Persistent Inadequacies in Infant and Young Child Feeding Practices and Their Determinants

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Abstract Background: Malnutrition is a major public health problem and is directly associated with poor infant and young child feeding (IYCF) practices. The study aimed to identify the inadequacies in the feeding practices for children aged 0-23 months through a cross-sectional KAP survey. Methods: Data was collected on demographic indicators, IYCF practices, 24 hours dietary recall, childhood illnesses and anthropometrics and compared with WHO guidelines. Results: Only 44.8% mothers timely initiated breastfeeding, 57% fed colostrum and 32.9% practiced exclusive breastfeeding. Only 63.2% children were breastfed beyond first year and 42.2% up to second year. Nearly half of the children were introduced to complementary feeding at 6-8 months. Minimum meal frequency (MMF) was offered to 57.5%, minimum dietary diversity (MDD) to 53.2% and minimum acceptable diet (MAD) to 37.1%. Prevalence of childhood illnesses was high. Prevalence of stunting, wasting and underweight was 19.1%, 4% and 11.4%, respectively. Mother’s working status was positively associated with timely initiation of breastfeeding (OR 1.82; 95% CI 1.17, 2.83) and MDD (OR 1.53; 95% CI 0.93, 2.51) but inversely associated with exclusive breastfeeding (OR 0.52; 95% CI 0.16, 1.66). Colostrum was given by mothers with better socioeconomic status (OR 1.3; 95% CI 0.84, 2.04) and higher education level (OR 1.22; 95% CI 0.71, 2.08). Socioeconomic status directly affected MDD (OR 2.32; 95% CI 1.40, 3.83) and MAD (OR 1.51; 95% CI 0.90, 2.54). The health status of children was negatively impacted by bottle feeding (OR 0.79; 95% CI 0.50, 1.27). Conclusions: The mothers showed moderate to low compliance to WHO IYCF indicators despite high educational status. The inadequacies in IYCF practices demand for immediate awareness interventions.

Keywords: IYCF, determinants, breastfeeding, complementary feeding, childhood illnesses


1. Introduction

Despite proper emphasis on nutrition in the Millennium Development Goals (MDGs) and Sustainable Development Goals (SDGs), malnutrition remains a major public health issue in the developing world. It is the cause of childhood morbidity and nearly half of the deaths of children less than 5 years of age [1-5]. According to global data, prevalence of stunting (indicator of chronic malnutrition) is 21.9% and wasting (indicator of acute malnutrition) is 7.3% and most of such malnourished children belong to South Asia and Africa [6,7,8]. Pakistan is unfortunately one of the hardest hit countries where the prevalence of stunting is as high as 40.2% and wasting is 17.7% [9]. Children suffering from wasting are at the highest risk of mortality which is better predicted by their mid upper arm circumference [10]. Wasting is directly related to severity of childhood illnesses in a dose-dependent manner [11].

Recent data suggest that prevalence of malnutrition is directly associated with inadequate infant and young child feeding practices (IYCF). Appropriate breastfeeding and complementary feeding practices in the first 2 years of life can help in the prevention of malnutrition [12] and also reduce the risk of childhood illnesses like pneumonia and diarrhea [13]. According to recent studies, poor infant and young child feeding practices are significantly correlated with prevalence of stunting, wasting and underweight [14,15]. WHO and UNICEF have devised a number of indicators to assess the feeding practices of infants and young children [16,17,18]. By measuring the indicators in a specific group of population, we can get a clear picture of the practices which need to be improved in
that region [19]. The present study was designed to assess the knowledge, attitude and practices (KAP) of mothers residing in Islamabad, the capital city of Pakistan, about infant and young child feeding (IYCF) using WHO/UNICEF indicators to get a clear understanding of the anomalies in the feeding patterns of young children.

2. Methods

The aim of this study was to determine the inadequacies in infant and young child feeding practices that directly affect the nutritional status of young ones. IYCF indicators developed by WHO/UNICEF were utilized to determine the feeding practices of infants and young children [20]. The indicators included 1) timely initiation of breastfeeding, 2) exclusive breastfeeding for children less than 6 months, 3) continued breastfeeding until fist birthday, 4) introduction of complementary feeding, 5) minimum dietary diversity, 6) minimum meal frequency, 7) minimum acceptable diet, 8) intake of iron-rich foods, 9) consumption of vitamin A-rich foods and 10) bottle feeding.

2.1. Ethical Considerations

The study received a prior approval from Ethical Review Board of Shaheed Zulfiquar Ali Bhutto Medical University, Islamabad vide letter No.F.1-1/2015/ERB/SZABMU/297 dated 30-08-2018. Written informed consent was obtained from all the study participants. Confidentiality was ensured by assigning codes to study participants at the time of data entry and using codes for data analysis and reporting.

2.2. Study Setting and Design

The study was undertaken in the urban and rural areas of Islamabad. It was a cross sectional survey. A mixed method approach involving quantitative and qualitative indicators was used to determine knowledge attitude and practices (KAP) of mothers regarding infant and young child feeding practices through a structured questionnaire developed in light of UNICEF tool that included five sections: 1) demographic information; 2) infant and young child feeding practices; 3) 24 hours dietary recall; 4) prevalences of childhood illnesses; and 5) Anthropometric measurements. The questions were translated from English to Urdu language and then back-translated to English to verify the correctness of translation.

2.3. Sampling Technique

A stratified two-stage sample design was used for the study. The urban and rural areas were taken as two separate strata. All the developed sectors under urban stratum and all the villages and towns under rural stratum were coded and two random codes were generated from each stratum giving a total of four primary sampling units (PSUs) for data collection. Households having children less than two years within the primary sampling units were adopted as secondary sampling units (SSUs). Only the households having children less than 2 years of age were included. The children with disabilities or special needs were excluded from the study. The tool was pretested in the field before administration. Calculated sample size was 384. Systematic random sampling was done in the randomly generated PSUs. Weight of children aged 6-23 months was taken with UNI electronic scale. Length/height was recorded using SHORR wooden board.

2.4. Data Analysis

Data was cleaned and entered into Microsoft Excel. Double data entry was done to avoid key-punch errors. IYCF indicators were analyzed according to the formulas given in WHO document [21]. For statistical analysis of data, SPSS version 22 was used. Variables were initially analyzed using descriptive statistics. Mean, standard deviation, median and range were calculated for continuous variables. Proportions were determined for nominal variables. Odds ratio was calculated by logistic regression with 95% CI. A p-value of <0.05 was considered statistically significant. Correlations of bivariate variables were drawn using Pearson correlation coefficient. Wealth indexes were based on the principal component analysis using household assets, household ownership status, materials used for the roof, floor and wall of the house, number of rooms, fuel for cooking, main source of drinking water and toilet facility. Wealth scores were divided into four quartiles with first being the richest and fourth being the poorest. For anthropometric measurements, WHO AnthroPlus software was used for calculating stunting, wasting and underweight through calculation of z-scores of children aged 6-23 months. A value of < -2 SD of the observed height-for-age (HAZ), weight-for-height (WHZ), and weight-for-age (WAZ) Z-score distributions indicated stunting, wasting and underweight, respectively. A value of > +2 SD WHZ indicated overweight.

3. Results

3.1. Demographic Indicators

Data was collected from 384 households belonging to urban and rural PSUs of Islamabad city, the capital of Pakistan. The mean (SD) family size was 6.3 (2.84) individuals. Minimum family size was 3 and maximum was 15 with a median of 6 individuals. The mean (SD) number of children in each household was 2.28 (1.32). Minimum number of children was 1 and maximum was 8 with a median of 2 children. The mean (SD) age of index child was 13.2 (8.07) months with an age range of 0 to 23 months. 57.8% were boys and 42.2% were girls. According to the results, 58.6% families were joint while 41.4% families were nuclear. The percentage of households belonging to first, second, third and fourth wealth quartiles were 30.9%, 33.5%, 29.9% and 5.5%, respectively, with first quartile belonging to the most affluent families and fourth quartile belonging to the poorest. This improved socio-economic status may be attributed to the fact that the study area was the capital of the country with good employment opportunities. Details of demographic indicators are listed in Table 1. Urban residence was positively associated with better socioeconomic status (OR 13.13; 95% CI 7.60, 22.66), education level (OR 2.33; 95% CI 1.36, 3.40)
and employment ratio of mothers (OR 1.35; 95% CI 0.87, 2.09).

Table 1. Socio-demographic characteristics of study population

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3.2. Mothers’ Characteristics

The mean (SD) age of mothers was 28.3 (5.29) years. The age range was 18 to 46 years with a median of 28 years. Majority of the mothers were highly educated and only a small fraction of women were illiterate (2.3%) again owing to better educational opportunities in the capital. The details of educational status are elaborated in Table 1. Nearly 70% of the women were house wives (Table 1). The most common occupation among the working mothers was school teaching (14.8%). Mothers of urban areas had higher education level (OR 2.33; 95% CI 1.36, 3.99) and better employment ratio (OR 1.35; 95% CI 0.87, 2.09) as compared to rural areas. Similarly, education level of mothers belonging to affluent families was higher than poorer cohort (OR 2.81; 95% CI 1.67, 4.75). Education status positively correlated with employment status (OR 1.16; 95% CI 0.65, 2.04).

3.3. Mothers’ Knowledge on Breastfeeding

The mothers generally considered breastfeeding beneficial. Majority were of the view that breastfeeding is useful for the child (82%) as it is rich in antibodies and helps in increasing immunity and consequently lessens disease burden (44.8%). Some considered breastfeeding good for mother’s health and postpartum recovery (16.7%). They also revealed that breastfeeding helps in developing and strengthening mother-child bond and increases affection (44.8%). The practice was found to be economically feasible by some (12.8%).

3.4. Inadequate Breastfeeding Practices

Almost all the children were offered breast milk by their mothers. However, only 44.8% (N=172) mothers put their child to breast with in the first hour of birth as recommended by WHO (Figure 1A). Out of the remaining, majority (~60%) of the mothers could not initiate breastfeeding timely because of their sickness. Colostrum, first milk which is rich in antibodies and nutrients, was given to only 57% of the children. Unfortunately, 44% of the mothers who didn’t givecolostrum to their children thought that it is stale and unfit for consumption despite their high educational background. Moreover, only 33.3% children were given breast milk as their first food after birth. Almost 47% children were given honey and 13.5% were given infant formula (Figure 1B). Exclusive breastfeeding under 6 months was practiced by only 32.9% of the mothers as calculated by 24 hours dietary recall (Figure 1C).

3.5. Determinants of Breastfeeding Practices

Being a working mother was positively associated with timely initiation of breastfeeding (OR 1.82; 95% CI 1.17, 2.83). Mothers with better socioeconomic status (OR 1.3; 95% CI 0.84, 2.04) and higher education level (OR 1.22; 95% CI 0.71, 2.08) preferred giving colostrum to their children. More male children received colostrum than female children (OR 1.39; 95% CI 0.90, 2.13). Exclusive breastfeeding was less practiced in urban areas as compared to rural areas (OR 0.28; 95% CI 0.10, 0.77). This practice decreased with mother’s age (OR 0.43; 95% CI 0.16, 1.13) and employment (OR 0.52; 95% CI 0.16, 1.66). Exclusive breastfeeding practice was higher in affluent as compared to poor households (OR 1.49; 95% CI 0.61, 3.88). Exclusive breastfeeding was again high in joint as compared to nuclear families (OR 1.43; 95% CI 0.51, 3.98). Bottle feeding was more common among children of employed/working mothers (OR 1.53; 95% CI 0.93, 2.53).

Figure 2. WHO Infant and Young Child Feeding indicators. A) Breastfeeding indicators. B) Complementary feeding indicators

3.6. Mothers’ Knowledge on Complementary Feeding

The World Health Organization recommends initiating complementary feeding between 6-8 months of age. But only 22.9% mothers were aware of the correct age. 26% mothers thought that children should be given complementary foods as soon as they are able to swallow, 16.7% associated it with child’s demand and 10.4% linked it with teething. Separate cooking was considered beneficial for child by majority of the mothers.

3.7. Area Graph based on Dietary Recall

The area graph, based on WHO/UNICEF guide, visually depicts the overall feeding patterns of children aged 0-23 months during a specific time period (Figure 3).

3.8. Inappropriate Complementary Feeding Practices

Almost half (51.8%) of the mothers initiated complementary feeding at the right age (Figure 2B). 41.8% children received complementary feeding before 6 months and the remaining received after 8 months. Nearly 32% (N=95) of the mothers always cooked separately for their child. 52.2% (N=156) mothers sometimes cooked separately and 14.7% (N=44) mothers never cooked separately for their child.

Minimum dietary diversity (MDD) based on 7 food groups, was calculated for children aged 6-23 months (N=299) according to the WHO/UNICEF guidelines. The children consuming foods from 4 or more food groups were meeting the criterion of minimum dietary diversity and constituted to be only 53.1% (Figure 2B). Break-up of food groups consumed is given in Figure 4A and 4B.

According to the criterion set by WHO/UNICEF for minimum meal frequency (MMF), 87% children belonging to 6-8 months age group and 55.1% (breastfed and non-breastfed combined) children belonging to 9-23 months age group were getting meals the minimum
number of times a day. The cumulative MMF was 57.5% for children aged 0-23 months (Figure 4C). According to our study, only 37.1% children were following the criterion of minimum acceptable diet (MAD). Consumption of iron-rich foods was 61.2% and vitamin A rich foods was 32.1% which was very low. A summary of complementary feeding indicators is given in Figure 2B.

3.9. Determinants of Complementary Feeding Practices

Timely introduction of complementary feeding was less practiced in urban areas (OR 0.85; 95% CI 0.55, 1.34) and by working women (OR 0.79; 95% CI 0.49, 1.28). Minimum meal frequency was negatively associated with urban residence (OR 0.73; 95% CI 0.46, 1.15), joint family system (OR 0.74; 95% CI 0.46, 1.18) and working status of mothers (OR 0.64; 95% CI 0.39, 1.06). On the contrary, minimum dietary diversity was positively associated with urban residence (OR 1.63; 95% CI 1.03, 2.58), mothers’ employment (OR 1.53; 95% CI 0.93, 2.51) and better socioeconomic status of the households (OR 2.32; 95% CI 1.40, 3.83). Minimum acceptable diet was also influenced by urban residence (OR 1.22; 95% CI 0.76, 1.98) and better socioeconomic status (OR 1.51; 95% CI 0.90, 2.54).

A direct correlation existed between MMF and MAD (R=0.614; p<0.001) as well as MDD and MAD (R=0.809; p<0.001) according to Pearson correlation of bivariate variables. Separate cooking for young children was positively impacted by better socioeconomic status (OR 1.14; 95% CI 0.59, 2.22). The odds of separate cooking for child were less for working women (OR 0.61; 95% CI 0.31, 1.17) and joint families (OR 0.49; 95% CI 0.25, 0.99).

3.10. High Burden of Childhood Illnesses

The mothers were enquired about the prevalence of childhood illnesses including cough, fever, flu, diarrhea and breathing difficulty during the last 2 weeks prior to survey. 70.8% (N=272) children suffered from one or more illnesses during the past 2 weeks before the day of interview. Almost 41.7% children suffered from cough, 47.9% had flu, 12.5% had diarrhea and 22.9% had breathing difficulty as inferred from multiple responses (Figure 5A). 25% of the children had one illness during the last 2 weeks which was mostly flu or cough. It was noted with concern that nearly half the children (~46%) were suffering with more than one illness (Figure 5B).

3.11. Determinants of Child Health

The health status of children was positively impacted by exclusive breastfeeding (OR 2.33; 95% CI 0.89, 6.14), giving colostrum to child (OR 1.13; 95% CI 0.71, 1.79), timely introduction of complementary feeding (OR 1.39; 95% CI 0.86, 2.26), minimum meal frequency (OR 1.38; 95% CI 0.82, 2.32) and minimum acceptable diet (OR 1.30; 95% CI 0.77, 2.20). Other determinants included socioeconomic status (OR 1.42; 95% CI 0.90, 2.26), urban residence (OR 1.48; 95% CI 0.96, 2.28), joint family structure (OR 1.11; 95% CI 0.71, 1.72) and more age of mothers (OR 3.30; 95% CI 2.06, 5.29). Health
status was negatively impacted by bottle feeding (OR 0.79; 95% CI 0.50, 1.27). Boys were less likely to be free of illnesses as compared to girls (OR 0.69; 95% CI 0.45, 1.07).

3.12. Anthropometric Findings

The prevalence of stunting among the children aged 6-23 months was 19.1%, wasting was 4.0%, underweight was 11.4% and overweight was 1.0%. The prevalence of malnutrition was significantly higher in rural areas as depicted by stunting (OR 2.6; 95% CI 1.39, 4.86), wasting (OR 10.9; 95% CI 1.39, 85.72) and underweight (OR 5.07; 95% CI 2.03, 12.65). Height-for-age was directly associated with MDD (OR 3.39; 95% CI 1.43, 8.06), MAD (OR 2.18; 95% CI 1.09, 4.34) and socioeconomic status (OR 6.54; 95% CI 3.47, 12.35). Weight-for-age was also directly impacted by MDD (OR 3.99; 95% CI 1.43, 8.06), MAD (OR 2.61; 95% CI 1.04, 6.52) and socioeconomic status (OR 9.42; 95% CI 3.94, 22.54). Prevalence of wasting was significantly higher in population with low socioeconomic status (OR 22.95; 95% CI 2.92, 180.39).

4. Discussion

The present study was conducted to determine the knowledge, attitude and practices of mothers regarding infant and young child feeding in Islamabad region. Malnutrition usually sets in the early years of life and is a major contributor to childhood mortality and morbidity. Childhood malnutrition is directly linked to inadequate infant and young child feeding practices. Islamabad is the capital city of Pakistan with population residing in both urban and rural areas. During sample collection, care was taken to give due representation to both the segments of population.

A large proportion of mothers were well educated in contrast to the national figures probably because the data was collected from the capital of Pakistan having improved education infrastructure with better access and affordability even in rural areas [9,22]. A logical correlation existed between education and working status of mothers which was in line with the previous findings [23].

Our study revealed that nearly 70% of the mothers were housewives. Although this figure corresponds to the national data [22], it is a matter of great concern that women, even after obtaining good education, either choose or are made to stay at home after marriage and fail to become a productive part of the work force which negatively affects national productivity and economy. School teaching remains the single most acceptable profession for women in the Pakistani society. The socioeconomic status was generally high which can be explained by the fact that the education and employment opportunities are much greater in the capital of the country.

Over all, the compliance to WHO IYCF indicators was not up to the mark and even lower than other countries of the region [14,24,25]. The World Health Organization recommends putting the child to breast with -in the first hour of birth. It not only initiates an immediate supply of nutrients and antibodies (colostrum) but also helps in the expulsion of placenta and delivery remains. However, despite having good educational background, nearly half of the mothers failed to implement the practice pointing towards lack of relevant information about the basic health and nutrition issues in our curriculum. Early initiation of breastfeeding was practiced more by working mothers which is in line with previous findings [26]. Moreover, more than two third of the children were given pre-lacteals instead of breast milk which may lead to diarrhea or other digestive disorders. The most common pre-lacteal was honey which is generally not advised by physicians as it can initiate allergic reactions in the newborn putting their life at risk [27,28].

According to WHO, the right age of complementary feeding initiation is 6-8 months, where the caloric requirements of the child increase to an extent which cannot be fulfilled by breastfeed alone. If breastfeeding is not initiated even after this age bracket, then a caloric deficit leads to malnutrition. Introducing complementary feeding before the recommended age results in diarrhea and other illnesses and thus cause more havoc than benefit [29]. According to our study, less than one-fourth mothers were aware of the right age of introduction of complementary feed and about half of the mothers actually practiced it.

According to the findings of 24 hours dietary recall, only about one-third mothers of under 6 months old children were practicing exclusive breastfeeding which is the basic right of every child. These figures are much lower than the recent national figures given by Pakistan Demographic and Health Survey (PDHS) 2018 and National Nutrition Survey (NNS) 2018 where almost 48% mothers are giving only breastfeed to their young ones under 6 months [9,22]. The PDHS report also reveals that breastfeeding decreases with increase in education level of mothers which falls in line with findings of our study. Nearly 90% of the 2-3 months old children in the present study were fed with formula milk which is indeed alarming. The prevalence of bottle feeding was also very high.

Regarding the complementary feeding indicators, minimum meal frequency and minimum dietary diversity were practiced by more than half of the mothers. More dietary diversity was observed in economically affluent families which is in line with the previous studies [26,30]. Minimum acceptable diet figures were far from satisfactory but still better than the national figures of 3.6% [9] and 12.7% [22] owing to the better socio-economic conditions of the families residing in the capital city. The intake of vitamin A rich foods by our study population was 32% which is again very low.

More than two-third of the children suffered from one or more illnesses during the two weeks before the survey. High prevalence of childhood illnesses is an expected outcome for a population where exclusive breastfeeding is practiced by less than one-third of the mothers [13,31] and minimum acceptable diet is given to just over one-third children. The statistical inferences point towards the positive role of exclusive breastfeeding, colostrum, timely introduction of complementary feeding and minimum acceptable diet in improved child health. Socioeconomic status, urban residence and joint family structure also help in maintaining good health of children. Another
Inadequate complementary feeding practices as described directly impacted by low socioeconomic status and burden would lift the pressure from health budget economic productivity of the country. Lesser disease children. Healthy children would grow up intohealthy hier young child feeding practices would decrease the disease childhood illnesses was on the rise and needs to be proposed the integration of infant and young child feeding chapter in the currently running health programs for improved outreach and better utilization of the available resources.

5. Conclusion

The present study has explicated the infant and young child feeding practices in the capital of Pakistan. Although we have seen better education and employment status in the residents, it does not translate into appropriate feeding practices of the young ones. The breastfeeding practices were far from satisfactory and the indicators of timely initiation of breastfeeding, colostrum feeding to newborn and exclusive breastfeeding are quite worrisome. Regarding complementary feeding, the practice of earlier initiation of weaning needs to be dealt with. Minimum acceptable diet was available to only one-third of the children despite having good education, employment and socioeconomic status of the parents. Bottle feeding prevalence was very high and consumption of foods rich in micro-nutrients was very low. The prevalence of childhood illnesses was on the rise and needs to be addressed on priority basis. Betterment in infant and young child feeding practices would decrease the disease burden and improve the health and nutritional status of the children. Healthy children would grow up into healthier adults and would contribute to the work force to increase economic productivity of the country. Lesser disease burden would lift the pressure from health budget which could then be channelized towards education and development programs.

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Statement of Competing Interests

The authors have no financial disclosures or competing interest.

List of Abbreviations

CI, Confidence Interval; HAZ, Height-for-Age Z-score; IEC, Information, Education and Communication; IYCF, Infant and Young Child Feeding; KAP, Knowledge, Attitude and Practices; MAD, Minimum Acceptable Diet; MDD, Minimum Dietary Diversity; MDG, Millennium Development Goals; MMF, Minimum Meal Frequency; NNS, National Nutrition Survey; OR, Odds Ratio; PDHS, Pakistan Demographic and Health Survey; PSU, Primary Sampling Unit; SD, Standard Deviation; SDG, Sustainable Development Goals; SSU, Secondary Sampling Unit; UNICEF, United Nations Children’s Fund; WAZ, Weight-for-Age Z-score; WHO, World Health Organization; WHZ, Weight-for-Height Z-score.

References


