STUDENTS' CORNER
RESEARCH ARTICLE

Maternal hygiene and knowledge on complementary feeding during infancy and early childhood in Lahore, Pakistan

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Abstract

Objective: To assess practice and knowledge levels regarding complementary feeding among mothers of infants.

Method: The analytical cross-sectional study was conducted in CMH Lahore Medical College & Institute of Dentistry, Cantonment, Lahore, Pakistan, from December 2021 to April 2022, and comprised mothers of children aged 6-24 months. Data was collected using a self-administered questionnaire exploring hygiene practices and knowledge related to complementary feeding. Data was analysed using SPSS 23.

Results: Of the 117 mothers with mean age 38.5±27.3 years, 115(98.3%) were married and 97(82.9%) resided in urban settings. Among the infants, 70(59.8%) were aged 12-24 months, 55(47%) were first-born, 72(61.5%) were exclusively breastfed for the first 6 months and 45(38.5%) continued breastfeeding along with complementary feeding after 6 months. Hygiene practices correlated to both marital status and the type of family ($p<0.05$). A significant association was found between mother's occupation to breastfeeding and hygiene practices ($p<0.05$). There was no significant association of breastfeeding practices with maternal age and maternal education ($p>0.05$).

Conclusion: Maternal information related to complementary feeding was found to be good, and breastfeeding practices were significantly associated with the mother's occupation. Maternal hygiene practices were also good, and were significantly associated with the mother's occupation and type of family.

Key Words: Breastfeeding, Child feeding, Child nutrition, Complementary feeding.

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Introduction

The optimal development of infants is dependent upon the way they have been fed different kinds of foods in their early lives. Complementary feeding is the process of introducing liquid and semi-solid foods of various kinds to meet the growing nutritive requirements of the infant which, as time passes, breastfeeding alone cannot fulfil.[1] According to World Health Organisation (WHO), complementary feeding should be appropriate, must have appropriate texture, have variety and be in sufficient quantities, and should be adequate and nutritive enough to meet the growing needs of a child. Complementary feeding should be started from 6 months onwards.[2]

Irrelevant complementary feeding practices can result in more than one problems, such as stunting, delay in motor and mental development, neurological and mental fatigue, diarrhoea, loss of micro-nutrients and macro-nutrients, and malnutrition.[3] In most countries, the majority of the decline in length-for-age during the first two years of life occurs during the complementary feeding period between 6 and 23 months of age.[4]

Infant and child mortality rates in Pakistan are among the highest in the world at 53 infant deaths and 63 deaths under 5 per 1000 live births in 2023.5 Rural areas have a high burden of malnutrition in comparison to the urban areas, with a 6% higher underweight rate, 2.4% higher stunting rate and 3.4% higher prevalence of wasting.[6]

It has been proven through evidence that maternal education is linked with the timely introduction of complementary feeding, meal frequency, dietary diversity, and the practice of a minimum acceptable diet.[7] The erstwhile Federally Administered Tribal Areas (FATA) in Pakistan represented the worst nutrition situation, as reported in the National Nutrition Survey (NNS) 2011, according to which, stunting rate among under-5 children was 58%, indicating poor economic conditions and food insecurity in the region. Early complementary feeding is found to be associated with various gastrointestinal (GI) infections, and late introduction beyond the age of 6 months may lead to iron deficiency anaemia.[8] Dietary diversity is closely associated with socioeconomic and demographic characteristics as is the

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case with Pakistan where myths abound, such as certain nutritious foods being harmful to the infants,.[9]

Among children living in low-income settings, diarrhoea has been linked with unsanitary complementary feeding practices, including contaminated food preparation and storage environment, such as the method of washing utensils, use of contaminated utensils, poor storage of food and utensils, presence of animals in food preparation areas, lack of hand washing at crucial times that is before food preparation and child feeding.[10] To make improvements, it is important to identify and address hurdles in accessing and consuming nutrient-dense foods. Interventions to enhance complementary feeding practices and the dietary fine of complementary meals ought to bear in mind the contextual and proximal determinants of stunting. Effective Infant and Young Child Feeding (ICYF) practices are well-developed, primarily focussing on promoting breastfeeding plans to promote complementary feeding and encouraging strategies to improve family and community nutrition. Further, interventions have proven to improve ICYF practices.[11] In order to attain the best outcomes nationally, these interventions must be supported by government policies.

The current study was planned to assess practice and knowledge levels regarding complementary feeding among mothers of infants.

Subjects and Methods

The descriptive, cross-sectional study was conducted in Lahore, Pakistan, from December 2021 to April 2022 after receiving ethical approval. The sample was raised using non-random convenience sampling technique. from the general population. Those included were Lahore-based mothers having at least one child aged 6-24 months. Mothers of babies with low birthweight (LBW), premature babies and babies having congenital deformities were excluded.

After taking informed consent from the subjects, data was collected using Google Forms, with the survey questionnaire consisting of structured, closed-ended questions. The questionnaire was designed in the light of WHO guidelines and was modified according to the target population[12].

The questionnaire asked the mothers to fill the survey for their most recent child aged at least 6 months. The first component of the questionnaire was about the socio-demographic profile of the participants. The second section explored maternal knowledge on complementary feeding, and breastfeeding practices. The third section contained maternal hygiene practices related to preparation and storage of complementary food for the infants.

The sample size was calculated using Cochran formula with 5% margin of error and 95% confidence interval (CI) with assumed prevalence of 50%[13].

Data was analysed using SPSS 23. Frequencies and percentages were used for categorical variables, and mean and standard deviation for quantitative variables. Chi-square test was used to assess the significance of association between independent and dependent variables. $P<0.05$ was considered significant.

Results

Of the 117 mothers with mean age 38.5±27.3 years, 115(98.3%) were married, 97(82.9%) resided in urban settings, 69(59%) lived in joint families, 79(67.5%) were part of households having income Pak Rupees (PKR) 50,000 per month, 4(3.4%) were illiterate and 70(59.8%) were housewives (Table 1).

Table-1: Socio-demographic characteristics (n = 117).

Characteristic	Frequency (n)	Percentage (%)
Maternal Age		
<20 years	5	4.3
21 – 30 years	72	61.5
>30 years	40	34.2
Marital Status		
Married	115	98.3
Divorced	2	1.7
Residence		
Rural	20	17.1
Urban	97	82.9
Mother's Educational Status		
Illiterate	4	3.4
Primary	3	2.6
Middle	5	4.3
Secondary	6	5.1
Graduate	51	43.6
Master	48	41.0
Mother's occupation		
Employed	47	40.2
Unemployed/Housewife	70	59.8
Age of baby (in months)		
6 – 8 months	25	21.4
9 – 11 months	22	18.8
12 – 24 months	70	59.8
Birth order of the child		
First	55	47.0
Second	6	5.1
Third	31	26.5
Fourth	25	21.4

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Child ever immunized as per EPI		
Yes	111	94.9
No	6	5.1
Education status of the husband		
Primary	2	1.7
Middle	6	5.1
Secondary	12	10.3
Graduate	36	30.8
Master	61	52.1
Type of family		
Joint	69	59.0
Nuclear	48	41.0
Income per month		
Less than 30,000 PKR	8	6.8
30,000 – 39,999 PKR	16	13.7
40,000 – 50,000 PKR	14	12.0
More than 50,000 PKR	79	67.5

Table-2: Maternal hygiene practices and knowledge regarding complementary feeding.

Knowledge and practice	Frequency (n)	Percentage (%)
Breastfeeding practices		
The child was breastfed		
No	14	12.0
Yes	103	88.0
The child was exclusively breastfed for the first 6 months		
No	45	38.5
Yes	72	61.5
Breastfeeding was continued along with complementary feeding		
No	72	61.5
Yes	45	38.5
Complementary feeding practices		
Initiation of complementary feeding		
Early (<6 months)	49	41.9
Optimal (6 months)	61	52.1
Late (>7 months)	7	6.0
Types of complementary feeding		
Combination	50	42.7
Commercially prepared	9	7.7
Homemade	58	49.6
Frequency of complementary feeding		
Once a day	26	22.2
Twice a day	47	40.2
Thrice a day	44	37.6
Nutrient content of complementary food		
Inclusion of iron-rich food in complementary food		
No	28	23.9
Yes	89	76.1
Inclusion of meat, poultry, fish, and egg in complementary food		
No	14	12.0
Yes	103	88.0
Vegetarian diet-only complementary food		
No	41	35.0
Yes	76	65.0

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Inclusion of fruits and vegetables in complementary food		
No	9	7.7
Yes	76	65.0
Feeding during and after illness		
Less frequent breastfeeding		
No	66	56.4
Yes	51	43.6
Switching to an only-fluid diet		
No	54	46.2
Yes	63	53.8
More food encouraged		
No	41	35.0
Yes	76	65.0
Maternal Hygiene practices		
Washes hands before food preparation		
No	2	1.7
Yes	115	98.3
Uses clean utensils to prepare and serve food		
No	16	13.7
Yes	101	86.3
Treatment of drinking water		
No	3	2.6
Yes	114	97.4
Washes hands before eating		
No	1	0.9
Yes	116	99.1
Washes hands after defecation		
No	28	23.9
Yes	89	76.1
Use of soap to wash hands		
No	10	8.5
Yes	107	91.5

Among the infants, 70(59.8%) were aged 12-24 months, 55(47%) were first-born, 103(88%) were breastfed, 72(61.5%) were exclusively breastfed for the first 6 months, 45(38.5%) continued breastfeeding along with complementary feeding after 6 months, 58(49.6%) received homemade complementary food, and 47(40.2%) were fed twice a day (Table 2).

Regarding complementary food, 103(88%) children had a diet rich in poultry, meat and fish, 76(65%) received a vegetarian diet, 76(65%) had access to fruits and vegetables, and 89(76.1%) were receiving iron-rich complementary food.

During and after an illness, 51(43.6%) children had their diets adjusted to less frequent breastfeeding, 63(53.8%) to a fluid-only diet, and 89(76%) were encouraged to have more diet after an illness.

Majority of the mothers 115(98.3% indicated that they washed their hands before food preparation, 116(99.1%) washed their hands before eating, 89(76.1%) washed their hands after defecation, 107(91.5%) used soap to

Table-3: Association of variables with hygiene practices and breastfeeding regarding complementary feeding.

Variables	Hygiene practices	Breastfeeding
Mother's occupation		
Employed	47 (77.05%)	14 (22.9%)
Unemployed	24 (42.8%)	32 (57.1%)
P-value	P-value = 0.012	P-value = 0.048
Type Of Family		
Nuclear	48 (75%)	16 (25%)
Joint	33 (62.3%)	20 (37.7%)
P-value	P-value = 0.005	P-value = 0.52
Marital status		
Divorced	2 (16.7%)	10 (83.3%)
Married	50 (47.6%)	55 (52.4%)
P-value	P-value = 0.035	P-value = 0.27
Age of baby(months)		
6-8 months	9 (37.5%)	15 (62.5%)
9-11 months	12 (42.9%)	16 (57.1%)
12-24 months	30 (46.2%)	35 (53.8%)
P-value	P-value = 0.522	P-value = 0.06
Maternal age		
Less than 20 years	5 (20.8%)	19 (79.2%)
21 – 30 years	20 (44.4%)	25 (55.6%)
More than 30 years	26 (54.2%)	22 (45.8%)
P-value	P-value = 0.46	P-value = 0.31
Maternal Education		
Illiterate	4 (21.1%)	15 (78.9%)
Primary	3 (30%)	7 (70%)
Middle	5 (33.3%)	10 (66.7%)
Secondary	5 (25%)	15 (75%)
Graduate	12 (42.9%)	16 (57.1%)
Master	15 (60%)	10 (40%)
P-value	P-value = 0.89	P-value = 0.99

wash their hands, 114(97.4%) had access to treated water and 101(86.3%) washed their utensils before cooking.

There was a significant association of maternal employment status with hygiene and breastfeeding practices, while hygiene practices also had significant association with marital status and type of family (Table 3).

Discussion

Adequate nutrition in children aged 6-24 months is required for ensuring their healthy growth and development. Globally, 45% of mortality of children under-5 is due to malnutrition,[12] with Pakistan having some highly negative rates of malnutrition in comparison with other developing countries.[13] A study in the United States found that adherence to recommended complementary feeding practices becomes associated with a higher nutritional repute in children with a decreased occurrence of malnutrition.[14] This indicates the necessity of assessing maternal complementary feeding knowledge and hygiene practices in Pakistan. Such a research was not conducted in the Pakistani city of Lahore, which, to our knowledge, makes the current study novel.

A majority of the mothers (51.3%) had started complementary feeding at the optimal age of 6 months. The result is comparatively lower than a previous study in Ethiopia.[15] There was a large proportion (41.9%) of mothers who initiated early complementary feeding before 6 months, which has been found in previous research in Nigeria as well.[16] A study in the Netherlands proposed various factors associated with inappropriate complementary feeding[17]. The current research found that complementary feeding initiation was non-significantly associated with the type of family. Early complementary feeding before 6 months was associated with an increased risk for infections as well as stunting and wasting.[8] For that reason, the high occurrence of early initiation of complementary feeding illustrated a requirement for interventions to teach mothers to improve their complementary feeding practices.

The current study found a significant association of breastfeeding practices with mothers' employment and marital status. This is consistent with previous findings.[18] Hygiene practices also showed a significant association with the mother's occupation and the type of family, which suggests children belonging to joint families have better hygiene practices.[19] However, maternal education did not show any significant relationship with breastfeeding or hygiene practices, which is inconsistent with earlier findings.[20] This could be due to the high ratio (43.6%) of mothers with higher education in the current sample.

Mothers who gave their children adequate portions of food rich in various nutrients was high (76.1%) in the current study, which is a positive indicator for preventing iron deficiency during the first two years of life.[21]

The study showed that 61.5% mothers did not continue breastfeeding with complementary feeding, which is lower than findings previously observed in Pakistan.[22] This is substantiated by a study in South Asia which found uneven progress in breastfeeding practices trends, and highlighted Pakistan as one of two countries of particular concern.[23]

Although the majority (65%) of mothers correctly knew that their child should be given more food after illness, inappropriate complementary feeding by mothers during and after an illness were observed in the current study. A large proportion (43.6%) of mothers were opting for less

frequent breastfeeding during and after illness, and 53.8% mothers said they would switch to a fluid-only diet during and after an illness. This is in line with a previous study in South Asia[24] which found less than optimal feeding practices during and after an illness. This incorrect maternal practice could be due to inadequate information about the needs of sick children, and a lack of appropriate counselling from professionals. This asserts the need of providing mothers with correct and timely information on feeding during and after an illness.

As the intake of complementary foods increases, observing good hygiene practices is crucial for the prevention of GI illnesses. A majority of mothers had good hygiene practices in washing hands before food preparation, using clean utensils to prepare and serve food, treating drinking water, washing hands before eating, and using soap to wash hands. However, only 76% mothers indicated they washed their hands after defecation, which is lower compared to 97% reported by a previous study in Pakistan.[25] This could be due to a lack of health education, and interventions like targeted training to increase the adoption of recommended hygiene practices of mothers can prove helpful.

The relationship between maternal hygiene practices and the immunisation status of a child proved non-significant. This is likely because the incidence of diarrhoeal disease in the child would be the variable affecting both these factors, as indicated by a study in Ethiopia that found a lower incidence of diarrhoeal disease in children who were fully vaccinated.[26] Therefore, the current study indicated the need to account for the medical history of the child in place of recent illnesses and prior hospital admissions.

The current study had some limitations, as it did not take into account anthropometric measurements of the child for the determination of nutritional status, and for association with minimum meal frequency and diversity. Also, the majority of respondents were residing in urban areas, which did not allow it to compare rural and urban areas.

Despite the limitations, however, the current study was able to accumulate important information about the prevalence of good knowledge of complementary feeding and good hygiene practices among mothers. It also highlighted the need for targeted training for mothers on certain hygiene practices, such as washing hands after defecation, as well as educating mothers on breastfeeding practices, and feeding practices during and after an illness. As the majority of respondents in the study (47%) had first-born children, future studies are recommended to explore a potential decline or improvement of complementary feeding practices and maternal hygiene practices with children of higher birth order. Overall, it is recommended to give continued priority to the development of complementary feeding practice modules to bring about improvements in maternal knowledge in Lahore.

Conclusion

Maternal information related to complementary feeding was found to be good, and breastfeeding practices were significantly associated with the mother's occupation. Maternal hygiene practices were also good, and were significantly associated with the mother's occupation and type of family.

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Author's Contributions

NN: Compiled results and discussion, contributed to conception and design.
MA: Write methodology and data collection.
MJ: Data collection, write down introduction.
MA: Data collection, compile results.
IM: Conception and design, drafting the article.