

A STUDY OF THE FACTORS AFFECTING THE DURATION OF EXCLUSIVE BREASTFEEDING

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ABSTRACT

• **Objective:** This study aims to identify factors affecting the duration of exclusive breastfeeding during the first 6 months of life.

• **Material and Method:** The study was carried out on two groups of women, a study group of 125 women who received breastfeeding counselling voluntarily between July 2002 and June 2003, and a control group of 125 women who did not receive any counselling.

Hospital interventions during delivery, sociodemographic characteristics of the mother, support of the father and family members, antenatal education of the mother, are the factors evaluated for the duration of exclusive breastfeeding. The analysis was performed using the Cox regression method and significant hazard ratio values were used for analysis. The data evaluated in this study was approved by the Ethical Committee of The medical Faculty of Istanbul University (Nr. 21375).

• **Results:** At 6 months of age 57.6% of the infants from the study group and 11.2% from the control group were exclusively breastfeeding. When the two groups were evaluated together the leading factor affecting the duration of exclusive breastfeeding was found to be antenatal education ($p=0.036$). Within the first 6 months of life, the risk of stopping breast-feeding among mothers who did not receive antenatal education is 1.67 times higher than in those who had antenatal education.

• **Conclusion:** Our findings show that, the proportion of exclusive breastfeeding was significantly high in the study group. This difference became more significant among mothers who had antenatal education on breast-feeding. In conclusion, antenatal education and breast-feeding counselling seemed to be necessary for successful breast-feeding during the first 6 months of life.

• **Key Words:** Breastfeeding counselling, antenatal education, Cox regression analysis, hazard ratio. *Nobel Med 2009; 5(3): 53-57*

ÖZET

YALNIZ ANNE SÜTÜ İLE BESLENMEYİ ETKİLEYEN FAKTÖRLER

• **Amaç:** Bu araştırmanın amacı, ilk 6 ay yalnız anne sütü ile beslenme süresini etkileyen faktörleri incelemektir.

• **Materyal ve Metod:** Çalışma, Haziran 2002 ile Temmuz 2003 arasında gönüllü olarak emzirme danışmanlığı alan 125 anne ile emzirme danışmanlığı verilmiş 125 annenin yer aldığı kontrol grubunda yapıldı. Doğum sırasındaki hastane uygulamaları, annenin sosyo-demografik özellikleri, babanın ve aile bireylerinin emzirmeye desteği, annenin doğum öncesi eğitimi gibi özellikler yalnız anne sütü ile beslenmeyi etkileyen faktörler olarak değerlendirilecektir. Bu değişkenlerin yalnız anne sütüne etkisi Cox regresyon analizi ile değerlendirildi ve anlamlı olarak gözlenen değişkenlerin hazard ratio değerleri incelendi. Bu çalışmada, İÜ. Cerrahpaşa Tıp Fakültesi Etik Komitesi tarafından onaylanmış (Sayı=21.375) olan veriler ile uygulama yapılmıştır.

• **Bulgular:** Çalışma grubundaki bebeklerin %57,6'sının ve kontrol grubundaki bebeklerin %11,2'sinin, altı aylıkken yalnız anne sütü ile beslendikleri gözlemlenmiştir. İki grup değerlendirildiğinde, anne sütü ile beslenme süresini etkileyen başlıca faktörün, doğum öncesi eğitim olduğu bulunmuştur (p=0,036).

İlk altı ayda, yalnız anne sütü ile beslenmeyi bırakmanın riskinin, doğum öncesi emzirme eğitimi almayan annelerde, bu eğitimi alan annelerden 1,67 daha yüksek olduğu görülmüştür.

• **Sonuç:** Bulgularımıza göre, yalnız anne sütü ile beslenme, çalışma grubunda anlamlı olarak daha yüksekti. Bu farklılık, doğum öncesi emzirme eğitimi alan annelerde daha belirgindi. Sonuç olarak, doğum öncesi eğitim ve emzirme danışmanlığı, yaşamın ilk 6 ayında annesütüyle beslenmenin başarısı için gerekli gözükmektedir.

• **Anahtar Kelimeler:** Emzirme danışmanlığı, doğum öncesi emzirme eğitimi, cox regresyon analizi, hazard oranı. Nobel Med 2009; 5(3): 53-57

INTRODUCTION

Malnutrition has been responsible, directly or indirectly, for 60% of the 10.9 million deaths annually among children under five. Over two-thirds of these deaths, which are often associated with inappropriate feeding practices, occur during the first year of life. No more than 35% of infants worldwide are exclusively breastfed during the first four months of life and complementary feeding frequently begins too early or too late, and foods are often nutritionally inadequate and unsafe.¹ Breast milk is the natural first food for babies, it provides all the energy and nutrients that the infant needs for the first months of life, and it continues to provide up to half or more of a child's nutritional needs during the second half of the first year, and up to one-third during the second year of life. Breastfeeding is an unequalled way of providing ideal food for the healthy growth and development of infants; it is also an integral part of the reproductive process with important implications for the health of mothers. The World Health Organization (WHO) suggests that, for the first 6 months of life all infants should be on exclusive breastfeeding and that breastfeeding should be continued at least for 2 years.²

All around the world, projects to promote, protect and support breastfeeding in the community are developed by governments, WHO and UNICEF.^{2,3} Breastfeeding counselling is an important component of the activities

promoted by governments all around the world to promote, protect and support breastfeeding.^{1, 3} Developed the 40-hour Breastfeeding Counselling: A training course to train a cadre of health workers that can provide skilled support to breastfeeding mothers and help them overcome problems.

Such programs have been carried out in Turkey since 1991. The 40-Hour Breastfeeding-Counselling Program was also adapted to Turkey in 1994. First the counselling was done by a physician and two nurses trained for counselling. Since then, many health personnel such as physicians, nurses and midwives attended these courses in Turkey and offer breastfeeding counselling all over the nation. However, there are very few studies evaluating the impact of breast feeding counselling on exclusive breastfeeding rate.

MATERIAL and METHOD

This case-control study was conducted between July 2002 and June 2003 among mothers whose infants were on monthly follow-up at the Child Health Surveillance Clinic (CHSC) of the Istanbul Medical Faculty Hospital. The main source of clients for this clinic is women delivering at the University Obstetric Department adjacent to CHSC. Mothers giving birth at this hospital and particularly those attending CHSC are relatively homogenous in socio-economic and cultural level and the majority are from lower-middle class. →

Table 1: Duration of exclusive breastfeeding according breastfeeding counselling to status of the mother

Duration of breastfeeding	With breastfeeding counselling		Without breastfeeding counselling		χ^2
	n	%	n	%	
1 month	125	100.0	125	100.0	
2 month	125	100.0	117	93.6	0.26
3 month	123	98.4	104	83.2	1.59
4 month	92	73.6	39	31.2	21.44*
6 month	72	57.6	14	11.2	39.12*

For the number of mothers who stopped breastfeeding, $\chi^2=67.78$, $df=4$, $p<0.001$ * $p<0.001$

Table 2: Antenatal education and the risk of weaning.

Time period*	p	Exp (β) (OR)	Exp (β) for %95 CI	
			Lower	Upper
Maternal education less than 8 years	0.645	0.854	0.436	1.672
Maternal education between 9-11 years	0.111	0.677	0.419	1.093
Working mother	0.942	1.016	0.665	1.552
Normal spontaneous delivery	0.497	1.162	0.753	1.795
Antenatal education	0.036*	1.611	1.032	2.514
Conflicting advice	0.247	1.298	0.834	2.021
Breastfeeding after 2 hours of delivery	0.304	0.805	0.533	1.217
Help for breastfeeding in the maternity hospital	0.408	0.811	0.493	1.333
Rooming-in	0.568	1.414	0.431	4.640
Father support	0.488	0.873	0.595	1.281
Family support	0.236	1.291	0.846	1.971
Female sex	0.356	0.825	0.547	1.242

* $p<0.05$

Some of the mothers attended antenatal education classes conducted at the Woman and Child Health Education and Research Unit (WCHERU). This education program covers topics such as newborn care, woman's health after delivery, family planning and breastfeeding. Husbands could also attend the education program. The attendance was on a voluntary basis.

The study group consisted of 125 mothers who received breastfeeding counselling at WCHERU, and their infants. All the health personnel of WCHERU attended the 40-hour breastfeeding counselling courses. As a control group, 125 mothers who gave birth in the same period and who were not referred to WCHERU for breast-feeding counselling service were recruited. Data were collected from the records of the Child Health Surveillance Clinic (CHSC) and the breastfeeding-counselling forms.

The routine follow-up schedule of the CHSC by the trained paediatric health personnel starts at the age of 2 weeks and includes visits at 1, 2, 3, 4, 6, 9, 12 months. During each visit, the parents were asked to supply detailed information on the infant's feeding regimen, parent-child interaction, the baby's develop-

ment and on any health or other problems that may have come up since the last visit. In addition, mothers who had problems in feeding their infants, e.g. they could not breastfeed, were offered counselling upon doctor's suggestion or the mother's request, at WCHERU. A breastfeeding counselling form was filled for each woman. This form included questions like hospital interventions during delivery, sociodemographic characteristics of the mother, father's and family's opinions about breastfeeding, and the present breastfeeding problem and whether they had antenatal education on breastfeeding. Questions in this form were asked retrospectively to the mothers in the control group. Infants subject to research were from a regular pregnancy period without problems, born during the expected time and over 2500 grams at birth without any congenital malformation and disease. The duration of exclusive breastfeeding was recorded in infants' personal records at the Clinic. Infants who did not receive water and formula were accepted as being exclusively breastfed. Mother's sociodemographic characteristics and birth information were obtained from the Child Health Surveillance Clinic records. The mothers' educational levels were categorized as low (less than 8 years of education), middle (8-11 years of education) and high (more than 11 years of education). The data evaluated in this study was approved by the Ethical Committee of The medical Faculty of Istanbul University (Nr. 21375).

Duration of exclusive breastfeeding according breastfeeding counselling status of the mothers was analyzed using χ^2 . Breastfeeding-counselling, the type of maternity hospital implementations, the socio-demographic characteristics of the family and the presence of family support were taken as variables which may affect the duration of exclusive breastfeeding. The effects of these variables on duration of exclusive breastfeeding were analyzed using Cox regression. This model allows the covariates (independent variables) in the regression equation to vary with time.^{5,6} Statistical significance was taken as $p<0.05$.^{4,6} The duration of exclusive breastfeeding was analyzed as time variable and breastfeeding-counselling dependent. All other factors in this research were analyzed as independent variables. All independent variables were qualitative. For the first time, in a study on the factors affecting the duration of exclusive breastfeeding, the hazard ratio was included.⁵

The hazard ratio was estimated by the following equation: O1 (observed value) / E1 (expected value) divided by O2/E2.⁵ In our study, the hazard ratio or risk of the absence of the antenatal education on breast-feeding duration, in the case of mothers who stopped breastfeeding were compared with the case of those who still breastfed their infants. →

RESULTS

Infants whose mother's were subject to counselling were 4.2 ± 1.3 (median 4) weeks old. Sex distribution in the study and control groups were similar ($\chi^2=1.03$, $df=1$, $p>0.05$). The average age of the mothers was 25.50 ± 3.2 years in the study group and 26.01 ± 3.1 years in the control group. This difference was not statistically significant ($t(248)=1.279$, $p>0.05$). At the end of 4 months, the proportion of mothers who had exclusively breastfed their infants was 73.6% in the study group and 31.0% in the control group and the difference was statistically significant ($\chi^2=67.780$, $df=4$, $p<0.001$) (Table 1). The working status of the mother did not affect the duration of exclusive breastfeeding in the study group. On the other hand, the duration of breastfeeding was short if a mother in the control group was working, and this difference was statistically significant ($\chi^2=18.32$, $df=4$, $p<0.05$). No correlation was found between the duration of exclusive breastfeeding and the maternal educational status. However, in the study group the duration of exclusive breastfeeding was significantly high among mothers who had middle-level education ($\chi^2=158.54$, $df=6$, $p<0.05$) and in the control group this duration was significantly low among mothers whose education level was low ($\chi^2=122.09$, $df=4$, $p<0.05$). In the study group, 46.0% of the mothers who were directed by the health personnel exclusively breastfed their babies for 6 months ($\chi^2=21.49$, $df=3$, $p<0.05$), this ratio was 4.4% in the control group. ($\chi^2=38.46$, $df=4$, $p<0.05$). The duration of exclusive breastfeeding was short among infants who had received prelacteal feeding in the study ($\chi^2=33.58$, $df=3$, $p<0.05$) and in the control groups ($\chi^2=39.78$, $df=4$, $p<0.05$). The most important variable affecting the duration of exclusive breastfeeding was found to be antenatal education according to the analysis by Cox regression (Table 2). The effect of not having breastfeeding education during the time of weaning is interpreted with hazard ratio (Table 3). As a result, the absence of antenatal education increases the risk of weaning before 6 months, 1.67 times. This value is the same for weaning before 4 months of age.

DISCUSSION

Promotion, protection and support of breastfeeding, led to a gradual increase in the number of mothers who want to breastfeed their children. Similarly, the number of breastfeeding mothers who needed breast-feeding counselling increased.^{2,8} According to data obtained from the Turkish Population and Health Survey, the amount of infants who are on exclusive breastfeeding in the first month is 14%, whereas this decreases to 10% at the end of the third month.¹⁰ In this study, all mothers in the study group had exclusively breastfed

their infants for the first month and this ratio was 93.6% in the control group. But after three months, exclusive breastfeeding rate decreased to 73.6% in the study group and to 31.2% in the control group (Table 1).

The results of a national survey indicate that 1.8 % of all infants aged 6 months in Turkey are exclusively breastfed.¹¹ In this study, 57.6% of the infants in the study group and 11.2% in the control group were exclusively breastfed. The high values in the study group, could be related to the support of the Child Health Surveillance Unit to breastfeeding during the study period. In addition, some of the mothers had antenatal education on breastfeeding and this could also increase the percentage of exclusively breastfed babies. The results of another study from Turkey pointed out that mothers who had counselling after delivery, breastfed their infants for a longer time.¹²

In literature, it is frequently stated that the encouraging behaviours of doctors and nurses about breastfeeding immediately after delivery have influenced mothers and led them to breastfeed their infants.^{13,14} According to our results, the duration of exclusive breastfeeding both in the study and the control groups was positively affected by breastfeeding-counselling.

In our study, with respect to breastfeeding counselling, when all the factors affecting exclusive breastfeeding duration in the first 6 months were evaluated, antenatal education was found to be significant (Table 2). Akram et al. reported that health education programs in the antenatal period as well as after delivery could promote exclusive breastfeeding practices.¹⁵ In another study, antenatal education was associated with increased rates of prolonged breastfeeding, possibly due to increased patient confidence in their choice.¹⁶ There is also some evidence pointing to the possibility of antenatal education being helpful especially to primigravida women. It was also declared that antenatal education might be more effective if the person(s) who could influence a mother's decision to breastfeeding is/are also included in the antenatal education program.¹⁷ Kistin et al shows the positive effect of prenatal education on breastfeeding in low-income women¹⁶, while Kaplowitz has mentioned the increase of knowledge through pamphlets. But the increase in knowledge did not improve the attitudes towards breastfeeding.¹⁵ Shrima et al draw attention to the fact that exclusive breastfeeding is not a traditionally recognized practice in general and that its duration is mainly associated with knowledge and information about breastfeeding.¹⁷ We report in this study on the importance of antenatal education in improving the attitude towards exclusive breastfeeding, for the first 6 months of life. According to the findings of this study, the risk of breastfeeding →

termination (HR) before 6 months among mothers who did not have antenatal education was 1.67 times higher than among mothers who had antenatal education (Table 3). In a systematic review, all forms of extra support were found to be beneficial in stopping any breastfeeding before six months of age.¹⁸ In this meta-analysis the effect of extra professional support to exclusive breastfeeding did not have a full statistical significance.¹⁸ It was concluded that further trials were required to evaluate the effectiveness of lay and professional support on breastfeeding. Studies on the benefits of antenatal education were carried on groups ranging between 40-130 women and focused on breastfeeding. One study was carried out on 735 women³ but was not on exclusive breastfeeding. To our knowledge this is the only study on exclusive breastfeeding. According to our results, antenatal education and breastfeeding counselling after delivery will significantly increase the proportion of infants who were exclusively breastfed during the first six months. This study had some limitations though. It was structured as a case-control study and some data for the control group was obtained retrospectively, the socio-economic level of the mothers in this study is not representative of the general population. Maternal education is relatively higher than the general level. The variables determined in the case-control studies which are planned to demonstrate the effect of breastfeeding counselling on breastfeeding duration are generally evaluated by performing analyses taking into account a single factor only. In most fields of science, a number of factors affect the course of events. In the

Table 3: Antenatal education and the risk of weaning.

Time period*	Women at risk antenatal education			Observed number of weaning women antenatal education			Expected number of weaning women antenatal education		
	Yes	No	Total	Yes	No	Total	Yes	No	Total
Exclusive breastfeeding									
1 month	124	126	250	0	8	8	3.96	4.04	8
2 months	124	118	242	1	14	15	7.68	7.32	15
3 months	123	104	227	53	43	96	52.01	43.99	96
4 months	70	61	131	13	32	45	24.04	20.96	45
6 months	70	61	131	13	32	45	24.04	20.96	45

Hazard Ratio = 1.67 (5) *Time period evaluated in months

statistical methods developed recently in the field, only odds are given (OR=Exp.≤). In this study, Cox regression analysis was performed to evaluate all factors dependent on time. The negative effect of the absence of factors bound together (HR) is important, and should be stated for applications. The results of our study with this method are impressive. During our literature research, we could not find any study that has been set up in this manner on breastfeeding. In this perspective, our research method can be a starting point for further research projects.

The higher educational level of the mothers involved in this study compared to the general population and their socio-economical situation, as well as analyzing the working data for 4-15 months babies retrospectively, may be seen as factors decreasing the validity of the obtained results. We think however, that because our study was concerned exclusively with breastfeeding, it would be a contribution to other workers in that field.



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