

## Original Article

# Prevalence of Timely Introduction of Complementary Feeding and its Related Factors in Children 6–24 Months of Age in Hyderabad, Pakistan

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### ABSTRACT

**Background:** A child at the age of 6 months requires an additional and improved nutrition, besides mother's milk for better growth and immunity, to protect them from many diseases. Lack of timely initiation of complementary feeding (CF) is an important cause of undernutrition in children under 5 years of age which is an underlying cause of more than 40% of morbidity and mortality. **Objectives:** The study aimed to estimate the prevalence of and factors related to timely introduction of CF in children 6–24 months of age. **Methods:** This was a mixed-method study. This study was conducted in a rural area of Hyderabad, Pakistan. A sample of 106 households was selected through multistage sampling technique. Mothers of children between 6 and 24 months of age were interviewed through questionnaire and in-depth interview guide for quantitative and qualitative parts, respectively. **Results:** The prevalence of early initiation of CF in the study area was found out to be 48%, those who started in time believed that children were old enough (42%) or the child was crying excessively (33%), and hence, they had to introduce complementary foods for children. In total, around 63% of mothers were empowered to decide about their children feeding. Factors such as mothers' education, living in cemented house, and watching television were significantly associated with their children given CF at the age of 6 months. Qualitative data suggested that mothers commonly weaned their infants with animal milk, tea, and biscuits, and they lacked in correct knowledge about CF practices. **Conclusion:** A significant proportion of mothers in rural areas of Pakistan delay CF. We found that maternal education, residence in cemented houses, and exposure to media play a part in timely introduction of CF to children aged 6–24 months.

**KEYWORDS:** *Complementary feeding practices, Infant and young child feeding, Malnutrition*

## INTRODUCTION

A child's initial 5 years are very critical for their mental and physical development. Therefore, children who are introduced to complementary feeding (CF) late in their life are at risk to undernutrition.<sup>[1,2]</sup> A child must be exclusively breastfed till the age of 6 months, and from 6 months of age, his diet needs to be complemented with semisolid and later solid foods as breastfeeding alone does not fulfill their nutritional requirements.<sup>[3,4]</sup>

Although deaths in children under 5 years of age have decreased by 50%, i.e., 12.7 million in 1990, still 5.9 million died in 2015 mostly because of preventable causes, and undernutrition is the underlying cause in 45% of these deaths globally.<sup>[5]</sup> According to UNICEF estimates, 26% or 165 million children were

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stunted globally in 2011, and three-quarters of this burden was distributed in South Asia and sub-Saharan Africa.<sup>[6]</sup> Despite economic development worldwide over the past few decades, tackling undernutrition still remains a challenge for low- and middle-income countries (LMICs).<sup>[7]</sup> According to the recent Pakistan Demographic and Health Survey, 45%, 11%, and 30% of children <5 years of age were stunted, wasted, and undernourished, respectively. The survey also found that among infants 6–9 months, only 5.3% were exclusively breastfed, 10.3% received breast milk along with water, 11% received breast milk with cow's milk, and only 56.6% received CF in addition to breast milk.<sup>[8]</sup> Pakistan approved a national infant and young child feeding practices (IYCF) strategy in 2008 to guide care providers and communities to ensure that children are breastfed and given CF according to the WHO recommendations. As rural Pakistan is more impoverished with respect to child feeding, 20% of children in urban and only 12% in rural areas are fed according to the IYCF strategy which recommends that children between 6 and 23 months need to be given frequently and increasing amounts of a variety of foods.<sup>[8]</sup>

Factors, such as socioeconomic status of the household, knowledge about locally available foods, and timely introduction of CF and related practices of mothers, are reported as important determinants of the nutritional status of children.<sup>[9]</sup> Since breastfeeding has been promoted globally, its rates have generally improved; however, improvement in CF needs attention. In LMICs, a quarter of preschool-age children are affected by undernutrition and much of that are attributed to delay in timely introduction of CF.<sup>[10]</sup> The IYCF practices have shown positive effect on the growth of children enabling them to grow in length and weight with respect to their age.<sup>[11,12]</sup>

Nutrition-related research in Pakistan and other LMICs has historically focused on improving breastfeeding practices only, and these countries had applied very little emphasis on improving the practices of CF. The little existing work on CF had focused to determine the level of optimum and suboptimum CF practices while no attention has been given to study the factors related to delay in introducing CF. The results of our study will aid health educators and policy-makers to devise better IYCF strategies by incorporating factors identified through this study.

### Objectives

The aim of this study was to determine the prevalence of and factors related to optimal CF practices among mothers of children aged 6–24 months in Hyderabad, Pakistan.

## METHODS

A mixed-method study design was used. Data were collected from mothers of children aged 6–24 months during April to June 2012. One union council (a smaller administrative unit in a Taluka) was selected from Hyderabad where 40% of the population lived in rural areas. The study population included mothers having at least one child aged 6 to 24 months residing in Tando Qaiser Union Council of rural Taluka. This study site was a rural area covered by lady health workers, and it was conveniently reachable to researchers. Mothers of children with illnesses such as tuberculosis and severe undernutrition were excluded from the study.

### Quantitative methods

We estimated sample size using the formula for simple random sampling, given below. Assumptions included 52% prevalence of CF practices,<sup>[12]</sup> 5% level of level of confidence, and 10% margin of error.

$$n = \frac{z^2 \hat{p} \hat{q}}{d^2}$$

$$n = \frac{1.96^2 (0.52)(0.48)}{(0.1)^2} = 96$$

We added 10% to the estimated sample to adjust for the nonresponse rate, and the final sample size obtained was 106. We used a multistage sampling technique to select participants. In the first stage, the union council was selected conveniently; in the second stage, four to five subclusters served by lady health worker were identified; in the third stage, one area was selected randomly through lottery method. Finally, 106 households were selected through systemic sampling method.

Female data collectors were hired to collect quantitative data using a predevised questionnaire. The questionnaire was initially developed in English and then translated into local language, Sindhi. The questionnaire was pretested on 10% of the samples ( $n = 11$ ) who were not part of the final sample. It contained sociodemographic and nutrition knowledge and practice.

### Qualitative methods

Field guide was developed to conduct in-depth interviews (IDIs) with mothers. A total of five IDIs were conducted. The participants did not allow tape recording; therefore, notes and responses were handwritten by a notetaker. IDIs were continued till the thematic saturation was achieved. IDI questions included: What is your opinion about breastfeeding? What do you understand about CF? How are the decisions made in your family as to what the newborn should be feed with?

Prelacteal feed meant any substitute for breast milk;<sup>[13]</sup> ever breastfed meant infants who were ever breastfed; current breastfed meant children aged <24 months of age who were breastfed at the time of study; exclusive breastfeeding meant infants <6 months of age who were breastfed exclusively; and optimal CF was defined as introduction of semisolid/solid food to child at the age of 6 months.<sup>[14]</sup>

### Ethical considerations

The study was approved by the Internal Review Board of Health Services Academy, Islamabad (approval code: 12-4-16). We obtained written and informed consent from the participants before the interviews. The data were kept secured to ensure confidentiality.

### Data analysis

Data were analyzed through the Statistical Package for the Social Sciences version 19. Frequencies and percentages were calculated, and univariate logistic regression analysis was run with the dependent dichotomous variable of optimal versus suboptimal CF practices. We used Chi-square test to measure the statistical significance of factors associated with timely introduction of CF at 95% confidence level. The qualitative data analysis was performed manually using the testimonies and merged the data under common themes. Initially, the data were translated into English and cross-checked by the researchers. The data were triangulated along with the qualitative results so as to merge conclusions from similar results.

## RESULTS

Among 106 initially approached, six refused to participate and data were analyzed from 100 mothers. Mean age of participated mothers was  $27.98 \pm 5.425$  years and only 41% of those women ever attended formal school. Mean age of the children was  $15.62 \pm 5.183$  months and 54% of those were females. About 53% of the fathers had no formal education and 17% studied up to the primary level. More than half (55%) of the participants lived in extended families, 37% lived in mud brick houses, and 35% of households had no toilet facility. The average family size was  $8.14 \pm 3.31$ . Only 33% of the mothers knew about all five situations when hands must be washed, i.e., before cooking, feeding children or eating meal, and after toilet use and cleaning child's bottom, and only 37% of the mothers washed their hands in all of those five situations. About 44% of the families' monthly income was between 1000 and 2000 PKR (US\$ 10-20) per person. About 91% and 10% of mothers, respectively, watched TV or listened to radio once a week.

We found that 52% of the children were not being fed with semisolid food at or after the age of 6 months and

64% were being breastfed by their mothers. From the qualitative testimonies, we found that 41.7% of mothers started introducing CF at optimal age as they believed that the child was old enough, whereas 53.8% of mothers fed their babies were breast milk because they thought babies are crying for milk only. About 63.5% and 70.8% of mothers in optimal CF and suboptimal CF groups, respectively, decided about their children's feeding themselves [Table 1].

We performed a univariate regression analysis using "feeding practices" as the dependent variable. We found that mothers who practiced optimal CF were 2.91 times more likely to have ever attended a school, 2.78 times more likely to have resided in a cemented house, twice as likely to have watched TV

**Table 1: Introduction to complementary feeding to study participants at 6 months of age**

	Frequency, n (%)
Complementary feeding at 6 months	
Yes	48 (48.0)
No	52 (52.0)
Reasons for optimal CF (n=48)	
Child old enough	20 (41.7)
Child crying for more feeding	16 (33.3)
Mother working	3 (6.2)
No breast milk production	3 (6.2)
Advised by family head	2 (4.2)
Pregnancy	2 (4.2)
Advised by health-care provider	1 (2.1)
Child did not take mother's milk	1 (2.1)
Reasons for suboptimal CF (n=52)	
Child cried for breast milk	28 (53.8)
Child old enough	6 (11.5)
Advised by health-care provider	4 (7.7)
Advised by family head	3 (5.8)
Mother working	3 (5.8)
Child did not drink breast milk	2 (3.8)
Child weak enough so not able to eat	2 (3.8)
No mother's milk or pregnancy	2 (3.8)
Do not know	2 (3.8)
Decision-makers for child's feeding in suboptimal group (n=52)	
Mother	33 (63.5)
Mother-in-law	9 (17.4)
Family head	4 (7.7)
Husband	3 (5.7)
Do not know	3 (5.7)
Decision-makers in optimal CF group (n=48)	
Mother	34 (70.8)
Husband	6 (12.5)
Mother-in-law	5 (10.4)
Family head	3 (6.2)

CF: Complementary feeding

at least once a week, 1.09 times listened to radio at least weekly, twice likely lived in a nuclear family, compared to mothers who had delayed CF. However, the associations for listening to radio, type of family, and mothers still breastfeeding were not statistically significant ( $P \geq 0.05$ ) [Table 2].

## Qualitative analysis

### Breastfeeding

Although most of the mothers in IDIs reported breastfeeding their children, they reported not breastfeeding their children on confirmation of their pregnancy. Women also discontinued breastfeeding because they thought that they could not produce enough milk to feed the child. Some mothers reported it as their choice. A mother said: "I only breastfed my first child".

### Knowledge about complementary feeding

Only one mother adequately knew about the types of food to be introduced and appropriate time to introduce semisolid food. A mother 13 months child reported: "I find no need to start any foods and my child is satisfied with my milk."

### Types of complementary foods common in the area

Tea, biscuits, cow's milk, goat's milk, potato, and rice were listed as the suitable food to be introduced as CF. Most women fed their children with cow, buffalo, or goat's milk; however, three mothers switched to feeding their children tea and biscuits as their children suffered from vomiting and diarrhea which they attributed to animal milk. A mother

said: "I have to feed my child cereal (commercially available) or rice when I have to take my child out of home otherwise I feed him with tea and biscuits."

### Perceptions about introducing any semisolid

The participants believed that their children did not like any other food except of their own milk. On introduction of CF, children suffered from diarrhea and vomiting. A few mothers believed that poverty was the reason why they could not purchase fruits or any other food for their children. Others were unconvinced with other foods and considered only breast milk as the safest food for their children. A mother said: "Anything except mother's milk is dangerous to health; therefore, nothing should be fed to a child before the age of 2 years."

### Decision-making

Two participants believed that they followed the suggestions of their mothers-in-law for their child feeding as they believed that they are more experienced. Mother in an IDI said: "My mother-in-law has had seven children, so she is more experienced than me and I follow her advice."

## DISCUSSION

Our study found that more than half of women did not comply with optimal CF practices for children at six months of age. This study also found that lack of education of mothers and living in mud houses (an indicator of poverty) was related to suboptimal CF practices while watching television was related with better practices.

**Table 2: Factors associated with timely introduction of complementary feeding: Univariate analysis of covariates with optimal versus suboptimal complementary feeding practices among mothers**

	Optimal, n (%)	Suboptimal (n=52), n (%)	OR	95% CI	P
Mothers ever attended school					
No	22 (47.8)	37 (71.2)	1	1.27-6.65	<0.01
Yes	26 (52.2)	15 (28.8)	2.91		
Type of house					
Mud brick houses	12 (25)	25 (48.1)	1	1.18-6.5	0.02
Cemented	36 (75)	27 (51.9)	2.78		
Watched TV once in a week					
No	0	9 (17.3)	1	1.70-2.62	<0.01
Yes	48 (100)	43 (82.7)	2.12		
Listened to radio once in a week					
No	5 (10.4)	5 (9.6)	1	0.29-0.03	0.99
Yes	43 (89.6)	47 (90.4)	1.09		
Type of family					
Joint	22 (45.8)	33 (63.5)	1	0.922-4.57	<0.01
Nuclear	26 (54.2)	19 (36.5)	2.05		
Mother still breastfeeding					
No	20 (41.7)	16 (30.8)	1	0.70-3.65	0.30
Yes	28 (58.3)	36 (69.2)	1.61		

Data are frequencies. OR: Odds ratio, CI: Confidence interval

Our results are consistent with similar research from Pakistan and other LMICs. The recent National Nutrition Survey of Pakistan showed that the rate of timely introduction of semisolid food to children in rural areas of the country was 45%.<sup>[15]</sup> However, timely initiation of CF practices shown by our study is lower than in the regional countries compared to 71%, 70%, and 55% of children in Bangladesh,<sup>[16]</sup> Nepal,<sup>[17]</sup> and India,<sup>[18]</sup> respectively. However, Sri Lanka has the highest CF rate in South Asia, i.e., 84%.<sup>[19]</sup>

Educated mothers in our study were 2.91 times more likely to feed their children optimally. Earlier studies have reported that maternal education is significantly associated with suboptimal CF practices.<sup>[20]</sup> Our qualitative findings also support and explain that most of the mothers were not aware about the specific age of the children when it was important to start CF. They gave various reasons for not introducing CF on time. Some believed that semisolid and solid foods were hard on their children, and they avoided these foods because they were worried that the children could suffer from vomiting or diarrhea. Despite that the mother is the primary caretaker of the child, most of the decisions including what to feed is made by her husband and mother-in-law. Mother also acknowledged that their mothers-in-law have more knowledge about the importance of CF children on nutrition-rich foods.

Type of house was significantly associated with CF practices in our study, which is considered as an indicator of socioeconomic status. The likelihood of starting CF in at optimum age of children was 2.78 times higher among mothers who lived in cemented houses. Poverty has been shown to be significantly associated with delayed introduction of complementary foods elsewhere.<sup>[16,21]</sup> A previous study also reported that introduction of CF on time is shown to be higher in richer households.<sup>[22]</sup> In the testimonies, mothers reported giving children tea, biscuits, and dairy products as part of CF because nutritious CF food was expensive to afford. Therefore, food security and knowledge about the essential foods for children and their local availability are critical to the children receiving their CF on time.<sup>[21]</sup>

Lack of knowledge has been associated with mothers failing to initiate CF on time.<sup>[23]</sup> Watching television, at least once a week, was associated with timely initiation of CF, and this finding is consistent with other studies that show that media exposure, especially watching television, is related to better CF practices.<sup>[22]</sup>

The Lancet nutrition series recommended that CF practices could be improved, to prevent undernutrition and related morbidity in children under 5 years of

age, through highly effective interventions such as counseling mothers and families about nutrition and locally available and cultivated essential foods, provision of food supplements, and subsidies for food insecure segments of the population.<sup>[21]</sup> As the households were not numbered, we had to select the participants through a systematic sampling method, which was a limitation of our study. Other limitations included the reliance on mother's recall to ascertain the feeding practices and lack of permission to record the qualitative interviews.

## CONCLUSION

The prevalence of delayed introduction of CF in children aged 6-24 months is still high in rural areas of Pakistan. Lack of education, lower socioeconomic status, and lack of media exposure are the factors associated with timely initiation of CF. The results of the study can be applicable in other similar settings. Further research is required to measure CF initiation behavior among mothers and its association with long-term outcomes such as under-five child mortality and morbidity.

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## Conflicts of interest

There are no conflicts of interest.

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