Mother		
	20–25years	47	47
	26–30years	38	38
	>31 years	15	15
3.	Educational Status of Father		
	No formal education	8	8
	Primary education (1st–7th)	3	3
	Secondary education(8th–10th)	26	26
	Higher secondary (PUC)	18	18
	Graduation	36	36
	Post - Graduation	9	9
4.	Educational Status of Mother		
	No formal education	8	8
	Primary education(1st–7th)	5	5
	Secondary education (8th–10th)	18	18
	Higher secondary (PUC)	25	25
	Graduation	33	33
	Post-Graduation	11	11
5.	Occupation of Father		
	Government employee	5	5
	Private employee	42	42
	Self-employed	35	35
	Daily wages	18	18
6.	Occupation of Mother		
	Homemaker	80	80
	Government employee	1	1
	Private employee	14	14
	Self-employed	2	2
	Daily wages	3	3
7.	Monthly Family Income (Rs.)		
	10,000–20,000	53	53
	20,000–30,000	47	47
8.	Type of Family		
	Nuclear family	59	59

	Joint family	41	41
9.	Type of Diet		
	Vegetarian	6	6
	Non-vegetarian	94	94

The majority of fathers (64%) were aged 31–40 years and mothers (47%) were aged 20–25 years. Most fathers (36%) and mothers (33%) had completed graduation. The dominant occupation for fathers was private employment (42%), while 80% of mothers were homemakers. Over half (53%) had a monthly income of Rs. 10,000–20,000. Nuclear families comprised 59% of the sample and 94% followed a non-vegetarian diet.

B. IYCF Practices

Table 2: Frequency and Percentage Distribution of IYCF Practice Indicators (n=100).

Sn.	IYCF Practice Indicators	Category	Frequency(f)	Percentage (%)
1.	Early initiation of breast feeding	Within 1 hour	68	68
		1–24 hours	23	23
		After 24 hours	9	9
2.	Exclusive breastfeeding under 6 months	3–4 months	1	1
		5–6 months	99	99
3.	Introduction of solid/semisolid/soft foods	Yes	87	87
		No	13	13
4.	Minimum dietary diversity (6–24 months)	Yes	62	62
		No	38	38
5.	Minimum meal frequency (6–24 months)	Adequate	70	70
		Inadequate	30	30
6.	Continued breast feeding (12–24 months)	Yes	41	41
		No	19	19
		Not applicable	40	40
7.	Bottle feeding	Yes	15	15
		No	85	85
8.	Unhealthy food consumption	Yes	35	35
		No	65	65

68% of children received breast milk within one hour of birth and 99% were exclusively breastfed for 5–6 months. Timely complementary feeding was introduced in 87% of children; 62% met minimum dietary diversity; 70% met minimum meal frequency; and 41% of children aged 12–24 months continued breastfeeding. 85% of parents avoided bottle feeding and 65% of children had healthy food consumption patterns.

C. Nutritional Status

Table 3: Frequency and Percentage Distribution of Nutritional Status (n=100).

Sn.	Indicator	Status	Frequency (f)	Percentage (%)
1.	Stunting	Normal	93	93%
		Stunted	5	5%
		Severely stunted	2	2%
2.	Underweight	Normal	78	78%
		Underweight	20	20%
		Severely underweight	2	2%
3.	Wasting	Normal	61	61%
		Wasted	13	13%
		Severely wasted	26	26%

The mean weight of children was 8.68 kg (SD $\pm$ 1.825) and mean length was 78.08 cm (SD $\pm$ 8.448). The prevalence of stunting, underweight, and wasting was 7%, 22%, and 39% respectively. Overall, 46% of children were found to be undernourished (meeting at least one criterion of stunting, underweight, or wasting according to WHO Growth Standards, 2006).

D. Association between IYCF Practices and Nutritional Status

Table 4: Association between IYCF Practices and Stunting (n=100).

IYCF Indicator	Normal (n)	Stunted(n)	χ^2 (d f)	p-value
Early initiation of breast feeding (with in 1 hour)	64	4	2.098, df =2	0.350 NS
Exclusive breast feeding (5–6 months)	92	7	0.076, df =1	0.783 NS
Introduction of solid/ semisolid foods	80	7	1.125, df =1	0.289 S*
Minimum dietary diversity	55	7	4.613, df =1	0.032 S*
Minimum meal frequency	63	7	3.226 ,df =1	0.072 NS
Continued breast feeding(12–24months)	37	4	5.744, df =2	0.050 S*

S*=Significant ($p \leq 0.05$); NS=Not Significant

Introduction of solid/semisolid foods, minimum dietary diversity, and continued breast feeding were significantly associated with stunting ($p < 0.05$).

Table 5: Association between IYCF Practices and Under weight (n = 100)

IYCF Indicator	Normal (n)	Underweight (n)	χ^2 (df)	p-value
Early initiation of breast feeding (with in1 hour)	57	11	4.208,df=2	0.122 NS
Exclusive breast feeding (5–6 months)	78	21	3.581,df=1	0.050 S*
Introduction of solid/semi solid foods	73	14	13.613,df=1	0.000 S*
Minimum dietary diversity	52	10	3.277,df=1	0.070 NS
Minimum meal frequency	60	10	8.092,df=1	0.004 S*
Continued breast feeding (12–24months)	31	10	1.804,df=2	0.406 NS

Exclusive breastfeeding duration, introduction of solid/semisolid foods, and minimum meal frequency were significantly associated with underweight ($p < 0.05$).

Table 6: Association between IYCF Practices and Wasting (n=100)

IYCF Indicator	Normal (n)	Wasted (n)	χ^2 (df)	p-value
Early initiation of breast feeding (within 1 hour)	44	24	1.623, df=2	0.444 NS
Exclusive breast feeding (5–6 months)	61	38	1.580, df=1	0.209 NS
Introduction of solid/ semi solid foods	57	30	5.740, df=1	0.017 S*
Minimum dietary diversity	43	19	4.787, df=1	0.029 S*
Minimum meal frequency	47	23	3.701, df=1	0.054 S*
Continued breast feeding (12–24 months)	26	15	0.344, df=2	0.842 NS

Introduction of solid/semisolid foods, minimum dietary diversity, and minimum meal frequency were significantly associated with wasting ($p < 0.05$).

Regarding the association between socio-demographic variables and nutritional status, no significant association was found for most variables. However, type of family (nuclear vs. joint) was significantly associated with nutritional status ($\chi^2 = 6.274$, $df = 1$, $p = 0.012$, S*).

Discussion

The present study found that 46% of children aged 6–24 months in selected urban areas of Bangalore were undernourished. The prevalence of stunting (7%), underweight (22%), and wasting (39%) was observed, with wasting notably higher than national NFHS-5 estimates (18.5%), while stunting and underweight were lower than national figures (32.2% and 29.5% respectively). This elevated wasting prevalence in an urban setting may be attributable to acute dietary inadequacy in low-income families despite relatively good breastfeeding initiation rates.

The first research hypothesis (H1) was accepted

IYCF indicators including timely introduction of complementary foods, minimum dietary diversity, minimum meal frequency, and continued breastfeeding demonstrated statistically significant associations ($p < 0.05$) with under nutrition outcomes. These findings align with a community-based study in West Bengal (2013) that reported significant associations between IYCF indicators and nutritional status among children aged 6–

24 months. However, they contrast with a study by Manisha D. (2018) in Pune, which found no significant association, possibly due to differences in sample size, urban demographics, or community health interventions. The second hypothesis (H2) was partially accepted: while most socio-demographic variables showed no significant association with nutritional status, family type (nuclear vs. joint) was significantly associated ($p = 0.012$). Children in nuclear families showed better nutritional status, possibly reflecting fewer dependents, greater dietary focus, and better caregiver attention.

The high compliance with exclusive breastfeeding (99% for 5–6 months) and timely complementary feeding (87%) in this urban cohort is encouraging but insufficient to prevent malnutrition, underscoring that quality of complementary feeding—specifically dietary diversity and meal frequency—is equally critical.

Conclusion

This study highlights that despite relatively high compliance with WHO-recommended IYCF practices in the studied urban community, the prevalence of

malnutrition—particularly wasting—remains significant among children aged 6–24 months. Key IYCF indicators, including timely introduction of complementary foods, minimum dietary diversity, and meal frequency, showed statistically significant associations with under nutrition outcomes. Family structure (type of family) was the only socio-demographic variable significantly associated with nutritional status. Strengthening community-based IYCF counseling, growth monitoring, and access to nutrient-rich foods is essential to improve child nutritional outcomes in urban areas.

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