

# Breastfeeding and Infant Nutrition Knowledge, Attitude, and Practices of Parents

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## What is already known on this topic?

- World Health Organization (WHO) and United Nations International Children's Emergency Fund (UNICEF) recommend that children should be initiated to breastfeeding within the first hour of birth and be exclusively breastfed for the first 6 months of life—meaning no other foods or liquids are provided, including water.
- From the age of 6 months, children should begin eating safe and adequate complementary foods while continuing to breastfeed for up to 2 years and beyond.

## What this study adds on this topic?

- This study is innovative because there has been original research on the parents' knowledge about breastfeeding and complementary nutrition.
- Although there is knowledge among parents on breastfeeding and human milk, they need to be supported especially to continue exclusive breastfeeding during first 6 months and continue breastfeeding along with appropriate complementary foods up to 2 years of age or beyond.
- The implication is that global and national regulatory frameworks are needed to maintain WHO-recommended breastfeeding practices.

## ABSTRACT

**Objective:** This study aimed to evaluate the knowledge, attitude, and practices of parents about breastfeeding, complementary food, and infant nutrition who have healthy infants born at term and under 2 years of age.

**Materials and Methods:** This is a cross-sectional study conducted among the parents of infants who came for well-child visits to pediatric clinics of 4 hospitals. Healthy infants under 2 years of age and who had been born at term were interviewed. The questionnaire included 35 questions to evaluate parents' knowledge, attitude, and practices about breastfeeding and infant nutrition in addition to sociodemographic data. Data were obtained via questionnaire and were analyzed using Statistical Package for the Social Sciences 20.0 package program.

**Results:** The study group consisted of 679 infants and their parents. The median durations of exclusive breastfeeding and total breastfeeding time were found to be 4 months and 10 months. Although 75% of the participants stated that infants must be exclusively breastfed for 6 months, the rate of exclusive breastfeeding for the first 6 months was 44%. The 393 (58%) participants used formula for infant nutrition and 47 (12%) of those started with complementary feeding. 90% of the participants stated that formula advertisements did not affect their decision on starting formula but the rate of thinking that other people may be affected by the advertisements was 80%.

**Conclusion:** The knowledge of parents on human milk is not insufficient but they need to be supported especially to continue exclusive breastfeeding during the first 6 months and appropriate complementary food during the weaning period.

**Keywords:** Human milk, breastfeeding, complementary feeding, breastfeeding knowledge

## INTRODUCTION

Breastfeeding is one of the most effective ways to ensure child health and survival in addition to maternal health. World Health Organization (WHO) recommends exclusive breastfeeding up to 6 months of age, with continued breastfeeding along with appropriate complementary food up to 2 years of age or beyond.<sup>1</sup> Although it is reported that improving breastfeeding rates globally can prevent over 800 000 deaths in children under 5 years of age,<sup>2</sup> the latest version of the Turkey Demographic Health Study (TDHS)-2018 reports decreasing exclusive breastfeeding rates and increasing early weaning rates with complementary food compared with the previous report.<sup>3</sup>

Breastfeeding and complementary feeding practices vary due to mother and infant's demands in addition to cultural, educational, and economic factors between and within

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countries. High-income countries are reported to have shorter breastfeeding duration than low-income and middle-income countries. However, even in low-income and middle-income countries, only 37% of infants younger than 6 months are reported to be exclusively breastfed.<sup>2</sup> In our country, as an upper-middle-income country, the rate of exclusive breastfeeding is 41% according to the latest report of the demographic health survey. Moreover, median durations for exclusive breastfeeding are very short in the first 2 months, especially among mothers educated less than in high school or higher education.<sup>3</sup>

According to the "Theory of Planned Behavior," the most important determinant of one's behavior is known to be one's behavioral intention, and thus, the amenable factors including education, knowledge, and social support may influence breastfeeding behavior.<sup>4,5</sup>

## MATERIALS AND METHODS

### Study Design

This study had a multicentric, cross-sectional, descriptive research design. The planning phase of the study began in January 2015, and data were collected from August 2015 to January 2016. Data evaluation was completed in June 2017.

### Study Setting and Sample Selection

The research population consisted of parents and their children who came for well-child visits to pediatric clinics in 4 hospitals. It is aimed to reach at least 80% of the infants and their parents who visited between the study dates in 4 centers. The study sample constituted 88% of the study population. The data obtained results in a total of 679 parents and their children in the study sample. The inclusion criteria for the parents in the study were as follows: having a 0- to 24-months-old child, no mental or communication problems, and a volunteer. The inclusion criteria for the study children were as follows: a birth weight over 2500 g, no malnutrition or congenital anomalies, and no health problems. The subjects participated voluntarily after being fully informed about the objectives and methods of the study. They signed an informed consent form and filled in questionnaires that adhered to the Declaration of Helsinki protocols (World Medical Association). Ethical approval for this study was obtained by the Institutional Review Board of Istanbul University (No. 1541/2017).

### Data Collection and Procedures

Data were obtained via a questionnaire, which was prepared by the authors. The research questions were based on the WHO recommendations for infant and young child-feeding practices. To obtain responses to questions, mothers and children were taken into a quiet room and the questions were administered via face-to-face interviews. The demographic questionnaire included questions about parents' age, job, education, monthly income, living city, the number of children, the gender of the child, age of infants, and consanguineous marriage status. The questionnaire included 35 open and closed-ended types of questions to evaluate parents' attitude and practices about breastfeeding and infant nutrition. The questions to determine the knowledge about breastfeeding and infant nutrition depended on the 10 facts on breastfeeding

reported by WHO<sup>6</sup> and included questions on suggested durations of exclusive breastfeeding and any breastfeeding, in addition to knowledge on short-term and long-term benefits of infants and mothers. Ten questions (the status of receiving breastfeeding counseling, the person giving breastfeeding counseling, the hospital where the birth was given, delivery type, exclusively breastfeeding time, breastfeeding time) were also planned in order to understand the source of knowledge and the factors determining their decision-making process on practice.

### Statistical Analysis

The data were analyzed using the Statistical Package for Social Sciences, version 18.0 software (SPSS Inc.; Chicago, IL, USA). Categorical data were summarized by presenting number and percentage (%) values. Abnormally distributed data were presented as median (min-max). Kruskal-Wallis or Mann-Whitney *U* test was used to analyze numerical data between different groups if the data were non-normally distributed. Spearman correlation test was used if the data were non-normally distributed. The *P*-value of <.05 is considered statistically significant.

## RESULTS

### Effects of Sociodemographic Factors on Breastfeeding and General Characteristics of Parents and Children

The study group consisted of 679 infants and their parents (92% mothers, 3% fathers, and 5% both).

Among the children in the study, 46% were female and 54% were male. The median age of infants was 9 (min: 0.3, max: 24) months. The sociodemographic properties of the parents and infant characteristics are presented in Table 1.

The rate of working mothers was 43% before delivery, but this rate decreased to 17.5% after delivery.

The median duration of exclusive breastfeeding and total breastfeeding were found to be 4 months and 10 months, respectively.

When we evaluated the sociodemographic factors on breastfeeding durations, the median duration of exclusive breastfeeding was significantly higher among mothers who graduated from university (5.5 months) than other groups (4 months) (Figure 1, *P* = .002).

Moreover, the median duration of exclusive breastfeeding was higher among infants with fathers educated from university, but the difference was not significant statistically (*P* = 0.09). The other sociodemographic properties did not affect the duration of exclusive and total breastfeeding periods (*P* > .05, each).

The rate of breastfeeding counseling was 72%; 95% of which occurred during the postpartum period. The most common health professionals to provide breastfeeding counseling were nurses (87%), while doctors participated in only 8.8% of the counsellings.

The rate of starting to breastfeed on the first day after delivery was 90%. When the participants were asked about the suggested total breastfeeding period, 67% of them answered that the infants should be breastfed until 2 years old.

**Table 1.** The Sociodemographic Properties of the Study Group and General Characteristics of the Infants (n = 679)

Maternal age, median years (min-max)	31 (18-49)
Mother's education, n (%)	
No education/educated under 5 years	21 (3)
Elementary/middle school graduate	196 (29)
High school graduate	163 (24)
University graduate	299 (44)
Paternal age, median years (min-max)	34 (20-55)
Father's education, n (%)	
No education/educated under 5 years	7 (1)
Elementary/middle school graduate	203 (30)
High school graduate	231 (34)
University graduate	238 (35)
Financial income, n (%)	
Low	61 (9)
Middle	536 (79)
High	81 (12)
Number of children (median)	2
Gender of the infants (male/female), n	366/313
Age of infant, median months (min-max)	9 (0.3-24)
Delivery type, %	
Cesarean	66
Vaginal	34
Place of delivery, %	
Medical faculty hospitals	51
Public hospitals	11
Private hospitals	38

### The Knowledge Level of the Parents About Breastfeeding

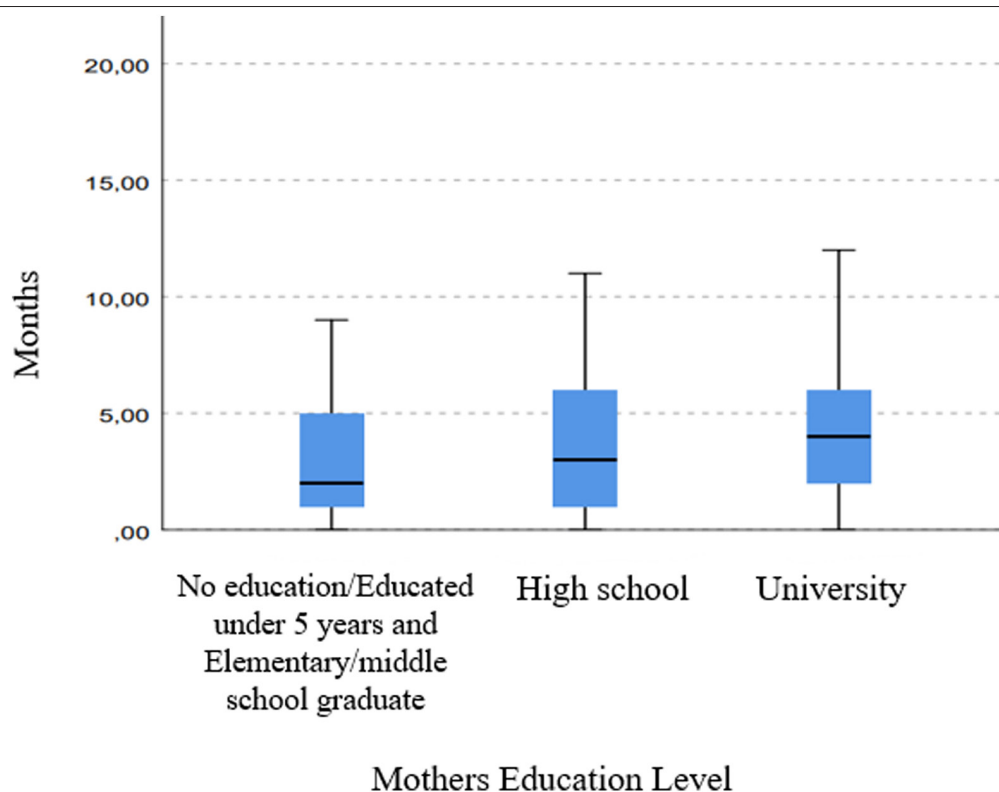
The rate of having the knowledge to breastfeed beyond 2 years old was only 2.1%. Although 75% of the participants stated that infants must be exclusively breastfed for 6 months, the rate of exclusive breastfeeding for the first 6 months was 44% in our study.

The rate of correct knowledge about the protective effect of human milk from infections was 92% while 75% from breast cancer.

A total of 38% of the participants stated that they knew about contraindications of breastfeeding, but 62% of them were false contraindications. The most common false contraindications that participants stated are that breastfeeding should be ceased if the mother has an infectious disease, including flu (35%), any drug use even if prescribed by a doctor (16%), and mastitis (6%). Moreover, 9% of the participants believed that infant formula was indicated in case of recurrent infectious diseases. The median number of correct answers about the benefits and contraindications of breastfeeding was 6 in the study group. But the median duration of exclusive and total breastfeeding periods did not differ between participants with correct answers <6 and ≥6. The knowledge level of the parents about breastfeeding is presented in Table 2.

### Complementary Feeding Practices

The median age to start complementary food was 6 months, whereas it was 4 months for water. The most common reason to start complementary food before 6 months of age was stated as breastfeeding refusal (median age: 4 months), while the

**Figure 1.** The effect of maternal education on exclusive breastfeeding duration (Kruskal-Wallis test).

**Table 2.** The Knowledge Level of the Parents About Breastfeeding and Effect on Breastfeeding Durations

Knowledges About Breastfeeding	Correct (%)	False/No Idea (%)
Infants should be exclusively breastfed for the first 6 months	75	25
Breastfeeding should continue up to 2 years or beyond	67	33
Breastfeeding protects the infant from childhood diseases	92	8
Breastfeeding strengthens the immune system of infants	93	7
Breastfeeding increases the intelligence of the infant	86	14
Solid foods should be phased after first 6 months	45	55
Breastfeeding protects mothers from some illnesses (breast cancer/ovarian cancer/type 2 diabetes/postpartum depression)	75	25
Breastfeeding should be continued when mothers get flu	65	35
Breastfeeding should be ceased in some circumstances	38	62

**Table 3.** The Attitudes and Practices of Parents About Complementary Feeding

<b>Age to start (median months)</b>	<b>6</b>
<b>Food to start (%)</b>	
Yogurt	33
Pureed fruit	21
Soup	15
Pureed vegetables	9
Formula milk	7
Fruit juice	5
Pudding	4
Egg	3
Others (tea, bread, cheese, and biscuit)	3

most common reason to start formula was stated as insufficient human milk (median age: 2 months). Yogurt (33%) and pureed fruit (21%) were the most common preferred foods for complementary feeding. 45% of the participants believed that starting complementary food earlier than 6 months has some detrimental effects on child health and the most common reasons were supposed to be intestinal infections and food allergies.

The rate of participants who used salt for infant nutrition was 34%. The use of other products that are not recommended for infant nutrition was lower than the use of salt. Table 3 shows the attitudes and practices of participants about complementary food.

The 393 (58%) of the participants used formula for infant nutrition, and 47 (12%) of that was started with complementary feeding. The median age to give formula for the first time was 2 months. Figure 2 summarizes the practices of participants regarding breastfeeding and complementary feeding.

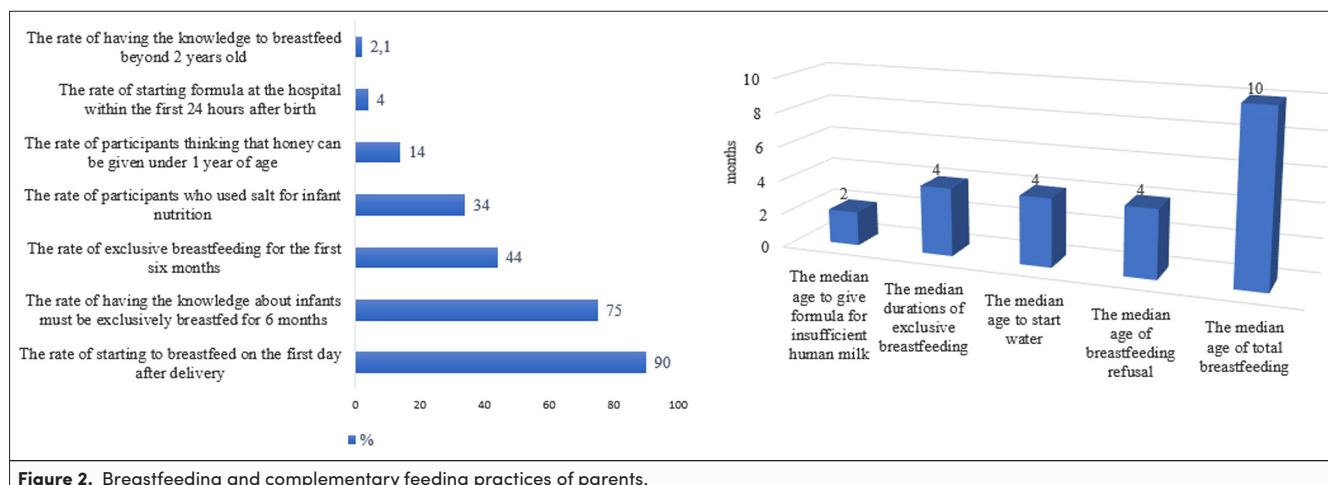
The decision to give formula was led by doctors (46%), neighbors, friends (19%), family members (15%), and other health professionals (9%).

Four percent of the participants stated that they started formula at the hospital within the first 24 hours after birth.

The rate of participants who stated to have been introduced to formula was 7.7%. 90% of the participants stated that formula advertisements did not affect their decision on starting formula milk, but the rate of thinking that other people may be affected by the advertisements was 80%.

## DISCUSSION

The results of this study show that although the knowledge of parents on breastfeeding and human milk is not insufficient, they need to be supported to continue exclusive breastfeeding during the first 6 months and to introduce appropriate complementary food during the weaning period. The most common reason to give formula was insufficient human milk at around 2 months, and 55% of the decisions to give formula were led by health professionals indicating that they also should be

**Figure 2.** Breastfeeding and complementary feeding practices of parents.

encouraged to recommend exclusive breastfeeding during the first 6 months. It is previously reported that the period including the first 2-6 weeks following birth is critical in supplementing breastfeeding and maternal perception of insufficient milk supply is the most common concern in this period.<sup>7,8</sup> But, it is also reported that there was no significant relationship between perceived and actual insufficient milk supply.<sup>9</sup> Although it is not known exactly, the prevalence of actual biological milk insufficiency is thought to be low.<sup>10</sup> If the healthcare professionals differentiate the perceived and the actual insufficient milk supply and support the mother to continue exclusive breastfeeding, it will probably prevent unnecessary formula supply in this critical period.

The median duration of exclusive breastfeeding was found to be 4 months in the study group. This is at least 2 months longer than reported in the recent report (1.8 months) of TDHS which reflects the national attitude. The longer duration of exclusive breastfeeding in our study group than reported in national data may be related to the institutions this study was conducted. This current study was performed in 4 well-child clinics of Departments of Social Pediatrics at University Hospitals and/or pediatric hospitals affiliated with a university, in which support for exclusive and continued breastfeeding by healthcare professionals is essential.

In addition, the median duration of exclusive breastfeeding was significantly higher among mothers who graduated from university (5.5 months) than other groups (4 months) in our study. As a matter of fact, the effect of demographic factors on breastfeeding durations shows challenging results in the literature between and within countries. Although research studies from high-income countries show that high income, better-educated women are more likely to breastfeed than those in low-income groups with fewer years of formal education, there are many other factors affecting breastfeeding intention and success.<sup>2,11</sup> Support from healthcare professionals and maternal satisfaction, intended breastfeeding duration, prior breastfeeding experience, and confidence in the ability to breastfeed are well defined to predict breastfeeding duration.<sup>12-15</sup> In a recent large cohort, 92% of nulliparous women stated the intention to breastfeed to some degree and 75.9% stated the intention to exclusively breastfeed. In our study, we did not evaluate the intention of the mothers but the higher education level was the only demographic factor that was associated with longer exclusive breastfeeding.

According to our results, the rate of correct knowledge about suggested durations of exclusive and total breastfeeding was 75% and 67%, respectively; though, the rate of exclusive breastfeeding for six 6 months was 44%, while continued breastfeeding by the end of 2 years was 38%. The rate of correct knowledge about the positive effects of breastfeeding on infants' immune system, protective effect against childhood diseases, and positive effect on infants' intelligence was 93%, 92%, and 86%, respectively. On the other hand, 75% of the participants were aware of the protective effect of breastfeeding against any breast cancer, ovarian cancer, type 2 diabetes, and postpartum depression. The rate of correct knowledge about the effects of breastfeeding on infants' health was higher than that of knowledge on mothers' health. The median number of

correct answers about the benefits and contraindications of breastfeeding was 6 in the study group. But the median duration of exclusive and total breastfeeding periods did not differ between participants with correct answers <6 and ≥6. Our results indicate no significant difference between the knowledge level about breastfeeding and breastfeeding duration. However, Yılmaz et al<sup>16</sup> have recently reported that the increase in knowledge about human milk and breastfeeding increased the number of exclusive breastfeeding for 6 months. It is not surprising to expect higher knowledge of breastfeeding with better breastfeeding practices. But we suggest that this increase may be related to continuing training of mothers which also gives support to continue breastfeeding that is previously known to be the most important factor, rather than knowledge levels of the mothers. To suggest that maternal knowledge level affects the breastfeeding durations, informing and evaluating the groups should follow a similar schedule. In another report about breastfeeding knowledge and breastfeeding, a higher level of breastfeeding knowledge was shown to protect against the early cessation of exclusive breastfeeding.<sup>17</sup> Mothers who were interested in this subject and had a greater knowledge about breastfeeding were more likely to complete the survey. As with all internet surveys, this was the limitation of this survey. In this report, Zielińska et al<sup>17</sup> have reported higher scores in questions about health benefits for infants, reflecting the opinion of 92% of respondents similar to our results. An interesting point of our results is that although the knowledge level about the benefits of breastfeeding is not insufficient, the participants were prone to cease breastfeeding for any reason due to false contraindications. When the participants were asked if there were any conditions that breastfeeding should be ceased, the rate of correct knowledge "Yes" was 38% attributing that breastfeeding has some contraindications. But when the reasons to cease were asked, 62% of them were false contraindications. The most common false contraindications that participants stated that breastfeeding should be ceased were infectious diseases of the mother including flu (35%), any drug use even if prescribed by a doctor (16%), and mastitis (6%). Thus we suggest that breastfeeding counseling and education should include contraindications and false contraindications of breastfeeding in order to prevent inappropriate practices.

Complementary feeding practices are known to be influenced by sociocultural factors such as public beliefs and cultural norms just as breastfeeding practices. Across cultures, it is known that babies show a preference for sweet tastes suggesting a biological basis for these preferences resulting in the natural acceptance of human milk.<sup>18</sup> Infants experience what they are given; moreover, these experiences are reported to influence later food choices and are important in establishing life-long food habits.<sup>19,20</sup> In our study group, the most common preferred foods to begin with for complementary feeding were yogurt (33%) and pureed fruit (21%) contrary to recommendations but in accordance with the national data. The most common foods given to children at age 6-23 months were cheese, yogurt, and other milk products (74% and 73%, respectively) and other fruits and vegetables (74% and 77%, respectively) in TDHS-2018.<sup>3</sup>

When our participants were asked, "why" they started complementary feeding, the most common answers were "breastfeeding became insufficient" (36%) and "it was time for



complementary feeding" (30%), and the median age to begin complementary food in our study group was 6 months. Although UNICEF<sup>21</sup> and WHO strongly recommend complementary food after the first 180 days, the American Academy of Pediatrics recommends beginning at around 6 months, while The European Society for Paediatric Gastroenterology Hepatology and Nutrition (ESPGHAN) insists on recommending to begin at 4-6 months of age. Most recently, the European Food Safety Authority<sup>22</sup> revised its opinion on the appropriate age range for the introduction of complementary foods to infants as "from around 6 months of age." In our study group, 45% of the participants believed that starting complementary food earlier than 6 months has some detrimental effects on child health and the most common reasons were supposed to be intestinal infections and food allergies. Although it is clearly recommended that no sugar or salt should be added to complementary foods,<sup>23</sup> the rate of participants who added salt to complementary foods between 6 and 12 months of age was 34%. The use of other products that are not recommended for infant nutrition including honey was lower than the use of salt. 14% of participants stated that honey can be given under 1 year of age.

When the participants were asked if they had any problems with infant feeding, 13% of them stated the infant had anorexia. This current study did not evaluate whether this problem caused any nutrition problem or only a perception of participants. Further studies are suggested to evaluate the perceptions of caregivers about infant feeding problems.

According to our results, the rate of using formula for infant feeding was 58% at any period under 2 years of age, 12% of which was started with complementary feeding. 4% of the participants stated that they started formula at the hospital within the first 24 hours after birth. The rate of participants who had been introduced formula was 7.7% despite the rules of the "Milk Code." A recent study conducted among 693 mothers with children aged less than 24 months in 2 states of Mexico reported that 11% of the women attending public and private health facilities received free human milk substitute samples in the previous 6 months.<sup>24</sup> Interestingly, 90% of the participants stated that formula advertisements did not affect their decision on starting formula but the rate of thinking that other people may be affected by the advertisements was 80%. Previous research has shown that mothers and caregivers often cannot differentiate between the different stages of human milk substitute products.<sup>25</sup> In the absence of regulation prohibiting cross-promotion through similar packaging and labeling, the widespread retail promotion of growing-up milk could serve to indirectly promote a manufacturer's entire range of human milk substitutes, circumventing restrictions on human milk substitutes promotion.<sup>26</sup> As marketing remains widespread even in countries that have adopted the International Code of Marketing of Breast-milk Substitutes, the adoption of stricter regulatory frameworks is needed to counter the impacts of formula marketing globally.<sup>27</sup>

### Limitations

Although we took a community sample, generalizability is limited due to population growth in Turkey. In addition, not all hospitals have social pediatric clinics. Due to a large number of patients in some clinics, the time to conduct a survey is limited.

In addition, breastfeeding, supportive nutrition, and breastfeeding counseling can be investigated in more detail by scanning under separate headings.

### CONCLUSION

The knowledge of parents on breastfeeding and human milk is not insufficient, they need to be supported especially to continue exclusive breastfeeding during the first 6 months and appropriate complementary food during the weaning period. Health professionals have an important role in decision-making to give formula and thus should be encouraged to recommend exclusive breastfeeding during the first 6 months. Global and national regulatory frameworks are needed to maintain WHO-recommended breastfeeding practices.

**Ethics Committee Approval:** This study was approved by Ethics committee of Istanbul University (Approval No: 1541/2017).

**Informed Consent:** Written informed consent was obtained from the participants who agreed to take part in the study.

**Peer-review:** Externally peer-reviewed.

**Author Contributions:** Concept – S.G.S., G.G.; Design – S.G.S., G.G.; Supervision – G.G., M.K.; Funding – S.G.S., O.B., M.K.; Materials – S.G.S., O.B., M.K., B.N.; Data Collection and/or Processing – S.G.S., O.B., M.K., B.N.; Analysis and/or Interpretation – S.G.S., O.B., M.K., B.N.; Literature Review – S.G.S., O.B., B.N.; Writing – S.G.S., O.B.; Critical Review – G.G., M.K.

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