Original Article

Feeding Problems in a Sample of Children under 5 Years at a Primary Health-Care Center in Erbil, Iraq

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Abstract

Background: The feeding issues of children under 5 years of life have effects on overall growth and development. **Objectives:** This study aimed to find out the prevalence of feeding problems and their associated factors among a sample of children under 5 years visiting a primary health-care center in Erbil city. **Materials and Methods**: In this cross-sectional study, the mothers who visited the primary health centers for the medical checkup of their children under 5 years were consecutively screened for the eligibility criteria between February 1, 2020, and June 30, 2020. **Results**: The children were located in the following age groups: 6–9 months (11.3%), 9–12 months (4.9%), 12–24 months (32.0%), and >24 months (51.7%). The children had an abnormal height for age (8.9%), weight for age (6.9%), and weight for height (14.3%). The prevalence of formula feeding was 49.0% in children. The prevalence of feeding problems was 75.9%, including mono-feeding (20.2%) and multi-feeding issues (55.7%). The prevalence of complementary food was 2.0% only. The prevalence of active feeding was 54.2%. The study showed that younger age group had a significantly higher prevalence of feeding problem ($P < 0.001$). The study showed that children with abnormal weight for age were more likely to have feeding problems compared to those with a normal weight for age (100% vs. 74.1%, $P = 0.019$), respectively. **Conclusions**: The present study showed that a considerable percentage of children have feeding issues. The feeding issues were higher in younger age groups.

Keywords: Breastfeeding, children, nutrition, pediatric population

Introduction

Adequate feeding is essential for the infant's health, growth, and development. Poor feeding during infancy increases the risk of infection and death. Poor feeding also impairs growth and may have lifelong effects such as increasing the risk of poor development or obesity.[1,2]

Breast milk is an important source of energy and nutrients in children aged 6–23 months. It can provide half or more of a child's energy needs between the ages the 6 and 12 months, and one-third of energy needs between 12 and 23 months. Breast milk is also a critical source of energy and nutrients during illness and reduces mortality among children who are malnourished. Children and adolescents who were breastfed as babies are less likely to be overweight or obese.[3]

Around the age of 6 months, an infant's needs for energy and nutrients start to exceed what is provided by milk, and complementary foods are necessary to meet those needs. An infant of this age is also developmentally ready for other foods. If complementary foods are not introduced around the age of 6 months, or if they are given inappropriately, an infant's growth may falter.[4,5]

Guiding principles for appropriate complementary feeding are:

- Continue frequent, on-demand breastfeeding until 2 years of age or beyond
- Practice responsive feeding (for example, feed infants directly and assist older children. Feed slowly and patiently, encourage them to eat but do not force them, talk to the child, and maintain eye contact)
- Practice good hygiene and proper food handling
- Start at 6 months with small amounts of food and increase gradually as the child gets older

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- Gradually increase food consistency and variety
- Increase the number of times that the child is fed: 2–3 meals per day for infants aged 6–8 months. The children of 3–4 months are fed by fortified complementary food or vitamin–mineral supplements as needed
- Use fortified complementary foods or vitamin–mineral supplements as needed
- During illness, increase fluid intake including more breastfeeding, and offer soft, favorite foods (source IMCI, module 2+ infant and young child feed/WHO/April 2020).

The 2019 edition of SOWC explored the issue of children, food, and nutrition. Significant progress has been made over the past two decades, but one-third of children under the age of 5 years are considered to be malnourished – stunted, wasted, or overweight. Besides, two-third of children are at risk of malnutrition and hidden hunger because of the poor quality of their diets. The main The State of the World's Children challenge to this issue is a broken food system that unable to provide suitable and required diets.[6]

The World Health Organization (WHO) has reported that 2.7 million child deaths annually or 45% of all child deaths are contributed to undernutrition. Infant and young child feeding are considered to have a crucial role in improving child survival and promoting healthy growth and development. The first 2 years of a child is so critical for optimal nutrition to decrease morbidity and mortality, chronic diseases, and to encourage better development. Optimal breastfeeding saves annually 820,000 children under the age of 5 years.[7] Only 37.0% of the children younger than 6 months of age are exclusively breasted in low-income and middle-income countries. Therefore, it is so important to explore the feeding issues of children under 5 years of life due to its effect on overall growth and development.[8]

The aim of this study was to identify feeding problems among a sample of children under 5 years visiting a primary health-care center in Erbil city. Specific objectives included determination of the prevalence of feeding problems in children under 5 years of age, the association between feeding problems and related factors including sociodemographic characteristics of the child and his/her family, as well as finding out types of feeding problems in children under 5 years of age.

Materials and Methods

Study design and sampling

A cross-sectional study was conducted in Erbil city, the capital of the Kurdistan Region of Iraq. The mothers who visited the primary health centers (PHCs) for the medical checkup of their children under 5 years were consecutively screened for the eligibility criteria. The children who were required for the study were selected consecutively in a nonprobability way. The subjects were selected from the following PHCs: Zhyan, Shahedan, Tayrawa, and Shady in Erbil city between February 1, 2020, and June 30, 2020. The selected PHCs were from the different geographical distribution of the city: one from north, south, west, and east.

Inclusion and exclusion criteria

Inclusion criteria included all children aged under 5 years who attended the four chosen PHCs in Erbil city. Exclusion criteria included infants <6 months of age.

Data collection and measures

The data were collected from the mothers and recorded in a predesigned questionnaire been prepared by the researcher through proper utilization of relevant literature. The questionnaire was separated into three following parts:

Part I

The first part covered the following sociodemographic variables: age, gender, residence, mother work, and mother educational level, and socioeconomic status of the family estimated by education and occupation of the father with private car and own house.

Part II

The nutritional information was recorded in the second part of the study. The information was immunization history, breastfeeding, milk type, amount of milk, complimentary food, eating vitamins, using appetizer, and having any disease, consuming food based on the WHO recommendation. Other nutritional issues were bottle feeding, insufficient milk, improper intake of food, lack of active feeding, and not feeding well during illness.

Part III

The anthropometric measures and the presence of anemia were recorded in the third part of the questionnaire.

The weight and height were measured in kg and cm, respectively. The body mass index (BMI) of the children was evaluated based on the *Z*-scores. The *Z*-scores between −2 and +2 were considered normal weight, >+2 as overweight, and <−2 as underweight. The *Z*-scores were determined based on the growth charts of the WHO. The feeding problem was established as having one of the following criteria: eating complementary feed according to the WHO recommendations (amount: 1 cup = 250 ml and frequency: 3–4 main meals and 1–2 snacks), receiving quality or type of food according to the WHO recommendations, active feeding, or receiving serving by children.

The anemia was determined by either palmer or mucous membrane pallor or by done complete blood count.

Statistical analysis

The prevalence of feeding issues in children under 5 years was determined in number and percentage. The types of feeding problems were determined in number and percentage. The association of feeding problems with sociodemographic, BMI, and anemia was examined in Pearson's Chi-squared and Fisher's exact tests. $P < 0.05$ was considered a statistically significant difference. The statistical calculations were performed by the Statistical Package for the Social Sciences version 25 (SPSS, IBM Company, Chicago, IL 60606, USA).

Ethical considerations

The protocol of this study was approved by the Ethics Committee at the College of Medicine, Hawler Medical University, and an acceptance letter from the Directorate of Health of Erbil is obtained. The written consent form was taken from the mothers of all children before participation in the study.

Results

The children who were included in this study aged 6–9 months (11.3%), 9–12 months (4.9%), 12–24 months (32.0%), and ≥24 months (51.7%) and were males (55.2%) and females (44.8%). They were from urban (88.2%) and rural areas (11.8%). Most of the children had medium (62.6%) and low socioeconomic status (35.0%). The majority of the mothers of the children were homemakers (93.0%) and had no official educational certificate (66.0%) [Table 1].

The prevalence of complementary feeding was 49.5% in children and 88.5% received the adequate amount and frequency. More than half of the children had active feeding (54.2%) and 65.0 ate by themselves. In addition, 59.6% of the children receive adequate quality of food [Table 2].

The study did not show a significant difference in complementary feeding, amount and frequency, quality, active feeding, and own serving between male and female children [Table 3].

The study revealed that 58.0% and 18.0% of the children had multi-feeding and mono-feeding issues, respectively. Only 24.0% of the children had no feeding problems [Figure 1].

The study showed that children of younger age were more likely to have feeding issues. The prevalence of issues was 91.30% (6–9 months), 100 (9–12 months), 81.54% (12–24 months), and 66.67% (≥24 months; $P = 0.007$) [Table 4].

The study showed that children with anemia were more likely to have feeding issues (93.10%) compared to the children without anemia (62.93%; $P < 0.001$) [Table 5].

The study did not find a significant difference in feeding issues between children with normal and abnormal anthropometric measures [Table 6].

Table 1: General characteristics of the children and their parents

Characteristics	*n* (%)
Age (months)	
6-9	23 (11.3)
9-12	10 (4.9)
12-24	65 (32.0)
≥24	105 (51.7)
Gender	
Male	112 (55.2)
Female	91 (44.8)
Residence	
Urban	179 (88.2)
Rural	24 (11.8)
SES	
Low	71 (35.0)
Medium	127 (62.6)
High	5 (2.5)
Mother's work	
Homemaker	187 (93.0)
Employee	14 (7.0)
Mother's education	
Illiterate	65 (32.0)
Read and write	69 (34.0)
Primary	32 (15.8)
Secondary	29 (14.3)
College	8 (3.9)

SES: Socioeconomic status

Table 2: Frequency distribution of the World Health Organization criteria of feeding problems

WHO criteria	*n* (%)
Complementary feeding	
Yes	101 (49.8)
No	102 (50.2)
Adequate amount and frequency	
Yes	85 (88.5)
No	11 (11.5)
Adequate quality	
Yes	121 (59.6)
No	82 (40.4)
Active feeding	
Yes	110 (54.2)
No	93 (45.8)
Own serving	
Yes	132 (65.0)
No	71 (35.0)

WHO: World Health Organization

Discussion

This study showed a high prevalence of feeding problems in children under 5 years old. The feeding problems were significantly higher in younger children and those with anemia. The study showed that a considerable percentage of children do not adhere to the WHO criteria for feeding children.

A study conducted in 204 healthy children aged between 1 and 5 years of age revealed that 26.9% have feeding issues. The children with feeding issues were less likely to eat at their tables or the family table.[9] Tribble[10] conducted some interviews with women in the Sulaimani Governorate in Iraqi Kurdistan to understand the reasons behind initiate breastfeeding and formula use. She analyzed the data of the 2000 and 2011 Multiple Indicator Cluster Surveys as well. The study showed that being urban, wealthier, and more educated raised the probability of a mother to use infant formula. However, only increasing education and wealth were shown to associate with breastfeeding probability. There was a significant difference in the probability of using the formula in mothers among Iraqi governorates. For example, in 2000, Karbala (24.32%) had a lower probability

Table 3: Association of the World Health Organization criteria of feeding problems by gender

WHO criteria	Male, *n* (%)	Female, *n* (%)	*P*
Complementary feeding			
Yes	49 (43.8)	52 (57.1)	0.058
No	63 (56.2)	39 (42.9)	
Adequate amount and frequency			
Yes	51 (87.9)	34 (89.5)	0.816
No	7 (12.1)	4 (10.5)	
Adequate quality			
Yes	71 (63.4)	50 (54.9)	0.223
No	41 (36.6)	41 (45.1)	
Active feeding			
Yes	60 (53.6)	50 (54.9)	0.845
No	52 (46.4)	41 (45.1)	
Own serving			
Yes	68 (60.7)	64 (70.3)	0.153
No	44 (39.3)	27 (29.7)	

Pearson's Chi-squared test was performed for statistical analyses. WHO: World Health Organization

Table 4: Association of sociodemographic characteristics of the child and the mother with children's feeding problems

Characteristics	Feeding problems		*P*
	No, *n* (%)	Yes, *n* (%)	
Age (months)			
6-9	2 (8.70)	21 (91.30)	0.007
9-12	0 (0.00)	10 (100)	
12-24	12 (18.46)	53 (81.54)	
≥24	35 (33.33)	70 (66.67)	
Gender			
Male	25 (22.32)	87 (77.68)	0.502
Female	24 (26.37)	67 (73.63)	
Residence			
Urban	43 (24.02)	136 (75.98)	0.916
Rural	6 (25.00)	18 (75.00)	
SES			
Low	16 (22.54)	55 (77.46)	0.673
Medium	31 (24.41)	96 (75.59)	
High	2 (40.00)	3 (60.00)	
Mother work			
Homemaker	44 (23.53)	143 (76.47)	0.670
Employee	4 (28.57)	10 (71.43)	
Mother education			
Illiterate	17 (26.15)	48 (73.85)	0.165
Read and write	15 (21.74)	54 (78.26)	
Primary	12 (37.50)	20 (62.50)	
Secondary	3 (10.34)	26 (89.66)	
College	2 (25.00)	6 (75.00)	

Pearson's Chi-squared test was performed for statistical analyses. SES: Socioeconomic status

of formula use and higher percentage points of breastfeeding (6.78%) compared to Sulaimani. The probability of breastfeeding and formula use has been decreased over the ensuing decade,

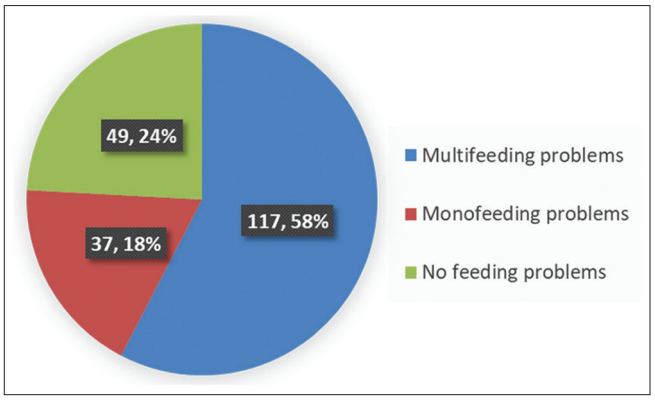

Figure 1: Prevalence of feeding problems

respectively. The mothers reported that they breastfeed their children during stressful times and uses formula when working outside the home. Anyhow, the situation of breastfeeding and formula use must be examined within each governorate.[10]

A group of physicians developed a questionnaire and distributed randomly among doctors in the Middle East and North Africa. They aimed to assess knowledge and practices about complementary feeding, the impact of iron deficiency, and its prevention. The study showed that 39.0% of physicians do not adhere to the European Society for Pediatric Gastroenterology, Hepatology, and Nutrition guidelines about complementary feedings.[11]

Anyhow, the situation of breastfeeding and formula use must be examined within each governorate. A research study conducted in this region showed that the mothers who breastfed exclusively have higher levels of postnatal self-efficacy compared to the mothers who use formula.[12] A cross-sectional study conducted in Saudi Arabia showed that low-income and less-educated women are more likely to breastfeed their infants.[13] The lower education could be an associated factor to not meet the WHO criteria in this study, because majority of the mothers were not officially educated in this investigation.

The present study showed that a considerable percentage of children are formula users. The United Nations Children's Fund has recommended breastfeeding up to 2 years of age and beyond to increase survival. The breastfeeding must be started within 1 h of birth and exclusively for the first 6 months of life and continue to be breastfed up to 2 years of age and beyond. The breastfeeding should be combined with safe, age-suitable feeding of solid, semi-solid, and soft foods.[14]

The family system surrounding child life has a crucial role in establishing and promoting behaviors that persist throughout the child's life. The early-life experiences with different tastes and flavors have an important role in promoting healthy eating in future life.[15] Parental food habits and feeding are the important dominant factors of a child's eating behavior and food choices.[15]

A study conducted in Saud Arabia showed that 95.6% of mothers start breastfeeding and 59.8% initiate breastfeeding

Table 5: Association of general characteristics of the children's feeding and health status by feeding problems

Characteristics	Feeding problems		*P*
	No, *n* (%)	Yes, *n* (%)	
Immunization			
Yes	44 (23.91)	140 (76.09)	0.972
No	4 (23.53)	13 (76.47)	
Breastfeed			
Yes	14 (14.74)	81 (85.26)	0.473
No	0 (0.00)	3 (100.00)	
Milk type			
Breastfeeding	3 (10.34)	26 (89.66)	0.710
Formula	8 (17.02)	39 (82.98)	
Mix	3 (16.67)	15 (83.33)	
Vitamin or appetizer			
Yes	9 (26.47)	25 (73.53)	0.698
No	39 (23.35)	128 (76.65)	
Favorite food			
Yes	2 (50.00)	2 (50.00)	0.207
No	45 (22.96)	151 (77.04)	
Disease			
Yes	8 (32.00)	17 (68.00)	0.327
No	41 (23.03)	137 (76.97)	
Anemia			
Yes	6 (6.90)	81 (93.10)	<0.001
No	43 (37.07)	73 (62.93)	

Pearson's Chi-squared test was performed for statistical analyses. The bold number shows the significant difference

Table 6: Association of anthropometric measures of the children by feeding problem

Anthropometric measures	Feeding problem (*n*=203)		*P*
	Yes, *n* (%)	No, *n* (%)	
Height for age			
Abnormal	15 (83.33)	3 (16.67)	0.438
Normal	139 (75.14)	46 (24.86)	
Weight for age			
Abnormal	14 (93.33)	1 (6.67)	0.100
Normal	140 (74.47)	48 (25.53)	
Weight for height			
Abnormal	25 (89.29)	3 (10.71)	0.074
Normal	129 (73.71)	46 (26.29)	
BMI for age			
Abnormal	21 (80.77)	5 (19.23)	0.531
Normal	133 (75.14)	44 (24.86)	

BMI: Body mass index

within the 1st h. Exclusive breastfeeding among infants aged 0–6 months is 44.3%. The median duration of breastfeeding and exclusive breastfeeding is 12 and 3 months, respectively. In addition, only 21.7% received the first complementary feeding at 6 months of age.[16]

It seems that feeding issues in children are associated with parents' and physicians' knowledge and practice rather than other sociodemographic aspects. Therefore, the educational services and better training of the physicians are suitable strategies to reduce the feeding issues of preschool children.

Conclusions

The present study showed that a considerable percentage of children have feeding issues. The feeding issues were higher in younger age groups.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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