

## ORIGINAL ARTICLE

# Facilitators and Barriers Related to Complementary Feeding Practices among Mothers of Children Under 2 Years of Age in Karachi

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## ABSTRACT

**Aim:** To identify the underlying Facilitators and Barriers influencing Complementary feeding practices among mothers of children under 2 years of age in Karachi and to determine the level of Knowledge, attitudes and practices of Complementary feeding practices among mothers of children under 2 years of age in Karachi.

**Methods:** A cross-sectional study was conducted in Karachi, Pakistan, from September 2022 to February 2023, focusing on complementary feeding practices among mothers of under-two-year-olds. A self-administered questionnaire was administered to participants, identifying facilitators and barriers. The study included mothers and children under 24 months old, lactating or non-lactating, who have delivered a child or have children up to 2 years old. Data was analyzed using SPSS and Chi-square test to determine associations between variables.

**Results:** The majority of the mothers displayed poor knowledge and the practices regarding complementary feeding were found to be fair. With regards to barriers and facilitators of complementary feeding practices, mother's and father's education were significant facilitators while level of attitude was found to be a significant barrier which influenced feeding practices among mothers.

**Conclusion:** Mothers of children under 2 years old, especially non-literate ones, have poor complementary feeding knowledge and practices. Global health goals include reducing child malnutrition through supplemental feeding. Reduce child morbidity and death with complementary feeding education that changes behavior.

**Key words:** Complementary feeding practices, Facilitator, Barriers

## INTRODUCTION

Complementary feeding, the gradual introduction of solid or semi-solid foods alongside breastfeeding, is essential for ensuring that infants receive adequate nutrition during the critical first two years of life. The World Health Organization (WHO) recommends exclusive breastfeeding for the first six months, followed by the timely initiation of complementary foods, while continuing breastfeeding until at least two years of age<sup>1</sup>. This practice is critical in preventing malnutrition, stunting, and other developmental deficiencies in children<sup>2</sup>. However, many mothers in low- and middle-income countries (LMICs), including Pakistan, face numerous challenges in adhering to these guidelines<sup>3</sup>.

In Karachi, Pakistan's largest urban center, complementary feeding practices are influenced by a combination of socio-economic, cultural, and healthcare-related factors. According to the Pakistan Demographic and Health Survey (PDHS) 2018, only 48% of infants are exclusively breastfed for the first six months<sup>4</sup>, and many mothers delay the introduction of complementary foods beyond the recommended period. These delays contribute to the high rates of stunting (38%) and wasting (7%) in children under five<sup>5</sup>. The barriers that contribute to these suboptimal feeding practices include poverty, limited access to healthcare services, and persistent traditional beliefs about weaning and infant nutrition<sup>6</sup>.

Maternal education is one of the most significant facilitators of appropriate complementary feeding practices. Mothers who are knowledgeable about the nutritional needs of their children are more likely to introduce diverse and nutrient-rich foods at the appropriate time<sup>7</sup>. A growing body of research has highlighted the role of cultural beliefs and family dynamics in shaping complementary feeding practices. In many households, elders particularly mothers-in-law play a decisive role in determining when and what infants are fed. These family members may adhere to traditional feeding practices, such as pre-lacteal feeding (giving infants honey, water, or other substances before breastfeeding)<sup>8</sup>, which can delay the initiation of breastfeeding and interfere with the timely introduction of complementary foods. Additionally, misconceptions about the nutritional value of certain foods often result in inadequate feeding practices that fail to meet the

developmental needs of the child<sup>9</sup>.

Despite the promise of such interventions, more research is needed to understand how they can be effectively integrated into existing healthcare structures and how to overcome socio-cultural barriers that impede optimal feeding practices<sup>10</sup>. In Karachi, where diverse communities with varying socio-economic backgrounds coexist, a one-size-fits-all approach may not be effective. Tailored strategies that consider the unique challenges faced by different segments of the population are essential for improving complementary feeding practices in this urban context<sup>11</sup>.

Hence, the objective of the following research is to explore underlying the facilitators and barriers related to complementary feeding practices among mothers of children <2 years of age in Karachi. Secondly, it will also assess the level of knowledge, attitudes, and practices of complementary feeding practices among mothers of children <2 years of age in Karachi.

## MATERIALS AND METHODS

This cross-sectional and descriptive was carried out at Karachi, Pakistan from 1<sup>st</sup> September 2022 to 1<sup>st</sup> February 2023. The study was conducted among mothers of under-two-year children in Karachi, Pakistan. The self-administered questionnaire was administered to the study participants face to face in different hospitals of Karachi and also via Google form, consisting of questions identifying facilitators and barriers influencing complementary feeding practices in Karachi. The minimum sampling size calculated using Epi Info with expected frequency of appropriate complementary feeding practice (50%) was 384. All the voluntary participants were comprehensively explained the purpose of the study and had participated on the basis of informed written consent. A mother and child were included in the study if the child was less than and equal to 24 months of age. The youngest child was taken as the index child and all the responses obtained were based on this child. Lactating mothers or non-lactating mothers, who have delivered a child or have children up to 2 years of age were included. Those mothers who never delivered a child or have children greater than 2 years of age were excluded. A validated questionnaire used in previous researches<sup>12</sup> was administered to the study participants face to face consisting of questions regarding knowledge, attitudes, practices and identifying factors that facilitated or hindered complementary feeding practice among mothers. Data was analyzed and

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computed using SPSS. Chi-square test was used to find out the association between different variables.

## RESULTS

Majority 232(60.4%) mothers were involved between 26-31 age. Three hundred and fourteen (81.9%) mothers were unemployed, had 166(43.2%) completed primary education. One hundred and ninety one (49.7%) fathers have secondary education. 244(63.5%) households had an average monthly income of 50,000-250,000 PKR. A joint family system was prevalent, with 218(56.8%) living in such households, and 251 (65.4%) participants had fewer than three children. One hundred and forty seven (38.3%) children had largest proportion between 6-12-month age group (Table 1).

Table 1: Sociodemographic characteristics of the children (n=384)

Variable	No.	%
<b>Child's Age (months)</b>		
6-12	147	38.3
13-18	119	31.0
19-24	118	30.7
<b>Gender</b>		
Female	200	52.1
Male	184	47.9
<b>Mother's Age (years)</b>		
< 25	152	39.6
> 25	232	60.4
<b>Mother's Employment Status</b>		
Employed	70	18.2
Unemployed	314	81.8
<b>Father's Education</b>		
No Education	37	9.6
Primary Education	156	40.6
Secondary Education	191	49.7
<b>Mother's Education</b>		
No Education	70	18.2
Primary Education	166	43.2
Secondary Education	148	38.5
<b>Monthly Household Income</b>		
Poor Income	51	13.3
Average Income	244	63.5
High Income	89	23.2
<b>Type of Household</b>		
Nuclear Family	166	43.2
Joint Family	218	56.8
<b>No. of Children</b>		
<3	251	65.4
>3	133	34.6

Despite 76.8% of mothers understanding the correct definition of complementary feeding, the overall level of knowledge was low, with only 28.4% having good knowledge, and 71.6% having poor knowledge. While 64.3% of mothers knew the correct age (6 months) to initiate complementary feeding, only 57.3% knew the minimum frequency of feeding for children aged 6-8 months. Knowledge was highest regarding the composition of the child's diet, with 91.9% recognizing family food and 93% understanding the importance of fruits and vegetables. However, despite high levels of correct responses in some areas, significant gaps in knowledge about frequency and appropriate feeding utensils were observed (Table 2).

A significant association was found between child's age ( $p=0.04$ ) and the mother's level of knowledge. Mothers of younger children (aged 6-12 months) had the least knowledge (27.8%), while those with children aged 19-24 months demonstrated the highest levels of knowledge (11.19%). Additionally, the level of attitude was significantly associated with knowledge ( $p=0.05$ ), where mothers with poorer attitudes surprisingly exhibited better knowledge. Those with poor attitudes had better knowledge of complementary feeding (30.7%), while mothers with good attitudes had lower knowledge (19.2%) [Table 3].

Table 2: Respondents' knowledge of complementary feeding practices

Variable	No.	%
<b>Correct knowledge</b>		
Correct definition of Complementary feeding	295	76.8
Correct age to initiate Complementary feeding(6months)	247	64.3
Correct age to stop Breastfeeding (17-24 months)	316	82.3
Frequency of breastfeeding after starting other feeds	229	59.6
<b>Minimum frequency of giving Complementary food in a day</b>		
6-8 months (2 times)	220	57.3
9-11 months (3 times)	118	30.7
>12 months (4 times)	210	54.7
<b>A child between 6 months and 2 Yrs. should have a diet consisting of?</b>		
Cerelac (yes)	319	83.1
Family food (yes)	353	91.9
Proteinous food (yes)	336	87.5
Drinks (yes)	262	68.2
Adult milk (yes)	290	75.5
Fruits and vegetables (yes)	357	93.0
Beverage (no)	276	71.9
Egg (yes)	348	90.6
Milk products (yes)	352	91.7
Implication of starting Complementary feeding late	285	74.2
Appropriate utensil for feeding	309	80.5
<b>Overall Level of Knowledge</b>		
Good	109	28.4
Poor	275	71.6

Table 3: Complementary Feeding Practices among Respondents

Variable	No.	%
<b>Still breastfeed your child</b>		
Yes	230	59.9
No	154	40.1
Continued breastfeeding for up till two years	86	22.4
<b>Banana, yogurt and rice causes chest infection</b>		
Yes	186	48.4
No	29	7.6
Don't Know	169	44.0
<b>Meat, Pulses, Nuts and egg are hot and hard to digest</b>		
Yes	159	41.4
No	23	6.0
Don't Know	202	52.6
Feeding whenever child gives a cue	182	47.4
Adding salt to feeds	228	59.4
Feeding by the mother	256	66.7
Always wash hands before feeding	257	66.9
Always wash & sterilize feeding utensils after feeding	227	59.1
Bottle feeding	51	13.3
Feeding with cup	24	6.3
Feeding with plate/spoon	309	80.5
<b>Overall Level of Practice</b>		
Good practice	160	41.7
Fair practice	119	31.0
Poor practice	105	27.3

Table 4: Respondents' Attitude of Complementary Feeding Practice

Variable	No.	%
<b>initiation of weaning and breast feeding practice alongside</b>		
Strongly Disagree	40	10.4
Disagree	257	66.9
Strongly Agree	17	4.4
Agree	62	16.1
Undecided	8	2.1
<b>Preference between packaged and locally available food</b>		
Strongly Disagree	4	1.0
Disagree	19	4.9
Strongly Agree	178	46.4
Agree	170	44.3
Undecided	13	3.4
<b>Assumed hygiene measures before feeding a child</b>		
Strongly Disagree	-	-
Disagree	2	0.5
Strongly Agree	231	60.2
Agree	151	39.3
Undecided	-	-
<b>Overall level of attitude</b>		
Good	153	39.8
Poor	231	60.2

Only 39.8% of the mothers demonstrated a good attitude towards complementary feeding, while 231(60.2%) had a poor attitude. A large number of 297(77.3%) disagreed with the practice of initiating weaning alongside breastfeeding. Despite these poor attitudes, nearly all mothers (99.48%) agreed with the necessity of hygiene measures before feeding. Moreover, most participants (90.6%) preferred locally available foods due to affordability (Table 4).

Attitude was significantly associated with monthly household income ( $p=0.004$ ), knowledge ( $p=0.05$ ), and practice ( $p=0.02$ ). Mothers with average income exhibited the worst attitudes (38.5%), while those with better attitudes were linked to lower income. Similarly, mothers with poor knowledge were more likely to have a good attitude towards complementary feeding (30.7%).

In contrast, mothers with good knowledge often displayed poor attitudes (19.2%). Mother's education ( $p=0.04$ ) and father's education ( $p=0.03$ ) were significantly associated with better complementary feeding practices. Seventy one (18.4%) mothers have primary education demonstrated better practices than those with secondary education 60(15.6%). Likewise, fathers with secondary education 78(20.3%) had better practices compared to less educated fathers. However, the level of attitude was also a significant barrier ( $p=0.01$ ). Mothers with poor attitudes surprisingly showed better complementary feeding practices 109(28.4%), while those with better attitudes 51(13.3%) exhibited worse practices (Table 5).

Table 5: Factors associated with complementary feeding practices

Variables	Good Practice	Fair Practice	Poor Practice	X <sup>2</sup>	P value
<b>Factors as facilitators</b>					
<b>Mother's education</b>					
No education	29	29	12	9.97	0.04
Primary education	71	53	42		
Secondary education	60	37	51		
<b>Father's education</b>					
No education	11	19	7	10.86	0.03
Primary education	71	48	37		
Secondary education	78	52	61		
<b>Monthly household income</b>					
Poor	18	18	15	2.89	0.58
Average	102	79	63		
High	40	22	27		
<b>Factors as barriers</b>					
<b>Level of Attitude</b>					
Good Attitude	51	51	51	8.02	0.01
Poor Attitude	109	68	54		
<b>Employment status</b>					
Employed	27	23	20	0.34	0.84
Unemployed	133	96	85		

## DISCUSSION

Pakistan is considered as one of the largest populated country with highest birth rate<sup>13</sup>. Within the decades there has been a very less reduction in infant mortality with 62 in 1000 live births<sup>14-15</sup>. There are various reasons associated with such a high infant mortality whereas malnutrition is one of the main cause<sup>16,17</sup>. National surveys has lead to documentation of 1/3rd children population under five to be underweight presenting stunted growth in 40.2% with 17.2% wasting among children less than five years<sup>18</sup>. The major cause of malnutrition in children is related with non-breastfeeding practices as well as deficiencies through complementary feeding<sup>19</sup> where, it is crucial to introduce complementary foods to a child to supply essential minerals, vitamins and amino acids for optimal growth.

This study identified parental education as a significant facilitator of complementary feeding practices. Specifically, both the mother's education level ( $p=0.04$ ) and the father's education level ( $p=0.03$ ) had a marked impact on feeding behaviors. These results align with findings from studies conducted in other low- and middle-income countries, where maternal education has been consistently linked to improved infant feeding practices.<sup>20</sup> Educated mothers are more likely to understand the importance of timely and appropriate complementary feeding, as well as the nutritional needs of their infants, leading to better dietary diversity and overall feeding quality<sup>21</sup>.

Interestingly, in the present study, mothers with primary education (18.4%) exhibited better feeding practices compared to those with secondary education (15.6%). This may suggest that more educated mothers face additional socioeconomic pressures, such as employment, that limit the time and attention they can devote to feeding<sup>22</sup>. The role of paternal education was also notable, with fathers having secondary education (20.3%) being associated with better feeding practices. This finding is consistent with studies suggesting that fathers' educational attainment influences health-related decisions within the household, especially in patriarchal societies where men often control resources and

decision-making<sup>23</sup>. Another, facilitator that remained insignificant was monthly household income which showed that mothers who belong to average and high income groups were showing good complementary feeding practices as compared to the ones who belong to low income group.

Surprisingly, our results showed that attitudes toward feeding were the only significant barrier ( $p=0.01$ ), and poorer attitudes were associated with better feeding practices (28.3%). In contrast, mothers with better attitudes exhibited worse practices (13.3%). This counterintuitive result may reflect underlying complexities in the socio-cultural context. It is possible that mothers with better attitudes toward feeding are more exposed to modern feeding recommendations but face challenges in translating these attitudes into practice due to external barriers such as financial constraints, time limitations, or lack of family support<sup>24</sup>. On the other hand, mothers with less favorable attitudes might rely on traditional, tried-and-tested feeding methods that are, in practice, more effective for their children's nutritional needs. Other research has shown similar outcomes, where positive attitudes towards health-related behaviors do not necessarily result in positive outcomes, often due to practical constraints.<sup>25</sup> These findings highlight the importance of not just focusing on educational interventions but also addressing structural barriers that prevent the application of knowledge into action. Moreover, another barrier which showed insignificant association was found to be employment status, which showed that mothers who are employed displayed poor practices as opposed to the ones who are unemployed.

The results of this study suggest that improving maternal and paternal education could be a key strategy to enhance complementary feeding practices in Karachi. However, this should be coupled with practical support, such as time-saving feeding strategies or community-based initiatives that help mothers apply their knowledge in their everyday lives. Given the surprising finding related to attitudes, further research is needed to explore the gap between feeding attitudes and practices in this population. Tailored interventions that account for these discrepancies could help

bridge the gap between knowledge and practice, ensuring that positive attitudes translate into better health outcomes for children under two years of age.

## CONCLUSION

A window of opportunity exists during the complementary feeding period to prevent all forms of malnutrition, such as stunting, waste, obesity, and overweighting. Our analysis revealed that the practice of complementary feeding is hindered by a lack of knowledge regarding complementary feeding, which results in a limited number of infants receiving minimally acceptable complementary feeding. In order to enhance the knowledge and feeding practices of mothers, it is imperative to provide them with appropriate complementary feeding education that emphasizes opportune initiation. The first foods and feeding experiences of children are crucial not only for their immediate survival but also for their potential throughout their lifespan. Good nutrition during the early years has the potential to influence a more equitable and sustainable future through government investments and contributions from various sectors of society.

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1. Conception and design of or acquisition of data or analysis and interpretation of data.
  2. Drafting the manuscript or revising it critically for important intellectual content.
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- All authors agree to be responsible for all aspects of their research work.

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