






Prevalence and duration of breast milk feeding in very preterm infants: A 3-year follow-up study and a systematic literature review

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Abstract

Background: The World Health Organization recommends exclusive breast milk feeding until 6 months and continuing up to 2 years of age; little is known about whether very preterm infants are fed in accordance with these recommendations. We aimed to describe the prevalence and duration of breast milk feeding in very preterm children and to systematically review internationally published data.

Methods: We evaluated breast milk feeding initiation and duration in very preterm children born in 2 Portuguese regions (2011-2012) enrolled in the EPICE cohort and followed-up to the age of 3 (n = 466). We searched PubMed® from inception to January 2017 to identify original studies reporting the prevalence and/or duration of breast milk feeding in very preterm children.

Results: 91.0% of children received some breast milk feeding and 65.3% were exclusively breast fed with a median duration of 2 months for exclusive and 3 months for any breast milk; only 9.9% received exclusive breast milk for at least 6 months, 10.2% received any breast milk for 12 months or more, and 2.0% for up to 24 months. The literature review identified few studies on feeding after hospital discharge (n = 9); these also reported a low prevalence of exclusive breast milk feeding at 6 months (1.0% to 27.0%) and of any breast milk at 12 months (8.0% to 12.0%).

Conclusions: The duration of breast milk feeding among Portuguese very preterm infants was shorter than recommended. However, this appears to be common globally. Research is needed to inform strategies to promote continued breast milk feeding.

KEYWORDS

breast feeding, breast milk, EPICE project, very preterm infants

*Members of the EPICE-Portugal Network are given in Appendix.

1 | INTRODUCTION

There is a general recommendation to provide exclusive breast milk feeding during the first 6 months of life to both full-term and preterm infants, and to continue up to 2 years or longer with complementary foods.^{1,2} There is evidence regarding the health benefits of breast milk feeding for very preterm infants (born at <32 weeks of gestation), namely, in decreasing multiple neonatal morbidity conditions related to prematurity, such as infections and necrotizing enterocolitis, and also, in the improvement of neurodevelopmental outcomes.^{2,3}

Despite these benefits, a low prevalence of breast milk feeding is still described and seems common in very preterm children.⁴⁻⁶ Most research has focused on breast milk feeding in hospital or at discharge home from hospital with fewer studies able to describe the full duration of breast milk feeding.⁶ In Portugal, the frequency of breast milk feeding in these children has only been evaluated twice, at discharge in 2003⁴ and 15-22 days after delivery during Neonatal Intensive Care Unit (NICU) stay in 2013,⁷ both studies described the North region. No information is available about the duration of exclusive or any breast milk feeding in Portuguese very preterm infants. Also, in the international context, a systematic evaluation of the prevalence and duration of breast milk feeding in very preterm infants is lacking.

Therefore, this study aimed to describe the frequency and duration of breast milk feeding in Portuguese very preterm infants and to systematically review the published literature on breast milk feeding in very preterm infants, with a focus on studies providing data on the duration of exclusive breast milk for the first 6 months and any breast milk through at least the first year.

2 | METHODS

2.1 | Design

A cohort of very preterm Portuguese children was followed. They were recruited as part of the longitudinal study Effective Perinatal Intensive Care in Europe (EPICE) that included all live births between 22 and 31 completed weeks of gestation occurring in 19 regions from 11 European countries, in 2011 to 2012.⁸ The study was approved by the Ethics Committee of the participating hospitals and by the Portuguese Data Protection Authority (authorization 7426/2011). Informed consent was obtained from all parents or legal representative.

2.2 | Setting and sample

The EPICE study in Portugal involved all the public maternity and neonatal intensive care units (NICUs) from 2 regions [North and Lisbon and Tagus Valley (LTV)] ($n = 27$), along with 3 private units from LTV. In 2011 and 2012, 68.6% and 66.3% of all very preterm births in Portugal occurred in these 2 geographical regions, respectively.⁹

The sample included all infants discharged alive from all NICUs whose parents provided informed consent [544 (89.6%) of 607 eligible participants].¹⁰ At the 3-year follow-up, 2 children had died, 2 children had been adopted and unavailable for further evaluation according to legal rules, 5 parents declined to participate, and 69 were unreachable. Thus, 466 infants remained for this analysis (Figure S1). Participants were compared to 78 non-participants regarding maternal and infant characteristics. Mothers of participants were older, and more frequently born in Portugal, primipara, and breast milk feeding at discharge (Table S1).

2.3 | Data collection

Data on maternal and infant characteristics at baseline were abstracted from medical records by local health care professionals using a pretested standardized questionnaire.¹⁰ We collected data on maternal age, mother's country of birth, parity (primipara vs multipara), twinning, gender, gestational age at birth (weeks), birth-weight (g), length of hospitalization (days), type of feeding at discharge, and neighbourhood socio-economic deprivation.

Information on breast milk feeding practices was obtained using a structured questionnaire completed by the parents or legal guardians when the children were 3 years of age (chronological age), using a computer-assisted telephone interview, by trained interviewers. Parents were asked if the child has ever received breast milk feeding, including donor's milk. If the answer was yes then they were asked for how long the child received breast milk exclusively and for how long the child received breast milk feeding combined with formula feeding or with other type of foods and/or beverages.

2.4 | Definition of variables

Gestational age was based on the best estimate of the obstetrical team, using information from ultrasound measures and last menstrual period. Infants were georeferenced according to their home address using the ArcGIS Online World Geocoding Service and Google Maps. Neighbourhood socio-economic deprivation was assessed using the European Deprivation Index (EDI) that is used to classify small areas according to their level of socio-economic deprivation. The construction of EDI, which was developed for 5 European countries, was fully described elsewhere.¹¹ In Portugal, EDI score resulted from the weighted sum of the following standardized variables at census block group level: % overcrowded households, % households with no bath or shower, % household with no indoor flushing, % households occupied by non-owners, % women aged 65 or more, % individuals with low education, % individuals in low-income occupation, and % unemployed individuals. The EDI score was categorized in quintiles of increasing deprivation (1-least to 5-most deprived).¹²

Regarding our outcome of interest, exclusive breast milk feeding was considered when the infant received no food or drinks other than the mother's own milk or donor's milk, regardless of route of administration. Any breast milk feeding was considered



if the infant received some breast milk, regardless of route of administration, and independently if it was only exclusive or mixed (the addition of formula or other food and/or drink to breast milk). Duration of breast milk feeding was defined as the age of the child, reported in months of chronological age, when the exclusive and any breast milk feeding was stopped completely. Information on any breast milk feeding was obtained for all 466 participants, but 13 did not report the duration period, remaining 453 with information on any breast milk feeding duration. To compute exclusive breast milk feeding, we excluded 22 participants [19 did not report the information and 3 provided unreliable information (duration ≥ 12 months)], remaining 444 participants for analysis of exclusive breast milk feeding.

2.5 | Statistical analysis

Sample characteristics are presented as counts and proportions for all categorical variables, and median and percentile 25 and percentile 75 (p25-p75) for non-normally distributed continuous variables. We compared the maternal and infant characteristics of children receiving exclusive and any breast milk for shorter vs longer durations. Proportions were compared using a chi-square test and non-normally distributed continuous variables with the Kruskal-Wallis test. The duration of exclusive and any breast milk feeding was categorized in 3 groups: (1) never received the type of breast milk considered; (2) between >0 and <4 months for exclusive and between >0 and <6 months for any breast milk; (3) and ≥ 4 months for exclusive and ≥ 6 months for any breast milk. The cut-off point of 4 months for exclusive breast milk was considered because this is the length of the fully paid maternity leave in Portugal, and so the proportion of children on exclusive breast milk for at least 6 months was very low which would result in lack of statistical power. Also for any breast milk, we defined the cut-off point of 6 months as the proportion of children on any breast milk for at least 12 months was very low which would result in lack of statistical power.

Kaplan-Meier curves estimates were fitted to describe exclusive and any breast milk feeding duration (continuous variable) only among infants who initiated breast milk feeding.

Analyses were performed using STATA 11.0 software (Stata Corporation, College Station, TX, USA).

2.6 | Systematic literature review

The review was conducted based on the Preferred Reporting of Systematic Reviews and Meta-Analysis (PRISMA) guidelines.^{13,14} PubMed® was searched from inception to January 2017, to identify original published studies reporting the prevalence and/or duration of breast milk feeding in very preterm infants. The following search expression was used [(“breast milk” OR breastmilk OR breastfeeding OR feeding OR “human milk”) AND (“very preterm” OR “very premature” OR “extreme prematurity” OR “extremely preterm” OR “extremely premature” OR “extreme preterm” OR “very low birth

weight” OR “very low birthweight”) AND (duration OR prevalence OR frequency OR proportion)], 443 studies were identified.

Retrieved publications were screened by 2 researchers (CR and RT) following predefined criteria to determine eligibility. Studies were excluded if: (1) the full text was not written in English, French, German, Italian, Portuguese, or Spanish; (2) did not involve humans (e.g. in vitro or animal research); (3) non-original articles (e.g. book chapters, review articles, editorials, comments, guidelines); (4) reported qualitative research or case studies; (5) non-observational (e.g. randomized controlled trials); (6) case-control; (7) not focused on very preterm infants (≤ 32 weeks of gestational age) or very low birthweight (≤ 1500 g); (8) data not related to the prevalence and/or duration of breast milk feeding; and (9) duplicate studies or evaluating the same sample.

Two researchers (CR and RT) evaluated the included studies to extract the following data: year of publication, country, infants' year of birth, sample size, gestational age, and/or birthweight. The prevalence by type of breast milk feeding practices was extracted, also considering the reporting period (e.g. at initiation, at hospital discharge) and/or duration reported, whenever available. Differences in the data extracted by the 2 researchers were discussed involving a third researcher (HB) whenever necessary.

In this review, breast milk feeding practices were categorized as: exclusive breast milk, mixed (breast milk with formula) and any breast milk (receiving some breast milk, independently if it was exclusive or mixed). Breast milk was considered if it was the mother's own milk or a donor's milk and regardless of the feeding method (directly from the breast, bottle, tube, or cup).

3 | RESULTS

3.1 | Prevalence and duration of breast milk feeding

Our sample included 26.4% ($n = 123$) extremely preterm (<28 weeks) and 73.6% ($n = 343$) very preterm (28 to 31 weeks) infants with a median gestational age of 29 weeks (p25-p75: 27-31). The median birthweight was 1170 g (p25-p75: 945-1430) and the median length of hospital stay was 51 days (p25-p75: 37-71). Overall, the prevalence of exclusive breast milk feeding initiation was 65.3% (290/444) and 91.0% (424/466) for any breast milk feeding. No differences were found between North and LVT on exclusive (63.3% vs 67.1%) or any breast milk feeding (89.4% vs 92.4%).

Figure 1A shows that 34.7% of very preterm infants never received breast milk exclusively, 24.8% were exclusively fed with breast milk for <2 months, and 9.9% for at least 6 months or more. While only 9.3% (42/453) of very preterm infants never received any breast milk, 25.8% were fed for <2 months and 38.4% between 2 months and <6 months. Overall, 26.5% received any breast milk for 6 months or more, 10.2% for 12 months or more, and 2.0% 24 months or more (Figure 1B).

Tables 1 and 2 summarize maternal and infant characteristics according to exclusive and any breast milk feeding duration respectively. No differences were found for exclusive breast milk feeding

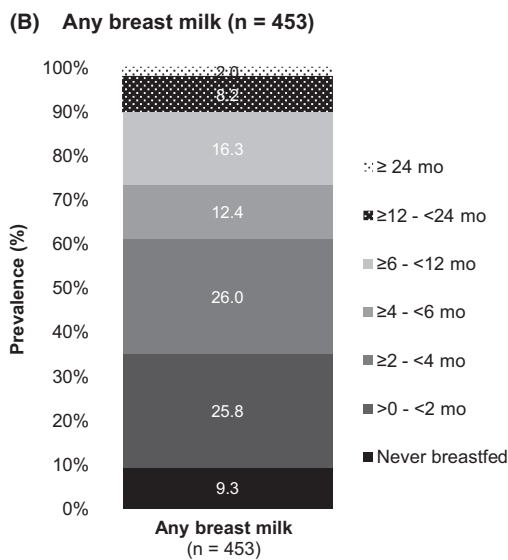
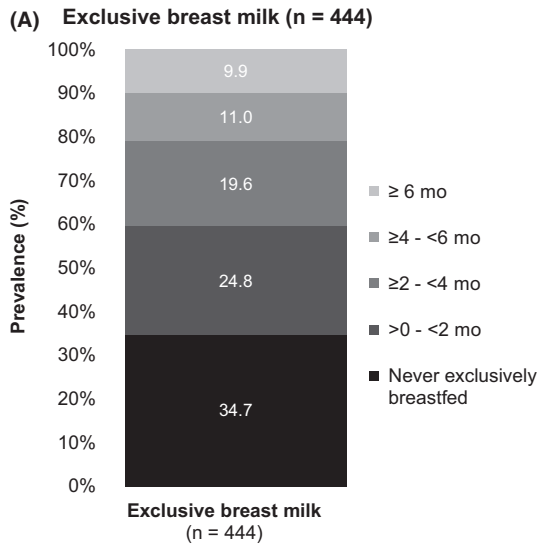


FIGURE 1 A and B, Duration of exclusive breast milk feeding (A) and any breast milk feeding (B) in Portuguese very preterm infants. The duration is reported in months of chronological age.

regarding the maternal and infant characteristics evaluated. We observed that among children who never received any breast milk feeding, 26.2% were of non-Portuguese mothers and 52.4% were of multiparae women; of those who received any breast milk for at least 6 months or more, 15.8% were of non-Portuguese mothers and 36.1% of multiparae women.

Figure 2A,B present the proportion of very preterm infants remaining on exclusive and any breast milk by month, up to 6 and 12 months, respectively, only among infants who initiated breast milk feeding. The duration of exclusive breast milk feeding ranged from 0.1 to 9.0 months, with a median duration of 2.0 months (p25-p75: 1.0-4.0). At 6 months of age <5% of children were on exclusive breast milk feeding. Any breast milk feeding duration ranged from 0.1 to 36.0 months, with a median duration of 3.0 months (p25-p75: 1.2-6.0). At the end of the first month, 25% of children had already

TABLE 1 Exclusive breast milk feeding duration (chronological age) according to maternal and infant characteristics (n = 444)

Characteristics	Exclusive breast milk feeding duration (chronological age)		
	Never (n = 154) n (%)	<4 months (n = 197) n (%)	≥4 months (n = 93) n (%)
<i>Maternal age at birth (y)</i>			
≤29	49 (31.8)	80 (40.6)	31 (33.3)
30-34	54 (35.1)	67 (34.0)	43 (46.2)
≥35	51 (33.1)	50 (25.4)	19 (20.4)
Missing	0	0	0
<i>Mothers' country of birth</i>			
Portugal	131 (85.1)	179 (90.9)	82 (88.2)
Others	23 (14.9)	18 (9.1)	11 (11.8)
Missing	0	0	0
<i>Neighbourhood socio-economic deprivation</i>			
1 (least deprived)	40 (26.5)	65 (33.0)	33 (36.3)
2	36 (23.8)	42 (21.3)	16 (17.6)
3	22 (14.6)	23 (11.7)	14 (15.4)
4	26 (17.2)	32 (16.2)	18 (19.8)
5 (most deprived)	27 (17.9)	35 (17.8)	10 (11.0)
Missing	3 (1.9)	0	2 (2.2)
<i>Parity</i>			
Primipara	92 (59.7)	138 (70.0)	61 (66.3)
Multipara	62 (40.3)	59 (30.0)	31 (33.7)
Missing	0	0	1 (1.1)
<i>Twin</i>			
No	105 (68.2)	134 (68.0)	65 (69.9)
Yes	49 (31.8)	63 (32.0)	28 (30.1)
Missing	0	0	0
<i>Child's gender</i>			
Male	87 (56.5)	108 (54.8)	57 (61.3)
Female	67 (43.5)	89 (45.2)	36 (38.7)
Missing	0	0	0
<i>Gestational age at birth (wk)</i>			
24-27	44 (28.6)	51 (25.9)	23 (24.7)
28-29	35 (22.7)	61 (31.0)	27 (29.0)
30-31	75 (48.7)	85 (43.2)	43 (46.2)
Missing	0	0	0
<i>Birthweight (g)</i>			
<1000	49 (31.8)	73 (37.1)	28 (30.1)
≥1000	105 (68.2)	124 (62.9)	65 (69.9)
Missing	0	0	0
<i>Length of hospitalization (d)</i>			
Median (p25-p75)	52 (37-71)	52 (39-71)	47 (34-70)
Missing	0	0	0

p25, percentile 25; p75, percentile 75.

**TABLE 2** Any breast milk feeding duration (chronological age) according to maternal and infant characteristics (n = 453)

Characteristics	Any breast milk feeding duration (chronological age)		
	Never (n = 42) n (%)	<6 months (n = 291) n (%)	≥6 months (n = 120) n (%)
<i>Maternal age at birth (y)</i>			
≤29	11 (26.2)	111 (38.1)	38 (31.7)
30-34	15 (35.7)	104 (35.7)	50 (41.7)
≥35	16 (38.1)	76 (26.1)	32 (26.7)
Missing	0	0	0
<i>Mothers' country of birth</i>			
Portugal	31 (73.8)	267 (91.8)	101 (84.2)
Others	11 (26.2)	24 (8.2)	19 (15.8)
Missing	0	0	0
<i>Neighbourhood socio-economic deprivation</i>			
1 (least deprived)	8 (19.0)	97 (33.6)	39 (33.3)
2	11 (26.2)	58 (20.1)	26 (22.2)
3	6 (14.3)	42 (14.5)	14 (12.0)
4	11 (26.2)	41 (14.2)	24 (20.5)
5 (most deprived)	6 (14.3)	51 (17.6)	14 (12.0)
Missing	0	2 (0.7)	3 (2.5)
<i>Parity</i>			
Primipara	20 (47.6)	197 (67.7)	76 (63.9)
Multipara	22 (52.4)	94 (32.3)	43 (36.1)
Missing	0	0	1 (0.8)
<i>Twin</i>			
No	26 (61.9)	196 (67.4)	90 (75.0)
Yes	16 (38.1)	95 (32.6)	30 (25.0)
Missing	0	0	0
<i>Child's gender</i>			
Male	21 (50.0)	165 (56.7)	71 (59.2)
Female	21 (50.0)	126 (43.3)	49 (40.8)
Missing	0	0	0
<i>Gestational age at birth (wk)</i>			
24-27	14 (33.3)	70 (24.0)	34 (28.3)
28-29	10 (23.8)	85 (29.2)	32 (26.7)
30-31	18 (42.9)	136 (46.7)	54 (45.0)
Missing	0	0	0
<i>Birthweight (g)</i>			
<1000	16 (38.1)	99 (34.0)	37 (30.8)
≥1000	26 (61.9)	192 (66.0)	83 (69.2)
Missing	0	0	0
<i>Length of hospitalization (d)</i>			
Median (p25-p75)	56.5 (39-88)	52 (37-70)	47.5 (36-70)
Missing	0	0	0

p25, percentile 25; p75, percentile 75.

stopped any breast milk feeding. At 12 months of age <10.0% of children received any breast milk and at 18 months <3%. In 34.4% of the cases, breast milk feeding stopped during hospital stay.

3.2 | Systematic literature review

From the literature review, we identified 31 studies^{4,6,15-43} that address the prevalence and/or duration of breast milk feeding in very preterm infants (Table S2), reporting data from 34 different countries (1 study was multicenter): 16 European, 11 American, 3 Oceanian, 3 Asian, and 1 African. Articles were published between 1998 and 2016, and described data collected between 1986 and 2015. Among the 31 studies included, 11 reported the prevalence of breast milk feeding at initiation, 13 at hospital discharge, 9 at some other time (e.g. in the first 2 weeks after birth, at 36 weeks postmenstrual age), and 13 presented complete data on overall duration. Only 9 studies^{6,18,21,28,35,36,39,41,42} presented data for breast milk feeding specifically at 6 months or more (chronological or corrected age) and 2 studies^{6,36} at 12 months (chronological age) (Table 3). The prevalence of any breast milk feeding at 6 months or more (chronological or corrected age) ranged from 19.9% in Israel¹⁸ to 50.0% in Denmark,⁶ and for exclusive breast milk ranged between 1.0% in Sweden²⁸ and 27.0% in Denmark.⁶ At 12 months, the prevalence of any breast milk was 8.0% in Denmark⁶ and 12.0% in Sweden,³⁶ the only studies reporting this information. None of the studies presented data for breast milk feeding duration for more than 12 months.

4 | COMMENT

4.1 | Principal findings

This is the first description of the duration of breast milk feeding in Portuguese very preterm infants. We found that 91.0% of the very preterm infants initiated any breast milk feeding and 65.3% exclusive breast milk feeding. The median duration of exclusive breast milk feeding was 2 months and of any breast milk feeding 3 months. The World Health Organization (WHO) recommends 6 months of exclusive breast milk with continued breast milk feeding along with complementary foods up to 2 years of age or beyond.^{1,2} In Portugal, very preterm infants are clearly far from achieving this recommendation, despite high initiation rates for any breast milk feeding.

4.2 | Interpretation

In Generation XXI, a population-based Portuguese birth cohort, including live births with at least 24 weeks of gestation, and assembled in 2005/2006 in the metropolitan area of Porto, the proportion of infants that never received breast milk was similar to the observed in our very preterm sample (8.4% vs 9.0%).⁴⁴ The median durations of exclusive and any breast milk feeding in our study were shorter than in infants from the Generation XXI cohort, 2.0 vs 2.5 months for exclusive and 3.0 vs 5.5 months for any breast milk feeding, respectively.⁴⁴ In 2013, the prevalence of any breast milk feeding

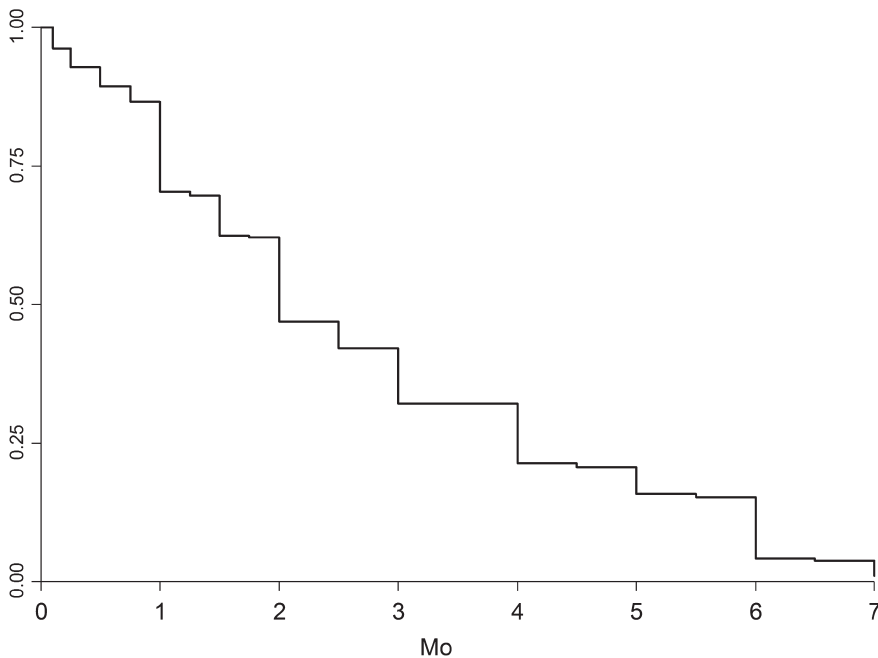
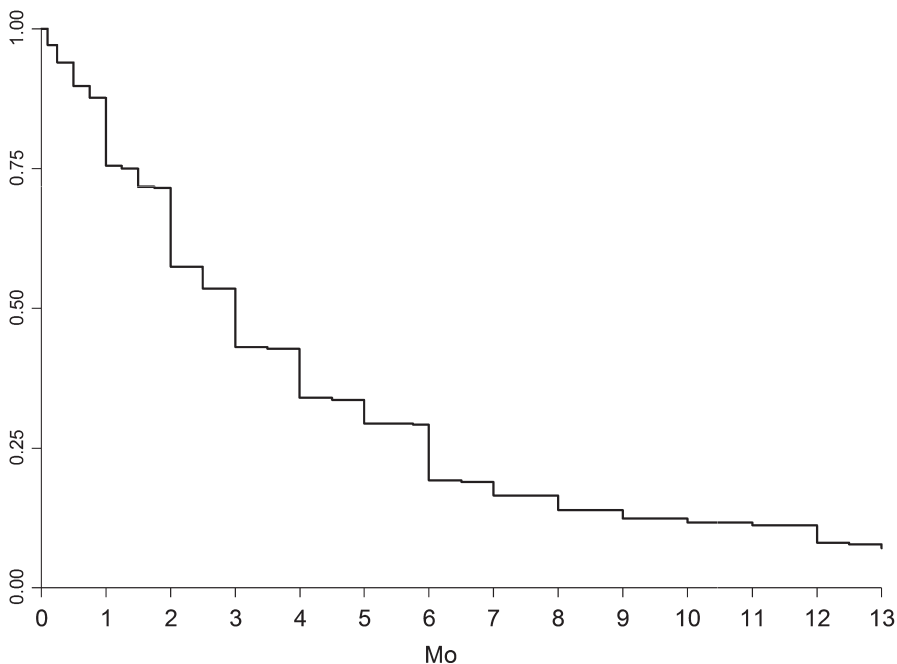
(A) Exclusive breast milk (n = 290)**(B) Any breast milk (n = 411)**

FIGURE 2 A and B, Kaplan-Meier curve with estimates of exclusive breast milk feeding duration (A) and of any breast milk feeding duration (B) in very preterm infants in Portugal, only among infants who initiated the type of breast milk feeding considered. The duration is reported in months of chronological age.

in the North region of Portugal was 96.7% in very preterm infants evaluated at 15-22 days after delivery and 96.4% in full-term infants analysed during the puerperium.⁷

Few studies reported breast milk feeding prevalence and duration in very preterm infants, and most of them described the prevalence at initiation, during hospitalization, and/or at discharge, as revealed our systematic literature review. In addition, we observed that the prevalence and duration of breast milk feeding in very preterm infants varies widely across countries. At initiation period, the prevalence of any breast milk feeding in very preterm infants was 99.0% in Denmark

(2009/2010),⁶ 96.8% in Australia (2011/2012),²¹ and 75.5% in the USA (2007-2010).²⁰ The Australian study showed that the proportion of very preterm infants that received breast milk for more than 6 months was 41.7%,²¹ while it was only 26.5% at 6 months or more in our sample. Similarly, in Denmark and Sweden, 50.0% and 45.0% of very preterm infants were being fed with breast milk at 6 months of age respectively.^{6,36} At hospital discharge, results from a population-based study of very preterm infants born in 2003 in 8 European regions showed the prevalence of any breast milk feeding at discharge ranged between 19% in Burgundy (France) and 70% in Lazio (Italy),

TABLE 3 Main characteristics of the studies included in the systematic literature review with information on breast milk feeding practices at or after 6 months of age (chronological or corrected age)

First author, year of publication	Country	Infants' year of birth	Sample size	Gestational age (weeks) or Birthweight (g)	Breast milk feeding practices	Prevalence (%)	Duration of breast milk (months)
Morag, 2016	Israel	2012-2014	181	<32	Any	19.9	6 CA
Sharp, 2015	Australia	1990-1992 2011-2012	432 253	<32	Any	25.8 41.7	>6
Maastrup, 2014	Denmark	2009-2010	60	24-27	Exclusive Any	27.0 50.0	6 6
			257	28-31	Exclusive Any	8.0 23.0 47.0	12 6 6
Flacking, 2011	Sweden	2001-2002	103	<32	Exclusive Any	1.0 43.0	6 CA 6 CA
Åkerström, 2007	Sweden	1996, 2001, 2004	27 82	<28 28-31	Any Any	41.0 47.0	6 CA 6 CA
Flacking, 2007	Sweden	1993-2001	225	<32	Any	45.0	6
Smith, 2003	USA	1991-1993	361	≤1500	Any	22.0	9
Horwood, 2001	New Zealand	1986	280	<1500	Any	12.0	12
Elder, 1999	Australia	1990-1991	538	<33	Any	21.6	>6
						21.1	≥8
						26.9	>6

CA, Corrected age.



while 50% of participating Portuguese very preterm were fed with any breast milk at discharge (6% exclusive and 44% mixed).⁴ This review did not find any study reporting data on breast milk feeding after 12 months in very preterm infants. Furthermore, there is a paucity of data from Southern and Eastern Europe countries.

The low prevalence and short duration of breast milk feeding among very preterm infants may be explained by several factors. First, by difficulties inherent to their higher neonatal morbidity, such as the delicate transition from enteral to oral feeding and the long stay in the stressful environment of the NICUs.^{18,32} In addition, factors related to health care services may play an important role in the support and promotion of breast milk feeding as it has been shown that hospital policies and practices, independently of maternal sociodemographic factors, exert influence on the initiation and duration of breast milk feeding.⁴⁵ A previous study of the Portuguese infants in the EPICE cohort found a wide variation in the prevalence of breast milk feeding at discharge across Portuguese NICUs, ranging from 49.0% to 83.4% for any breast milk and from 3.3% to 50.0% for exclusive breast milk. This study found that NICUs characteristics, as having designated members to support mothers who were breast feeding, influence feeding practices independently of maternal and infant characteristics.⁴⁶ Furthermore, an inadequate legislation covering maternity protection may hinder women to breastfeed their child.⁴⁷ In Portugal, mothers have access to 4 months of fully paid parental leave, which is shorter than the WHO recommendation for exclusive breast milk feeding. Considering that the association between early return to work and shorter breast milk feeding duration has been reported in several studies, this may partially explain the differences between countries described here, as Sweden, Australia, and Denmark provide longer periods of maternity leave than Portugal.⁴⁸ Overall, our findings indicate a need for improvements in breast milk feeding supportive measures for mothers at neonatal units and after discharge.^{21,49}

4.3 | Strengths of the study

A major strength of our study is the use of high-quality data, obtained from a population-based prospective cohort, using a structured questionnaire at 3 years of age. This allowed us to estimate the prevalence and total duration of exclusive and any breast milk feeding until the age of 3. In addition, our study also included a systematic review, and to the best of our knowledge, this is the first systematic review describing the prevalence and/or duration of breast milk feeding in very preterm infants.

4.4 | Limitations of the data

Our results could be affected by potential recall bias due to retrospective data collection, and the time between stopping breast milk feeding and reporting for most parents. In a birth cohort from Denmark, comparing data on breast milk feeding obtained from the self-administered questionnaire at 18 months with the weekly short

message service (SMS) questions since birth, a longer duration of exclusive breast milk feeding using the self-administered questionnaire was observed, while the duration of any breast milk feeding was similar between the 2 methods.⁵⁰ In a Brazilian study, 70% of mothers correctly recalled breast milk feeding duration when their children were 4 years of age, while 21% reported higher duration and 9% reported lower duration.⁵¹

Another limitation was the lack of detailed information on sociodemographic characteristics, such as mother's employment and educational level. However, we georeferenced the infants and used the European Deprivation Index to classify neighbourhood socio-economic deprivation index, which has been used as a valid proxy of individual socio-economic position,¹¹ and we did not find differences. This result was unexpected considering that previous studies have shown that maternal socio-economic status is associated with initiation and duration of breast milk feeding in very preterm infants.^{31,36} However, the European Deprivation Index is a validated and robust measure with very fine geographical scales and was used in other studies with Portuguese data that reported associations with different outcomes.^{52,53}

Regarding our systematic literature review, a considerable heterogeneity was observed across the studies, not allowing us to conduct a meta-analysis. It is difficult to compare the findings of studies on breast milk feeding prevalence due to the different definitions of breast milk feeding used—only breast feeding or breast and bottle feeding; the misclassification of exclusive breast milk feeding; the different periods of assessment—during hospital stay, at or after hospital discharge; and the use of chronological/corrected age when reporting the duration. In this sense, the comparisons among studies should be performed carefully.

5 | CONCLUSIONS

Given that the duration of both exclusive and any breast milk feeding is positively associated with several optimal health outcomes and, as we found that in Portugal both were below the recommendations, more studies are needed to clarify the longitudinal obstacles to breast milk feeding beyond hospital discharge. Appropriate interventions are needed to increase both the prevalence and duration of exclusive and any breast milk feeding among this vulnerable population. Hence, enabling women to remain at home with their infants for a longer period through a more comprehensive labour policy and maternity leave provision (e.g. to establish 6 months mandatory paid maternity leave) represent public health measures that can contribute to improve breast milk feeding practices in Portugal.⁴⁷

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SUPPORTING INFORMATION

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APPENDIX

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