

Factors Associated With Breastfeeding Duration

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Summary. *Background and Objective.* The assessment of the factors associated with breastfeeding duration helps in creation of a national policy according to the World Health Organization strategy and recommendations. The objective of the study was to identify the factors associated with breastfeeding duration.

Material and Methods. These analyses are based on a sample of mothers with babies attending one family health center in Kaunas, Lithuania. Completed questionnaires were obtained from 195 mothers (response rate, 97.5%). One year later, the same respondents, who had 1-year-old children, answered questions of the second questionnaire.

Results. Half (53.8%) of the surveyed women breastfed for 3–5 months, 29.7% for 6 months and more, and 16.5% of the respondents breastfed for less than 3 months. The oldest (31–40 years) women breastfed their babies significantly longer than the youngest (<20 years) mothers. The mothers with a higher education breastfed their babies significantly longer than the less educated mothers. The married women breastfed longer than single or living with a partner. The mothers who did not give extra fluids and pacifiers breastfed significantly longer than the women who gave them. The majority of the mothers who had sore nipples, milk stasis, and mastitis breastfed for only up to 3 months.

Conclusions. Mothers at risk of short breastfeeding duration should be targeted as a group for breastfeeding promotion early in the pregnancy. The education of healthcare professionals who provide prenatal and postnatal care allows them to choose women who need additional breastfeeding support.

Introduction

Today it is undoubted that breastfeeding is the only correct way of infant's nutrition having unique biological and emotional influence on the health of both the mother and the child (1–3). The World Health Organization (WHO) in the Global Strategy on Infant and Young Child Feeding recommends continuing breastfeeding with complementary feeding up to 2 years and beyond (4, 5). Lithuanian data show that the breastfeeding duration in Lithuania is constantly increasing, i.e., 34.1% of mothers breastfed for up to 3 months in 1993, 44.9% in 1999 (according to the National Nutrition Center), 57% in 2008, and 62.3% in 2011 (according to the Statistics Lithuania) (6, 7). In comparison with other countries, the maternity leave in Lithuania is long, i.e., 3 years. The maternity allowance is 70% and 40% of the mother's salary during the first and the second year, respectively. During the third year, mothers can stay at home with a guarantee to return to

the same workplace. Nevertheless, the breastfeeding rates remain low: the percentage of at least partially breastfed infants aged 6 months was nearly 3 times lower in Lithuania in comparison with Norway (26.6% and 80%, respectively) (5). Thus, further measures to promote, protect, and support breastfeeding must be taken.

In order to improve the initiation and duration of breastfeeding, it is essential to address local attitudes; however, changing public perception of the best way to feed infants and young children is a big challenge (1). The promotion of breastfeeding is one of the most important tasks for neonatologists, pediatricians, family doctors, specialists of public health, and other professionals working in the field of mother's and child's health. The baby-friendly hospital initiative is likely to increase the number of mothers who start breastfeeding in a maternity unit but not feeding duration (8). The data of questionnaire-based surveys in Lithuania show that the majority of women breastfed their babies in maternity units, but about 30% of them stopped breastfeeding after 1 month, 30.5% of mothers breastfed their infants for up to 6 months, and only 10% breastfed

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for up to 1 year (6). It has been determined that there are 2 critical periods for breastfeeding within the first 4 months. One is the first week after delivery when 25% of mothers stop breastfeeding, and the other one is from the second up to the eight week after delivery when other 40% of women stop breastfeeding (9). Qualified support for the mother given by healthcare professionals is very important in any period of lactation, but the data from studies in Lithuania showed that knowledge and activities of healthcare professionals in promoting breastfeeding were insufficient (10). It is very important to improve training programs for health professionals, create optimal conditions for breastfeeding, and encourage mothers to breastfeed for the recommended duration.

Breastfeeding rates are also influenced by ethnicity and cultural attitudes, which differ both among and within countries (11, 12). Other factors including sociodemographic characteristics (mother's age, marital status, education, and duration of maternity leave), medical factors (maternity ward routines, mode of delivery, and woman's health), and mother's beliefs and attitudes related to breastfeeding, provision of support, and direct help from the family and the public seem to be important (13–15). The aim of the study was to identify the main factors associated with breastfeeding duration.

Material and Methods

Study Population. These analyses are based on a sample of mothers with babies attending one family health center in Kaunas, Lithuania. All the mothers (in total 200) who gave birth to live newborns from September 1, 2008, to February 28, 2009, were invited to participate voluntarily in our study. Written informed consent and the filled questionnaire were obtained from 195 mothers (response rate, 97.5%). Respectively, 1 year later (from September 1, 2009, to February 28, 2010), the same respondents (in total 195), who had 1-year-old children, answered the questions of the second questionnaire.

The ethical approval of the survey was obtained from the Bioethics Center of Kaunas University of Medicine (now Lithuanian University of Health Sciences), and the permission was received from the administration of Šilainiai Family Health Center.

Methods. Two original questionnaires (one given to the mothers after delivery and the other given to the same mothers 1 year later) were prepared according to the experience of Lithuanian scientists working in the field of breastfeeding (16–18). The questionnaires were anonymous. A pilot study was carried out in the same healthcare institution on August 8–9, 2008, i.e., 20 copies of the first questionnaire were distributed to the mothers who recently gave birth and 20 copies of the second ques-

tionnaire to the mothers having 1-year-old babies. The pilot study helped find out if the questions were intelligible for the respondents. The questionnaire was adjusted after the pilot study. Some questions were complemented with intermediate answers because part of the respondents could not indicate any answer from the given ones in the questionnaire. The first questionnaire consisted of 3 groups of the questions: general questions (mother's age, education, marital status, and parity), pregnancy-related questions (pregnancy planning, attendance of a school for pregnant women, and mother's health during pregnancy), and questions about delivery and maternity (mode of delivery, time of the first contact with the neonate, baby feeding type when leaving the maternity unit). The second questionnaire consisted of the questions about baby feeding during the first year of life: duration and mode of breastfeeding, breastfeeding at nighttime, introduction of fluids, giving pacifiers, and problems associated with breastfeeding (sore nipples, milk stasis, and mastitis). Finally, the mothers were asked if they addressed healthcare professionals for consultation when the quantity of milk in the breasts decreased and which source of knowledge about breastfeeding was the most important for the mothers. The majority of the questions of both questionnaires were close-ended, i.e., possible answers were given. Only a few questions could be answered freely indicating quantitative values, i.e., hours or months (e.g., breastfeeding duration). To avoid recall bias, some answers of the mothers were compared with the outpatient data records. The permission to use the outpatient data records during the survey was received from the Bioethics Center of Kaunas University of Medicine and from the administration of the Family Health Center. The outpatient data records were checked only if the mothers could not exactly answer the question about breastfeeding duration.

In order to determine the association between maternal sociodemographic factors and breastfeeding duration, the respondents were divided into 3 groups according to age (less than 20 years, 20–30 years, and 31–40 years old), into 4 groups according to the level of education (higher university, higher nonuniversity [college], secondary, and unfinished secondary education), and into 3 groups according to the marital status (married, living with a partner, and single).

The WHO has defined 3 types of breastfeeding: exclusive breastfeeding, breastfeeding, and predominant breastfeeding (19). The main outcome measure of this study was the duration of any breastfeeding during the first 12 months of life.

The duration of breastfeeding in months was calculated from the dates of babies' birth and the dates of breastfeeding cessation as stated by the mothers.

The respondents were divided into 3 groups according to breastfeeding duration: less than 3 months, from 3 to 5 months, and 6 months and longer.

In order to determine the association between the time of the first breastfeeding and its duration, the mothers were divided into 3 groups: the first feeding within 1 hour after the child's birth, 1 to 3 hours after the birth, and more than 3 hours after the birth.

Statistical Analysis. The answers to the survey questions were coded and entered to the SPSS 15.0 application. The distribution of qualitative variables was compared by the chi-square test (χ^2). The significance level $\alpha=0.05$ was chosen while testing the hypothesis.

Results

Sociodemographic Characteristics of Mothers. The respondents of different age, educational level, and marital status were surveyed in this study. The age of the respondents varied from 17 to 40 years. The distribution of the mothers according to the sociodemographic characteristics is shown in Table 1.

Table 1. Distribution of Respondents According to Age, Education, and Marital Status

Characteristic	No. (%)
Age, years	
<20	15 (7.7)
20–30	140 (71.8)
31–40	40 (20.5)
Education	
University	104 (53.8)
College	51 (26.2)
Secondary	37 (19.0)
Unfinished secondary	2 (1.0)
Marital status	
Married	161 (82.6)
Living with a partner	27 (13.8)
Single	7 (3.6)

Factors Associated With Breastfeeding Duration. It was established that 53.8% (n=105) of the surveyed women breastfed for 3–5 months, 29.7% (n=58) for 6 months and more, and 16.5% (n=32) of the respondents breastfed for less than 3 months.

The analysis of the association between the maternal age and breastfeeding duration showed that the oldest (31–40 years) women breastfed their babies significantly longer than the youngest (<20 years) ones. The percentage of the oldest women among the mothers who breastfed for 6 months and more was 3 times greater in comparison with that among the women who breastfed for less than 3 months (29.3% and 9.4%, respectively) (Table 2).

A significant relation was established between the maternal education and breastfeeding duration, i.e., the mothers with higher education breastfed their babies significantly longer than the less educated mothers (Table 2). There were 79.3% of the mothers with a university education among those who breastfed longer than 6 months and only 12.5% among the mothers who breastfed for less than 3 months.

The data of the survey showed a significant relation between the woman's marital status and breastfeeding duration; i.e., the married women breastfed longer than single or living with a partner (Table 2).

This childbirth was the first for more than half (56.9%) of the surveyed women. There was no significant relation between breastfeeding duration and parity.

The majority (75.9%) of the women reported that they had planned their pregnancy. There was a significant relation between breastfeeding duration and pregnancy planning. Almost two-thirds (59.4%) of the women who responded that they had not planned their pregnancy were in the group of the shortest breastfeeding duration, and only 17.2% of such women were among the women who breastfed longer ($\chi^2=26.036$, $df=4$, $P<0.05$).

Table 2. Distribution of Mothers According to Social Characteristics and Breastfeeding Duration

Characteristic	Breastfeeding Duration			
	Less than 3 months	3–5 months	6 months and more	
Age, years				
<20	34.3	3.8	0.0	$\chi^2=6.93$, $df=4$ $P<0.05$
20–30	56.3	77.2	70.7	
31–40	9.4	19.0	29.3	
Education				
Higher university	12.5	52.4	79.3	$\chi^2=78.96$, $df=6$ $P<0.05$
Higher nonuniversity (college)	15.6	33.3	19.0	
Secondary	65.6	14.3	1.7	
Unfinished secondary	6.3	0.0	0.0	
Marital status				
Married	50.0	85.7	94.8	$\chi^2=32.55$, $df=4$ $P<0.05$
Living with a partner	43.8	10.5	3.4	
Single	6.2	3.8	1.8	

Values are percentage.

The associations between the duration of breastfeeding and the mother's health during pregnancy, attendance of a school for pregnant women, and the time of the first breastfeeding did not reach statistical significance.

A total of 54 women (27.7%) gave birth naturally without anesthesia, 88 women (45.1%) with anesthesia, and 53 women (27.2%) had a cesarean delivery.

No significant association between the delivery mode and breastfeeding duration was established; however, there was a tendency noticed that the women who had a cesarean delivery breastfed shorter, i.e., there were twice more women who had a cesarean delivery among the women who breastfed for less than 3 months in comparison with the mothers who breastfed for up to 6 months and longer.

The study results showed an association between the breastfeeding mode and its duration, i.e., the mothers who breastfed on demand, fed their babies longer in comparison with the mothers who breastfed according to the timetable. There were significantly more women who breastfed following the timetable in the group of the shortest breastfeeding duration in comparison with the longest (37.5% and 1.7%, respectively) (Table 3).

The majority (n=147, 75.4%) of the mothers did not give extra fluids (water or tea) between feeds. An association between breastfeeding duration and giving extra fluids between feeds was determined, i.e., the mothers who did not give extra fluids breastfed longer than the mothers who gave them. The percentage of the mothers who did not give extra fluids between feeds was significantly greater in the group of the longest breastfeeding duration than in the group of the mothers who breastfed for 3–5 months (94.8% and 18.8%, respectively) ($\chi^2=74.6$, $df=1$, $P<0.05$).

Besides, two-thirds (n=123, 63%) of the mothers gave pacifiers to their babies. The women who did not give pacifiers breastfed significantly longer than the women who gave them ($\chi^2=57.86$, $df=2$, $P<0.05$). All the women who breastfed for less than 3 months responded that they had given pacifiers to their babies.

Many surveyed women had problems while breastfeeding: the majority (68.7%) of them had sore nipples, 30.8% of the respondents had milk stasis, and 8.7% had mastitis.

A significant relation between breastfeeding duration and sore nipples was observed ($\chi^2=29.247$, $df=4$, $P<0.05$). The percentage of the women who had sore nipples was 2 times greater in the group of the shortest breastfeeding duration than that in the group of the longest breastfeeding duration (90.6% and 43.1%, respectively, $P<0.05$).

A relation between milk stasis in the breasts and breastfeeding duration was determined. There were significantly more mothers who had milk stasis in the group of the shortest breastfeeding duration (65.4%) in comparison with the group of the longest breastfeeding duration (10.3%) (Table 3). The mothers who had mastitis breastfed their babies significantly shorter than the mothers who did not have it (Table 3).

More than three-thirds (75.4%) of the mothers breastfed their babies exclusively while leaving maternity home, 24.1% of them additionally gave formula, and only 1 (0.5%) mother answered that her newborn got only formula. The women who exclusively breastfed their newborns while leaving maternity home breastfed longer than the women who additionally gave formula, i.e., almost all the women (94.8%) who breastfed exclusively for 6 months and longer breastfed their newborns while leaving maternity home, and only 5.2% of those women ad-

Table 3. Distribution of Mothers According to the Characteristics of Breastfeeding and Breastfeeding Duration

Characteristic	Breastfeeding Duration			
	Less than 3 months	3–5 months	6 months and more	
Breastfeeding mode				
Feeding on demand	62.5	95.2	98.3	$\chi^2=36.93$, $df=2$ $P<0.05$
Feeding according to timetable	37.5	4.8	1.7	
Milk stasis				
Occurred	65.4	32.4	10.3	$\chi^2=30.58$, $df=2$ $P<0.05$
Did not occur	34.6	67.6	89.7	
Mastitis				
Occurred	25.0	8.6	0.0	$\chi^2=18.07$, $df=2$ $P<0.05$
Did not occur	75.0	91.4	100.0	
Feeding method while leaving maternity home				
Only mother's milk	37.5	76.2	94.8	$\chi^2=39.25$, $df=4$ $P<0.05$
Mother's milk and formula	59.4	23.8	5.2	
Only formula	3.1	0.0	0.0	

Values are percentage.

ditionally gave formula to their newborns (Table 3).

Only 44 (22.6%) surveyed mothers positively answered the question whether they asked healthcare professionals for consultation when the quantity of milk in the breasts decreased. For more than two-thirds (68.2%) of the women, the most important sources of knowledge about baby feeding were mass media (radio, TV, newspapers, and magazines). Only 21% of the respondents mentioned healthcare professionals.

Discussion

Breastfeeding duration depends on a number of determinants, some of which may be modifiable. These include traditional healthcare practices; influence of the family and friends; living environment; maternal education, employment, and workplace; and availability of breast-milk substitutes (11). The importance of various factors to the initiation and duration of breastfeeding can be different due to socioeconomic and cultural background.

Mothers vary by age, education, marital status, and previous breastfeeding experience. Literature provides the consistent results of a positive association between breastfeeding duration and maternal age (12, 20–22). Younger mothers are substantially less likely to breastfeed their infants than older mothers: 22% of mothers who were 19 or younger breastfed their infants for up to 6 months compared with 33% of mothers who were 20 to 29 and 51% of mothers who were 30 years and older in the United States (23).

A higher level of education seems to allow mothers to formulate right decisions regarding breastfeeding practices (23). The data of studies carried out in Canada showed that not completing a high school was a risk factor for early breastfeeding cessation (24). In the multivariate analysis, years of education were the only significant socioeconomic predictor of 6-month exclusive breastfeeding (12). The study conducted at the University of Edinburgh in 2008 showed that 86% of mothers having a degree and only 31% of mothers who did not have any degree had breastfed their children (25).

The results of our study confirmed literature data about the association between maternal age, education, and breastfeeding duration, i.e., young mothers with a lower education breastfeed their babies shorter in comparison with older and better educated mothers.

Women's perceptions of infant feeding are often formed before they become pregnant or give birth. Maternal knowledge about breastfeeding is strongly related to breastfeeding duration (23). The data of the study performed in the University of Edinburgh showed that 75% of mothers who attended antenatal classes went on to breastfeed in comparison with

51% of mothers who did not attend classes. This study found that antenatal classes tripled the chances of breastfeeding, regardless of such factors as age and education (25). Our study did not reveal a significant relation between the attendance of a school for pregnant women and breastfeeding duration, but only 28.7% of the mothers attended a school for pregnant women.

Health education programs that promote the benefits of breastfeeding need to target both men and women. Postpartum ward-level breastfeeding interventions, which combine support from a partner, are likely to be most effective in maintaining breastfeeding rates. Among mothers who provided any breast milk at 6 months, the partner and the family were reported as mothers' outstanding sources of breastfeeding support (24). The presence of the partner is likely to provide increased support for the mother: partnered women breastfed longer compared with single mothers (1, 12, 26, 27). According to the data of the United States Department of Health and Human Services, 82% of infants born in 2007 to married women were ever breastfed compared with 61% born to unmarried mothers. The difference was greater for breastfeeding at 6 and 12 months, i.e., married mothers were almost twice as likely as unmarried mothers to still breastfeed at those time points (23). The result of the present study is in agreement with the data of the mentioned studies, i.e., according to our data, the married women breastfed significantly longer than single mothers or women who lived with a partner. However, some studies failed to demonstrate this association (20).

Our survey showed a significantly positive relation between breastfeeding duration and pregnancy planning. The finding that pregnancy intentions are associated with breastfeeding outcomes appears to cut across cultures because it is fully consistent with previous findings from Ghana (28) and the United States (29). These studies indicated that children born from unplanned pregnancies were more likely to be breastfed for short duration. It is possible that women with unplanned pregnancies may experience psychosocial pressures and stresses that restrain them from following desirable public health behaviors and committing to breastfeed for a prolonged period. To our knowledge, only one study in Philippines negated these results (30). The authors concluded that there could be a few explanations of their results. Mothers with intended pregnancies are more likely to be emotionally ready; thus, they are more likely to provide their infants with needs they perceive to be "best." Although these mothers are informed on the benefits of breastfeeding, some believe it to be insufficient. On the other hand, a mother whose last pregnancy was unintended would

tend to practice lactational amenorrhea in order not to conceive again. Reproductive health services should be further strengthened by increasing the availability and the accessibility of effective family planning methods. However, prospective studies are needed to further understand if and how pregnancy intentions influence breastfeeding outcomes in different settings (29, 30).

According to literature data, the delivery mode and anesthesia have an influence on breastfeeding duration. Cesarean delivery influences breastfeeding duration due to later milk production, and epidural fentanyl can have an impact on infant's behavior. Results about the relationship between the type of delivery, anesthesia, and breastfeeding duration in literature are controversial. In a Canadian study, vaginal delivery was found to increase exclusive breastfeeding rates at 6 months by 25% as compared with a cesarean delivery (12, 31). The data of another study, however, are in disagreement about the relationship between the type of delivery and breastfeeding duration (32). The study about the influence of an epidural anesthetic during a vaginal delivery on breastfeeding duration revealed that women who received large doses of fentanyl breastfed shorter in comparison with women who received less fentanyl or no fentanyl (33). According to the data of another study, the breastfeeding success rate was high despite large doses of fentanyl (34). The data of the present study did not show a significant relation between the delivery mode and breastfeeding duration, but the tendency to breastfeed shorter was observed for the women who had a cesarean delivery.

The routines at maternity units, especially early contact between the mother and her infant, are very important for successful breastfeeding (1). According to literature data, the earlier breastfeeding starts, the longer the mother feeds her baby (16, 35). Although we did not find a significant relation between the time of the first breastfeeding and breastfeeding duration, the tendency was observed that the women who breastfed earlier for the first time had a longer lactation period.

Most observational studies have reported an association between the use of pacifiers and shortened breastfeeding duration (14, 36, 37). Our results have confirmed these data. Still, the data of 4 studies with the highest level of evidence do not support an adverse relationship between the use of pacifiers and breastfeeding duration or exclusivity (38).

Demand feeding that is a physiological prerequisite for breastfeeding is now becoming the norm. Exclusive breastfeeding fully satisfies the nutritional and fluid needs of most infants until the age of about 6 months. It is agreed that extra fluids and comple-

mentary feeding should not be offered routinely to babies until this age because of a negative impact on lactation (1, 5, 6). The results of our study coincide with literature data, i.e., the mothers who fed on demand and did not give extra fluids between feeds breastfed their babies longer.

There is strong evidence that conflicting advice from healthcare professionals is related to early cessation of breastfeeding (1). Our study showed that 24.1% of the mothers additionally gave formula while leaving maternity home and most of them breastfed for only up to 3 months.

Sore nipples and milk stasis in the breasts are common problems that occur among breastfeeding mothers. These conditions are not only uncomfortable for the mother and the baby but also have a negative impact on lactation (1, 14, 37). The results of our study confirm literature data, i.e., the majority of the mothers who had sore nipples, milk stasis, and mastitis breastfed for only up to 3 months.

Short hospital stays make the teaching of breastfeeding a challenge. Qualified support from primary healthcare professionals could encourage and help mothers continue successful breastfeeding after discharge from maternity home. However, our data showed that only 21% of the surveyed mothers asked for consultation with healthcare professionals. Most of the women (68.2%) said that they obtained the information about baby feeding from mass media.

In conclusion, the education of healthcare professionals who provide prenatal and postnatal care regarding the risk factors of short breastfeeding duration allows them to choose the target audience of women who need additional breastfeeding promotion, education, and support.

Conclusions

The findings of this study may have implications for the breastfeeding promotion program in Lithuania because they suggest that young (<20 years) women, living alone, and those with a lower level of education or with unplanned pregnancies are more likely to need additional breastfeeding support. Mothers at risk of short breastfeeding duration should be targeted as a group for breastfeeding promotion and education early in the pregnancy. This group of women and their family members should be well informed not only about the advantages of breastfeeding but also about the barriers and ways to overcome them. Further studies are needed to understand how pregnancy intentions influence infant feeding behavior.

Statement of Conflict of Interest

The authors state no conflict of interest.

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