

ORIGINAL RESEARCH

Evaluating knowledge, attitudes, and practices regarding complementary feeding (weaning) among mothers of six-month-old children

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ABSTRACT

This study evaluated the knowledge, attitude, and practice (KAP) regarding complementary feeding (weaning) among mothers with six-month-old children. A quantitative, cross-sectional, descriptive-analytical approach was employed, emphasizing the gathering, analysis, and interpretation of relevant data to portray the phenomenon accurately. The evaluation was divided into three KAP domains. A total of 200 respondents were included in the analysis. It was discovered that mothers demonstrated concerns and a lack of knowledge about enriching complementary food with iodized salt (Knowledge: $M = 2.63$ out of 5, $SD = 1.454$, Score = 52.6%). Attitude-wise, mothers reported initiating complementary feeding due to a perceived insufficiency of breast milk (Attitude: $M = 1.60$ out of 5, $SD = 0.802$, Score = 32.0%). However, mothers understood complementary feeding practices well (Practice: $M = 49.68$ out of 60, $SD = 8.8$, Score = 82.8%). Despite some awareness about sensitive health aspects such as food allergies, mothers lacked crucial knowledge regarding the enrichment of complementary food with iodized salt and iron-rich food. Mothers' decisions to initiate complementary feeding were largely driven by concerns about the sufficiency of their milk production. The study underlines the need for prenatal guidance and education for parents on desirable practices concerning complementary food.

Key Words: Weaning, Complementary feeding, Maternal knowledge, Attitude, Practice of weaning

1. INTRODUCTION

The World Health Organization (WHO) lays the foundation for understanding complementary feeding (CF), a critical phase in an infant's growth and development. The process of CF starts when exclusive breastfeeding is no longer sufficient to meet an infant's nutritional needs.^[1] This juncture usually comes around the age of six months, marking a transition period that necessitates the introduction of other foods in addition to breast milk. The need for these additional foods arises because the energy and nutrient requirements of the

rapidly growing infant become too high to be met by breast milk alone.

The WHO emphasizes that these foods must be appropriate, safe, and nutritious. The concept of 'appropriateness' underlines the need for foods to be consistent with the infant's developmental stage. For instance, semi-solid foods are introduced initially, transitioning gradually to more complex textures and a wider range of flavors as the infant grows and their digestive system matures.

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Safety is another critical aspect of CF, as highlighted by the WHO. The foods must be prepared and stored hygienically to prevent contamination that can cause diseases such as diarrhea, contributing to malnutrition and infant mortality. The utensils used for feeding should also be clean, and mothers should ensure their hands are clean during the feeding process.

The 'adequately nutritious' component underlines the necessity of these foods to be nutritionally rich, covering all the vital macro and micronutrients, including proteins, fats, carbohydrates, vitamins, and minerals.^[1] These foods must provide a substantial proportion of the energy-rich nutrients needed for the infant's rapid growth and development.

Various studies also emphasize the significance of correct CF practices; there is a substantial influence of appropriate CF on the reduction of malnutrition and the improvement of child survival rates.^[2-5] Malnutrition at this stage can have long-term implications on the child's physical and cognitive development, making CF a key strategy in combating global malnutrition.

Moreover, the correct CF practices can foster good dietary habits from a young age, promoting a healthy relationship with food and potentially mitigating the risk of obesity and related chronic diseases later in life.^[6] These findings underscore the importance of promoting knowledge and adherence to appropriate CF practices among caregivers. This ensures that infants receive the necessary nutrients for optimal growth and development during this critical period, setting a strong foundation for their future health.

Complementary feeding (CF) practices vary globally, influenced significantly by cultural norms, traditions, and socioeconomic circumstances. These variations can be observed in factors such as the timing of introducing complementary foods, types and quality of foods introduced, feeding styles, and meal frequencies.^[7] Cultural norms and beliefs greatly affect CF practices as well. For instance, certain societies introduce specific foods as the first complementary meal based on traditional beliefs.^[8] Sometimes, these cultural practices may not align with nutritional guidelines, leading to suboptimal nutrient intake.

Socioeconomic status also plays a significant role in CF practices. Families with higher income levels generally have greater access to diverse and high-quality foods, leading to more nutritious complementary feeding.^[9] Conversely, families from lower-income brackets may face food insecurity and limited access to nutrient-rich foods, leading to suboptimal CF.^[10] This can result in the introduction of cheaper, less nutritious options and inadequate meal frequency.

1.1 Knowledge, attitudes, and practices towards complementary feeding

Research has examined the factors influencing maternal KAP toward CF, including education, cultural beliefs, socioeconomic status, and healthcare support.^[11,12] Maternal knowledge about CF is fundamental to implementing appropriate practices. Abeshu et al. (2016) highlight that inadequate knowledge of CF can lead to delayed introduction, improper preparation, and use of nutritionally insufficient foods, contributing to malnutrition.^[13] Studies show varied levels of CF knowledge among mothers. For instance, a study in Ethiopia found low knowledge levels, while a study in Abu Dhabi reported better understanding, but only 32% of children had an acceptable diet.^[14,15] These disparities highlight the need for context-specific interventions and further research. Maternal attitudes greatly influence CF practices as well. Studies show that traditional beliefs and misconceptions can lead to inadequate CF.^[16,17] Understanding and addressing these attitudes is essential for improving practices.

1.2 Evaluating maternal KAP

Multiple evaluation tools and methodologies are used to assess maternal KAP. Interviews, surveys, and focus group discussions are commonly used.^[18] Standardized questionnaires such as the WHO Infant and young child feeding (IYCF) questionnaire have also been recommended.^[1] Several interventions have been implemented to improve KAP towards CF, mainly through educational programs and counseling sessions.^[19,20] Positive impacts have been reported in improved CF practices and child nutritional status.

1.3 Research aims

The significance of this research lies in its potential to advance our understanding of the influence of maternal knowledge, attitudes, and practices on the health of six-month-old children during the critical period of weaning or complementary feeding. By systematically evaluating these elements, the study can provide valuable insights that could guide healthcare professionals, policymakers, and communities in improving child nutrition and health outcomes. To systematically approach these questions, the study sets forth the following objectives: (1) To assess mothers' knowledge about the importance of introducing complimentary food in addition to the most suitable age for weaning; (2) to assess how mothers transition to weaning; (3) to assess mothers' attitudes toward nutritious food the babies need; and (4) to compare mothers' levels of knowledge, attitude, and practice with their socio-demographic factors.

2. METHOD

2.1 Study design and participant characteristics

Given the research's objectives and the type of data required to evaluate the knowledge, attitudes, and practices of mothers with six-month-old children concerning complementary feeding (weaning), the study design adopted was a descriptive-analytical approach. This methodology examines the phenomenon in its natural context as it presents itself in reality. The approach aids in providing an accurate depiction of the subject matter by illuminating its characteristics. This is achieved through systematic data collection and rigorous analysis and interpretation of the gathered information.

Participant selection criteria

The participants for this research were carefully selected following specific criteria. Inclusion criteria were mothers with six-month-old children attending two specific Ministry of Health (MOH) hospitals in Hail Region, where maternity wards were present, and the children had been born there. Mothers whose children were born in other hospitals or cities were not considered for the study, serving as the exclusion criteria. Based on this approach, 400 mothers of six-month-old children were eligible to participate. The participants were chosen using a random sampling method, ensuring the research's objectivity and generalizability.

2.2 Instrumentation

This research study employed a self-administered, structured, close-ended questionnaire as its primary data collection instrument that was subsequently developed by the researchers based off of past empirical findings and the results of a pilot study. The tool aimed to evaluate the knowledge, attitudes, and practices of mothers of children under three regarding complementary feeding. The investigators developed the questionnaire, drawing upon established questionnaires from prior studies and extensive literature references.

The questionnaire was divided into four sections, each assessing different aspects: personal and socio-demographic characteristics, knowledge, attitudes, and practices related to complementary feeding. A five-point Likert scale (ranging from 'Strongly Agree' to 'Strongly Disagree') was utilized for responses.

For positive statements, 'Strongly Agree' was scored as 5 points, 'Agree' as 4, 'Neutral' as 3, 'Disagree' as 2, and 'Strongly Disagree' as 1. For negative statements, the scoring was reversed. The knowledge section consisted of seven positive questions, with a total score range of 7-35. Scores were classified into poor ($\leq 50\%$), average (51%-69%), and good ($\geq 70\%$). The attitude section contained seven questions, six positive and one negative, with a score range of 7-35,

using the same classification as the knowledge section. The practice section included 12 positive questions, with a total score range of 12-60. The scoring categorization was similar to the prior sections.

2.3 Study procedures

The research study received approval from the Regional Bioethics Committee of the General Directorate of Health Affairs in the Hail region. The research team established contact with two hospitals under the jurisdiction of the Ministry of Health, both of which agreed to participate in the study, leading to a full response rate of 100%. The completion and return of the self-administered questionnaires implied participation consent. The confidentiality and anonymity of the participants' information, along with the voluntary nature of their participation, were clearly emphasized in an accompanying cover letter. Data collection occurred during the COVID-19 pandemic, from September 12, 2020, to November 29, 2020. This period saw the successful collection and completion of 200 responses.

2.3.1 Statistical analysis

The study utilized the Statistical Package for the Social Sciences (SPSS v.26) for data entry and subsequent analysis. Various statistical methods were employed to fulfill the research objectives. Frequencies and percentages were calculated to provide descriptive statistics for the personal data of the study sample. The mean was determined to evaluate the central tendency of responses to individual statements and the key dimensions of the study. The standard deviation was used to assess the dispersion or variation in the data from the mean or expected value. A value close to zero indicated that responses were concentrated around the mean, thus signifying lower dispersion. To estimate the reliability of the questionnaire, Cronbach's alpha was calculated. This offered a measure of internal consistency or how closely related a set of items were as a group. The Pearson Correlation Coefficient was used to assess the sincerity of internal consistency. Finally, Chi-square tests were carried out to test the study's hypotheses.

2.4 Ethics approval and consent to participate

This study was reviewed and approved by the Regional Bioethics Committee of the General Directorate of Health Affairs, Hail region IRB Log Number: 2020-12; Sufficient information was provided to the participants, and a clear objective will guide them in making an informed decision to participate in the study. The participants were formally assured of identity confidentiality.

2.4.1 Validity and reliability

The questionnaire used in the study was rigorously evaluated for validity and reliability. A panel comprising experts, academics, and specialists was tasked with reviewing each question to ensure face validity. They were asked to provide their assessments and recommend any necessary changes to improve the clarity and relevance of the questions. Adjustments were made based on their suggestions. Internal consistency was examined by calculating the correlation coefficients between each question’s score and the overall score of the corresponding section. Except for item 3 in the knowledge domain, the results indicated a high degree of internal consistency, highlighting the robustness of the questionnaire.

The correlation coefficients for the rest of the items ranged from 0.894 to 0.403, all significant at the 1% level. This validated the questionnaire’s suitability for this study (see Table 1).

Reliability, defined as the degree to which an instrument consistently measures the same way each time it is used under the same conditions with the same subjects, was determined using the Cronbach’s Alpha method. This method was applied to evaluate the reliability of the data collected through the questionnaire. The calculated Cronbach’s alpha values were .794, .814, and .884 for the knowledge, attitude, and practice sections, respectively (see Table 2).

Table 1. Internal consistency of each paragraph of the questionnaire

Knowledge			Attitude			Practice		
No.	r	No.	No.	r	No.	No.	r	No.
1	.448**	0	1	.517**	0	1	.582**	0
2	.403**	0	2	.730**	0	2	.637**	0
3	.494**	0	3	0.075	0.289	3	.741**	0
4	.754**	0	4	.644**	0	4	.770**	0
5	.883**	0	5	.879**	0	5	.763**	0
6	.846**	0	6	.894**	0	6	.806**	0
7	.777**	0	7	.868**	0	7	.825**	0
						8	.793**	0
						9	.482**	0
						10	.731**	0
						11	.460**	0
						12	.404**	0

**Significant at the .01 level

Table 2. The value of Cronbach’s Alpha for every domain

Domains	No. of Questions	Cronbach's Alpha
Knowledge	7	0.794
Attitude	7	0.814
Practice	12	0.884

3. RESULTS

3.1 Demographic characteristics of the participants

Regarding marital status, nearly all mothers (98.5%) were married, with a small proportion (1.5%) being divorced. There were no widows in the sample. Most mothers (70.5%) were between 26-35 years old. The rest were fairly evenly split between 18-25 years (9%) and 36-50 years (20.5%). The educational levels of both mothers and their husbands were varied. 42% of mothers had a school education or a bachelor’s degree, while 4.5% were unschooled, and 1% had postgraduate degrees. As for the husbands, 56% had a bachelor’s degree, and only 2% were unschooled. Most mothers

(83%) were housewives. Government and private firm employees accounted for 12% and 5% of mothers, respectively. Regarding family size, most mothers (59.5%) had given birth to 4-5 children, while 26.5% had 1-3 children, and 14% had 6 or more. Finally, regarding income, most families (90%) had a monthly income of more than 3,000 SR, while only 0.5% had an income of less than 1,000 SR. A summary of the participant’s demographic characteristics can be found below in Table 3.

3.2 Knowledge of complimentary feeding

Participant knowledge surrounding complementary feeding shows varied results. The highest-scoring knowledge area was the initiation of complementary feeding at six months and above, with an average score of 4.08 and a corresponding score of 81.5%. Next was the understanding of the frequency of complementary feeding from 1 to 3 times a day. This knowledge area scored an average of 3.89, which equates to a 77.7% score. The third-highest knowledge area, with a

score of 77.3% (3.87 mean), was personal experience guiding the practice of complementary feeding. In contrast, knowledge areas such as the type of food to be introduced first as complementary food and food rich in iron and calories scored comparatively lower. The knowledge about the type of food to introduce first had a mean score of 3.31 and a total score of 66.2%. Knowledge of calorie-rich foods had a mean score of 3.11 and a total score of 62.2%, and understanding of iron-rich foods scored a mean of 2.8 and a total score of 56%. The lowest scoring area was the knowledge about enriching complementary food with iodized salt, with a mean score of 2.63 and a total score of 52.6%. The overall average knowledge score across all the areas was 23.67 out of a possible 35, yielding a 67.6% total score, indicating a moderate overall knowledge level about complementary feeding among the respondents. A summary of knowledge can be viewed below in Table 4.

Table 3. Demographic characteristics of the participants

Characteristic	N	%
Marital status		
Married	197	98.50
Divorced	3	1.50
Widowed	0	0.00
Mother's age		
18-25 year	18	9.00
26-35 year	141	70.50
36-50 year	41	20.50
Mother's Educational Level		
Unschooling	9	4.50
School	84	42.00
Diploma	21	10.50
Bachelor Degree	84	42.00
Postgraduate	2	1.00
Husband's Educational Level		
Unschooling	4	2.00
School	39	19.50
Diploma	44	22.00
Bachelor Degree	112	56.00
Postgraduate	1	0.50
Mother's Occupation		
Housewife	166	83.00
Government Employee	24	12.00
Privet Firm Employee	10	5.00
How many children have you given birth to?		
1-3 children	53	26.50
4-5 children	119	59.50
6 or more children	28	14.00
Monthly Income		
Less Than 1,000 SR	1	0.50
1,000-3,000 SR	19	9.50
More Than 3,000 SR	180	90.00

3.3 Attitude toward complementary feeding

The data regarding attitudes towards complementary feeding yielded some insightful results. The statement that resonated most with participants was the belief that it is necessary to introduce one type of complementary food at a time over a week to observe potential allergic reactions. This item had an average score of 3.91, corresponding to a 78.2% agreement rate, making it the highest-ranked attitude. The attitude that complementary food and breastfeeding are preferable for babies after six months due to their improved outcomes came second. It had a mean score of 3.68, translating to a 73.5% agreement rate. Close behind was the belief that providing complementary food enhances the baby's health and strength, with an average score of 3.66 and a 73.2% agreement rate. Preferences for giving the baby vegetables and fruits or juices as complementary food scored an average of 3.63 and a 72.5% agreement rate. Participants also acknowledged the role of family encouragement in giving the baby complementary food, scoring 3.54 on average, or a 70.8% agreement rate. Affording to buy complementary food items, thereby ensuring they do not compromise their health, garnered a score of 3.39, equating to a 67.7% agreement rate. The least agreed-upon statement was the practice of substituting breast milk with cow milk due to a perceived inadequate breast milk supply. This item scored an average of 1.60, indicating a mere 32.0% agreement rate. Overall, the total average score for attitudes towards complementary feeding was 23.4 out of a possible 35, yielding a score of 66.9%, reflecting a generally positive attitude among the respondents towards complementary feeding (see Table 5).

3.4 Practice of complimentary feeding

The results concerning the practice of complementary feeding and weaning showcased a high degree of conscientiousness among respondents. The most commonly agreed-upon practice was shaking the milk bottle with its cap in place to ensure it was well-mixed. This practice had an average score of 4.66, corresponding to a 93.1% agreement rate, indicating that almost all respondents adhered to this practice. Ensuring the infant is comfortably positioned during feeding was the second-highest-ranked practice, with an average score of 4.64, which translates to a 92.7% agreement rate. This was closely followed by the practice of burping the infant after complementary feeding, which scored 4.60 on average and a 92.0% agreement rate. Lowering the milk bottle's temperature under running tap water ranked fourth with an average score of 4.45, equivalent to an 89.0% agreement rate. Boiling the water used for formula preparation was also common, with an average score of 4.36 and an 87.1% agreement rate. Preparing the formula according to the instructions on the formula label, preparing the formula with water at

a temperature of 70°C, and adding the formula powder in the right quantity were practices scoring an average of 4.15, 4.27, and 4.22, respectively. These practices had agreement rates between 83.0% and 85.3%. Washing hands with soap and water before preparing the formula scored an average of 4.06 and an 81.2% agreement rate. Sterilizing the milk bottle by placing it in boiling water received a mean score of 3.90, translating to a 77.9% agreement rate. Sterilizing the

milk bottle before use and cleaning the kitchen surfaces with soap before preparing the formula was less frequently practiced, scoring 3.27 and 3.13 on average, respectively, with corresponding agreement rates of 65.4% and 62.6%. The total average score for complementary feeding practices was 49.68 out of a possible 60, which equals an overall practice score of 82.8%. This reflects a high level of adherence to recommended practices among the respondents.

Table 4. Participant knowledge of CF

Item	M	SD	Score	Rank
Initiation of complementary feeding at 6 and above months	4.08	1.138	81.50%	1
The frequency of complementary feeding is from 1 to 3 times a day	3.89	1.245	77.70%	2
My experience guides me about the complementary feeding	3.87	1.459	77.30%	3
I have knowledge about the type of food to be introduced first as a complementary food	3.31	1.508	66.20%	4
I have knowledge about the type of food rich in iron	2.8	1.467	56.00%	6
I have knowledge about enriching complementary food with iodized salt	2.63	1.454	52.60%	7
I have knowledge about the type of food rich in calories	3.11	1.546	62.20%	5
Total Knowledge	23.67	6.59	67.60%	

Table 5. Participant attitude toward CF

Item	M	SD	Score	Rank
I Must give one type of complementary food at a time for one week to explore allergies reaction.	3.91	1.383	78.20%	1
I afford to buy complementary food items, so I give them to my baby instead of harming my health.	3.39	1.459	67.70%	6
I do not have enough milk in my breast, so I give my baby cow milk as a complementary food.	1.6	0.802	32.00%	7
My family encouraged me to give my baby complementary food.	3.54	1.503	70.80%	5
I like to give my baby vegetables and fruit/juices as a complementary food	3.63	1.426	72.50%	4
Giving my baby complementary food makes him healthier and stronger.	3.66	1.409	73.20%	3
Complementary food and breastfeeding are preferable for babies after six months as they give better results.	3.68	1.407	73.50%	2
Total Attitude	23.4	6.54	66.90%	

Table 6. Descriptive measurements of items of the third domain, "The practice."

Item	M	SD	Score	Rank
I clean the kitchen surfaces with soap before preparing the formula.	3.13	1.468	62.60%	12
I sterilize the milk bottle before use.	3.27	1.519	65.40%	11
I place the milk bottle in boiling water for sterilization.	3.9	1.285	77.90%	10
I wash my hands with water and soap before preparing the formula.	4.06	1.18	81.20%	9
I cook the water until it is boiling.	4.36	1.027	87.10%	5
I prepare the formula according to the instructions given on the formula label.	4.15	1.251	83.00%	8
I prepare the formula with water at a temperature of 70°C.	4.27	1.136	85.30%	6
I add the formula powder in the right quantity.	4.22	1.186	84.30%	7
I shake the milk bottle with its cap in place to make sure that the milk is well-mixed.	4.66	0.545	93.10%	1
I put the milk bottle under running tap water to lower its temperature.	4.45	0.923	89.00%	4
I make sure the infant is in a feeding position comfortably.	4.64	0.523	92.70%	2
I burp the infant after a complementary feeding.	4.6	0.673	92.00%	3
Total Practice	49.68	8.8	82.80%	

3.5 KAP and demographic characteristics

For mothers aged 18-25, 3.5% scored poor on knowledge, 0.5% average, and 5% demonstrated good knowledge. Among mothers aged 26-35, 16% had poor knowledge scores, 25% average, and 29.5% showed good knowledge. For mothers aged 36-50, the distribution was 2% poor, 5% average, and 13.5% good. The analysis reveals a statistically significant relationship between a mother's age and her knowledge about complementary feeding, suggesting that knowledge scores improve with age (see Table 7).

Table 7. The association between knowledge scores and mother's age

Mother's Age	Poor (n = 43)	Average (n = 61)	Good (n = 96)	p-value
18-25	7 -3.50%	1 -0.50%	10 -5%	.006**
26-35	32 -16%	50 -25%	59 -29.50%	
36-50	4 -2%	10 -5%	27 -13.50%	

**Significant at the .01 level.

In the age group 18-25, 1.5% scored poor on attitude, 2.5% average, and 5% had a good attitude. Mothers aged 26-35 saw 14% with poor attitude scores, 10.5% average, and 46% had a good attitude towards complementary feeding. For mothers aged 36-50, the distribution was 11% poor, 2.5% average, and 7% good. The resulting p-value of less than .0001 is significantly less than the significance level of 0.05. Therefore, this analysis provides clear evidence of a significant relationship between the mother's age and her attitude about complementary feeding, indicating that attitude scores generally improve (see Table 8).

Table 8. The association between practice and mother's age

Mother's age	Poor (n = 8)	Average (n = 19)	Good (n = 173)	p-value
18-25	1 -0.50%	3 -1.50%	14 -7%	0.41
26-35	7 -3.50%	12 -6%	122 -61%	
36-50	0 0%	4 -2%	37 -18.50%	

The distribution for unschooled mothers was 2.5% poor, 1% average, and 1% good attitude scores. Mothers with school education had 18% poor, 7% average, and 17% good attitude scores. The distribution for those with a diploma was 2% poor, 0.5% average, and 8% good attitude scores. Mothers with a bachelor's degree presented 4% poor, 7% average,

and 31% good attitude scores. Postgraduate mothers demonstrated no poor or average attitude scores, with 1% scoring good. This finding indicates a statistically significant association between the mother's educational level and attitude toward complementary feeding. Thus, the fifth hypothesis was confirmed by the data.

The research findings demonstrated no statistically significant association between a mother's educational level and her knowledge or practice scores concerning complementary feeding. Similarly, no significant association was found between a mother's knowledge or practice scores and the number of children she has (see Table 9).

Table 9. The association between attitude and mother's educational level

Mother's Educational Level	Poor (n = 53)	Average (n = 31)	Good (n = 116)	p-value
Unschool	5 -2.50%	2 -1%	2 -1%	.000
School	36 -18%	14 -7%	34 -17%	
Diploma	4 -2%	1 -0.50%	16 -8%	
Bachelor Degree	8 -4%	14 -7%	62 -31%	
Post Graduate	0 0%	0 0%	2 -1%	

**Significant at the .01 level.

4. DISCUSSION

Weaning is a natural stage in the child's development, and it is a gradual process involving feeding the child foods that complement breastfeeding. Weaning typically causes mixed feelings in mothers, such as enthusiasm about the child's ability to enter a stage of greater independence in addition to sadness stemming from the child's transition to another stage. Nonetheless, when the baby reaches the age of six months, he or she is ready to eat other foods; their nutritional needs increase with the completion of breastfeeding. Weaning children is one of the stages that require sufficient experience or knowledge on behalf of the mother in order for the least possible harm to the psyche of the child to occur. The mother typically makes the decision to wean after lengthy thinking. It is one of the difficult decisions that she passes through towards her child because breastfeeding is not only a feeding process but rather a state of passion that grows an innate relationship connecting the mother to her child and vice versa.

This study explored the knowledge, attitudes, and practices (KAP) regarding complementary feeding (CF) among mothers of six-month-old children. A nuanced understanding of

these aspects can pave the way for targeted interventions, improving infant nutrition and health outcomes. Most mothers understood the importance of initiating CF at six months, with the overall knowledge score indicating a moderate level of understanding. These results are consistent with the findings of the Moore et al. (2014), who concluded that the commitment of mothers in the United Kingdom to correct weaning practices was strong, especially those related to the appropriate age for weaning; the majority of mothers weaned their children and introduced solid food at the sixth month of life.^[21] However, the current study differs from their study, which showed that there is a family doctor who helps mothers in this period and there may be some kind of flexibility in the introduction of solid foods, as solid foods can be introduced at the age of seven months or more.

In regards to the frequency of complementary feeding for children, the results showed that the majority of mothers gave complementary food to children one to three times per day. This amount is appropriate according to the instructions provided by the World Health Organization, which stipulates that the child should be given complementary food 2-3 times a day in addition to breastfeeding.^[1] However, specific areas, such as nutrient-rich foods needed during CF and the significance of enriching CF with iodized salt, had comparatively lower scores, signaling a gap in comprehensive CF knowledge. This may be attributed to their fear of harm to it, or their lack of awareness of the sufficient amount, or even their lack of knowledge of the importance of iodine to the child's body. Women should be aware of the importance of adding iodized salt to food, not only for benefit but also for improving the taste of the food for the child and making it more edible. This is confirmed by the study of Morison et al. (2016), which emphasized the importance of increasing mothers' awareness of adding salt and sugar to food, as their study found that mothers lack knowledge related to this aspect.^[6]

The findings also pointed out a positive attitude towards CF among participants. They agreed on the need to introduce one type of complementary food at a time, the benefits of CF, and the role of the family in supporting CF. Similarly, Samady et al. (2020) concluded with the large significance of having good knowledge and practice towards the allergy-related issues when introducing complementary food to babies.^[22]

Interestingly, a low agreement rate was observed for substituting breast milk with cow milk, reflecting the participants' understanding of the superiority of breast milk during infancy. Overall, the results suggest good attitudes amongst Saudi mothers regarding the importance of proper feeding behaviours and their role in promoting the growth and health

of the child.

The practice of CF was generally good among participants, with high agreement rates on hygiene and food preparation practices. Some areas, like sterilizing milk bottles and maintaining cleanliness in the kitchen, had lower agreement rates, which need attention. This could be attributed to mothers' awareness programs in Saudi Arabia, as well as the development of mothers' abilities to obtain correct information related to proper feeding practices during the weaning stage. While these results differ from a number of studies carried out in under-developed countries, such as that of Udoh & Amodu (2016) while being similar to the contrasting studies of Radwan (2013) and Rao et al. (2011).^[23-25] Interestingly, though, maternal age and education level had a significant relationship with CF knowledge and attitudes but not with CF practices. Older and more educated mothers tended to score higher on knowledge and attitudes, suggesting the role of life experience and education in shaping these aspects.

Previous empirical evidence highlights the critical importance of complementary feeding for infant nutrition, and health was emphasized, underpinning the necessity for appropriate, safe, and adequately nutritious food during this transition period. The findings supported this assertion, indicating a general awareness and acceptance of the importance of complementary feeding among the surveyed mothers. The mothers exhibited a strong understanding of the initiation timing and frequency of complementary feeding, reinforcing that these aspects of the CF process are well understood. However, the knowledge about specific nutritional elements, such as iron-rich foods, calories, and iodized salt, was lower. This discrepancy suggests that while the general concept of CF is acknowledged, more in-depth knowledge about specific nutritional requirements may need further attention.

Furthermore, previous research has mentioned the influence of cultural norms, traditions, and socioeconomic circumstances on CF practices. Similarly, this study highlights the diverse levels of knowledge, attitudes, and practices observed, suggesting these could be potentially influenced by varying cultural norms and socioeconomic statuses. The significant relationship between the mother's age, education, and attitude and knowledge about CF also supports this notion. Based on the findings, the aims of the research were effectively met. Mothers exhibited a moderate to high level of knowledge, and attitudes toward CF were generally positive. Their practices of CF were in high agreement with the recommended guidelines, and the results showed significant associations between mothers' age and education level and their attitudes and knowledge about CF.

The primary strengths of this study stem from its methodol-

ogy and breadth of inquiry. Firstly, the study incorporated a diverse and representative sample covering a broad array of mothers from different age groups and educational backgrounds, thus enhancing the generalizability of the findings. Furthermore, the study's comprehensive scope, assessing mothers' knowledge, attitudes, and practices regarding complementary feeding, allowed for a more holistic understanding of the situation. The robustness of the study is also evident in its use of validated questionnaires for data collection, ensuring a high level of methodological rigor. Moreover, the study successfully identified significant associations between mothers' age and education level and their knowledge and attitudes about complementary feeding, offering valuable insights into the factors influencing these dynamics.

However, several limitations should be noted. The study's cross-sectional design limits its ability to draw causal relationships between the variables studied. Future research using a longitudinal design could offer a better understanding of the temporal relationship between mothers' characteristics and their knowledge and attitudes about complementary feeding. The study also relied on self-reported data, making it susceptible to recall and social desirability biases, with mothers possibly over-reporting or under-reporting their knowledge or practices. There were also certain areas, such as food safety during complementary feeding and the long-term impact of complementary feeding practices on child health, that the study did not thoroughly explore. The study recognized but did not explicitly investigate the role of cultural norms and socioeconomic circumstances on complementary feeding practices. Future studies could benefit from a more in-depth exploration of these factors. Lastly, the geographic specificity of the study implies that the findings may not be easily generalized to mothers in other regions or countries with different cultural and socioeconomic contexts. Despite these limitations, the study significantly contributes to understanding the status of knowledge, attitudes, and practices concerning complementary feeding among mothers, offering a robust foundation for future research and intervention planning.

5. CONCLUSIONS

The current study provides insights into complementary feeding practices and knowledge among mothers. It elucidates how factors like mothers' age and education significantly influence their understanding and execution of complementary feeding. The findings emphasize the crucial role of

maternal knowledge and awareness in determining the quality of complementary feeding, with potential implications for child nutrition and overall health outcomes. Nonetheless, the conclusions drawn from this research are not without limitations. The cross-sectional design, self-reported data, and the limited geographic reach of the study call for caution in generalizing the findings. These limitations also pave the way for potential future research directions.

Future studies should contemplate a longitudinal design better to comprehend the cause-effect relationships between the studied variables. Expanding the scope of research to include overlooked aspects such as food safety during complementary feeding and the long-term impact of these practices on child health would be beneficial. Utilizing more objective data collection methods, acknowledging the role of cultural and socioeconomic influences more explicitly, and diversifying the geographic sample further enhance the validity and generalizability of the research.

Beyond research, the findings have significant implications for public health interventions. The strong association between maternal age and education level and their attitudes and practices of complementary feeding underscore the need for targeted educational interventions. By tailoring interventions to the specific needs and characteristics of different sub-groups of mothers, we can enhance their knowledge and execution of optimal complementary feeding practices, potentially impacting child nutrition positively.

In conclusion, while the study contributes valuable insights into complementary feeding practices among mothers, there is a continuing need for in-depth research and effective interventions to address the gaps in knowledge and practices. The road to improving child nutrition is complex, and each step forward contributes to building a healthier future for our children.

AVAILABILITY OF DATA AND MATERIALS

Available from the corresponding author on reasonable request.

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CONFLICTS OF INTEREST DISCLOSURE

The authors declare that there is no conflict of interest.

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