Central European Journal of Nursing and Midwifery

Cent Eur J Nurs Midw 2016;7(1):368–376
doi: 10.15452/CEJNM.2016.07.0002

ORIGINAL PAPER

AGE OF THE INTRODUCTION OF THE FIRST COMPLEMENTARY FOOD AND DETERMINANTS OF ITS EARLY INTRODUCTION BY SLOVAK MOTHERS

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Received May 5, 2015; Accepted August 20, 2015.

Abstract

Aim: To assess the age of introduction of complementary food (CF) and the factors leading to early introduction of CF (≤ four months). *Design:* Cross-sectional study. *Methods:* In the period October 2011 to April 2012 we conducted research on 405 mothers of infants living in the Slovak Republic, particularly in the regions of Prešov (56.0%) and Košice (20.5%). The questionnaire, of our own design, integrated 13 factors. Statistical analysis included descriptive statistics and logistic regression (95% CI). *Results:* The first CF was introduced at 5.5 months (M = 5.47; SD = 1.22; range 1.0 to 10.0). Early introduction of CF was identified in 24.2% of children. A significantly higher risk of early introduction of first CF was found in respondents with: lower maternal age (OR = 4.436), lower levels of education (secondary education without GCE/vocational qualifications – OR = 10.140), lower maternal awareness of healthy nutrition (OR = 2.996), lower levels of satisfaction with their financial situation (OR = 1.927), and in single mothers (OR = 5.143), and children receiving combined milk nutrition rather than purely breastfeeding (OR = 3.888). *Conclusion:* Recognition of the factors leading to early introduction of CF allows the implementation of effective prevention strategies by health professionals.

Keywords: complementary food, infant, early introduction of complementary food, maternal age, mother's education.

Introduction

Complementary feeding is an essential part of infant nutrition in the first year of life as it creates the foundation for the healthy growth of infants and development of their personality. The introduction of complementary foods (CF) (in English literature referred to as "complementary foods" or "weaning foods", and in Slovak/Czech literature as "nemliečne príkrmy" – "non-milk foods") plays a key role in the healthy transition from exclusive milk feeding to regular family foods. The introduction to CF is significantly determined by culture, the caregiver´s characteristics and preferences, food availability, and scientific knowledge (Agostoni et al., 2008). One of the most important requirements for the introduction of CF is timing – CF should be introduced at a time when the need for energy and nutrients is higher than frequent exclusive breastfeeding can provide (WHO, 2003). The early introduction of CF (according to the majority of professionals, ≤ four months of age) replaces breast milk and leads to its limited production. Immunal immaturity of the intestinal mucosa and functional immaturity of the kidneys promote the development of gastrointestinal diseases, food allergies or intolerances (Michaelsen et al., 2003), celiac disease (Norris et al., 2005), and alimentary nitrate methemoglobinemia (Przyrembel, 2008), and puts strain on kidney function due to osmosis (Nevoral, 2003).

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Aim

The research objectives included: identifying the age of the first introduction of CF, and the kind of foods used in CF preparation; establishing the reasons for the first introduction of CF, and identifying those who have most influence over caregivers regarding the introduction of CF; and analysing the factors causing caregivers to introduce CF prematurely.

Methods

Design

The questionnaire integrated the self-designed items, aimed at the assessment of the age at introduction to first CF (in months), the type of

foods used in the preparation of CF, identification of the reasons for the introduction, and those who played a role in adding CF to the infant´s diet. The items drew on questionnaires used in the analyses of infant nutrition conducted in England – Infant Feeding Survey (The Health and Social Care Information Centre, 2005), and in the USA – Infant Feeding Practices Study II (Centers for Disease Control and Prevention, 2009). For the purpose of the presented research, we consider the introduction of CF at the age of ≤ four months (Agostoni et al., 2008) as early introduction. Factors behind early introduction of CF included:

- infant's sex, birth weight, term of delivery, mode of delivery, number of children in the family, type of milk feeding (breast milk alone vs. combined milk nutrition, i.e., breastfeeding and formula feeding)
- maternal age and social status, place of residence, smoking status, and level of education (higher education, i.e., university education; medium education, i.e., secondary education with GCEs; lower education, i.e., secondary education without GCEs and vocational courses),
- and level of maternal awareness of healthy living.

The respondents were divided into two groups according to whether they were assessed as having ´higher´ awareness of healthy nutrition (based on their positive agreement with the statement "I actively search for information on healthy eating and try to live healthily"), or "lower" awareness of healthy nutrition (those whose responses included: "I listen to what people say about the topic, and I want to try to live healthily, but so far I haven´t been as successful as I would like", "Sometimes I read something about the topic", and "I´m not at all interested in it"). In the item relating to respondents´ subjective satisfaction with their family financial situation we used the Likert scale of responses (defined as the scale from "very satisfied" down to "very dissatisfied"). The respondents were divided into groups categorized as having "a higher level of satisfaction with their financial situation" ("very satisfied", "satisfied"), and "a lower level of satisfaction with their financial situation" ("dissatisfied", "very dissatisfied", "don't know").

The following criteria were determined for the selection of the respondents:

- Inclusion criteria: caregivers of an infant 12 months of age (maximum 16 months), whereby for the purpose of this research, a caregiver represents a person taking care of an infant (born in the eighth month of pregnancy or later) for most of the day during the period of complementary feeding.
- Exclusion criteria: respondents´ infants should not have been diagnosed with a chronic disease requiring a specific approach to feeding, and babies born prematurely (in ≤ seventh month).

Sample

Our research sample consisted of 405 respondents, all mothers of infants (100.0%). The average age was 28.45 years (SD = 4.74; range: 18–44 years of age). Among the eight regions of the Slovak Republic, the Prešov region – 56.0%, and the Košice region – 20.5% predominated. The average birth weight of babies was 3331.13 g (SD = 501.82; range 2,100–4,860 g). The weight of 85.4% of babies was physiological, and 74.1% of babies were born in term. (Table 1)

Table 1 Socio-demographic characteristics of infants and mothers

	n (%)		n (%)
Maternal age at delivery (years)	28.45 (4.74)	**Maternal education**	
< 20	23 (5.7)	vocational course	20 (4.9)
21–29	225 (55.6)	secondary education without GCEs	20 (4.9)
30–39	149 (36.8)	secondary education with GCEs	171 (42.2)
> 40	8 (2.0)	University	194 (47.9)
Sex of infant		**Marital status**	
Female	215 (53.1)	married	368 (90.9)
Male	190 (46.9)	divorced	3 (0.7)
Place of residence		single	17 (4.2)
Banská Bystrica region	5 (1.2)	cohabiting with a partner	17 (4.2)
Bratislava region	19 (4.7)	**Birth weight**	
Košice region	83 (20.5)	< 2,500 g	21 (5.2)
Nitra region	0 (0.0)	2,500–4,000 g	346 (85.4)
Prešov region	227 (56.0)	> 4,000 g	38 (9.4)
Trenčín region	21 (5.2)	**Term of delivery**	
Trnava region	21 (5.2)	born in term	77 (19.0)
Žilina region	29 (7.2)	born preterm	300 (74.1)
		born postterm	28 (6.9)

Data collection

The research was carried out October 2011 – April 2012. The questionnaires were distributed to paediatricians´ offices (practitioners providing care for children and adolescents), maternity/family centres, and pre-school facilities within the territory of the Slovak Republic. The respondents completed the questionnaire data retrospectively. At the time of the completion of the questionnaires, the respondents´ youngest infants were 12–15 months of age. The rate of response for the questionnaires was 69.7%.

Data analysis

For statistical processing of data obtained, SPSS 17.0 software and the functions of Microsoft Office Excel 2007 were used. For descriptive statistics, calculation of the mean (M), standard deviation (SD), sum total (n), and percentage (%) were used. We also used logistic regression with OR (odds ratio) and 95% confidence interval (CI), followed by the chi-square test, and Fisher's exact test. To evaluate statistical significance, a significance level of $p < 0.05$ was applied.

Results

The first CF was introduced at 5.5 months of age (M = 5.47; SD = 1.22; range 1.0–10.0). The introduction of CF into the infants´ diet peaked in the sixth, fifth, and fourth months (36.5%; 22.0%; and 21.5%). Early introduction of CF (in the fourth month and earlier) was identified in 24.2% of infants. Vegetables (59.8%), potatoes (19.8%), and fruit (9.4%) predominated in the preparation of the first solid foods. The most frequently usedvegetables were carrots (84.7%). Mothers preferred apples (77.0%) and bananas (21.0%) over other fruits.

Reasons for the introduction of the first complementary food

From the respondents´ perspective, the most common reason for the introduction of CF into infants´ diets was that they considered their infants to be mature enough to consume it (n = 198; 49.0%). The other reasons stated included infant´s interest in the consumption of solid foods (n = 44; 10.9%), lack of breast milk (n = 37; 9.2%), and constant hunger of infants (n = 35; 8.7%). According to respondents, hunger (18.4% vs. 5.5%), and lack of breast milk (14.3% vs. 7.5%) played a significantly greater role in the first introduction of CF compared with mothers who introduced the first solid foods in ≥ fifth month. In the group of respondents who had introduced the first CF in ≥ fifth month, ´infant maturity´ dominated statistically (57.0% vs. 23.5%). (Table 2)

Table 2 Reasons for the introduction of first complementary food

Reason for the introduction of CF	All groups of respondents	Age of introduction of the first CF	
		≤ 4th month	≥ 5th month
	n (%)	n (%)	n (%)
My child was nursing too much	1 (0.2)	0 (0.0)	1 (0.3)
My child was drinking too much formula	8 (2.0)	4 (4.1)	4 (1.3)
My child was hungry a lot of the time	35 (8.7)	18 (18.4)	17 (5.5)
I did not have enough milk	37 (9.2)	14 (14.3)	23 (7.5)
My child was not gaining enough weight	18 (4.5)	7 (7.1)	11 (3.6)
I wanted to feed my child something in addition to breast milk or formula	31 (7.7)	9 (9.2)	22 (7.2)
It would help my child sleep longer at night	13 (3.2)	5 (5.1)	8 (2.6)
My child was old enough to begin eating something in addition to breast milk/formula	198 (49.0)	23 (23.5)	175 (57.0)
My child had a medical condition that might be helped by feeding complementary food	5 (1.2)	1 (1.0)	4 (1.3)
When I or anyone else around eat, my child shows interest in food	44 (10.9)	12 (12.2)	32 (10.4)
Other reason			
Advice from doctor	7 (1.7)	3 (3.0)	4 (1.3)
Child did not want to drink breastmilk	1 (0.2)	1 (1.0)	0 (0.0)
Began complementary feeding from the sixth month	4 (1.0)	0 (0.0)	4 (1.3)
It was recommended to introduce gluten during breastfeeding	1 (0.2)	0 (0.0)	1 (0.3)
It was necessary for me to do it	1 (0.2)	1 (1.0)	0 (0.0)

CF – complementary foods. One respondent who introduced CF in ≥ 5th month did not provide an answer for this item.

Persons influencing respondents to introduce first complementary food

Paediatricians (44.4%) and respondents´ mothers (19.3%) were those most likely to influence the decision to give the first CF to infants. Those who introduced the first CF early were significantly influenced by their mothers (37.8% vs. 13.4%) and their grandmothers (6.1% vs. 0.7%), whereas respondents who introduced CF in ≥ fifth month were influenced by paediatricians to a statistically higher degree (52.1% vs. 20.4%). (Table 3)

Table 3 Persons affecting respondents in the introduction of the first complementary food

Most important person	All group of respondents n = 405 n (%)	Age of introduction of first CF ≤ 4th month n = 98 n (%)	≥ 5th month n = 307 n (%)
Paediatrician	180 (44.4)	20 (20.4)	160 (52.1)
Nurse	12 (3.0)	4 (4.1)	8 (2.6)
Lactation consultant	1 (0.2)	0 (0.0)	1 (0.3)
Child's father/partner	21 (5.2)	5 (5.1)	16 (5.2)
Respondents' mother	78 (19.3)	37 (37.8)	41 (13.4)
Mother-in-law	13 (3.2)	6 (6.1)	7 (2.3)
Grandmother	8 (2.0)	6 (6.1)	2 (0.7)
Another family member	9 (2.2)	3 (3.1)	6 (1.9)
Girlfriend	11 (2.7)	0 (0.0)	11 (3.6)
Decision of respondent	72 (17.7)	17 (17.3)	55 (16.9)

CF – complementary foods

Factors leading to the early introduction of the first complementary food

We identified nine statistically significant factors out of the 13 investigated. Significantly higher likelihood of early introduction of the first CF was associated with surgical deliveries (OR = 2.096), lower age of maternity (≤ 24 years old) (OR = 4.436), lower levels of maternal education (secondary education with GCEs – OR = 2.715; secondary education without GCEs/vocational qualifications – OR = 10.140), maternal smoking status before pregnancy (OR = 2.694) and during the introduction of CF (OR = 5.215), lower maternal awareness of healthy nutrition (OR = 2.996), lower maternal level of satisfaction with their financial situation (OR = 1.927), single mothers (OR = 5.143), and mothers cohabiting with partners (OR = 3.200). The analysis of the results suggest that the likelihood of the introduction of the first CF in the fourth month and earlier was almost four times higher (OR = 3.888) in infants who had received combined milk nutrition in comparison with those who had been exclusively breastfed: 15.4% and 41.3% respectively. (Table 4)

Discussion

The introduction of CF, including the age of the introduction of the first CF, is a dynamic and flexible process, and every infant should be managed individually (Frühauf, 2006; Alvisi et al., 2015). According to the ESPGHAN Committee, the first CF should be introduced between 17–26 weeks of age (Agostoni et al., 2008). A similar view is shared by the European Food Safety Authority (2009). Despite the stated age range appropriate for the introduction of CF, it is necessary to bear in mind that the introduction is determined by a number of factors such as birth weight, gestational age, the pace of development of psycho-motor skills, and breast milk nutritional status (Michaelsen et al., 2003), which most mothers, as laymen, are not familiar with, or are not able to expertly assess. Therefore, the final decision regarding the introduction of the first CF should be in healthcare providers´ hands (Frühauf, 2006). On average, mothers introduce the first CF at 5.5 months of age. Most mothers (58.5%) introduce CF at an appropriate age. Early introduction was observed in 24.2% of respondents, a lower percentage in comparison with most other studies performed in developed countries: Germany – 29.4% before the fourth month (Foterek, Hibik, Alexy, 2014), England – 50% in the fourth month (Bolling et al., 2007), the Czech Republic – 41% before the fourth month (Schneider, 2005), the USA – 40.4% before the fourth month (Clayton., 2013), Australia – 35.3% in the fourth month (AIHW, 2011), Canada – 85% in the fourth month (Friel et al., 2009), Sweden – 4.4% (Brekke et al., 2005), and Denmark – 7% (Kronborg et al., 2014).

Table 4 Factors leading to the introduction of the first complementary food

Variable	n (%)	Age of introduction of first CF: ≤ fourth month OR (95% CI)
Infant sex		
girls	215 (53.1)	1
boys	190 (46.9)	1.057 (0.670–1.666)
Birth weight		
2,500–4,000 g	346 (85.4)	1
above 2,500 g	21 (5.2)	1.636 (0.638–4.191)
below 4,000 g	38 (9.4)	1.168 (0.544–2.508)
Term of delivery		
born in term	300 (74.1)	1
born preterm	77 (19.0)	1.545 (0.889–2.685)
born postterm	28 (6.9)	0.930 (0.363–2.387)
Mode of delivery		
vaginal	289 (71.4)	1
surgery	116 (28.6)	2.096 (1.298–3.384)
Number of children		
two and more children	228 (56.3)	1
one child	177 (43.7)	1.476 (0.935–2.331)
Mother's age (years)		
25–30	192 (47.4)	1
≤ 24	86 (21.2)	4.436 (2.528–7.783)
31–35	99 (24.4)	0.765 (0.389–1.505)
36–40	24 (5.9)	1.913 (0.736–4.973)
≥ 41	4 (1.0)	1.549 (0.156–15.347)
Mother's education level		
higher	194 (47.9)	1
medium	171 (42.2)	2,715 (1.590–4.636)
lower	40 (9.9)	10,140 (4.745–21.667)
Place of residence		
urban	273 (67.4)	1
rural	132 (32.6)	1.276 (0.793–2.055)
Mother's marital status		
married	368 (90.9)	1
divorced	3 (0.7)	0.000 (0.000)
single	17 (4.2)	5.143 (1.897–13.940)
cohabiting with partner	17 (4.2)	3.200 (1.196–8.561)
Smoking before pregnancy		
no	329 (81.2)	1
yes	76 (18.8)	2.694 (1.585–4.578)
Smoking during introduction of complementary food	385 (95.1)	1
no	20 (4.9)	5.215 (2.066–13.167)
yes		
Awareness of healthy nutrition		
higher awareness	170 (42.0)	1
lower awareness	235 (58.0)	2.996 (1.785–5.029)
Satisfaction with financial situation		
higher level of satisfaction	211 (52.1)	1
lower level of satisfaction	194 (47.9)	1.927 (1.213–3.062)
Type of milk consumed at the time of the introduction of first CF		
breast milk	260 (64.2)	1
combined milk nutrition	145 (35.8)	3.888 (2.418–6.252)

Reference group – children with introduction of first CF (complementary foods) in ≥ fifth month. Vaginal delivery also includes delivery with forceps and vacuum extractor.

Literary sources indicate mixed information about what kind of foods that should be used in the preparation of the first CF. In Czecho-Slovak literature, vegetables are recommended in particular (Nevoral, 2003; Kovács, 2007; Frühauf, 2009). The majority of respondents (59.8%) used vegetables in the preparation of the first CF. Vegetables can represent a risk to alimentary nitrate methemoglobinemia, especially if served in the fourth month or earlier (Furková, Skraková, 2007), which was found to be the case with 19.9% of mothers. The second most commonly used food in the preparation of the first CF was fruit (9.4%), whereby apples amounted to 77.0%, and bananas to 21.0%. The introduction of fruit as the first CF carries the risk of the subsequent rejection of vegetables (infants have an innate preference for sweet tastes).

Comparison of foods used in the preparation of the first CF in other countries reveals diverse results. Fruit is heavily used (79.2%) in Lithuania (Vingraite et al., 2004), cereal porridge (57.7%) in Canada (Friel et al., 2009), which is probably related to recommendation of Ontario Society of Nutrition Professionals in Public Health (Ontario Society of Nutrition Professionals in Public Health, 2011), and also in Australia (18.5%) (Newby, Davies, 2015), and rice porridge (60%) in Ireland. Vegetables are used by only 6% of Irish mothers (Tarrant et al., 2010). However, vegetables and potatoes predominate in the preparation of the first CF in Swiss (Dratva et al., 2006) and Swedish studies (Brekke et al., 2005). From the aforementioned data, we can conclude that the choice of the food used as the first CF is influenced by tradition, culture and its availability in the country.

Regardless of age of introduction, the most frequently stated reason for the introduction of the first CF is the perception of the infant as sufficiently mature for CF intake (49.0%). Similar results were identified in American mothers, amounting to 88.9% of respondents (Clayton et al., 2013), and in the Australian study (40.1%) (Newby, Davies, 2015). The maturity of the infant as the reason for the introduction of the first CF is predominant in mothers who introduced CF correctly – i.e., in ≥ fifth month after birth. At the same time it should be pointed out that almost 1/4 of mothers (23.5%) who introduce the first CF prematurely also consider their babies to be mature enough for the intake of solid foods. However, infants aged four months and younger are not physiologically and psycho-socially prepared for the consumption of solid foods. Therefore maternal perception of infant maturity is often misguided. Mothers´ mistaken beliefs should be corrected in advance by proper education provided by healthcare professionals so that they can interpret infant development more accurately. Mothers who introduced CF prematurely did so for statistically significant reasons such as lack of breast milk and constant infant hunger. These reasons are often solved by the introduction of formula feeding, and subsequently, of CF, as is confirmed by the presented research results.

According to an Irish study, a significant reason for the introduction of first CF in ≤ 12 weeks was maternal perception of infant hunger (67% vs. 44% of mothers who introduced the first CF after 12th week), and out of a desire to facilitate infant sleep (25% vs. 7% of the mothers who introduced the first CF after 12th week) (Tarrant et al., 2010). Soothing of infants, and sleep facilitation were stated by 15% of Australian women as reasons for the introduction of the first CF before 17 weeks of age (Scott et al., 2009). However, neither the whole sample of respondents (3.2%) nor the group of mothers who had implemented the first CF prematurely (5.1%) mentioned the need for better sleep, especially at night, as the reason for the introduction of CF.

The introduction of the first CF was influenced in particular by paediatricians´ advice (44.4%), respondents´ mothers (19.3%), and respondents´ own experience (17.7%). Taking the infants´ age at the time of the introduction of the first CF into account, paediatricians were the most important persons influencing the age of introduction with 52.1% of mothers who integrated CF in ≥ first month. In the group who introduced CF prematurely, respondents´ mothers ($p = 0.000$) and grandmothers ($p = 0.001$) had the most significant impact. Mothers significantly influence the development of an individual, his/her opinions, attitudes and behaviour. However, due to the age gap between the respondents´ mothers and the respondents, and due to changes in the recommendations for the introduction of CF, we can predict that the influence of respondents´ mothers in relation to the issue will not necessarily always conform with the latest scientific research – which our research also indicates. The impact of health care professionals (paediatricians, nurses, or lactation consultants) was almost twice as great (55.0% vs. 24.5%) in mothers who introduced their infants to CF at the correct age. This can be explained if healthcare providers giving instructions related to the correct timing of first CF introduction do so too late. Presumably, mothers who tend towards earlier than recommended introduction of

CF due to the influence of other individuals (laity) or their own experience have already absorbed the attitudes of those around them, and attempts at education by healthcare professionals often, therefore, prove ineffective.

In cross-sectional study integrating 72 studies that analyse the factors influencing the early introduction of CF, the six most important factors include: low maternal age and education, low socio-economic status, rejection of breastfeeding or short-term breastfeeding, maternal smoking status, and lack of information and instructions from healthcare providers (Wijndaele et al., 2009).

When comparing the basic descriptive data regarding age of introduction of the first CF we discovered earlier introduction in infants receiving combined milk nutrition (M = 4.90) than in infants exclusively breastfed (M = 5.78). The risk of the introduction of CF at the age of four months was almost four times higher (OR = 3.888; $p < 0.000$) in the group of infants being fed by combined milk nutrition. A significant connection between the early introduction of CF and infants being fed combined milk nutrition has been confirmed by many other studies (Hendricks et al., 2006; Grummer-Strawn et al., 2008; Schiess et al., 2010). Lower age and education of mothers participating in our research, as well as in some other studies, (Kudlova, Rames, 2007; Rebhan et al., 2009; Scott et al., 2009; Tarrant et al., 2010; Brodribb, Miller, 2013; Kronborg et al., 2014) constitute risk factors for the early introduction of CF. Analysis of the research results suggests a significant increase in likelihood in relation to decreasing levels of maternal education. Mothers with secondary education without GCEs/vocational qualifications in particular showed a tenfold increase in the risk of early introduction of CF (OR = 10.140). A similar phenomenon was identified in an English study. 63% of mothers who left school at the age of 16 added CF to their infants´ diet in the fourth month of age in comparison with 40% of mothers who had completed school at the age of 19 (Bolling et al., 2007).

Maternal smoking status is another factor studied, often with significant results (Rebhan et al., 2009; Scott et al., 2009; Tarrant et al., 2010; Kronborg et al., 2014). In our research, a statistically significant relationship between maternal smoking status and the early introduction of CF was identified in mothers smoking before pregnancy ($p < 0.000$), and during the introduction of CF ($p < 0.000$), although in these cases the observed results may be biased by the sizes of the groups compared.

The results of the studies investigating the relationship between infant sex and age of the introduction of the first CF are not uniform. Some studies (Rebhan et al., 2009), including the present research, find no significance. Similarly, research results relating to the relationship between mothers´ marital status and early CF introduction were not consistent. While our results showed a fivefold higher risk of the early introduction of first CF in single mothers (OR = 5.143), which was the same result as a study conducted in Germany (Rebhan et al., 2009), exploring this relationship among Czech women living in Prague did not bring statistically significant results (Kudlova, Rames, 2007).

Gestational age, birth weight and the number of children did not affect infants´ age with regard to the introduction of CF. Similar results have been recorded in other studies (Rebhan et al., 2009; Tarrant et al., 2010). However, while in the German study the mode of delivery does not suggest any impact on the introduction of CF, the analysis of our results points to a twofold higher risk (OR = 2.096; $p < 0.002$) with the early introduction of CF in infants who were born by means of surgery rather than vaginally. Respondents´ health awareness has a significant impact on the nutritional status of dependent individuals. On the basis of our research we can say that mothers who have not made a point of insisting on the importance of healthy nutrition showed a higher tendency to add CF to their infants´ prematurely (OR = 2.996). A similar situation was identified in mothers who evaluated their own financial situation as less satisfactory (OR = 1.927).

Conclusion

The identification of groups of mothers at risk of early introduction of CF is significant in terms of understanding the mechanisms leading to this phenomenon as it subsequently enables the development of effective preventive strategies. The research results indicate that 1/4 of mothers introduce CF at an inappropriate time, and that the risk factors leading to the early introduction of CF include maternal age, health education, and milk feeding preference. Mothers are largely negatively affected by their social environment. Therefore, health professionals should pay special attention to these groups of mothers in particular, and thus minimize inappropriate feeding practices.

Ethical aspects and conflict of interest

All the respondents were fully informed of the research objectives, and agreed to participate in the research process. The authors declare that they have

had no conflict of interest and followed ethical guidelines when conducting the research.

Author contribution

Conception and design (SM, AS), data collection, data analysis and interpretation (SM, AS), manuscript draft (DM), critical revision of the manuscript (DM), final approval of the manuscript (DM).

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