



Research Paper

Knowledge, attitudes, and practices of weaning among Iraqi mothers of children under two years old

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ABSTRACT

Introduction: Weaning is a critical process that introduces solid foods alongside breastfeeding and plays an important role in a child's nutrition, immunity, and growth. Despite global recommendations, cultural traditions and misconceptions often influence maternal feeding practices.

Aim: This study aimed to assess the knowledge, attitudes, and practices of Iraqi mothers regarding weaning among children under two years of age.

Material and methods: A cross-sectional study was conducted among 300 mothers attending primary health care centers in Al-Hashimiyah District, Babil Governorate, Iraq, between May and October 2024. Data were collected using a structured questionnaire based on the standard knowledge, attitudes, and practices model and analyzed using SPSS version 25.

Results and discussion: Maternal knowledge about weaning was relatively high (mean = 7.45 ± 1.30). However, attitude (0.87 ± 1.04) and practice (2.95 ± 0.97) scores were lower. More than half of the mothers (54.67%) introduced complementary foods before four months of age. The most common initial weaning foods were rice water (54.67%) and sweetened water (19.67%). Family members and friends were the primary sources of information (65%). Knowledge and practices were significantly associated with higher education, employment, and better economic status ($p < 0.001$).

Conclusions: A gap exists between maternal knowledge and actual weaning practices. Cultural traditions and limited access to reliable information may contribute to this discrepancy. Strengthening maternal education and community-based interventions may improve appropriate weaning practices.

1. INTRODUCTION

Weaning refers to the gradual introduction of complementary foods while breastfeeding continues. This phase balances nutritional adequacy, cultural customs, and the infant's readiness for solid food.^{1,2}

The World Health Organization (WHO) recommends exclusive breastfeeding for the first six months of life. After that, nutritionally adequate and safe complementary foods should be introduced while breastfeeding continues for up to two years.^{3,4} This guidance stems from evidence that, by six months, breast milk or infant formula alone can no longer meet the increasing nutritional demands of rapid growth and development, particularly in terms of iron.^{5,6}

Delayed or inappropriate complementary feeding practices are linked to iron deficiency anemia and developmental delays in young children.⁷ Cultural traditions often shape weaning behaviors, frequently emphasizing food affordability over nutritional value.⁸

Practices like early tea consumption, common in parts of the Middle East, have been shown to impair iron absorption.⁹ In Iraq, traditional diets include iron-rich legumes and meats; however, post-conflict socioeconomic instability, maternal education disparities, and fragmented healthcare systems hinder adherence to global feeding guidelines. Childhood malnutrition remains a concern, with 12.6% of children under five exhibiting stunted growth.^{10,11} Despite these challenges, little research has explored how Iraqi mothers approach complementary feeding.

2. AIM

This study aims to examine mothers' knowledge, attitudes, and practices (KAP) regarding feeding children under two years of age.

3. MATERIAL AND METHODS

A cross-sectional study was conducted among 300 mothers attending primary health care centers (PHCCs) in Al-Hashimiyah District, Babil Governorate, Iraq. Data were collected over six months from 1 May 2024 to 31 October 2024.

Four PHCCs were selected using simple random sampling from the total of 29 centers in the district (approximately 14%). The study included mothers of children aged 4–23 months who attended the selected health centers during the study period and agreed to participate. Infants younger than four months were excluded because complementary feeding is not recommended before this age. Mothers of children with chronic illnesses or a history of prematurity were also excluded.

The minimum sample size was calculated using the formula for cross-sectional studies: $n = Z^2P(1 - P) / d^2$.¹² Using a prevalence (P) of 26%,¹³ a confidence level of 95% ($Z = 1.96$), and a margin of error of 5%, the calculated sample size was

296 participants. To compensate for possible non-response, 300 mothers were included.

Data were collected using a questionnaire. It was adapted from standard Knowledge, Attitude, and Practice (KAP) models used in public health research to assess maternal behaviors in infant feeding.¹³ Minor modifications were made to adapt the questions to the local context. The first section included information on the child's age (in months) and birth order. The second section collected maternal characteristics, including age, parity, and education level. The third section assessed maternal knowledge regarding weaning, including the definition of weaning, the appropriate age to introduce complementary foods, and suitable first foods for weaning. The fourth section evaluated weaning practices, including handwashing before feeding and the use of separate dishes for the child.

Knowledge and practice items were scored as 1 for correct responses and 0 for incorrect responses. The maximum scores were 11 for knowledge and 5 for practices. Attitude items were measured using three response options (agree, do not know, disagree), with a score of 1 assigned for the appropriate response and 0 for the other responses, resulting in a total possible score of four.

Complementary feeding timing was categorized into three groups:

- Early weaning: introduction of complementary foods before six months of age;
- Ideal weaning: introduction at six months of age;
- Late weaning: introduction after six months of age.

Statistical analysis was performed using the Statistical Package for the Social Sciences (SPSS), version 25. Categorical variables were summarized using frequencies and percentages, whereas continuous variables were presented as means and standard deviations.

The normality of continuous variables was assessed using the Shapiro-Wilk test. As knowledge, attitude, and practice scores approximated normal distribution, Student's t-test and one-way analysis of variance (ANOVA) were used for comparisons between groups. Post-hoc comparisons were conducted using the Least Significant Difference (LSD) test when appropriate. A p -value ≤ 0.05 was considered statistically significant.

Ethical approval for this study was obtained from the Ethical Committee of the Faculty of Medicine (Reference# MEC-19). Before starting the interviews, verbal consent was obtained from the mothers after they were informed about the study's objectives, the confidentiality of their responses, and their right to withdraw at any time.

4. RESULTS

The mothers' mean age was 27.13 years, with a standard deviation of 6.27 years. Among them, 44.7% were younger than 25 years, and 38.3% had attained higher education. The majority of the participants (68%) were unemployed. Other sociodemographic characteristics are presented in Table 1.

Table 1. Sociodemographic characteristics of participants and their children.

Variable	Frequency (No.)	Percentage (%)	Mean \pm SD
Mother's age (years)			
< 25	134	44.7	27.13 \pm 6.27
25–34	125	41.7	
35–44	41	13.7	
Mother's education			
Illiterate	42	14.0	
Primary	96	32.0	
Secondary	46	15.3	
High education	116	38.3	
Employment status			
Employee	96	32.0	
Nonemployee	204	68.0	
Number of children			
1	98	32.7	2.48 \pm 1.47
2	77	25.7	
3	59	19.7	
4	29	9.7	
\geq 5	37	12.3	
Birth order			
First	98	32.7	
Second	77	25.7	
Third	59	19.7	
Fourth and above	66	22.0	
Child age (months)			
4–6	26	8.7	
7–12	133	44.3	
13–18	85	28.3	
19–23	56	18.7	
Family type			
Nuclear	168	56	
Extended	132	44	
Number of family members			
3	31	10.3	6.84 \pm 3.13
4	46	15.3	
5	42	14.0	
6	45	15.0	
7	38	12.7	
8	31	10.3	
9	11	3.7	
\geq 10	56	18.7	
Economic status			
Sufficient	57	19.0	
Insufficient	112	37.3	
Can save	131	43.7	
First weaning diet			
Water and sugar	59	19.7	
Herbal mixture	21	7.0	
Rice water	164	54.7	
Bread and tea	1	0.3	
Biscuit and tea	38	12.7	
Family food*	8	2.7	
Date molasses	9	3.0	
Weaning time			
Early weaning	164	54.7	
Ideal weaning	125	41.7	
Late weaning	11	3.6	

* Family food: regular household meals such as rice, bread, vegetables, or meat given to the infant.

The mean knowledge score among mothers was 7.45 ± 1.30 , the mean attitude score was 0.87 ± 1.04 , and the mean practice score was 2.95 ± 0.97 , as shown in Table 2.

As shown in Table 3, a statistically significant difference in knowledge scores was observed according to maternal age ($p < 0.001$), employment status ($p < 0.001$), educational

level ($p < 0.001$), birth order ($p = 0.028$), family type ($p = 0.001$), number of family members ($p < 0.001$), and economic status ($p < 0.001$).

Practice scores showed statistically significant differences according to maternal age ($p = 0.007$), employment status ($p < 0.001$), maternal education ($p < 0.001$), family

Table 2. Descriptive statistics of knowledge, attitude, and practice (KAP) scores.

Scale (total score)	Minimum value	Maximum value	Mean \pm SD
Knowledge score (11)	4	11	7.45 ± 1.30
Attitude score (4)	0	4	0.87 ± 1.04
Practice score (5)	1	5	2.95 ± 0.97

Table 3. Relationships between total mothers' knowledge scores and the sociodemographic characteristics of mothers and their children.

Variable	Mean	SD	P Value
Mother's age (years)			
< 25	7.21	1.21	< 0.001
25–34	7.77*	1.34	
35–44	7.27	1.29	
Employment status			
Employee	8.06	1.33	< 0.001
Nonemployee	7.16	1.18	
Mother's education			
Illiterate	6.95	0.99	< 0.001
Primary	6.92	1.11	
Secondary	7.41	1.31	
High education	8.09*	1.27	
Number of children			
1	7.36	1.33	0.053
2	7.83	1.31	
3	7.31	1.34	
4	7.28	1.19	
5 and above	7.43	1.07	
Birth order			
First	7.30	1.33	0.028
Second	7.83*	1.31	
Third	7.31	1.34	
Fourth and above	7.36	1.12	
Child age (months)			
4–6	7.65	1.23	0.402
7–12	7.33	1.40	
13–18	7.60	1.35	
19–23	7.41	0.95	
Family type			
Nuclear	7.66	1.34	0.001
Extended	7.18	1.19	
Number of family members			
3	7.71	1.27	< 0.001
4	8.09*	1.46	
5	7.52	1.49	
6	7.36	1.11	
7	7.76	1.13	
8	7.03	1.05	
9	6.91	1.22	
10 and above	6.93	1.14	
Economic status			
Sufficient	7.16	1.08	< 0.001
Insufficient	7.04	1.31	
Can save	7.88*	1.35	

* Significance according to post hoc LSD analyses.

type ($p = 0.001$), number of family members ($p = 0.006$), and economic status ($p = 0.001$). No statistically significant associations were observed between practice scores and number of children ($p = 0.976$) or child age ($p = 0.275$), Table 4.

Attitude scores were significantly associated with employment status ($p < 0.001$), maternal education ($p < 0.001$), family type ($p = 0.021$), and economic status ($p < 0.001$). No statistically significant associations were observed between attitude scores and maternal age ($p = 0.105$), number of children ($p = 0.407$), birth order ($p = 0.262$), child age ($p = 0.654$), or number of family members ($p = 0.141$), Table 5.

5. DISCUSSION

Assessing mothers' knowledge and practices regarding infant feeding is essential for improving weaning behaviors and promoting child health.¹⁴

Regarding the first weaning diet, more than half of the mothers in the present study (54.67%) reported using rice water as the initial complementary food. From the mothers' perspective, the first weaning food should be sufficiently thin to allow the infant to drink it easily from a bottle. Similar findings were reported in a study conducted in Anbar,

Table 4. Relationships between total mothers' practice scores and the sociodemographic characteristics of mothers and their children.

Variable	Mean	SD	P Value
Mother's age (years)			
< 25	2.76	0.88	0.007
25–34	3.11*	1.05	
35–44	3.10	0.92	
Employment status			
Employee	3.32	1.04	< 0.001
Nonemployee	2.77	0.89	
Mother's education			
Illiterate	2.76	0.73	< 0.001
Primary	2.58	0.85	
Secondary	2.96	0.89	
High education	3.32*	1.04	
Number of children			
1	3.00	0.99	0.976
2	2.95	1.02	
3	2.92	0.82	
4	2.93	1.22	
5 and above	2.89	0.84	
Child age (months)			
4–6	3.31	0.97	0.275
7–12	2.91	0.96	
13–18	2.93	1.03	
19–23	2.91	0.88	
Family type			
Nuclear	3.12	1.02	0.001
Extended	2.73	0.86	
Number of family members			
3	3.23*	1.18	0.006
4	3.17	1.10	
5	3.12	0.86	
6	3.00	0.90	
7	2.84	0.72	
8	3.06	1.09	
9	2.64	0.92	
10 and above	2.52	0.83	
Economic status			
Sufficient	2.89	0.92	0.001
Insufficient	2.58	0.75	
Can save	3.16*	1.04	

* Significance according to post hoc LSD analyses.

Table 5. Relationships between total mothers' attitude scores and the sociodemographic characteristics of mothers and their children.

Variable	Mean	SD	P Value
Mother's age (years)			
< 25	1.32	1.26	0.105
25–34	1.65	1.28	
35–44	1.54	1.31	
Employment status			
Employee	2.03	1.43	< 0.001
Non-employee	1.23	1.11	
Mother's education			
Illiterate	1.48	1.19	< 0.001
Primary	1.02	1.13	
Secondary	1.41	1.17	
High education	1.91*	1.34	
Number of children			
1	1.61	1.44	0.407
2	1.38	1.14	
3	1.64	1.21	
4	1.28	1.28	
5 and above	1.30	1.20	
Birth order			
First	1.61	1.44	0.262
Second	1.38	1.14	
Third	1.64	1.21	
Fourth and above	1.29	1.22	
Child age (months)			
4–6	1.54	1.27	0.654
7–12	1.38	1.20	
13–18	1.55	1.28	
19–23	1.61	1.46	
Family type			
Nuclear	1.64	1.22	0.021
Extended	1.30	1.34	
Number of family members			
3	1.65	1.36	0.141
4	1.67	1.19	
5	1.88	1.29	
6	1.49	1.32	
7	1.29	1.35	
8	1.42	1.23	
9	0.91	0.94	
10 and above	1.23	1.24	
Economic status			
Sufficient	1.34	1.23	< 0.001
Insufficient	0.93	1.16	
Can save	1.86*	1.27	

* Significance according to post hoc LSD analyses.

Iraq, where rice water was also identified as the most common first complementary food, consumed by 61.9% of infants aged 5–6 months once per day.¹⁵ This similarity suggests a cultural preference for thin and easily digestible foods during the early stages of complementary feeding.

Although mothers in this study demonstrated relatively good knowledge regarding weaning practices, their actual practices did not always align with recommended guidelines. Similar patterns have been reported in other Iraqi studies, where adequate maternal knowledge did not necessarily

translate into appropriate feeding practices.^{15,16} Another Egyptian study found that 42.8% of mothers had a moderate knowledge level about weaning, and 64.3% held a positive attitude toward weaning practices.¹⁷

Similar discrepancies between maternal knowledge and actual infant feeding practices have been reported in other settings. A cross-sectional survey conducted in Poland among parents of infants aged 4–12 months found that most mothers considered their knowledge of complementary feeding to be sufficient and were generally aware of recommended

feeding guidelines. However, despite this awareness, some mothers still introduced foods such as fruit juices, cow's milk, or plant-based beverages earlier than recommended.¹⁸ This finding indicates that awareness of infant feeding recommendations does not always translate into appropriate feeding behavior. Such inconsistencies may be influenced by parental beliefs, cultural practices, and practical feeding challenges.

Maternal employment was significantly associated with higher knowledge scores. This finding may be explained by increased exposure to health information and greater access to educational resources among working mothers. Comparable results have been reported in studies conducted in Egypt.¹⁹ However, a study from Pakistan²⁰ reported no significant association between maternal employment and knowledge of weaning practices. This difference may be explained by greater exposure to information in professional environments and better access to educational resources.

The mean weaning knowledge score was significantly higher among highly educated mothers compared to those with lower educational levels ($p < 0.001$). Additionally, a study conducted in Pakistan found a significant association between mothers' knowledge and their educational status ($p = 0.01$).²⁰

A statistically significant difference in mean weaning knowledge was observed based on the children's birth order ($p = 0.028$); the second-born children had the highest mean knowledge score of 7.83, which may be attributed to increased maternal experience as the family grows. This result is consistent with an Egyptian study that reported a significant association between knowledge scores and birth order.²¹

There was a statistically significant difference in mean weaning knowledge based on economic status ($p < 0.001$). Mothers who reported being able to save had the highest mean knowledge score of 7.88. This suggests that financial stability may enable access to resources and information that enhance understanding of appropriate weaning practices. This finding aligns with a study conducted in Egypt, which found a significant association between family income and knowledge scores.²¹

Better practices were seen among mothers aged 25–34, those with higher education, employed, and financially stable ($p < 0.001$). These groups were more likely to understand and follow weaning guidelines. While a Nigerian study confirmed strong links between weaning practices, occupation, and education,²² an Indian study found no ties between family type or income and weaning.²³ This highlights the complex role of socioeconomic and cultural factors in shaping infant feeding behaviors.

Mothers who were employed, highly educated, living in nuclear families, and had high economic status showed a significantly higher mean attitude ($p < 0.001, p < 0.001, p = 0.021, p < 0.001$). This can be explained by the fact that mothers with higher education tend to be more knowledgeable about weaning practices that positively influence their attitudes. Furthermore, for those who live in nuclear family structures, mothers' behaviors are more independent, guided by their

own choices rather than influenced by the grandmothers' advice. Other studies have demonstrated that maternal education, employment status, and family structure significantly shape mothers' attitudes towards weaning practices. Mothers with higher education levels and employment are more likely to follow recommended guidelines. In addition, family structure affects maternal employment, which influences attitudes toward child-rearing practices.^{24,25}

The findings of this study have important clinical and public health implications. The high prevalence of early introduction of complementary foods indicates a need for improved counseling during antenatal and postnatal care visits. Health professionals working in primary health care centers should provide clear guidance to mothers regarding the recommended timing and nutritional quality of complementary feeding. Community-based educational interventions, particularly targeting mothers with lower educational and socioeconomic status, may help reduce inappropriate feeding practices and contribute to improved child growth and the prevention of micronutrient deficiencies.

This study has several limitations. First, its cross-sectional design does not allow causal inference. Second, data were based on mothers' self-reports and may therefore be subject to recall or social desirability bias. Third, the study was conducted in a single district in Babil Governorate, which may limit the generalizability of the findings to other regions of Iraq. Despite these limitations, it is the first study in a rural area of Babil Governorate to examine maternal beliefs and practices regarding weaning.

6. CONCLUSION

- (1) Most mothers initiate weaning earlier than recommended.
- (2) Maternal knowledge was relatively high, whereas attitudes and practices were suboptimal.
- (3) Socioeconomic status and education significantly influence practices.
- (4) Targeted education is needed to bridge the knowledge-practice gap.
- (5) These findings can guide the Ministry of Health and WHO-supported maternal education programs to align community practices with international complementary feeding standards.

Ethics approval

None declared.

Conflict of interest

None declared.

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Author contributions

Study design: SAA

Data collection: HHK

Statistical analysis: SAA, HHK

Data interpretation: SAA, HHK

Manuscript preparation: SAA, HHK

Literature search: SAA

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