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Validation of maternal recall on exclusive breastfeeding 12 months after childbirth

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Abstract

Objective: We aimed to assess the validity of maternal recall of exclusive breastfeeding (EBF) at 3 months obtained 12 months after childbirth.

Design: A population-based birth cohort study. The gold standard is maternal report of EBF at the age of 3 months (yes or no) and age of introduction of other foods in the infant's diet. EBF was considered when the mother reported that no liquid, semi-solid or solid food was introduced up to that moment. The variable to be validated was obtained at 12 months after childbirth when the mother was asked about the age of food introduction. The prevalence of EBF at 3 months, and sensitivity, specificity, positive (PPV) and negative predictive values (NPV), and accuracy of 12-month recall with 95 % CI were calculated.

Setting: Pelotas, Brazil.

Participants: 3700 mothers of participants of the Pelotas 2004 Birth Cohort.

Results: The prevalence of EBF at 3 months was 27·8 % (95 % CI 26·4, 29·3) and 49·0 % (95 % CI 47·4, 50·6) according to gold standard and maternal recall, respectively. The sensitivity of maternal recall at 12 months was 98·3 % (95 % CI 97·4, 99·0), specificity 70·0 % (95 % CI 68·2, 71·7), PPV 55·8 % (95 % CI 53·4, 58·1), NPV 99·1 % (95 % CI 98·6, 99·5) and accuracy 77·9 % (95 % CI 76·6, 79·2). When the analyses were stratified by maternal and infant characteristics, the sensitivity remained around 98 %, and the specificity ranged from 64·4 to 81·8 %.

Conclusions: EBF recalled at the end of the first year of infant's life is a valid measure to be used in epidemiological investigations.

Keywords
Validation studies
Accuracy
Sensitivity and specificity
Exclusive breastfeeding

The WHO recommends exclusive breastfeeding (EBF) for the first 6 months of life[1]. The infant should not receive any liquid (water, teas or juices), semi-solid or solid food before reaching 6 months of age, except medicines and supplements[2]. In low- and middle-income countries, only 37 % of infants <6 months of age are exclusively breastfed, and this prevalence is even lower in high-income countries[3]. Data from four national surveys collected through 24-h dietary recalls showed that EBF prevalence in Brazilian infants <6 months of age has increased from 2·9 % in 1986 to 36·6 % in 2013, with a statistically significant increase in each decade up to 2006 and a posterior stabilisation until 2013[4]. Similarly, among infants <2 months of age, there was an increase of 44 % in EBF prevalence between 1986 and 2006, and a reduction of 0·3 % between 2006 and 2013[4]. In Pelotas, a city in southern Brazil, data from three population-based birth cohorts showed that the prevalence of EBF at 3 months of age increased from 7·0 % in 1993 to 45·0 % in 2015[5].

Breastfeeding brings numerous benefits to the health of both mother and child[3,6–11]. The UNICEF and WHO recommend that countries should monitor breastfeeding rates at least every 5 years in order to detect negative trends and identify the need to direct resources for the strengthening of policies and programmes to promote breastfeeding[12]. Large national health surveys, such as the Multiple Indicator Cluster Survey (MICS)[13] and the Demographic and Health Survey (DHS)[14], which are responsible for

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collecting and disseminating accurate national nutrition and health data in low- and middle-income countries, as well as country-specific surveys, such as the National Health and Nutrition Survey (PNSN)[15] in Brazil, are applied in the form of interviews, with the aid of structured questionnaires, with information about EBF usually obtained by the use of 24-h dietary recalls.

Despite the importance of the accuracy of information collected and the availability of studies that have assessed the validity of maternal recall of breastfeeding duration[16–18], there are only few studies that have assessed the validity of maternal recall of duration of EBF[19–21]. Thus, the current study aimed to assess the validity of maternal information, obtained 12 months after childbirth, on the practice of EBF at 3 months of age among mothers of the Pelotas 2004 Birth Cohort in southern Brazil.

Methods

This study was conducted with data collected at birth and at 3- and 12-month follow-ups of the Pelotas 2004 Birth Cohort. All newborns in 2004, with at least 500 g of birthweight or 20 weeks of gestational age, whose mothers lived in the urban area of the municipality and in Jardim América, a neighbourhood adjacent to Pelotas belonging to a neighbouring municipality (Capão do Leão), were enrolled to the cohort. With a refusal rate of 0·8 %, 4231 newborns from the five maternity hospitals in the city were included in the cohort. Follow-up rates at 3 and 12 months were 95·7 and 94·3 %, respectively. Further methodological details about the cohort are available in previous publications[22,23].

For the present investigation, only newborns of single births were considered. A total of 3700 mothers provided information about the patterns of breastfeeding at 3- and 12-month follow-ups. Maternal report on EBF obtained at 3 months of age was used as the gold standard for validation analysis. Initially, mothers were asked if the infant received breast milk. Then the mothers were questioned about the introduction of other foods by means of the following questions: 'When has <INFANT'S NAME> begun to eat regularly (being presented one by one the foods in the following list): cow's milk, powdered milk, tea, juice, water, mashed fruits, soup, mashed vegetables, porridge, egg and other food?'. Regular consumption was considered when the food had been offered at least twice, on different days, in the last week. The age of introduction of each food was recorded in months and days. EBF was recorded when breastfed children were not fed any other liquid, semi-solid or solid foods up to 3 months of age.

The variable to be validated was obtained at 12 months after childbirth when the mother was asked about the age of food introduction. The question used was: 'Now, I am going to tell you a list of liquids and foods and let me know if you have started giving them to <INFANT'S NAME>. When I say "started", I want to know if <INFANT'S NAME> receives or received that liquid or food every day, or almost every day of the week. If you have already started giving it, I want to know when you have started: cow's milk, powdered milk, tea, juice, mashed fruit, soup, mashed vegetables, porridge, yogurt, bread or cracker, egg (yolk), egg (white), meat, bean broth, bean grain, pasta, legumes/vegetables (in pieces), and other foods'. The age of food introduction was collected in months and days from the first ingestion of each food. When the mother reported that no other liquid, semi-solid or solid food but breastmilk was introduced up to the age of 3 months, the breastfeeding pattern at 3 months was recorded as EBF.

In order to characterise the sample, the following information about the infant at birth was used: gestational age (complete weeks), sex (male or female) and weight (<2500 or ≥2500 g). In addition, the following maternal characteristics were used: age at delivery (subsequently categorised as ≤19, 20–29 or 30–46 years); self-reported skin colour (white, black or other); completed years of schooling at delivery (later categorised into 0–4, 5–8, 9–11 and ≥12 years); socioeconomic level based on the criteria of the Research Companies Brazilian Association (ABEP), which uses schoolarity of the family head and household assets, categorised into economic classes A/B (wealthiest), C or D/E (poorest)[24]; parity (number of children born alive or dead); maternal smoking during pregnancy (at least one cigarette per day in any trimester of gestation); marital status (without or with partner); self-reported depressive symptoms during pregnancy ('During pregnancy, did you have depression or nervous problem'? no; yes, treated; yes, untreated); type of delivery (vaginal or C-section); previous experience with breastfeeding (yes or no); and number of antenatal consultations. At the 3-month follow-up, the mothers were asked if they had returned to work after childbirth (yes or no) and if they were currently smokers (yes or no).

Statistical analyses were conducted in Stata, version 14.2 (StataCorp). To verify the sensitivity, specificity, positive (PPV) and negative predictive values (NPV), the statistical command 'diagt' was used. These parameters were first calculated for the entire sample and then after stratifying the sample according to the independent variables. Accuracy was calculated based on the following formula: (true positives + true negatives)/whole sample. The 95 % CI was calculated for all the estimated parameters. True and false positive and negative values were defined as follows:

- True positives: mothers who reported EBF both at the 3-month (gold standard) and 12-month follow-ups;
- False negatives: mothers who reported EBF at the 3-month follow-up, but in the 12-month follow-up they reported having introduced any liquid, semi-solid or solid food before the age of 3 months;
- True negatives: mothers not reporting EBF at the 3- and 12-month follow-ups;

- False positives: mothers not reporting EBF at the 3-month follow-up as well as, at the 12-month follow-up, not having introduced any liquid, semi-solid or solid food before the age of 3 months.

Results

At both follow-ups (3 and 12 months), the majority of mothers were between 20 and 29 years of age; self-reported white skin colour; lived with a partner; had two or more children; were non-smokers during or after pregnancy; had previous experience with breastfeeding; attended eight or more antenatal consultations; had a vaginal delivery; and had not returned to work after childbirth (Table 1). Approximately 20 % of the mothers reported depressive symptoms during pregnancy, and most received no treatment for depression. The proportion of mothers with lower years of schooling (<9 years) was higher at the 12-month (52·2 %) than at the 3-month follow-up (42·7 %), whereas the proportion from socioeconomic classes D/E was higher at the 12-month (44·3 %) than at the 3-month follow-up (38·6 %) (Table 1). As for infant characteristics (Table 1), the prevalence of low birthweight (LBW) (<2500 g) and preterm birth were 5·6 and 7·8 %, respectively, at the 3-month follow-up, and 9·5 and 12·6 % at the 12-month follow-up.

The prevalence of EBF by maternal report at the 3-month follow-up (gold standard) was 27·8 % (95 % CI 26·4, 29·3). At the 12-month follow-up, the maternal report provided a prevalence of EBF at 3 months of 49·0 % (95 % CI 47·4, 50·6) (data not presented in table). Maternal recall of EBF at 3 months at the end of the first year after childbirth showed a sensitivity of 98·3 % (95 % CI 97·4, 99·0),

Table 1 Maternal and child characteristics of the Pelotas 2004 Birth Cohort at 3 and 12 months postpartum – Pelotas, Rio Grande do Sul, Brazil

	Sample*, *n* 3700		EBF gold standard (obtained at 3 months), *n* 1028		EBF test (obtained at 12 months), *n* 1813	
Characteristics	*n*	%	%	95 % CI	%	95 % CI
Maternal						
Total			27·8	26·4, 29·3	49·0	47·4, 50·6
Age (years)						
≤19	681	18·4	12·7	10·8, 14·8	15·6	14·0, 17·3
20–29	1836	49·6	50·6	47·6, 53·7	50·3	48·0, 52·6
30–46	1182	32·0	36·7	33·8, 39·7	34·2	32·0, 36·4
Skin colour						
White	2716	73·4	74.6	77·9, 77·2	72·8	70·7, 74·8
Black	731	19·8	18·8	16·5, 21·3	20·5	18·7, 22·4
Other	253	6·8	6·6	5·2, 8·3	6·7	5·5, 7·9
Marital status						
Without partner	569	15·4	11·0	9·2, 13·1	14·5	12·9, 16·3
With partner	3131	84·6	89·0	86·9, 90·8	85·5	83·7, 87·1
Schooling (complete years)						
0–4	552	15·1	9·6	7·9, 11·5	13·5	12·0, 15·2
5–8	1512	41·2	33·1	30·2, 36·0	38·7	36·5, 41·0
9–11	1236	33·7	42·8	38·8, 44·8	36·0	33·8, 38·2
≥12	366	10·0	15·6	13·5, 18·0	11·8	10·3, 13·3
SES (ABEP)						
D/E (poorest)	1440	47·4	38·6	35·4, 41·9	44·3	41·8, 46·8
C	1062	35·0	36·8	33·7, 40·2	36·0	33·7, 38·5
A/B (wealthiest)	536	17·6	24·5	21·7, 27·5	19·6	17·7, 21·7
Parity						
1	1448	39·1	36·4	33·5, 39·4	37·7	35·4, 39·9
≥2	2252	60·9	63·6	60·6, 66·5	62·3	60·0, 64·5
Smoking during pregnancy						
No	2736	73·9	81·4	78·9, 83·7	76·5	74·5, 78·4
Yes	964	26·1	18·6	16·3, 21·0	23·5	21·6, 25·5
Maternal smoking at 3 months postpartum						
No	2764	74·7	82·4	79·9, 84,6	77·7	75·7, 79·5
Yes	936	25·3	17·6	15·4, 20·1	22·3	20·5, 24·3
Depressive symptoms during pregnancy						
No	2783	75·2	78·4	75·9, 80·9	77·7	75·7, 79·6
Yes, untreated	795	21·5	18·3	16·1, 20·8	19·6	17·8, 21·5
Yes, treated	121	3·3	3·2	2·3, 4·5	2·7	2·0, 3·6
Previous breastfeeding experience						
No	1809	48·9	43·7	40·7, 46·7	45·7	43·4, 48·0
Yes	1891	51·1	56·3	53·3, 59·3	54·3	52·0, 56·6

Table 1 *Continued*

Characteristics	Sample*, *n* 3700		EBF gold standard (obtained at 3 months), *n* 1028		EBF test (obtained at 12 months), *n* 1813	
	n	%	%	95 % CI	%	95 % CI
Type of delivery						
Vaginal	2020	54·6	53·7	50·6, 56·7	54·7	52·5, 57·1
C-section	1680	45·4	46·3	43·3, 49·4	45·2	42·9, 47·5
Number of antenatal consultations						
<8	1413	39·8	31·4	28·6, 34·4	37·6	35·4, 39·9
≥8	2137	60·2	68·6	65·6, 71·4	62·4	60·1, 64·6
Maternal postpartum work						
No	3209	86·7	89·0	86·9, 90·8	87·9	86·3, 89·3
Yes	491	13·3	11·0	9·2, 13·1	12·1	10·7, 13·7
Infant						
Sex						
Male	1911	51·7	50·0	46·9, 53·1	50·3	48·0, 52·6
Female	1789	48·4	50·0	46·9, 53·1	49·7	47·3, 52·0
Birth weight (g)						
<2500	322	8·7	5·6	6·4, 9·6	7·8	6·6, 9·1
≥2500	3377	91·3	94·4	92·8, 95·6	92·2	90·9, 93·4
Gestational age (weeks)						
≤36	499	13·5	9·5	7·9, 11·5	12·6	11·2, 14·2
≥37	3197	86·5	90·5	88·5, 92·1	87·4	85·8, 88·8

EBF, exclusive breastfeeding; SES, socioeconomic status; ABEP, Research Companies Brazilian Association.
*Mothers who reported about exclusive breastfeeding at 3 and 12 months postpartum.

Table 2 Validity of maternal recall on exclusive breastfeeding (EBF) at 3 months, obtained at 12 months after childbirth, compared with the gold standard (EBF at 3 months, obtained at 3-month follow-up) – Pelotas 2004 Birth Cohort, Rio Grande do Sul, Brazil

Parameters	*n*	*N*	%	95 % CI
Sensitivity	1011	1028	98·3	97·4, 99·0
Specificity	1870	2672	70·0	68·2, 71·7
PPV*	1011	1813	55·8	53·4, 58·1
NPV*	1870	1887	99·1	98·6, 99·5
Accuracy	1011 + 1870	3700	77·9	76·6, 79·2

PPV, positive predictive value; NPV, negative predictive value.
*PPV and NPV at an EBF prevalence of 27·8 %.

specificity of 70·0 % (95 % CI 68·2, 71·7) and accuracy of 77·9 % (95 % CI 76·6, 79·2). PPV and NPV were 55·8 % (95 % CI 53·4, 58·1) and 99·1 % (95 % CI 98·6, 99·5), respectively (Table 2).

The parameters of validation estimated according to maternal and newborn characteristics are described in Table 3. Among the different variables, sensitivity remained nearly 98·0 %, while specificity ranged from 66·4 to 81·8 %. PPV was higher among non-adolescent mothers, those who lived with a partner (58·1 %), those with ≥12 years of formal education (74·4 %), those who belonged to socioeconomic level A/B (69·4 %), those who did not smoke during pregnancy (59·4 %) or at the 3-month follow-up (59·3 %), and those who attended eight or more antenatal care consultations (61·6 %), as well as among mothers of infants with birth weight ≥2500 g (57·0 %) or ≥37 weeks of gestational age (57·7 %).

Discussion

The present study tested the validity of maternal recall on EBF at 3 months of age obtained 12 months after childbirth. The probability of maternal recall at the end of first year of child's life correctly identifying mothers who reported EBF at 3 months after delivery was 98·3 %. The specificity at 12 months was lower, with a 30 % rate of false-positive responses, possibly indicating that mothers – despite being aware that EBF is advocated up to the first 6 months of infant's life – reported having offered it even when they did not. The accuracy of almost 80 % is less than perfect or substantial but can be considered moderate[25], indicating that maternal recall on EBF at 3 months of age collected after 12 months of childbirth is a valid measure deserving application in surveillance studies.

The measurement of EBF is complex, as rates may vary according to the definition, measurement period, instrument of assessment and even child's age[26]. Although maternal recall on breastfeeding has been widely used in research, its validity and reliability have been questioned, because it is a memory-dependent information[18]. However, a literature review of articles published between 1966 and 2003 in English has found that maternal report on initiation and duration of any breastfeeding would be accurate and reliable, although the recall of breastfeeding duration might become less accurate as the period of recall increases[16]. On the other hand, the validity and reliability of maternal recall of EBF duration might be less accurate[16].

Table 3 Validation of maternal recall on exclusive breastfeeding at 3 months, obtained at 12 months after childbirth, according to maternal and infant characteristics – Pelotas 2004 Birth Cohort, Rio Grande do Sul, Brazil (*n* 3700)

	Sensitivity		Specificity		PPV		NPV	
Characteristics	%	95 % CI	%	95 % CI	%	95 % CI	%	95 % CI
Maternal								
Age (complete years)								
≤19	98·5	94·6, 99·8	72·1	68·1, 75·8	45·4	39·5, 51·4	99·5	98·2, 99·9
20–29	98·3	96·7, 99·2	69·6	67·0, 72·1	56·1	52·8, 59·3	99·0	98·2, 99·6
30–46	98·4	96·2, 99·4	69·2	65·9, 72·4	59·9	56·0, 63·8	98·9	97·7, 99·6
Skin colour								
White	98·0	96·8, 98·9	70·9	68·8, 72·9	57·0	54·2, 59·7	98·9	98·2, 99·4
Black	99·0	96·3, 99·9	66·5	62·4, 70·5	51·5	46·3, 56·7	99·4	98·0, 99·9
Other	100	94·7, 100	70·8	63·7, 77·2	55·7	46·5, 64·7	100	97·2, 100
Marital status								
Without partner	97·3	92·4, 99·4	66·4	61·9, 70·8	41·8	35·8, 48·0	99·0	97·2, 99·8
With partner	98·5	97·4, 99·2	70·7	68·8, 72·6	58·1	55·6, 60·6	99·1	98·5, 99·5
Schooling (complete years)								
0–4	99·0	94·4, 100	67·7	63·2, 72·0	39·5	33·3, 46·0	99·7	98·2, 100
5–8	98·5	96·6, 99·5	69·0	66·3, 71·6	47·5	43·7, 51·3	99·4	98·6, 99·8
9–11	97·6	95·7, 98·9	71·3	68·1, 74·4	63·9	60·1, 67·6	98·3	96·9, 99·2
≥12	99·4	96·5, 100	74·0	67·5, 79·9	74·4	68·0, 80·2	99·4	96·5, 100
SES (ABEP)								
D/E (poorest)	98·2	96·1, 99·3	69·0	66·2, 71·7	48·8	45·0, 52·7	99·2	98·3, 99·7
C	99·4	97·7, 99·9	69·2	65·8, 72·5	58·0	53·7, 62·2	99·6	98·6, 100
A/B (wealthiest)	97·6	94·6, 99·2	72·0	66·8, 76·8	69·4	63·8, 74·6	97·9	95·2, 99·3
Parity								
1	97·9	95·8, 99·1	70·5	67·7, 73·2	53·6	49·8, 57·4	99·0	97·9, 99·5
≥2	98·6	97·4, 99·4	69·6	67·3, 71·9	57·1	54·1, 60·0	99·2	98·5, 99·6
Smoking during pregnancy								
No	98·4	97·4, 99·2	70·4	68·2, 72·4	59·4	56·8, 62·0	99·0	98·4, 99·5
Yes	97·9	94·7, 99·4	69·1	65·7, 72·3	43·9	39·1, 48·8	99·3	98·1, 99·8
Maternal smoking at 3 months postpartum								
No	98·5	97·4, 99·2	70·1	68·0, 72·1	59·2	56·6, 61·8	99·0	98·4, 99·5
Yes	97·8	94·4, 99·4	69·8	66·4, 73·1	43·7	38·8, 48·7	99·2	98·1, 99·8
Depressive symptoms during pregnancy								
No	98·4	97·3, 99·1	68·9	66·8, 70·9	56·3	53·7, 58·9	99·1	98·4, 99·5
Yes, untreated	97·9	94·6, 99·4	71·8	68·1, 75·4	51·8	46·5, 57·1	99·1	97·7, 99·8
Yes, treated	100	89·4, 100	81·8	72·2, 89·2	67·3	52·5, 80·1	100	95·0, 100
Previous breastfeeding experience								
No	98·0	96·2, 99·1	71·4	68·9, 73·8	53·1	49·6, 56·1	99·1	98·3, 99·6
Yes	98·6	97·3, 99·4	68·5	65·9, 71·0	58·0	54·9, 61·1	99·1	98·3, 99·6
Type of delivery								
Vaginal	98·4	96·9, 99·3	69·3	66·9, 71·7	54·7	51·5, 57·8	99·1	98·3, 99·6
C-section	98·3	96·7, 99·3	70·8	68·1, 73·3	57·1	53·6, 60·5	99·1	98·2, 99·6
Number of antenatal consultations								
<8	97·7	95·4, 99·1	68·1	65·3, 70·9	46·4	42·5, 50·3	99·1	98·1, 99·6
≥8	98·8	97·7, 99·5	71·4	69·0, 73·7	61·6	58·7, 64·5	99·2	98·5, 99·7
Maternal postpartum work								
No	98·3	97·2, 99·0	69·7	67·8, 71·6	56·4	54·0, 58·9	99·0	98·4, 99·4
Yes	99·1	95·2, 100	71·4	66·6, 75·9	50·9	44·1, 57·7	99·6	98·0, 100
Infant								
Sex								
Male	98·6	97·2, 99·5	71·0	68·6, 73·4	55·6	52·3, 58·8	99·3	98·6, 99·7
Female	98·1	96·5, 99·1	68·9	66·2, 71·4	55·9	52·6, 59·2	98·9	97·9, 99·5
Birth weight (g)								
<2500	100	93·8, 100	68·6	62·6, 74·1	41·1	32·9, 49·7	100	98·0, 100
≥2500	98·2	97·2, 99·0	70·1	68·3, 72·0	57·0	54·6, 59·4	99·0	98·4, 99·4
Gestational age (weeks)								
≤36	99·0	94·4, 100	67·1	62·2, 71·7	42·4	35·9, 49·0	99·6	98·0, 100
≥37	98·3	97·2, 99·0	70·5	68·6, 72·4	57·7	55·3, 60·2	99·0	98·4, 99·4

PPV, positive predictive value; NPV, negative predictive value; SES, socioeconomic status; ABEP, Research Companies Brazilian Association.

More recently, a survey conducted in the United States has shown that maternal recall on any breastfeeding duration in the first year of child's life verified 6 years after childbirth had a high intraclass correlation coefficient (ICC = 0·84) against the gold standard obtained monthly by maternal report until 12 months of age[17]. In Brazil, researchers have found a high agreement (ICC = 0·92) between maternal recall on any breastfeeding duration

collected when the child was 2 years of age compared with reports collected monthly in the first 3 months of child's life (gold standard)[18], which is consistent with our findings.

In terms of EBF, an investigation has found that at 2 years after delivery, mothers overestimated EBF up to 6 months of age as compared with the gold standard measured weekly up to 1 month of life and monthly up to the age of 6 months[19]. A study in Guatemala tested two self-reported instruments to assess EBF in infants aged 3 months using the dose-to-mother deuterium oxide turnover (DMDOT) technique as the reference method. The prevalence of EBF was 50 % according to the current feeding practice reported, 61 % by the 24-h dietary recall and only 36 % when using DMDOT. The sensitivity to detect EBF from the mother's report was 92 % (95 % CI 62, 99), but from the 24-h dietary recall was 100 % (95 % CI 72, 100). The specificity for both methods was lower – 74 % (95 % CI 51, 89) for reported current feeding practice and 61 % (95 % CI 39, 79) for the 24-h dietary recall[21].

In Sri Lanka, two methods to collect retrospective data on EBF up to 6 months of age were tested: (1) based on an event calendar (date of introduction, frequency of use and quantity of specific food items) and (2) mother's recall at 9 months after childbirth[20]. The gold standard was obtained through prospective data collected since birth. The authors have reported 100 % sensitivity for both methods, specificity of 26·2 % (95 % CI 17·9, 36·8) for an event calendar, and specificity of 75·0 % (95 % CI 64·5, 83·2) for mother's recall at 9 months after childbirth[20]. The way the questions are framed may affect the accuracy of response from the mother. Asking the time of complementary feeding introduction (as in our study) may provide different results than asking the duration of EBF.

Some studies have reported differences in the validity of maternal recall on breastfeeding according to sociodemographic characteristics[17,19]. In our study, however, the sensitivity remained stable and around 98 % at the different maternal and child characteristics evaluated. On the contrary, PPV varied according to maternal age, economic class, schooling, smoking, number of antenatal care consultations attended, birthweight and gestational age, thus reflecting differences in the prevalence of EBF among these groups of mothers. Youngest mothers, those under socioeconomically disadvantaged conditions as well as smokers presented the lowest rates of EBF at 3 months. Such findings are in agreement with the results of Amissah *et al.* from the USA[17].

Our study has few strengths and limitations. The main strength is it being a population-based study. In addition, the gold standard information was collected near the moment of its occurrence. The mean age of infants when the follow-up occurred was 3·0 (SD 0·1) months, thus reducing the probability of recall bias. Among the limitations, it is possible that mothers taking part in a birth cohort study tend to remember more promptly of the events that occurred in the child's life than non-participating mothers, thus compromising the external validity of our results. Another point to consider is the information bias arising from the maternal knowledge about the recommendation of EBF for the first 6 months of infant's life. As a result, false-positive responses may be present in our findings at both follow-ups, thus increasing the estimated prevalence of EBF at 3 months and decreasing the specificity of maternal recall at 12 months.

Conclusion

This study contributes valuable data to epidemiological research on maternal recall of EBF. Information relating to EBF at 3 months of age obtained from mothers 12 months after childbirth showed almost 80 % accuracy. The information remained valid even after the sample was stratified by newborn weight, gestational age and several maternal characteristics.

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