UNIVERSITY OF THESSALY

MEDICAL SCHOOL

- MSc

Research Methodology in Biomedicine, Biostatistics and Clinical Bioinformatics

Assess the association of the duration of breastfeeding (any and exclusive) of mother-infant dyads in General hospital of Trikala from January 2015 until December 2016 with mothers' age, cesarean section, number of births.

Also assess the relationship of the choice of breastfeeding (partial or exclusive) with the specification factors below a) mothers' satisfaction b) home help c) information about breastfeeding

Αξιολογήστε τη συσχέτιση της διάρκειας του θηλασμού (μικτού και αποκλειστικού) των μητέρων-βρεφών στο Γενικό Νοσοκομείο Τρικάλων από τον Ιανουάριο του 2015 έως τον Δεκέμβριο του 2016 με την ηλικία των μητέρων, η καισαρική τομή, ο αριθμός των γεννήσεων.

Αξιολογεί επίσης τη σχέση της επιλογής του θηλασμού (μικτού ή αποκλειστικού) με τους παρακάτω προσδιοριστικούς παράγοντες α) την ικανοποίηση των μητέρων β) την βοήθεια στο σπίτι γ) την ενημέρωση για το θηλασμό

Επιβλέπων/Επιβλέπουσα:

Χρήστος Χατζηχριστοδούλου (xhatzi@med.uth.gr)
Δοξάνη Χρυσούλα
Στεφανίδης Ιωάννης

Chrysoula Papachristou MD, IBCLC, Pediatrician

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INTRODUCTION: Breast milk is the best food for the baby, especially during the first months of life. Exclusive breastfeeding is difficult to achieve.

PURPOSE: The purpose of this retrospective study is to record the frequency of breastfeeding for the first 6 months of life and the factors that contribute to the establishment and continuation of this.

METHODS: We performed a retrospective study using a telephone questionnaire to all mothers who gave birth at the obstetrics clinic of General Hospital of Trikala from January 2015 to December 2016.

RESULTS: Data were collected from 268 mothers. About 84,87% begun to nurse after birth, 37,64% of mothers continued with exclusive or partial breastfeeding up to 6 months, while 33,58% continued with exclusive breastfeeding up to the sixth postpartum month. Mothers who adopted lactation exclusively declared very well informed about the process ($p<0.001$). Home help seems to play a role in the choice of exclusive comparing with partial breastfeeding ($p=0,016$).

CONCLUSION: It appears that on the part of mothers there is strong interest in the initiation and establishment of breastfeeding. Almost all of the mothers who breastfeed up to sixth postpartum months continue with exclusive breastfeeding. The overall breastfeeding rates decline.

ΕΙΣΑΓΩΓΗ: Το μητρικό γάλα είναι καλύτερη τροφή για το μωρό, ειδικά κατά τους πρώτους μήνες της ζωής. Ο αποκλειστικός θηλασμός είναι δύσκολο να επιτευχθεί.

ΣΚΟΠΟΣ: Σκοπός αυτής της αναδρομικής μελέτης είναι η καταγραφή της συχνότητας του θηλασμού για τους πρώτους 6 μήνες της ζωής και των παραγόντων που συμβάλλουν στη δημιουργία και συνέχιση αυτού.

ΜΕΘΟΔΟΙ: Εκτελέσαμε μια αναδρομική μελέτη χρησιμοποιώντας ένα τηλεφωνικό ερωτηματολόγιο σε όλες τις μητέρες που γεννήθηκαν στην μαιευτική κλινική του Γενικού Νοσοκομείου Τρικάλων από τον Ιανουάριο του 2015 έως τον Δεκέμβριο του 2016. ΑΠΟΤΕΛΕΣΜΑΤΑ: Συλλέχθη-

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καν δεδομένα από 268 μητέρες. Περίπου το 84,87% άρχισε να θηλάζει μετά τη γέννηση, 37,64% των μητέρων συνέχισαν με αποκλειστικό ή μικτό θηλασμό έως και 6 μήνες, ενώ το 33,58% συνέχισε με αποκλειστικό θηλασμό μέχρι τον έκτο μήνα μετά τον τοκετό. Οι μητέρες που υιοθέτησαν τη γαλουχία αποκλειστικά δήλωσαν πολύ καλά ενημερωμένες σχετικά με τη διαδικασία ($p < 0{,}001$). Η βοήθεια που είχαν στο σπίτι φαίνεται να παίζει ρόλο στην επιλογή του αποκλειστικού σε σύγκριση με τον μικτό θηλασμό ($p = 0{,}016$). ΣΥΜΠΕΡΑΣΜΑ: Φαίνεται ότι από την πλευρά των μητέρων υπάρχει έντονο ενδιαφέρον για την έναρξη του θηλασμού. Σχεδόν όλες οι μητέρες που θηλάζουν έως και τους έξι μήνες μετά τον τοκετό συνεχίζουν με αποκλειστικό θηλασμό. Το συνολικό ποσοστό θηλασμού μειώνεται.

INTRODUCTION: Breastfeeding (BF) is the most nutritional food for the newborns for the first 6 months of life since it provides components that are precious for their optimal development and their immune system. This happens when exclusive breastfeeding (EBF) is achieved at least for 5 months.[1-2] The protection of exclusive breastfeeding can be considered "dose-dependent" since infants who breastfed exclusively six instead of four months had a lower probability of respiratory infection. [3-4]

Exclusive breastfeeding (EBF) is defined as “infants’ consumption of human milk with no supplementation of any type (no water, no juice, no human milk, and no foods) except for vitamins, minerals, and medications until six months”. [1-2] The WHO (World Health Organization) recommends that infants should exclusively breastfeed for the first six months of life in order to achieve optimal growth, development and health.[5]

In the USA the percentage of EBF at six months is as low as 24.9%. [6] In Canada, breastfeeding intention (90.0%) and initiation (90.3%) rates were high, although exclusive breastfeeding rates at 6 months after birth were lower than desirable (14.4%).[7] In many European countries,

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there are hospital systems that provide help, information, and guidance to mothers in order to establish and achieve exclusive breastfeeding. In Sweden, in the year 2015, 74% of infants were breastfeeding at four months of age and 63% at six months of age. At the age of one week, 95% of the infants were breastfeeding and nearly 78% were exclusively breastfed.[8] On the contrary in Ireland, breastfeeding rates are amongst the lowest in Europe .[9]

In Greece, according to the national public survey BF rate in 2009 was 22% at six postpartum months. The initiation of any BF was 87% but only 41% of mothers were exclusively breastfeeding their babies. At six months old the percentage of EBF dropped below 1% .[10] These findings are extremely disappointed. The aim of this study was to record the profile of mothers as far as the initiation and duration of BF and EBF are concerned in Trikala Hospital. Also to review the available evidence regarding reasons for not beginning and reasons for interrupting BF. Additionally, we attempted to measure how three specification factors, information, home help and satisfaction influence BF, in order to suggest to most appropriate strategy to support BF.

Abreviations BF= breastfeeding, EBF= exclusive breastfeeding

METHOD: During the years 2015 and 2016, about 456 women gave birth at the maternity clinic of Trikala hospital. The study population considered of mothers who delivered a healthy infant (gestational age>36 weeks). Mothers that their infants were transferred to the intensive care unit were not considered eligible for the study. All women included in our study, either they had the cesarean section or not. There was no ethnicity exclusion, apart from gypsies because of no cooperation at the follow up.

Ultimately, we collected data from 268 women,59% participation rate. The average age was 31,16 years.

AGE

Descriptive Statistics

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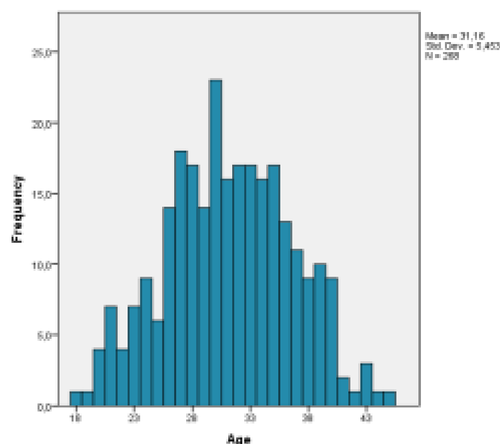
	N	Minimum	Maximum	Mean	Std. Deviation
Age	268	18	45	31,16	5,453
Valid N (listwise)	268				



Mothers stayed 3 to 4 days at the maternity clinic, with their newborns and received the same professional help from the midwives of the department as far as the breastfeeding is concerned. They had the first touch with their baby 1 to 2 hours after giving birth and had the chance to immediately start breastfeeding after birth, according to their will. They all lived in Trikala and did not have any kind of professional help apart from that received in our clinic.

The retrospective study was conducted using a telephone questionnaire to all mothers who gave birth at the obstetrics clinic of Trikala Hospital from January 2015 to December 2016. Maternal race, age and the address were obtained from maternal questionnaires administered before delivery and via maternal and infant records.

The questionnaire included information about breastfeeding initiation as far as the duration of it, after leaving the maternity clinic, the type of BF (EBF or partial BF) and some specification factors that we wanted to measure and figure out the way they influence mothers' decision about breastfeeding choices.

Initiation of BF included information about the reasons for not choosing to breastfeed their babies in the first days of life. They were also asked about the duration and the reasons for inter-

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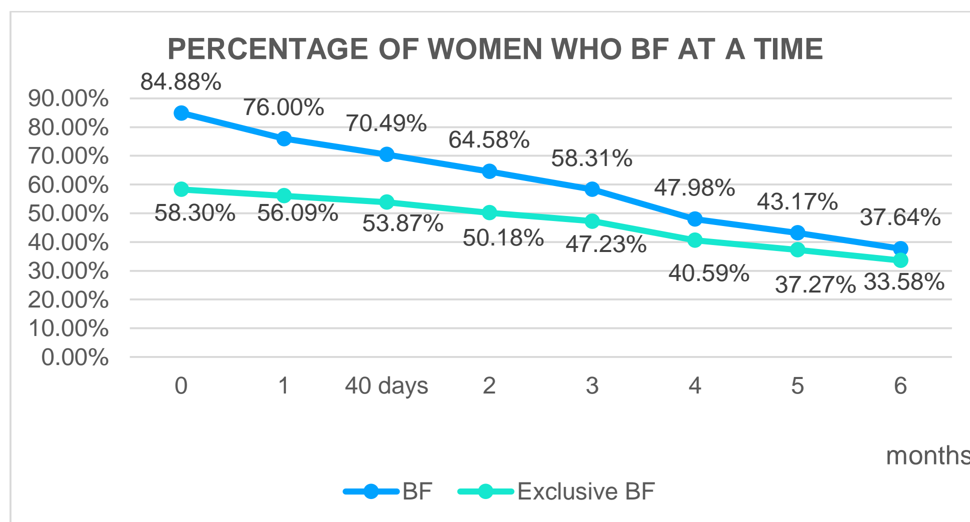
rupting BF. At this point, mothers were asked about three specification factors. These factors included information and guidance they had about the principles of BF, mainly from our nursery department during their stay after giving birth, the help they received while at home and the level of satisfaction they had during breastfeeding. For this reason, we asked them to complete a questionnaire. In order to measure these specification factors, we asked them to rate these in a scale from 1 to 5. One accounts for not receiving information or home help and 5 for having very much of each.

1	2	3	4	5
NONE	LITTLE	NEUTRAL	A LOT	VERY MUCH

RESULTS

Initiation rate for BF was 84,87%, with 58,3% of mothers exclusively breastfeeding their babies.BF rates decline to 64,58% in 2 postpartum months, (**20,29%** drop), 58,3% at 3 months, 37,64% at 6 postpartum months. As far as EBF is concerned, the percentage of mothers who choose to exclusively breastfeed their babies decline to 47,2% at 3 months and to 37,2% at 5 months, reaching 33,5% at 6 months.



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Fourteen percent of mothers did not start BF, 38 women out of 268. Most of them, (n=10) said that this was a personal choice, while others referred nipple problems (n=10), 'did not have milk'(n=5), baby could not find nipple (n=2), reasons that had to do with mothers' health (n=3), babies' health problems (n=2) and mothers' postpartum depression (n=2), other reasons like I do not want to answer, I do not know, family problems (n=5).

The discontinuation of BF in the next months was reported, with the most frequent reasons problems of milk supply referred as 'baby was hungry' (29%) or 'did not have enough milk' (21%) according to mothers, painful nipples (12%), tiredness (11%) and work (11%) are the next more frequent reasons for interrupted BF

INTERRUPTION	160 n%
Baby was hungry	46 (28,75)
Did not have milk	33 (20,62)
Painfull nipples	19 (11,87)
Getting back to work	18 (11,25)
Getting tired, getting bored	17 (10,62)
Mothers' health problems	8 (5)
Babys' health problems	4 (2,5)
I did not know how	3 (1,87)
Baby did not want	3 (1,87)
Baby could not	3 (1,87)
Other	6 (3,75)

As far as the percentage of the cesarean section in our sample is 62,3%

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09/06/2024 18:04:22 EEST - 18.217.164.153

	Frequency	Percent
missing	8	2,6
CT	167	62,3
CHILD BIRTH	93	35,1
Total	268	100,0

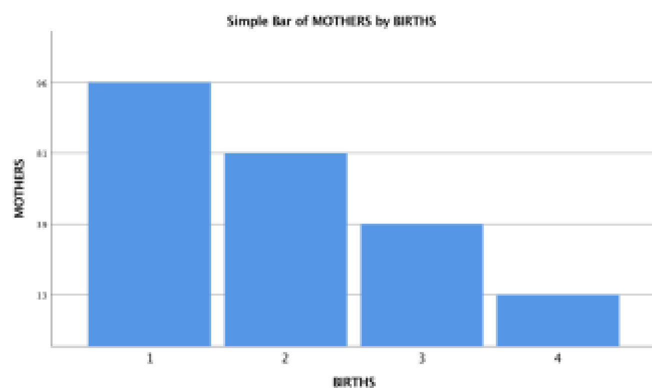
Count

		BF		Total
		PARTIAL	EBF	
	CT	49	95	144
	Normal birth	23	62	85
Total		72	157	229

Chi-Square Tests = 1,274 p value =0,272. ***NOT*** **SIGNIFICANT**

There is no correlation between birth type (cesarean section or normal child birth) and the choice of women to breastfeed exclusively or partially.

The distribution of birth order of children within the family is displayed by the following table and is given by the relative bar chart.



Count

	BF	Total

		PARTIAL BF	EBF	
NUNBER OF BIRTHS	1ος	35	61	96
	2ος	23	58	81
	3ος	11	28	39
	4ος OR next	3	10	13
Total		72	157	230

Chi-Square Tests = 2,797, p value =0,496. ***NOT*** **SIGNIFICANT**

There is also no difference in the percentage of EBF according to the birth order of the child. (p=0,496).

information

Information that mothers had from maternity clinic is related to BD. Overall 80,13% of mothers EBF said that they were a lot or very much informed about BF, comparing with those partially BF and only 48% reported they had this good information.

		BF		Total
		EBF	PARTIAL BF	
INFORMATION	1-3	33	37	70
	4-5	125	35	160
Total		158	72	230

Chi-Square Tests = 21,736 , p value= <0,000. **SIGNIFICANT**

Mothers well informed were more likely to adopt EBF rather than those with little or no information(p<0,000).

Home help

Exclusive BF was measured in accordance to if mothers had help at home. About 62% of wom-

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09/06/2024 18:04:22 EEST - 18.217.164.153

en adopted EBF rated ‘home help question’ with 4 or 5, which accounts for having very much help at home and only 38% did not have help enough (1-3 rate). Of mothers partially BF 45% had little or no help (1-3),while 55% had more help (rates 4-5). Comparing these results it seems that home help plays an important in the decision of EBF or partial BF (p=0,013).

Crosstab

Count

		HOME HELP		Total
		1-3	4-5	
	EBF	60	98	158
	PARTIAL BF	40	32	72
Total		100	130	230

Chi-Square Tests = 6,221, p value =0,013 **SIGNIFICANT**

Procedure

Mothers who exclusively breastfed report a higher percentage (69.87%) that they were 'more or less' pleased with the procedure compared to women who breastfed who reported that they were 'more or less' happy with the procedure 64 %. However, the difference is not statistically significant (p = 0.169)

Crosstab

Count

		BF		Total
		EBF	PARTIAL	
PROCEDURE	1-3	49	29	77
	4-5	109	43	152
Total		158	72	230

CONCLUSIONS

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The present study sample comprising mothers, who were recruited in a maternity ward of Trikala Hospital, indicated that a high percentage of mothers start to breastfeed. The initiation rate of any breastfeeding among the interviewed mothers was high, with more than half of them practicing EBF. There is a 47% drop for BF rates in the sixth postpartum months - from 84,9% to 37,64%. This drop recorded shows that many things can be done in order to increase the number of women that do not interrupt BF in the first postpartum months. The lack of breast-feeding friendly hospital practices has been consistently identified as detrimental for BF.[12,19]

EBF rates account for more than half of the mothers at the beginning. That means that more than 1 in 2 women choose to exclusively breastfeed even in a not baby friendly hospital. Although there is a decline in the next months, this is relatively limited, since at six months 33,5% continue with EBF (32,6% instead of 48,7% drop in any BF at six months). In comparison with the national survey, EBF at six months is below 1%. Exclusive and any BF rates were also reported in previous Greek studies, but the respective percentages were lower .[13]

If we compare the interruption rates between the EBF babies and the BF babies, we see that it is more likely for a mother not exclusively breastfeeding to stop BF rather than a mother who starts with EBF at the beginning, something that has been reported in other studies too.[14] In other words, more babies who were partially breastfeeding stop to breastfeed, compared to their exclusively breastfed counterparts, from the first until the sixth postpartum month. This, in turn, might suggest that promoting exclusive breastfeeding may be a good strategy to avoid early weaning. The protection of exclusive breastfeeding can be considered "dose-dependent", since infants who breastfed exclusively 6 instead of 4 months had a lower probability of respiratory infection .[3,4]

However, Bakoula et all concluded that women in Greece seemed capable of overcoming formula supplementation in the hospital environment and could revert to exclusive breastfeeding at home. [12] Hence, it can be postulated that mothers who choose to continue breastfeeding in this study possess the determination to overcome the related obstacles.

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The main reason for not beginning BF seems to be 'personal reasons', which makes the initiation of BF a personal choice - 10 out of 38 (25,6%). Among women who did not initiate breastfeeding, the most frequent reason given was not liking breastfeeding (48.2%), followed by returning to work or school (29.9%). [31]

On the contrary, women who start to breastfeed their babies decide to stop because of a sense of inadequacy in milk production. It should also be mentioned that the majority of mothers in the present study (50%) reported that the main reason for the cessation of breastfeeding was the production of inadequate milk volume. This belief is erroneous from a scientific point of view, as various studies have determined that less than 5% of mothers do not seem able to meet the goals regarding the appropriate weight gain of their infant, because of inadequate milk production. [15-18]

In Netherland's, 51,7% of women mentioned that one of the reasons for interrupted BF was that "I didn't have enough milk". The perception of their child's dissatisfaction with breastmilk alone and concerns about milk supply were both consistently cited as important reasons for stopping.[18] Inadequate milk production is also reported in rates close to 50% as the most important reason for the interruption in other studies too.[14,32]

It is essential to promptly identify the risk variables associated with the early interruption of EBF, thereby contributing to the efficacy of intervention measures for the support of EBF during the first six months after birth. [32,39] When a mother does not have confidence that she is providing an adequate quantity of milk for her infant, she is prone to consider stopping BF to feed his baby 'properly'. This finding is important in terms of intervention since guidance and information could help mothers feel less anxious and worried about feeding their babies. I could say that the benefits of BF, as they have scientifically been acknowledged and the absolute superiority in comparison with formula could be the answer to this feeling. [2,21] Thus, information is a field that can be improved, such as strategic intervention implementation in order to promote and improve BF rates. This can happen by solving problems and supporting mothers in practical matters

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09/06/2024 18:04:22 EEST - 18.217.164.153

such as in misconception matters too [22]. Women should receive anticipatory guidance while still in the hospital on how to prevent or manage common breastfeeding problems .[37]

During the first postpartum days, health care providers' skills, knowledge, attitudes towards BF, as well as their ability to transfer these skills to new mothers, can significantly influence breastfeeding experience. [38] The length of BF duration may further increase if mothers receive appropriate guidance from health professionals .[22]

We compared BF rates with national survey rates (2009). The initiation rate was higher reaching 89% in 2009 and it was 84,9% in Trikala the first day. In Trikala General hospital, the BF rate at 6 months was 37,4%. The interesting thing is that almost all of them 33,5%, were exclusively BF, while nationally in 2009 EBF is below 1%.

Comparing the new national survey, just released in March 2018, there was a large increase of the exclusive breastfeeding rates up to the 4th month of life - 24,5% from 8,7% in 2009- but at the end of the 6th month in both studies, the percentage of exclusive breastfeeding was found <1%. In both studies, the main reason for stopping breastfeeding or milk deficiency is reported .[36,10]

Despite the significant increase in EBF seen in the current study at breastfeeding indicators, these are far from the targets set by the WHO for exclusive breastfeeding (50% at the end of the 6th month until 2025).[29] According to recent epidemiological data from 21 European countries and the WHO, only 13% of infants were breastfeeding exclusively during the 6th month, with a significant reduction in rates between the 4th and 6th month. The rate of exclusive breastfeeding at the 6th month ranges, thus in the countries with available data is from 1% in the United Kingdom, 7% in Sweden, 14% in Norway to 49% in Slovakia. [30]

Breastfeeding is not fully protected and supported as expected, and a number of important international public health initiatives were endorsed by the World Health Organi-

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09/06/2024 18:04:22 EEST - 18.217.164.153

zation and the United Nations International Children's Emergency Fund in order to protect and support breastfeeding. [24-28] In our survey, we concluded that it is very important to protect and support BF initiation, so that by 2020 reach the healthy target rate 60,5% BF at 6 months [23] and consider the implementation of '10 steps of baby-friendly hospitals'[22] and at the same time promote the continuation in the next postpartum months. [27-28]

As we can see the decline of BF rates is more in the first 2 months of life, 20,3 % drop, so the first intervention steps should be done in this postpartum period. Early breastfeeding cessation is commonly influenced by inadequate milk supply, latching difficulties, and painful breasts or clogged milk ducts .[33] Fears of inadequate milk supply, painful breasts, and latching difficulties can be addressed through patient education .[34]

Apart from this, the specification factors that we measured help us understand how mothers perceive BF issues from their perspective. Information that mothers had from maternity clinic is related to BF. The more informed women were the better the BF rates. Mothers well informed were more likely to adopt EBF rather than those with little or no information(p=0,000). Hospital policies play an important role in promoting breastfeeding [32], such as indicated by the information women get from the maternity staff. Our results suggest that it is useful for hospital staff to provide mothers with information about breastfeeding and show mothers how to breastfeed. This kind of help make mothers feel more comfortable with BF the first days of life and increase the possibilities of initiation such as the duration of it.

The Baby-friendly Hospital Initiative, which aims to ensure that every baby is given the best start in life by creating environments where breastfeeding is accepted as the norm (World Health Organization, 2006), has to become a high priority activity in Trikala hospital and birth centers at the Greek health system overall.

Any intervention towards this direction could improve EBF rates. This, in turn, might suggest that promoting EBF may be a good strategy to avoid early weaning. Helping mothers in Greece is happening in a traditional way, according to which grandmothers and family members help

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mothers. The intervention has to be organized from the health department with the participation of specialists in order to promote and support BF. Throughout the literature, a recurring factor that influences a woman's decision to breastfeed is the presence of a support system, whether it is personal or professional.[35] In fact, support systems may be a greater influence than socioeconomic status; according to our findings home help affects exclusive bf rather any BF decision .[37]

EBF should become the optimal goal, in order to promote BF rates. Since the BF initiation rates are high, that is a good start to reinforce and promote strategies for BF. Interruption reasons show an inadequacy in BF education. Based on the positive data emerging from the public awareness campaign in different Countries of the world, and based on our compared and analyzed findings of our study, we strongly encourage an accurate training for all healthcare providers in maternity services and the adoption of adequate facilities in order to support breastfeeding and subsequently improve BF rates in the future.[38] Women should receive anticipatory guidance while still in the hospital on how to prevent or manage common breastfeeding difficulties .[37] This tuned strategy intervention seems to be of great importance for the substantial improvement of breastfeeding duration.

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