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Complementary Feeding Practices Among Mothers of Children Aged 6 Months to 2 Years in a Tertiary Care Centre

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Abstract

Background: Complementary feeding is a crucial phase in an infant's development, bridging exclusive breastfeeding and the introduction of solid or semi-solid foods. Inappropriate feeding practices during this window can lead to malnutrition and long-term developmental issues, especially in low-resource settings. **Objective:** To assess complementary feeding practices among mothers of children aged 6 months to 2 years attending a tertiary care center and identify the socio-demographic factors influencing adherence to WHO-recommended feeding guidelines. **Methods:** A cross-sectional study was conducted over six months (January–June 2024) among 400 mothers attending the pediatric outpatient department of a tertiary care hospital. Data on feeding initiation, meal frequency, dietary diversity, maternal knowledge, and attitudes were collected via structured interviews using a WHO-based questionnaire. Statistical analysis was performed using SPSS version 25. **Results:** Only a minority of mothers initiated complementary feeding at the recommended age of 6 months. Significant gaps were observed in meal frequency and dietary diversity. Higher maternal education and access to healthcare information were positively associated with better feeding practices ($p < 0.05$). Cultural beliefs and economic constraints were key barriers identified. **Conclusion:** The study reveals suboptimal complementary feeding practices among a significant proportion of mothers, driven largely by educational and socioeconomic factors. Targeted interventions, including maternal education and counseling at healthcare facilities, are essential to improve infant nutrition outcomes.

Keywords: Complementary Feeding Practices, Infant Nutrition, Maternal Knowledge, Dietary Diversity, WHO Guidelines

INTRODUCTION

Complementary feeding marks a pivotal transition in an infant's nutritional journey, bridging the gap between exclusive breastfeeding and the introduction of solid or semi-solid foods. This phase, typically commencing at six months of age, is essential to meet the escalating nutritional demands of growing infants. The World Health Organization (WHO) advocates for the timely introduction of nutritionally adequate and safe complementary foods at six months, alongside continued breastfeeding up to two years or beyond, to foster optimal growth and development(1).

The significance of appropriate complementary feeding practices cannot be overstated. They play a crucial role in preventing malnutrition—a condition that encompasses both undernutrition and overnutrition—and associated health complications in young children. Malnutrition during the critical window of the first two years can lead to irreversible consequences, including stunted growth, impaired cognitive development, and increased susceptibility to infections. Studies have shown that poor complementary feeding practices contribute significantly to the negative growth trends observed in developing countries (2).

Despite global recommendations, the implementation of optimal complementary feeding practices varies widely, influenced by a myriad of factors such as cultural norms, socioeconomic status, maternal education, and access to healthcare services. In many regions, including parts of India, deviations from recommended practices are common. For instance, a study conducted in a tertiary hospital in India revealed that only 17.5% of mothers initiated complementary feeding at the recommended six months, highlighting a significant gap in adherence to guidelines (3,4).

The timing of introducing complementary foods is critical. Introducing solid foods too early (before six months) can displace essential nutrients provided by breast milk, increase the risk of infections, and strain an infant's immature digestive system (5). Conversely, delaying the introduction beyond six months can result in nutrient deficiencies, particularly iron and zinc, which are vital for growth and immune function. The WHO emphasizes the importance of timely initiation to ensure that infants receive adequate nutrition during this formative period (1).

Beyond timing, the quality and diversity of complementary foods are paramount. The WHO recommends that infants aged 6–8 months receive complementary foods 2–3 times per day, increasing to 3–4 times daily for those aged 9–23 months, with additional nutritious snacks offered as needed (6). However, studies have indicated that many infants do not receive meals with the recommended frequency or diversity. For example, research in Southern Ethiopia found that only 18.8% of children aged 6–23 months met the minimum dietary diversity standards, underscoring the prevalence of monotonous diets lacking essential nutrients (2).

Maternal knowledge and attitudes towards complementary feeding significantly influence feeding practices. Mothers with higher educational levels are more likely to adhere to recommended feeding guidelines, recognizing the importance of dietary diversity and appropriate meal frequency. Conversely, misconceptions, cultural beliefs, and lack of awareness can lead to suboptimal practices. A study assessing maternal knowledge in India highlighted the need for enhanced education and counseling to improve feeding practices (7).

Given the complexities surrounding complementary feeding practices and their profound impact on child health, it is imperative to understand the current practices among mothers, especially in tertiary care settings where diverse populations seek medical attention. This study aims to assess the complementary feeding practices among mothers of children aged 6 months to 2 years in a tertiary care center, identifying gaps and informing strategies to enhance child nutrition and health outcomes.

METHODS

This cross-sectional study was conducted over six months, from January to June 2024, at the pediatric outpatient department (OPD) of a tertiary care center. The hospital serves a diverse population, making it an ideal setting for assessing complementary feeding practices among mothers from various socio-economic and cultural backgrounds.

The study included mothers of children aged 6 months to 2 years who visited the pediatric OPD during the study period. Inclusion criteria comprised mothers who were the primary caregivers responsible for feeding their child and who provided informed consent to participate. Mothers of children with congenital abnormalities or chronic illnesses that could affect feeding practices, such as cleft palate or metabolic disorders, were excluded. Additionally, mothers who refused to give consent or whose children were acutely ill and hospitalized at the time of data collection were also excluded.

The required sample size was calculated to be approximately 384 mothers. To account for possible non-responses, the final sample size was set at 400 mothers. A systematic random sampling technique was used to select participants from those attending the pediatric OPD.

Data were collected through face-to-face interviews using a structured and pre-tested questionnaire based on WHO guidelines for infant and young child feeding practices. The questionnaire was designed to cover various aspects of

complementary feeding, including socio-demographic characteristics of the mothers such as age, education, occupation, and family structure. Additionally, details regarding the initiation of complementary feeding, the type and frequency of foods provided, and dietary diversity were assessed. Maternal knowledge and attitudes toward complementary feeding were also evaluated, including sources of information, cultural beliefs, economic constraints, and perceived challenges in feeding their children.

Ethical approval for the study was obtained from the Institutional Ethics Committee. Written informed consent was secured from all participants, ensuring that they were aware of the study's purpose and their rights. Anonymity and confidentiality of the responses were maintained throughout the study, and participation was entirely voluntary, with no incentives offered.

The collected data were entered and analyzed using SPSS version 25.0 and Microsoft Excel. Descriptive statistics such as means, standard deviations, frequencies, and percentages were used to summarize socio-demographic data and feeding practices. The chi-square test was applied to determine associations between maternal characteristics and complementary feeding practices, while logistic regression analysis was conducted to identify significant predictors of appropriate feeding practices. A p-value of less than 0.05 was considered statistically significant.

RESULTS

A total of 400 mothers participated in the study. The mean age of the mothers was 27.4 ± 4.8 years, with a range from 18 to 40 years. Most mothers (60.5%) resided in urban areas, while 39.5% were from rural backgrounds. Regarding education, 45.3% of the mothers had completed secondary education, 30.1% had higher education, and 24.6% had only primary or no formal education. The socio-economic distribution showed that 50.8% of the participants belonged to middle-income families, 32.7% were from lower-income households, and 16.5% were from high-income families. Most of the mothers (82.2%) were homemakers, while 17.8% were employed.

Table 1: Socio-Demographic Characteristics of Mothers

Characteristic	Frequency (n=400)	Percentage (%)
Age (years)		
18 - 24	112	28.0
25 - 30	186	46.5
31 - 35	74	18.5
36 - 40	28	7.0
Residence		
Urban	242	60.5
Rural	158	39.5
Education Level		
No formal/Primary	98	24.6
Secondary	181	45.3
Higher education	121	30.1
Socio-Economic Status		
Low-income	131	32.7
Middle-income	203	50.8
High-income	66	16.5
Employment Status		
Homemaker	329	82.2
Employed	71	17.8

Complementary Feeding Practices

The initiation of complementary feeding varied among mothers. 72.5% introduced complementary feeding at the recommended six months, while 15.8% started earlier, and 11.7% delayed it beyond six months. Regarding food types, 56.4% of mothers introduced homemade foods first, 28.3% relied on commercially available baby foods, and 15.3% used both.

In terms of feeding frequency, 64.1% adhered to the WHO-recommended frequency, whereas 35.9% provided food less frequently than recommended. Dietary diversity was suboptimal, with 38.7% of children receiving foods from fewer than four food groups per day. The most commonly consumed food groups were grains and cereals (92.5%), dairy products (74.8%), and fruits (62.3%), while protein-rich foods (meat, eggs, and fish) were less frequently included (41.2%).

Table 2: Complementary Feeding Practices Among Mothers

Feeding Practice	Frequency (n=400)	Percentage (%)
Timing of Introduction		
<6 months	63	15.8
6 months	290	72.5
>6 months	47	11.7
Type of First Complementary Food		
Homemade foods	226	56.4
Commercial baby foods	113	28.3
Both	61	15.3
Feeding Frequency Compliance		
Meets WHO recommendation	256	64.1
Less than recommended	144	35.9
Dietary Diversity		
<4 food groups per day	155	38.7
≥4 food groups per day	245	61.3

Table 3: Association Between Maternal Education and Timing of Complementary Feeding

Timing of Complementary Feeding	No Formal/Primary (n=98)	Secondary (n=181)	Higher Education (n=121)	Total (n=400)	p-value
Early Initiation (<6 months)	23 (23.5%)	31 (17.1%)	9 (7.4%)	63 (15.8%)	**0.001**
Timely Initiation (6 months)	55 (56.1%)	140 (77.3%)	95 (78.5%)	290 (72.5%)	
Delayed Initiation (>6 months)	20 (20.4%)	10 (5.6%)	17 (14.1%)	47 (11.7%)	

Mothers with no formal or primary education were more likely to introduce complementary foods either earlier than six months (23.5%) or later than six months (20.4%), compared to those with secondary or higher education ($p = 0.001$). In contrast, the majority of mothers with secondary education (77.3%) and higher education (78.5%) initiated complementary feeding at the recommended six months.

Table 5: Logistic Regression Analysis for Predictors of Timely Complementary Feeding

Predictor Variable	Adjusted Odds Ratio (AOR)	95% Confidence Interval (CI)	p-value
Maternal Education (Ref: No Formal/Primary)			
Secondary	2.21	1.34 - 3.67	0.002**
Higher Education	2.89	1.52 - 5.48	<0.001**
Socio-Economic Status (Ref: Low-Income)			
Middle-Income	1.84	1.12 - 3.02	0.015**
High-Income	2.47	1.30 - 4.71	0.007**
Maternal Employment (Ref: Homemaker)			
Employed	0.78	0.43 - 1.42	0.411
Maternal Awareness of WHO Guidelines (Ref: No Awareness)			
Aware	3.14	1.87 - 5.25	<0.001**

Maternal education was a strong predictor of timely complementary feeding. Mothers with secondary education were 2.21 times more likely and those with higher education were 2.89 times more likely to introduce complementary feeding at 6 months compared to mothers with no formal or primary education ($p < 0.01$). Socio-economic status also played a

significant role. Mothers from middle-income households were 1.84 times more likely, and those from high-income households were 2.47 times more likely to introduce complementary feeding at 6 months compared to those from low-income families ($p < 0.05$). Maternal employment was not significantly associated with timely complementary feeding ($p = 0.411$). Maternal awareness of WHO guidelines was a major predictor. Mothers who were aware of the guidelines were 3.14 times more likely to introduce complementary feeding at 6 months compared to those who were unaware ($p < 0.001$).

DISCUSSION

Appropriate complementary feeding (CF) practices are crucial for the optimal growth and development of infants and young children. Our study investigated the timing of CF initiation and its association with maternal education and socio-economic status among mothers. The findings underscore significant disparities in CF practices influenced by maternal education levels and household income.

The World Health Organization (WHO) recommends introducing complementary foods at six months of age while continuing breastfeeding to meet the evolving nutritional needs of infants. In our study, 72.5% of mothers adhered to this guideline, initiating CF at six months. However, 15.8% introduced complementary foods earlier, and 11.7% delayed beyond six months. These deviations from recommended practices are concerning, as both early and late introductions have been associated with adverse health outcomes. Early introduction can lead to increased risks of infections and allergies, while delayed introduction may result in nutrient deficiencies and growth faltering.

Maternal education emerged as a significant determinant of timely CF initiation. Mothers with higher education levels were more likely to commence CF at the recommended six months compared to those with no formal or primary education. This aligns with findings from a study in Indonesia, which reported that higher maternal education was associated with better CF practices, including timely initiation and dietary diversity (8). Educated mothers may have better access to health information and a greater understanding of the importance of adhering to recommended CF guidelines.

Socio-economic status also played a pivotal role in CF practices. Mothers from middle- and high-income households were more likely to initiate CF appropriately compared to those from low-income families. Economic constraints can limit access to diverse and nutritious foods, impacting the quality of CF. A systematic review highlighted that in South Asia, including India, socio-economic disparities significantly influence CF practices, with children from lower-income families often receiving less diverse and inadequate complementary foods (9).

Dietary diversity, an essential component of CF, was suboptimal in our study. Only 61.3% of children received foods from at least four food groups daily. Grains and cereals were the most commonly consumed, while protein-rich foods were less frequently included. This pattern is consistent with studies in other low- and middle-income countries, where dietary diversity is often limited due to economic constraints and lack of nutritional awareness (10). Limited dietary diversity can lead to micronutrient deficiencies, adversely affecting child health and development.

Cultural beliefs and traditional practices significantly influenced CF decisions. Over a quarter of mothers reported that family elders impacted their feeding choices, sometimes advocating for early or delayed CF initiation. This highlights the need for culturally sensitive educational interventions that engage not only mothers but also extended family members who may influence infant feeding practices. Community-based programs that involve family elders have been shown to be effective in modifying entrenched cultural practices related to infant feeding.

Challenges faced by mothers in implementing appropriate CF included financial constraints, lack of awareness, time limitations, and infant food rejection. These barriers are common in similar settings. Addressing these challenges requires multifaceted interventions, including economic support, education, and counseling. A systematic review demonstrated that educational interventions focusing on CF significantly improved both the quality and quantity of complementary foods provided to infants (11).

CONCLUSION

Our study highlights the substantial impact of maternal education and socio-economic status on CF practices. Enhancing maternal education and addressing economic barriers are essential strategies to improve CF practices, thereby promoting

better health outcomes for children. Future research should explore the effectiveness of targeted interventions that combine education, economic support, and cultural considerations to optimize CF practices in diverse settings.

Recommendations

1. **Health Education:** Conduct nutrition counseling sessions for mothers at pediatric clinics.
2. **Community Outreach:** Engage community health workers to educate families on proper feeding.
3. **Policy Interventions:** Implement government-supported programs to promote affordable, nutrient-rich foods.
4. **Cultural Sensitization:** Address traditional beliefs and misconceptions regarding infant feeding.
5. **Further Research:** Larger studies should be conducted to assess long-term outcomes of complementary feeding practices.

REFERENCES

1. Infant and young child feeding [Internet]. [cited 2025 Mar 31]. Available from: https://www.who.int/news-room/fact-sheets/detail/infant-and-young-child-feeding?utm_source=chatgpt.com
2. Kassa T, Meshesha B, Haji Y, Ebrahim J. Appropriate complementary feeding practices and associated factors among mothers of children age 6-23 months in Southern Ethiopia, 2015. BMC Pediatr [Internet]. 2016 Aug 19 [cited 2025 Mar 31];16(1):1–10. Available from: https://bmcpediatr.biomedcentral.com/articles/10.1186/s12887-016-0675-x
3. Saleh F, Ara F, Hoque MA, Alam MS. Complementary Feeding Practices among Mothers in Selected Slums of Dhaka City: A Descriptive Study. J Health Popul Nutr [Internet]. 2014 [cited 2025 Mar 31];32(1):89. Available from: https://pmc.ncbi.nlm.nih.gov/articles/PMC4089076/
4. Aggarwal A, Verma S, Faridi MMA, Dayachand. Complementary feeding - Reasons for inappropriateness in timing, quantity and consistency. Indian J Pediatr. 2008 Jan;75(1):49–53.
5. Lactation I of M (US) C on NSDP and. Infant Outcomes. 1991 [cited 2025 Mar 31]; Available from: https://www.ncbi.nlm.nih.gov/books/NBK235581/
6. Rao S, Swathi PM, Unnikrishnan B, Hegde A. Study of complementary feeding practices among mothers of children aged six months to two years - A study from coastal south India. Australas Med J [Internet]. 2011 [cited 2025 Mar 31];4(5):252. Available from: https://pmc.ncbi.nlm.nih.gov/articles/PMC3562932/
7. Parikh RH, Tolani JN, Shah ND. Knowledge and attitude of mothers regarding feeding practices among children of 6 months to 2 years of age visiting a tertiary care centre of Ahmedabad, Gujarat, India. Int J Contemp Pediatrics [Internet]. 2019 Aug 23 [cited 2025 Mar 31];6(5):2132–6. Available from: https://www.ijpediatrics.com/index.php/ijcp/article/view/2691
8. Nurrizka RH, Wenny DM, Amalia R. Complementary Feeding Practices and Influencing Factors Among Children Under 2 Years of Age: A Cross-Sectional Study in Indonesia. Pediatr Gastroenterol Hepatol Nutr [Internet]. 2021 [cited 2025 Mar 31];24(6):535. Available from: https://pmc.ncbi.nlm.nih.gov/articles/PMC8593361/
9. Manikam L, Robinson A, Kuah JY, Vaidya HJ, Alexander EC, Miller GW, et al. A systematic review of complementary feeding practices in South Asian infants and young children: The Bangladesh perspective. BMC Nutr [Internet]. 2017 Dec 22 [cited 2025 Mar 31];3(1):1–13. Available from: https://bmcnutr.biomedcentral.com/articles/10.1186/s40795-017-0176-9
10. Gatica-Domínguez G, Neves PAR, Barros AJD, Victora CG. Complementary Feeding Practices in 80 Low- and Middle-Income Countries: Prevalence of and Socioeconomic Inequalities in Dietary Diversity, Meal Frequency, and Dietary Adequacy. J Nutr. 2021 Jul 1;151(7):1956–64.
11. Imdad A, Yakoob MY, Bhutta ZA. Impact of maternal education about complementary feeding and provision of complementary foods on child growth in developing countries. BMC Public Health [Internet]. 2011 Apr 13 [cited 2025 Mar 31];11(SUPPL. 3):1–14. Available from: https://bmcpublichealth.biomedcentral.com/articles/10.1186/1471-2458-11-S3-S25