



Original Article



Cultural and Socioeconomic Determinants of Mother's Complementary Feeding Practices on Nutritional Status of Children Under Five: A Cross-Sectional Study in Lahore, Pakistan

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ABSTRACT

Optimal nutrition and appropriate feeding practices in children determine the life and health of the child. **Objectives:** To investigate the cultural and socioeconomic determinants influencing mothers' complementary feeding practices, to evaluate mothers' knowledge, attitudes, and practices regarding complementary feeding, and to analyze the association between these factors and the nutritional status of children under 5. **Methods:** A cross-sectional study recruited 120 participants through a purposive sampling technique. Mothers with children under 5 were the targeted population living in Lahore. Data were collected through an online Google form and a self-administered, paper-based questionnaire divided into four sections: sociodemographic questions, questions on knowledge, attitude, and practices of complementary feeding, cultural practices, and questions related to the child's nutritional status. SPSS software version 27.0 was used for data analysis. **Results:** Almost (64.5%) of mothers knew that the correct age of initiation of complementary feeding was six months and were also aware of the risks of early initiation. The mother's age (p -value=0.022) and literacy levels (p -value=0.010) were significant factors. Other factors included place of residence and age of initiation of complementary feeding (p -value=0.042), feeding environment (p -value<0.001), and responsive feeding practices (p -value<0.001). **Conclusions:** It was concluded that cultural beliefs and feeding practices that affect complementary feeding in Lahore were analyzed, with the results cementing the need for culturally responsive interventions and empowerment of mothers to mitigate malnutrition. The findings offer valuable insights contributing to the development of targeted interventions for similar communities.

INTRODUCTION

Body condition is noticeably supported by nutrients from infancy to early childhood. Breastfeeding is important for the first six months of life, and recent brain science highlights that the foundations of adult fitness are installed from conception to early youth, with critical stages within the "first thousand days" (theorized by 24 months) and extending into the "second" thousand days" (up to five years) [1]. Nutritionally demanding situations at a certain stage of pregnancy, lactation and formative age have lifelong health effects. The "Global Strategy and Nutrition of Young Children" of World Health Organization (WHO) and

United Nations International Children's Emergency Fund (UNICEF) underlines the right and best nutrition for every child, which is recommended by 53 WHO/ Europe (EURO) Member States [2]. The WHO emphasizes that proper breastfeeding and supplementary feeding can save 820,000 less than 5 lives a year. However, malnutrition still causes 2.7 million child deaths, accounting for 45% of all global infant mortality [2]. Poor nutrition in children results in wasting, underweight and stunting, all of which increase the risk of mortality [3]. In Pakistan, the malnutrition situation is intense compared to other developing



countries. The National Nutrition Survey reports that 50% of Pakistani children are anemic, 44% are stunted, 33% are underweight and 15% are stunted. These statistics highlight the urgent need to improve breastfeeding, complementary feeding (CF) and maternal nutrition awareness [3]. Socio-economic popularity is a crucial matter, as poverty limits the training of mothers and thus the nutrition of children [4]. Lahore is a diverse city in Pakistan, and its population lives in both rural and urban areas. As a significant urban locality, its residents face challenges. In 2015, Lahore had 254,685 children under five years of age [4]. Therefore, current study uniquely contributes to the complementing literature on CF by examining cultural, paternal influence and socioeconomic factors in Lahore. Current study filled an important gap while discussing how cultural myths combined with educational level and responsive feeding affect a child's nutritional outcomes. This study was conducted in Lahore, a major metropolitan city with numerous cultural influences, making it an excellent location to analyze the determinants of complementary feeding and its effect on toddler fitness.

Current study aims to investigate the interplay of cultural norms, parental beliefs and feeding practices. It helped in making and understanding culturally sensitive interventions that can be implemented by identifying and targeting respective modifiable determinants that can lead to improved nutrition status in such urban settings.

METHODS

Using a cross-sectional design, data were collected through questionnaires at a single point in time. A list of eligible mothers with children under 5 years of age was converted to that obtained from girls' medical experts (Lady Health Worker (LHWs)) and sampling was done using a random range table. The sample size estimate was based entirely on a 50% expected knowledge prevalence of CF (P) with a ten percent margin of error, along with a ten percent inflationary aspect, resulting in a total final sample length of one hundred and twenty [5]. See the tested effects of cultural practices, myths and parental influences on complementary feeding practices and the child's dietary reputation. The data series were related to a Google Internet form and self-administered paper questionnaires. The link was taken from the Comprehensive Feeding Practices Questionnaire (CFPQ), an established tool for assessing parental feeding practices [6]. The CFPQ was adapted to suit the socio-economic context of Lahore and used simpler response classes instead of the traditional Likert scale to minimize complexity. This version facilitated the direct assessment of complementary feeding practices and challenging situations specific to this population, ensuring cultural relevance while maintaining the core elements of the CFPQ. The questionnaire

consisted of four parts: sociodemographic information; expertise, attitudes and practices related to complementary feeding; cultural practices, myths and parental influences; and the glory of baby food. Purposive sampling used 120 individuals. All subjects obtained information approximately by looking at the subject and providing verbal consent. Data analysis was started using SPSS version 27.0. Descriptive data consisting of frequency tables, options, implication, median, mode and known variance were calculated. For inferential evaluation, the chi-square test was used to assess associations between sociodemographic factors, cultural practices, parental influences, and myths with adherence to complementary dietary practices. Data confidentiality was maintained and all statistics were cleaned to ensure some accuracy. The Departmental Doctoral Program Committee (DDPC) Institute of Social and Cultural Studies approved the study, Letter No: D/119/ISCS University of the Punjab, Lahore. The study was also carried out according to the recommendations of the British Association for Educational Research guidelines. All participants were fully informed and briefed on the purpose of the study. Written informed consent was obtained by the participants before data collection.

RESULTS

Most mothers were aged 20-35 (64.5%), with education revealing that 20.9% are illiterate, 12.7% completed primary education, 13.6% reached middle school, 13.6% achieved intermediate status, and 39.1% were graduates. Predominantly fathers were employed with only 0.9% unemployed. Nearly half of the women had nuclear family (58.2%). The respondents were divided into urban and rural with 65.5% of the respondents are from urban areas while 34.5% being from rural areas. Income levels showed 61.8% earning above 50,000 PKR, 24.5% earning 30,000 to 50,000 PKR and the lowest being 13.6% earning 10,000 to 20,000 PKR only, while households typically had two children (36.4%), with most recent children aged 1-2 years (67.3%) (Table 1).

Table 1: Sociodemographic Characteristics of Respondent Living in Lahore

Variables	Frequency (%)
Age of Mother	
Below 20 Years	6 (5.5%)
20-35 Years	71 (64.5%)
Above 35 Years	33 (30.0%)
Mothers Education	
Illiterate	23 (20.9%)
Primary	14 (12.7%)
Middle	15 (13.6%)
Intermediate	15 (13.6%)

Graduation	43 (39.1%)
Fathers Occupation	
Employed	38 (34.5%)
Labourer	36 (32.7%)
Business	35 (31.8%)
Unemployed	1 (0.9%)
Type of Family Household	
Nuclear	64 (58.2%)
Joint	46 (41.8%)
Type of Residency	
Urban	72 (65.5%)
Rural	38 (34.5%)
Monthly Household Income	
10k to 20k	15 (13.6%)
30k to 50k	27 (24.5%)
50k and above	68 (61.8%)
1	20 (18.2%)
2	40 (36.4%)
3	32 (29.1%)
4 and More	18 (16.4%)
Age of Recent Child	
1-2 Years	74 (67.3%)
3-4 Years	21 (19.1%)
5 Years	15 (13.6%)

A majority of the mothers (64.5%) had an awareness of the risks of early initiation of CF and agreed that the correct age of initiation of CF is six months (52.7%), with the highest number of respondent mothers (35.5%) initiating CF to their children at six months. A large share of the mothers, 66.0%, offered the children home-prepared and commercially prepared CF. Most mothers faced several problems while giving their child CF; poor availability of healthy foods was the most common problem (44.5%). Nearly half of mothers (49.1%) reported feeding their children 1-2 times daily. Cultural practices (47.3%) and nutritional needs (40.0%) majorly affected food selection. Most mothers chose Cereals and carbohydrates (58.2%) to be given to their children (Table 2).

Table 2: CF Knowledge and Practices of Respondents Living in Lahore

Variables	Frequency (%)
Knowledge About the Importance of CF	
Yes	71 (64.5%)
No	39 (35.5%)
Knowledge About Risks Associated with Early Initiation of CF	
Yes	71 (64.5%)
No	39 (35.5%)
Knowledge About When CF Should Be Started	
At 04 Months	16 (14.5%)
Between 4-6 Months	36 (32.7%)
At 6 Months	58 (52.7%)
Age of Initiation of CF in Your Child	
At 04 Months	38 (34.5%)

Between 4-6 Months	33 (30.0%)
At 6 Months	39 (35.5%)
Age of Initiation of CF in Your Child	
At 04 Months	38 (34.5%)
Between 4-6 Months	33 (30.0%)
At 6 Months	39 (35.5%)
Type of CF Given	
Homemade	28 (25.5%)
Commercially prepared	16 (14.5%)
Both	66 (60.0%)
Challenges Faced in Providing CF	
Lack of Knowledge	16 (14.5%)
Limited Access to Healthy Foods	49 (44.5%)
Financial Constraints	24 (21.8%)
Time Constraints	2 (1.8%)
No Challenge	19 (17.3%)
How Often Do You Feed Your Child	
1-2 Times A Day	25 (22.7%)
2-4 Times A Day	54 (49.1%)
5 or more times a day	31 (28.2%)
How Do You Decide What Food to Give Your Child	
Based on Cultural Practices	52 (47.3%)
Based on Nutritional Needs	44 (40.0%)
Based on Availability	14 (12.7%)
Food Items Given to Your Child During Complementary Feeding	
Cereals and Carbohydrate-Based Food	64 (58.2%)
Fruits and Vegetables	16 (14.5%)
Meats and Dairy Food	30 (27.3%)

The association of sociodemographic characteristics with the CF initiation age was analyzed. A significant association was seen between the mother's age and CF initiation ($p=0.022$). Similarly, The mother's literacy level and age of initiation of CF were significantly associated ($p=0.010$), which indicates mothers with high education levels are more aware of the age of initiation of CF in their children than uneducated mothers. No significant association was observed between household family type and initiation age of CF among children ($p=0.703$). The type of residency and the age of CF initiation in children were significantly associated ($p=0.042$). No significant association was found between the number of children and the age of CF initiation ($p=0.318$) (Table 3).

Table 3: Association Between Sociodemographic Characteristics and Age of Initiation of CF

Variable	Age of Initiation of CF in Child			p-value
	At 4 Months	Between 4-6 Months	At 6 Months	
	Frequency (%)	Frequency (%)	Frequency (%)	
Age of Mother				
Below 20 Years	1 (2.6%)	2 (6.1%)	3 (7.7%)	0.022
20-35 Years	18 (47.4%)	25 (75.8%)	28 (71.8%)	
Above 35 Years	19 (50.0%)	6 (18.2%)	8 (20.5%)	

Mothers Education				
Illiterate	13 (34.2%)	1 (3.0%)	9 (23.1%)	0.001
Primary	8 (21.1%)	2 (6.1%)	4 (10.3%)	
Middle	4 (10.5%)	5 (15.2%)	6 (15.4%)	
Intermediate	7 (18.4%)	2 (6.1%)	6 (15.4%)	
Graduation	6 (15.8%)	23 (69.7%)	14 (35.9%)	
Fathers Occupation				
Employed	9 (23.7%)	18 (54.5%)	11 (28.2%)	0.000
Labourer	22 (57.0%)	2 (6.1%)	12 (30.8%)	
Business	7 (18.4%)	13 (39.4%)	15 (38.5%)	
Unemployed	0 (0%)	0 (0%)	1 (2.6%)	
Type of Family Household				
Nuclear	22 (57.9%)	21 (63.6%)	21 (53.8%)	0.703
Joint	16 (42.1%)	12 (36.4%)	18 (46.2%)	
Type of Residency				
Urban	24 (63.2%)	27 (81.8%)	21 (53.8%)	0.042
Rural	14 (36.8%)	6 (18.2%)	18 (46.2%)	
Monthly Household Income				
10k to 20k	8 (21.1%)	1 (3.0%)	6 (15.4%)	0.055
30k to 50k	10 (26.3%)	5 (15.2%)	12 (30.8%)	
50k and Above	20 (52.6%)	27 (81.8%)	21 (53.8%)	
Monthly Household Income				
1	8 (21.1%)	4 (12.1%)	8 (20.5%)	0.318
2	12 (31.6%)	12 (36.4%)	16 (41.0%)	
3	8 (21.1%)	12 (36.4%)	12 (30.8%)	
4 and More	10 (26.3%)	5 (15.2%)	3 (7.7%)	

A link between a child's nutritional status and the age of introduction to complementary feeding (CF) were analyzed. There was no statistically significant association between the present nutritional status and age of CF initiation ($p=0.546$). The distribution curves of CF initiation of all nutritional status categories (normal, underweight, obese) took a similar form, showing a high proportion of children initiated to CF at four months. Also, the 'caregiver's perception' of the infant's nutritional status had no statistically significant relation with the 'age of CF initiation' ($p=0.610$). Regardless of the perceptual satisfaction of the caregivers with their children's nutritional status, the initiation patterns of CF production, however, showed a constant trend across the three age categories. The null hypothesis, with a p-value of 0.554, was accepted, as there was no significant connection between the diagnosis of malnutrition or nutritional deficiency among children and the age of CF initiation. Even though the existence of children who were diagnosed with malnutrition and dietary deficiencies did not seem to affect the timing of CF initiation, the patterns remained the same within the "yes," "no," and "not sure" categories (Table 4).

Table 4: Association Between Child's Nutritional Status and Age of Initiation Of CF

Variable	Age of Initiation of CF in Child			
	At 4 Months	Between 4-6 Months	At 6 Months	p-value
	Frequency (%)	Frequency (%)	Frequency (%)	
Current Nutritional Status of the Child				
Normal	34 (89.5%)	29 (87.9%)	33 (84.6%)	0.546
Underweight	4 (10.5%)	3 (9.1%)	6 (15.4%)	
Obese	0 (0%)	1 (3.0%)	0 (0%)	
How Do You Feel About Your Child's Nutritional Status				
Very Satisfactory	11 (28.9%)	15 (45.5%)	13 (33.3%)	0.610
Somewhat Satisfactory	21 (55.3%)	13 (39.4%)	22 (56.4%)	
Neutral	5 (13.2%)	4 (12.1%)	2 (5.1%)	
Somewhat Dissatisfactory	1 (2.6%)	1 (3.0%)	2 (5.1%)	
Very Dissatisfactory	0 (0%)	0 (0%)	0 (0%)	
A Child Diagnosed With Malnutrition or Any Nutritional Deficiency				
Yes	7 (18.4%)	5 (15.2%)	9 (23.1%)	0.554
No	30 (78.9%)	26 (78.8%)	30 (76.9%)	

The cultural impact on children's nutritional status in our sample was not statistically significant ($p=0.267$). Children from all kinds of families, either who followed the family eating practices or who did not, distributed across the spectrum from normal, underweight, and obese, were relatively even. Moreover, no significant correlation existed between the children's feeding manner and the nutrition system ($p=0.930$). The feeding methods choices of caregivers, such as spoon-feeding, baby-led weaning or a combination of the two, had no significant impact on the dispersal of children into different nutritional categories. A significant correlation was observed between the feeding environment and children's nutritional status ($p<0.001$). Children fed in homes with peace and care were likelier to have normal nutrition, whereas kids from noisy and tense feeding environments were at a greater risk of being underweight. A significant association was observed between practising responsive feeding and the age of CF initiation ($p<0.001$) (Table 5).

Table 5: Association Between Cultural Practices and Children Nutritional Status

Variable	Current Nutritional Status of Your Child			
	Normal	Underweight	Obese	p-value
	Frequency (%)	Frequency (%)	Frequency (%)	
Age of Recent Child				
1-2 Years	65 (67.7%)	9 (69.2%)	0 (0%)	0.192
3-4 Years	19 (19.8%)	1 (7.7%)	1 (100%)	
5 Years	12 (12.5%)	3 (23.1%)	0 (0%)	
Cultural Practices Followed When the Child Was Fed				
Eating Together as a Family	30 (31.3%)	2 (15.4%)	1 (100%)	0.267

Offering Traditional Foods	50 (52.1%)	10 (76.9%)	0 (0%)	
Following Specific Mealtimes	16 (16.7%)	1 (7.7%)	0 (0%)	
Feeding Method				
Spoon-Feeding	57 (59.4%)	7 (53.8%)	1 (100%)	0.930
Baby-Led Weaning	12 (12.5%)	2 (15.4%)	0 (0%)	
Combination Of Both	27 (28.1%)	4 (30.8%)	0 (0%)	
Feeding Environment				
Calm and Supportive	88 (91.7%)	9 (69.2%)	0 (0%)	<0.001
Chaotic and Stressful	8 (8.3%)	4 (30.8%)	1 (100%)	
Practice Responsive Feeding and Respond to Infants' Hunger and Fullness Cues				
Yes	20 (52.6%)	30 (90.9%)	23 (59.0%)	<0.001
No	18 (47.4%)	3 (9.1%)	16 (41.0%)	

DISCUSSION

This study provided valuable insights into complementary feeding (CF) practices among respondents who had at most one or more children, fed them 2-4 times in the afternoon (49.1%) and faced limited access to healthy ingredients (44.5%). Significant associations were discovered between mother's age, schooling, father's career, house type and age of CF onset ($p < 0.05$), which is supported by the literature [7, 8]. In addition, cultural and responsive feeding practices were significantly associated with well-timed CF initiation ($p < 0.05$). A systematic review on PubMed highlighted that child-parent interactions, cultural practices and dietary routines are integral to the child's environment and influence CF [9]. Research from Great Britain and New Zealand confirms that cultural context and sensitive feeding influence child growth and development, which is the main focus of our study [10]. In addition, proper CF is essential for healthy weight gain and prevents both obesity and malnutrition [11, 12]. Poor nutritional intake among children remains a pressing problem in Pakistan [13]. Previous studies also suggest that maternal age and education are highly associated with appropriate feeding practices [14, 15]. A previous research found that inadequate CF practices are correlated with poor child health in Pakistan [16]. This study aimed to investigate different CF practices and their effects. Public health interventions in Pakistan need to be culturally sensitive, as research in this area is limited. Studies from low- and middle-income countries (LMICs) highlight peer counselling as a promising approach to improve CF, especially in culturally oriented countries such as India, Bangladesh, and Nepal [5]. In Pakistan, peer counselling could similarly support mothers in adopting appropriate CF practices. A systematic review in low- and middle-income countries found that more than 250 million children under five are at risk of stunting, but CF can increase height-for-age scores and reduce stunting by 13% [17]. Empowering mothers with basic skills also supports children's health

[18, 19]. This study faced limitations. Because of its cross-sectional design, we were unable to track children's growth over time. The sample was also small and limited to Lahore, affecting the generalizability and significance of some findings ($p > 0.05$). In addition, SPSS reported p -values to three decimal places (eg, zero 1/2) as per output precision. Future research should further investigate CF practices and toddler nutrition in Lahore [20]. Many global studies are pushing the need to investigate behavioural, cultural, dietary and environmental factors in CF and to teach households good practices for better health outcomes [21, 22]. In low- and middle-income countries such as Pakistan, further research is critical, focusing on RCTs, cohort studies, and mixed-methods designs to establish causality and communicate effective interventions.

CONCLUSIONS

This study highlighted the significant relationship between complementary feeding practices, cultural influences, and the nutritional status of children under 5 in Lahore, Pakistan. It was found that family structure plays a crucial role in determining the type and timing of complementary feeding, with maternal education being a key factor in the selection of appropriate feeding practices. The findings underscore the importance of culturally sensitive interventions tailored to the unique needs of local populations. Addressing the cultural, socio-economic, and educational determinants of feeding practices can lead to improved child nutrition and overall health outcomes. To optimize public health strategies, future interventions should focus on empowering caregivers with knowledge and resources to support optimal feeding practices, while also taking cultural and socio-economic contexts into account.

Authors Contribution

Conceptualization: MS

Methodology: JS, SH, RS, AK

Formal analysis: SJ

Writing review and editing: MS, FJ, FI

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

All the authors declare no conflict of interest.

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