

Prevalence and Predictive Factors of Exclusive Breastfeeding in the First Six Months of Life

Prevalência e Fatores Preditivos do Aleitamento Materno Exclusivo nos Primeiros Seis Meses de Vida

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Acta Med Port 2023 Jun;36(6):416-423 • <https://doi.org/10.20344/amp.18692>

ABSTRACT

Introduction: Exclusive breastfeeding (EBF) is currently recommended until six months of age. The Baby-friendly Hospital (BFH) initiative an international program to promote breastfeeding, was launched in Portugal in 1994. The aim of this study was to identify the prevalence and factors influencing breastfeeding in the first six months of life and to compare the results with a study carried out in 1999 including population from the same geographic area.

Methods: A prospective, longitudinal and observational study was carried out in two hospitals in the Lisbon metropolitan area, one BFH and another non-BFH. It consisted of different questionnaires answered by mothers at three distinct moments (zero, three and six months). The first questionnaire was applied between February and June 2019.

Results: A total of 423 infants were included, 324 from the BFH and 99 from the non-BFH. The breastfeeding rate was 94.3% at discharge, 78.2% at three months and 64.4% at six months, whereas EBF rate was 74.2%, 51.8% and 25.6% respectively. All women on EBF at six months, except one, were breastfeeding on demand. The discontinuation of EBF was associated with delayed skin-to-skin contact, Neonatal Intensive Care Unit admission, pacifier and artificial teats use, mother's return to work earlier and lower education levels. Conversely, factors that promote EBF were older gestational age, adequate birthweight, breastfeeding initiation in the first hour of life, rooming-in practice, shorter hospital stay and absence of infant's illnesses. Compared with 1999, although there was a significant improvement of breastfeeding rates at three and six months, the EBF rate was similar at six months (23%). Both studies identified the mother's lower education level and mother's return to work as contributing factors to breastfeeding discontinuation.

Conclusion: Our results are in agreement with previously reported causes of breastfeeding discontinuation and emphasize the importance of socio-cultural factors. Compared with 1999, the breastfeeding rates in this Portuguese population increased significantly at three and six months. However, it is still necessary to improve in order to achieve the World Health Organization global target.

Keywords: Breast Feeding; Infants; Mothers; Portugal

RESUMO

Introdução: O aleitamento materno exclusivo (AME) é recomendado até aos seis meses de idade. A iniciativa Hospital Amigo dos Bebés (HAB) é um programa internacional de promoção do aleitamento materno lançado em Portugal em 1994. O objetivo deste estudo foi identificar a prevalência e quais os fatores que influenciam o aleitamento materno nos primeiros seis meses de vida e comparar os resultados obtidos com um estudo decorrido na mesma área metropolitana em 1999.

Métodos: Foi desenvolvido um estudo prospetivo, observacional e longitudinal em dois hospitais da área metropolitana de Lisboa, um HAB e outro não-HAB. Consistiu em três questionários diferentes preenchidos pelas mães aos zero, três e seis meses de idade. O primeiro questionário foi aplicado entre fevereiro e junho de 2019.

Resultados: Foram incluídos 423 recém-nascidos, 324 do HAB e 99 do não-HAB. A taxa de aleitamento materno foi 94,3% à alta da maternidade, 78,2% aos três meses e 64,4% aos seis meses, enquanto a de AME foi 74,2%, 51,8% e 25,6% respetivamente. Todas as lactantes em AME aos seis meses amamentavam em regime de horário livre, à exceção de uma. O abandono do AME esteve associado ao atraso do contacto pele-a-pele, admissão na Unidade de Cuidados Intensivos Neonatais, uso de chupeta e mamilos de silicone, regresso antecipado das mães ao trabalho e nível educacional materno mais baixo. Contrariamente, os fatores que promoveram o AME foram idade gestacional superior, adequado peso ao nascimento, início do AM na primeira hora de vida, prática de *rooming-in*, internamento hospitalar mais curto e ausência de doença neonatal. Em comparação com o estudo de 1999, apesar de uma melhoria significativa da taxa de AM aos três e seis meses, a prevalência de AME foi semelhante aos seis meses (23%). Ambos os estudos identificaram como fatores que contribuem para o abandono do aleitamento materno o menor nível educacional materno e o regresso antecipado da mãe ao trabalho.

Conclusão: Os nossos resultados confirmam as causas de abandono do aleitamento materno reportadas anteriormente e realçam a importância de fatores socioculturais. Em comparação com 1999, a taxa de aleitamento aos três e seis meses aumentou significativamente em Portugal. Contudo, é necessária maior otimização para atingir o objetivo proposto pela Organização Mundial de Saúde.

Palavras-chave: Aleitamento Materno; Lactentes; Mães; Portugal

INTRODUCTION

Breastmilk is undoubtedly the most complete and adequate nutrient for infants. Exclusive breastfeeding (EBF) is currently recommended until six months of age by the World Health Organization (WHO), the European Society

for Pediatric Gastroenterology, Hepatology and Nutrition (ESPGHAN) and United Nations International Children's Emergency Fund (UNICEF).^{1,2} Moreover, it is encouraged to be continued during the first two years, alongside

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Recebido/Received: 08/06/2022 - Aceite/Accepted: 02/09/2022 - Publicado Online/Published Online: 22/03/2023 - Publicado/Published: 01/06/2023

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complementary feeding.³

Breastfeeding has several advantages to both babies and mothers. For infants, breastfeeding has proved beneficial for prevention of infections, hospitalizations, allergies, obesity, type 1 diabetes, celiac disease, some malignancies and other conditions.⁴⁻⁶ There are also lower rates of sudden death syndrome in exclusively breastfed infants.^{4,5} Concerning mothers, it reduces the risk of postpartum hemorrhage, lowers the risk of ovarian and breast neoplasia and also helps mothers delay fertility and return to their pre-pregnancy weight.^{4,5}

In 1991, the WHO and UNICEF created the Baby-friendly Hospital Initiative (BFHI), which consists of practical steps to protect, promote and support breastfeeding.⁶ In Portugal, this project was launched in 1994 and today fourteen hospitals are certified and some primary care units are also starting to implement these measures.⁷ Portuguese legislation seeks to protect mothers and promote breastfeeding and therefore, maternity leave has increased in 1995 from 98 days to five or six months when shared with the father.⁷ Afterwards, the mother is entitled to have a reduced working schedule up to one year since 2009.⁸

Despite recommendations, some European Union countries maintain a low rate of exclusive breastfeeding (EBF). In countries where initial rates are high, there is still a significant percentage of EBF discontinuation in the first six months of life. Portugal fits into the latter group, with an initiation rate higher than 90%, but an exclusivity rate of 17% to 34% at six months, a considerably lower rate than what is proposed by the WHO for 2025 which is 50%.^{5,7} Documented reasons for early discontinuation include low maternal age (below 20 years old), gestational age below 37 weeks, low socioeconomic level, sparse follow-up and early return to work.⁸ On the other hand, factors associated with prolonged breastfeeding are eutocic delivery, breastfeeding in the first hour of life and a good breastfeeding technique.⁷

Since the BFHI project began, studies have shown an increment in EBF in Portugal. A study published by UNICEF showed a significant increase in EBF rate at three months from 34.6% in 1995/1996 to 60.6% in 2014. However, at six months there was an initial increase from 20.6% in 1995/1996 to 36.6% in 2005 and subsequent decrease to 30.3% in 2014.⁹

It is essential to know the prevalence of breastfeeding and to identify not only protective factors but also factors associated with breastfeeding discontinuation in the first few months in order to protect it and improve its promotion.

The aim of this study was to identify the prevalence of breastfeeding in the first six months of life in the municipalities of Amadora, Sintra and Cascais, as well as factors associated with protection and discontinuation of breastfeeding. Additionally, another aim was to compare the results

with a study carried out in 1999 including population from the same geographic area.⁸

METHODS

This was a prospective, longitudinal and observational study developed in the postnatal wards of two level-II hospitals in the Lisbon metropolitan area: Hospital Professor Doutor Fernando Fonseca [a Baby-Friendly Hospital (BFH)], and Hospital de Cascais Doutor José de Almeida [a Non-Baby-Friendly Hospital (NBFH)]. Together, the two hospitals serve the municipalities of Amadora, Sintra and Cascais, with a total of 771 312 inhabitants, according to the census of 2021. The three counties include a significant percentage of migrant population from Portuguese Speaking African countries (e.g., Mozambique and Cape Verde), Brazil and Eastern European countries (e.g., Ukraine).

Both hospitals adopt a rooming-in policy of newborns and mothers in the postnatal ward. The study consisted of three different questionnaires answered by mothers, composed of closed-ended questions (dichotomous and multiple-choice). The first questionnaire was applied at discharge in the postnatal ward and included questions about pregnancy, birth, family history and aspects of breastfeeding. This phase took place in both hospitals concomitantly between February and April 2019 and was extended until June of the same year in Hospital Professor Doutor Fernando Fonseca. Subsequently, mothers were asked to reply to the other questionnaire, over the phone or through email, when the newborn reached the age of three and six months old. These questionnaires inquired about the medical history of the infant and aspects related to breastfeeding at that moment. In order to compare the current results with the results obtained in 1999, the same variables were included (breastfeeding and EBF rates; mother's age, nationality, education level, number of previous children; reasons for breastfeeding discontinuation; the time when mothers returned to work, who recommended formula and who gave most support).

All newborns were eligible for the study, apart from: 1) formal breastfeeding contraindications (mothers with: human immunodeficiency virus infection, active tuberculosis without treatment, active herpetic lesions in the nipples, taking drugs not compatible with breastfeeding; and newborn metabolic disease); 2) mothers who decided not to breastfeed; 3) gestational age under 35 weeks; 4) newborns with congenital malformations that interfered with breastfeeding; 5) newborns that did not start breastfeeding in the postnatal ward; 6) newborns of mothers unable to communicate in Portuguese or that were unreachable by phone or email; 7) newborns discharged directly from the Neonatal Intensive and Intermediate Care Unit; 8) mothers who did not consent to the study.

Descriptive and statistical analysis were performed with SPSS® v.23.0 (SPSS Inc, Chicago, IL, USA). Qualitative variables were expressed as frequencies and percentages and continuous variables as means/medians and interquartile ranges. The chi-square test or Fisher exact test were used to compare categorical variables. Additionally, binary logistic regressions were performed using as independent variables: exclusive breastfeeding and mixed feeding at zero, three and six months. Odds ratio (95% confidence interval) was used and a level of significance of $p < 0.05$ was assumed.

The ethics committee of both hospitals approved the study. Informed consent was obtained from all participants. All information was anonymous and confidential.

RESULTS

A total of 423 participants were included in this study (Fig. 1), 324 from the BFH and 99 from the NBFH. The drop-out rate at three months was 33.0% in the BFH and 23.0% in the NBFH (remaining $n = 293$) and at six months was 4.6% in the BFH and 3.9% in the NBFH (remaining $n = 280$).

A detailed description of the characteristics of the participants is presented in Table 1.

Globally, the breastfeeding rate in this study was 94.3% at discharge, 78.2% at three months and 64.4% at six months.

At discharge, 74.2% of newborns were exclusively breastfed, 20.1% had mixed feeding and 5.7% were solely formula-fed. Exclusively breastfed infants remained 61.8%

Table 1 – Reasons for breastfeeding discontinuation given by mothers

| Reasons for breastfeeding discontinuation | |
|-------------------------------------------|-----------------|
| Objective reasons | 44/150 (29.3%) |
| Infant failure to thrive | 11 |
| Breast problems | 3 |
| Maternal disease | 7 |
| Infant disease | 8 |
| Mother's return to work | 11 |
| Mother's decision | 4 |
| Non objectives reasons | 106/150 (70.7%) |
| Breast milk was weak | 12 |
| Breast milk wasn't enough | 52 |
| Baby crying | 10 |
| Baby did not want | 32 |

at three months old and the percentage of formula-fed infants increased to 38.2%. At six months, only 25.6% were exclusively breastfed (all of these, except one, were breastfed on demand), 6.7% had mixed feeding, 23.2% had already initiated complementary feeding associated with breastfeeding and 44.5% were fed with formula alone or complemented with solid food.

At discharge, formula was initiated in 43.5% due to physician or nurse recommendation, in 25.9% due to hypoglycemia and in 30.6% by maternal option. At this moment, nearly 90% of mothers felt confident about breastfeeding and the majority decided to breastfeed before pregnancy (74.5%). Breastfeeding advantages indicated by mothers were being healthy for the baby (96.6%), important for mother-child bond (75%), protection from infections (67.9%), natural feeding (63.3%), protection from allergies (51.2%), healthy for the mother (51.5%), and inexpensive (44.4%).

After discharge, formula was more frequently recommended by the pediatrician (32%), the family doctor (31%) or the nurse (19%), but in 11% of cases it was the mothers' own initiative. Reasons for breastfeeding discontinuation given by mothers are shown in Table 2.

At three months, while 63.8% of mothers felt they had enough support to take care of their children (in most cases the father and the grandmother), 25.6% admitted searching for help in the primary care setting and 29.3% in breastfeeding support lines, such as SOS breastfeeding.

Factors influencing breastfeeding

Several factors were found to be associated with EBF at discharge from the postnatal ward (Fig. 2): gestational age equal to or greater than 37 weeks [term birth, OR 4.43 (1.53 – 12.63)], eutocic delivery [OR 1.71 (1.10 – 2.67)], female

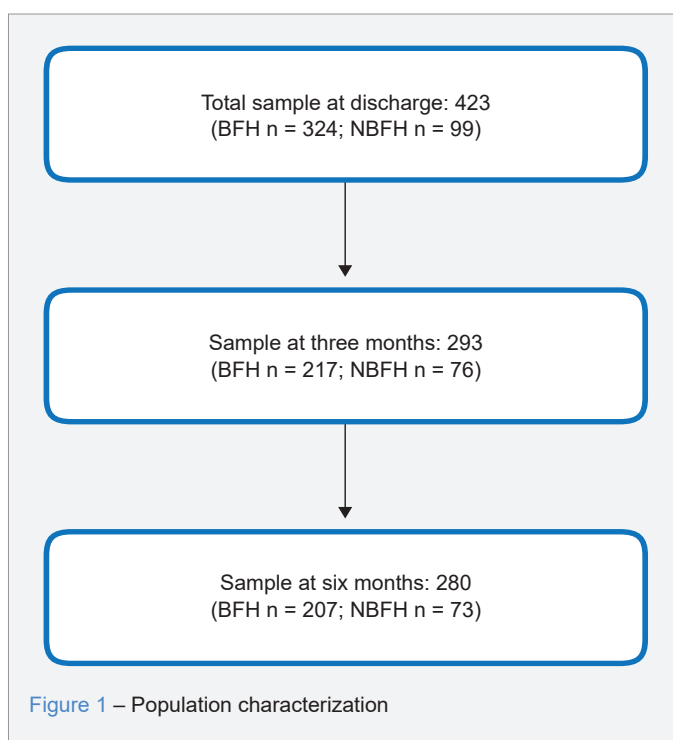


Table 2 – Results at zero, three and six months of age

| Inquiry at maternity discharge | n = 423 |
|-------------------------------------------------------|--------------------|
| Sociodemographic characteristics | |
| Mother's age, (years) mean [IQR] | 30.4 [26.0 – 35.0] |
| Father's age, (years) mean [IQR] | 35.6 [29.0 – 38.0] |
| Mother's nationality | |
| Portuguese, n (%) | 239 (56.5) |
| Foreign, n (%) | 172 (40.7) |
| Father's nationality | |
| Portuguese, n (%) | 237 (56.0) |
| Foreign, n (%) | 171 (40.4) |
| Father's employability, n (%) | 386 (91.3) |
| Household | |
| Nuclear family, n (%) | 271 (64.1) |
| Extended family, n (%) | 92 (21.7) |
| Pregnancy and delivery characteristics | |
| Pregnancy adequately monitored, n (%) | 294 (69.5) |
| High risk pregnancy, n (%) | 139 (32.9) |
| Twin pregnancies, n (%) | 10 (2.4) |
| Type of delivery, n (%) | |
| Eutocic | 243 (57.4) |
| Forceps/Suction | 51 (12.1) |
| Caesarian | 128 (30.3) |
| Epidural anesthesia, n (%) | 339 (80.1) |
| Complications during birth, n (%) | 17 (4.0) |
| Mother related, n (%) | 16/17 (94.1) |
| Newborn related, n (%) | 1/17 (5.8) |
| Infant's characteristics | |
| Gestational age, n (%) | |
| 37 weeks – 40 weeks plus 6 days | 347 (82.0) |
| 35 weeks – 36 weeks plus 6 days | 20 (4.7) |
| ≥ 41 weeks | 56 (13.2) |
| Birthweight, (g) mean [IQR] | 3226 [2898 – 3532] |
| Male gender, n (%) | 221 (52.2) |
| NICU admission, n (%) | 13 (3.1) |
| Hospital practices | |
| Skin-to-skin contact in the first hour of life, n (%) | 363 (85.8) |
| > 1h, n (%) | 137/363 (37.7) |
| < 1h or without contact, n (%) | 152/363 (41.9) |
| Breastfeeding in the first hour of life, n (%) | 371 (87.7) |
| Pacifier use, n (%) | 151 (35.7) |
| Artificial teats use, n (%) | 62 (14.7) |
| Inquiry at 3 months old | |
| n = 293 | |
| Infant's first appointment, (days) mean [IQR] | 15.1 [6.0 – 18.5] |
| Pacifier use, n (%) | 184 (62.8) |
| Artificial teats use, n (%) | 75 (25.6) |
| Mother at home, n (%) | 281 (95.9) |
| Inquiry at 6 months old | |
| n = 281 | |
| Infant's hospitalization, n (%) | 4 (1.4) |
| Infants who get sick, n (%) | 40 (14.2) |
| Pacifier use, n (%) | 172 (61.2) |
| Artificial teats use, n (%) | 54 (19.2) |
| Nursery, n (%) | 103 (36.7) |
| Mother at home, n (%) | 184 (65.4) |

newborn [OR 1.61 (1.08 – 2.41)], birthweight between 2500 g and 3999 g [OR 3.31 (1.53 – 7.14)], rooming-in [OR 5.48 (1.48 – 20.21)], earlier discharge from the postnatal ward [< 72 hours, OR 4.12 (1.81 – 9.75)] and breastfeeding in the first hour of life [OR 2.81 (1.40 – 5.65)]. Newborn latch observation was not associated with EBF at discharge.

In addition, mixed feeding at discharge was more frequent in cases of pregnancies monitored in a private obstetrician [OR 2.13 (1.01 – 4.50)], cesarean section [OR 2.00 (1.26 – 3.17)], transfer to the neonatal intensive care unit (NICU) [OR 7.24 (1.95 – 26.78)], newborn discharge after the fifth day of life [OR 4.26 (1.83 – 9.93)], absence of skin-to-skin contact [OR 2.14 (1.16 – 3.96)], use of pacifier [OR 1.75 (1.14 – 2.69)] and artificial teats [OR 2.02 (1.16 – 3.55)].

Exclusive breastfeeding at three months old (Fig. 3) was more common in infants from mothers and fathers with foreign nationality [OR 2.28 (1.38 – 3.75) and OR 2.24 (1.34 – 3.74) respectively]; newborns that did not use pacifiers [OR 2.01 (1.22 – 3.34)] nor artificial teats [OR 2.08 (1.22 – 3.54)]. Mixed feeding at three months old was associated with twin pregnancies [OR 7.32 (1.53 – 35.13)] and with the return of the mother to her workplace [OR 5.43 (1.08 – 27.41)].

Infants that until six months of age did not get sick [OR 3.18 (1.09 – 9.31)], did not use pacifiers [OR 1.80 (1.02 – 3.17)] neither joined a nursery [OR 2.04 (1.09 – 3.83)] had a greater probability of being on EBF by that age (Fig. 4). Mixed feeding at six months old was associated with a lower maternal educational level (below 9th degree) [OR 5.78 (1.11 – 30.25)], return of the mother to the workplace [OR 2.18 (1.28 – 3.70)], pacifier use [OR 2.21 (1.32 – 3.71)] and daycare attendance [OR 1.97 (1.17 – 3.31)]. The beginning of complementary feeding before six months of age was more likely in larger families with more than three children [OR 4.91 (1.37 – 17.66)].

DISCUSSION

In this study, the breastfeeding initiation rate was 94.3%, which is similar to other Portuguese studies that exhibit rates above 90.0%.¹ Portuguese studies between 2003 and 2014, reported EBF rates at discharge between 75% to 98% and at six months between 18.7% – 46.1%.^{1,5,9,11} In our study, the EBF rate at discharge was 74.2%, at six months old it dropped to 25.6%, which is substantially lower than the WHO global target of 50.0% for 2025.¹² This suggests that no significant improvement was seen in the last few years in the EBF rate during the first six months of life in Portugal.

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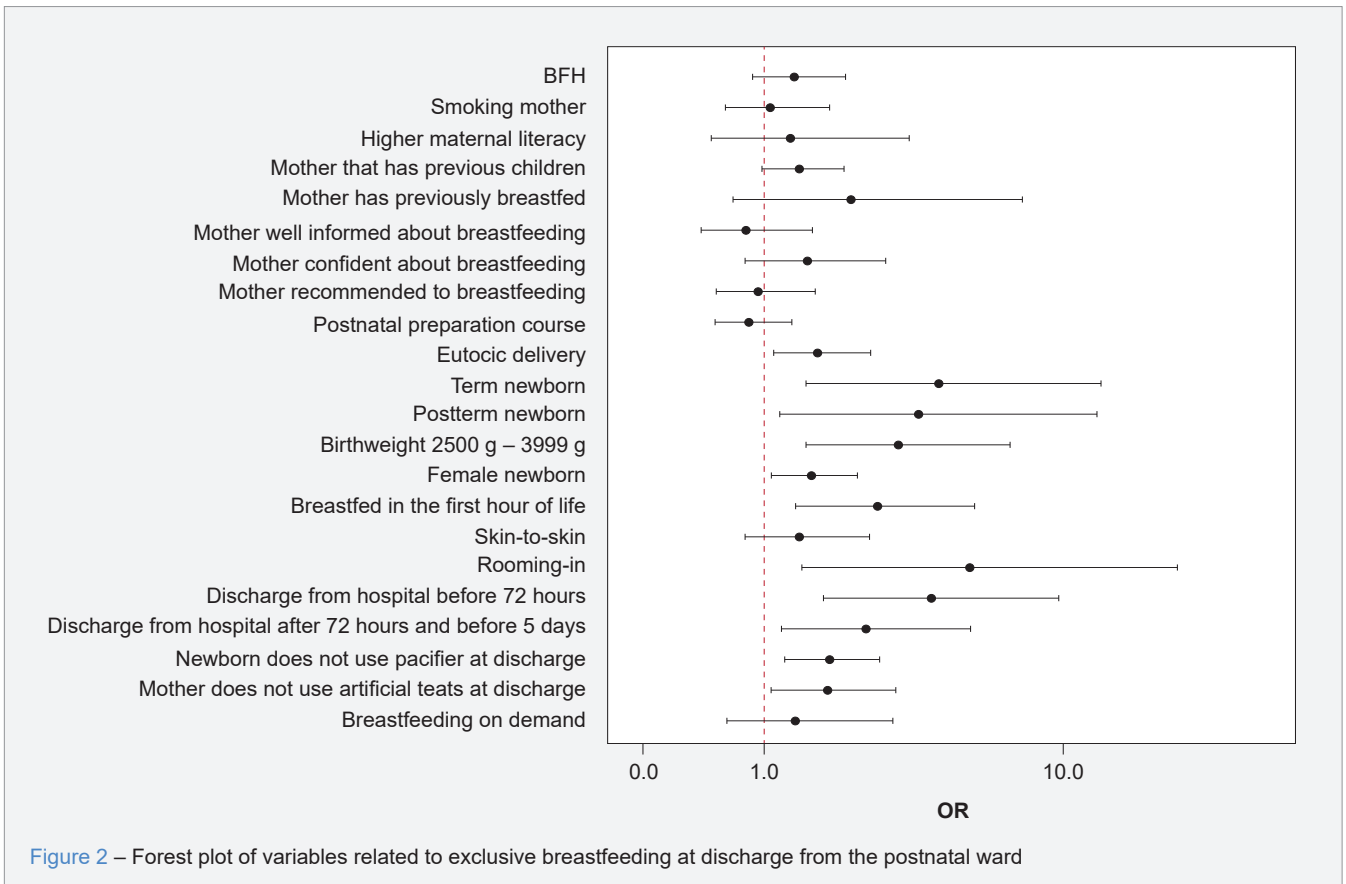


Figure 2 – Forest plot of variables related to exclusive breastfeeding at discharge from the postnatal ward

Factors influencing breastfeeding
Socio-cultural variables

Our results emphasize the importance of socio-cultural factors for discontinuing EBF during the first six months of life. Variables associated with a longer duration of breastfeeding are typically related to social status.¹³

Lower education levels are associated with the discontinuation of EBF.¹⁴ Accordingly, we observed that less-educated mothers had a 5.8 greater chance of their infant being on mixed feeding at six months.

Besides, maternal employment is a major factor in short-term breastfeeding patterns.¹⁵ In fact, in our study,

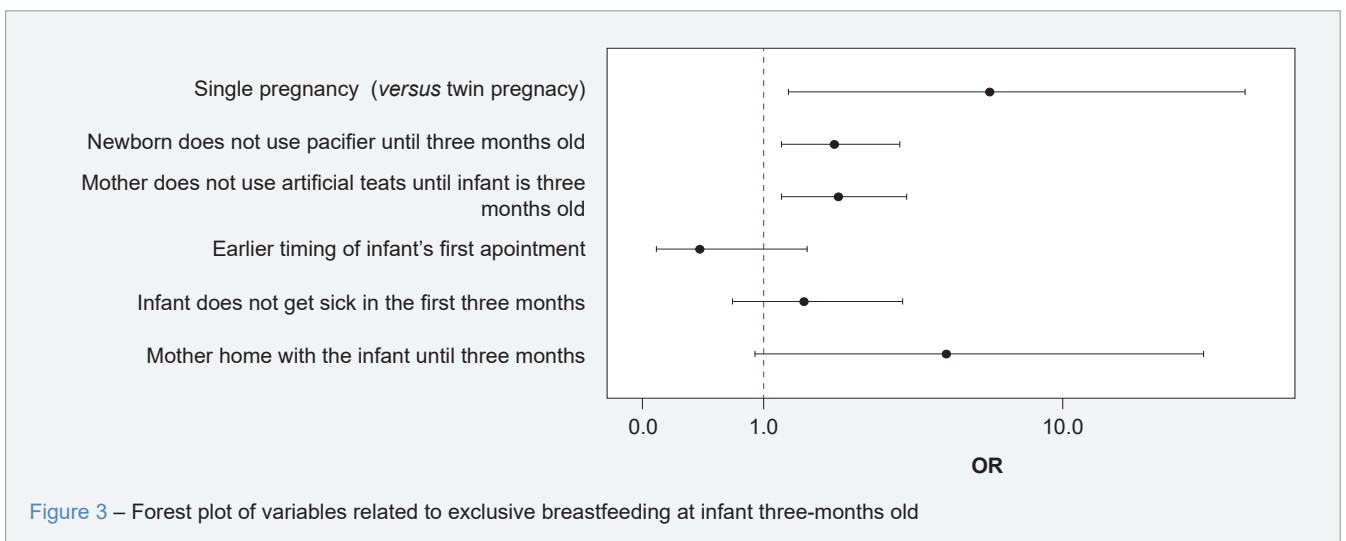


Figure 3 – Forest plot of variables related to exclusive breastfeeding at infant three-months old

higher mixed feeding rates were observed in infants that have already started attending nurseries at six months because their mothers returned to work. Beyond that, 30% of these women were not entitled to a breastfeeding schedule, suggesting the importance of providing breastfeeding breaks by employers and providing access to these women to a private area where they may pump and store breastmilk.¹⁵

EBF at three months old was more common in infants from mothers and fathers who are unable to communicate in Portuguese. Some reports describe exclusive breastfeeding adoption being more like a socio-cultural rather than technical process.¹⁶ There are some particularities about the African culture that may have a protective influence in EBF including grandmothers and other extended family members who frequently live together and have significant roles in childcare.¹⁶

No association between breastfeeding and maternal age was found.

Delivery and newborn characteristics

Other similar factors were NICU admission and cesarean delivery, which could be related to delayed skin-to-skin contact and, therefore, early discontinuation of EBF.¹⁵

On the other hand, factors that promoted EBF at discharge were gestational age (> 37 weeks), birthweight between 2500 g and 3999 g and shorter hospital stay (< 72 hours). A possible explanation is that some of the reasons that justify formula introduction, as hypoglycemia, are less common in newborns with normal birthweight and gestational age. Additionally, a longer hospital stay is usually due to maternal or newborn clinical complications, and these could be a cause of breastfeeding discontinuation.

Infant hospitalization is a known risk factor for early and later discontinuation of EBF.¹⁶ In fact, at six months, infants

who had not been sick were more likely to be exclusively breastfed.

Institutional practices during hospital stay

Hospital practices and training of healthcare personnel following the Baby-Friendly Hospital Initiative may have an enormous impact on the rate of EBF.^{17,18} Positive effects on EBF at maternity discharge were found for the rooming-in practice and breastfeeding initiation within the first hour of life [OR 2.81 (1.40 – 5.65)]. In agreement, Setegn *et al* showed that mothers who initiated breastfeeding within one hour of birth were two times more likely to practice exclusive breastfeeding than mothers who initiated it afterwards.¹⁵

Furthermore, several observational studies have shown a strong association between early pacifier use and early cessation of EBF.¹⁹ Of note, the use of pacifiers in our study adversely affected breastfeeding compliance at all ages (at discharge, three and six months).

Other factors that promoted mixed feeding at maternity discharge were the absence of immediate skin-to-skin contact after delivery and the use of artificial teats.²⁰ Although other reports identify newborn latch observation as a breastfeeding promoting factor, our statistical analysis did not confirm that. Almost all women on EBF at six months were breastfeeding on demand, highlighting the importance of this practice to keep milk production. At six months old, only non-use of pacifier and breastfeeding on demand presented a protective effect on exclusive breastfeeding among BFH practices.

Our study showed that women whose pregnancy was supervised by a private obstetrician, and not by a primary care physician, were 2.1 more likely to give formula earlier. A possible explanation is the difficulty of training healthcare personnel by the BFHI in private hospitals and clinics.

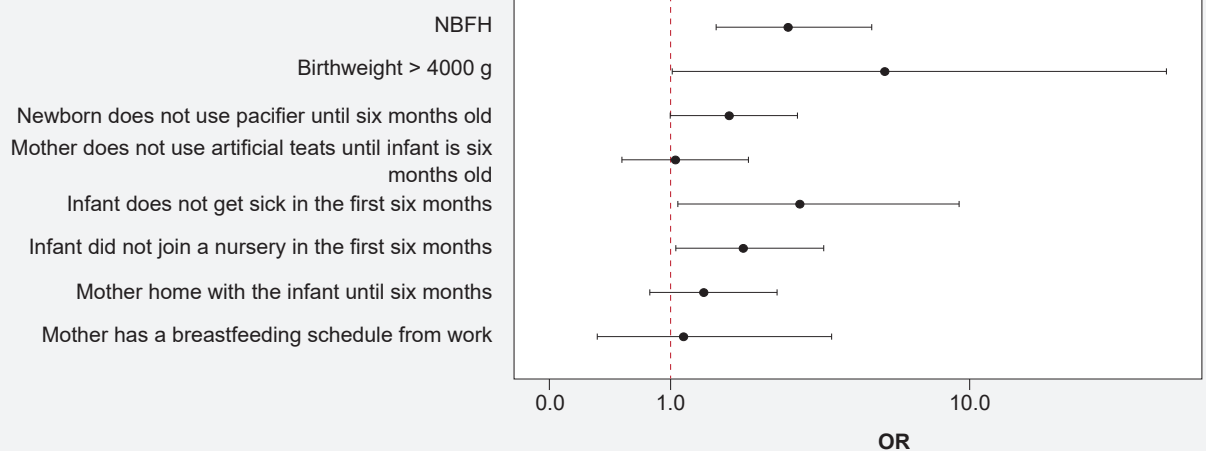


Figure 4 – Forest plot of variables related to exclusive breastfeeding at infant six-months old

What happened in the last twenty years?

Another aim of our study was to analyze the evolution of breastfeeding in the first six months of life in the last 20 years in Portugal. For that we compared our results with a study carried out in 1999 that included population from the same geographic area.¹⁰

In 2019, the breastfeeding rate at hospital discharge was slightly lower (94.3% vs 97.3%) but there was a significant improvement at three and six months, with breastfeeding rates of 78.4% and 64.6%, respectively, compared with 48.4% and 22.4% in 1999, respectively.

On the contrary, there is nowadays a higher rate of EBF at three months (58% vs 41%) but equal at six months of age (23% vs 23%). This is in line with other Portuguese studies that demonstrate the need to improve the EBF rate at six months to achieve the WHO global target (50%).^{5,23,24} A substantial difference is the age at which there is the greatest dropout of EBF. While nowadays it occurs between the third and the sixth month, in 1999 it was before the third month. This difference may be due to the longer duration of maternity leave in recent years.

Other factors explaining this improvement could be maternal age, number of previous child and the mother's nationality. As expected, at present there were fewer mothers between the age of 18 and 35 years (77.5% vs 89%), since today women give birth for the first-time at an older age and, consequently, get pregnant again more frequently after 35 years old. However, our analysis did not show any influence of maternal age in breastfeeding, unlike several studies that demonstrated that younger mothers abandon breastfeeding earlier.^{1,4,5} The percentage of primiparous women was significantly lower in our study (41.4% vs 87%) and that may have contributed to better results on breastfeeding rate, since it is known that being a primiparous is associated with early discontinuation of breastfeeding.^{1,5,22,25} In relation to the mother's nationality, the percentage of African mothers was 28.1%, in contrast to 13% of non-Caucasian mothers in 1999. This may be relevant because, as mentioned above, foreign nationality in our study was associated with EBF promotion.

Regarding the reason for breastfeeding discontinuation, mothers indicated more non-objective reasons than in 1999 (71% vs 66%) (Table 2). This is an important finding because it reflects the importance of improving maternal education about breastfeeding. A positive finding was that the mother's return to work was less often indicated as a reason for EBF cessation (7.3% vs 24%).

While in both studies the family doctor played an important role in formula recommendation, in our study pediatricians were not reported to have a protective influence but rather also contributing to formula introduction. Even so, the mother's initiative to introduce formula was much more fre-

quent in 1999 than nowadays (44% vs 10.8%).

Concerning the factors associated with EBF discontinuation, both studies identified the same factors including mother's lower education level and return to work. Similarly, we also identified that mothers that had previously breastfed were more likely to maintain EBF during the first six months.

A substantial difference between the two studies was the father's influence and support. Many women indicated a positive role of their husband, namely the possibility to take care of the child, while in 1999 the paternal influence was not emphasized. This may be related to the increasing importance of paternal participation in the child education in recent years.

Study limitations

There were some limitations to this study. First, participants were only recruited in urban areas, which could explain lower breastfeeding rates compared with other populations outside of this region. According to Venancio *et al*, urban mothers are more likely to have more job opportunities, which limits the time to stay with their infants and compromises EBF practice.²² Second, a self-completion questionnaire method for data collection may lead to different interpretations and a higher rate of unanswered questions. Third, different sample sizes and different dropout rates may have been responsible for bias and compromised study results. A possible explanation for a higher dropout rate in the BFH population, besides the mother's lower educational level, is that some African mothers may come to Portugal just to give birth, returning to their country after the first month. Additionally, social demographic differences between the two study populations may have influenced the results in a way that could not be appropriately measured, such as the socio-economic level.

CONCLUSION

Our results are in accordance with the reported causes associated with EBF discontinuation, but emphasize the importance of socio-cultural factors, including the mother's education level and mother's return to work.

Compared with 1999, Portuguese breastfeeding rates improved significantly at three and six months. However, in order to achieve the WHO global target, it is still necessary to improve the EBF rate, particularly at six months. Enhancing the education of families about breastfeeding could be the key to success. Continuous training of healthcare professionals should also be encouraged.

AUTHOR CONTRIBUTIONS

OV: Conception of the work and critical review of the manuscript.

JB: Conception of the work, statistical analysis and writing of the manuscript.

ARM, SC: Data collection and analysis, writing of the manuscript.

JM, RA, CPG: Data collection and analysis.

EP, RB: Critical review of the manuscript.

All authors have read and approved the final manuscript.

PROTECTION OF HUMANS AND ANIMALS

The authors declare that the procedures were followed according to the regulations established by the Clinical Research and Ethics Committee and to the Helsinki Declaration of the World Medical Association updated in 2013.

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DATA CONFIDENTIALITY

The authors declare having followed the protocols in use at their working center regarding patients' data publication.

COMPETING INTERESTS

The authors have declared that no competing interests exist.

FUNDING SOURCES

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.