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# Demographic, socioeconomic, and sociocultural factors associated with any breastfeeding in homeless mothers

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## Abstract

In high-income countries, breastfeeding has been shown to be positively associated with socioeconomic position. However, less is known about breastfeeding practices and their associated factors among extremely disadvantaged populations. We aimed to assess the associations of cultural origins and socioeconomic factors with any breastfeeding initiation and duration in homeless families. We analyzed data from 456 children aged 6 months to 5 years from the cross-sectional ENFAMS survey, conducted in 2013 among a random sample of homeless families in shelters in the Greater Paris area. Data were collected by bilingual interviewers in 17 languages. Four nested multivariable robust Poisson regression models were run in a hierarchical framework to determine the factors associated with breastfeeding initiation and with any breastfeeding for 6 months or more. Most of the children (86.0%) had previously been or were currently being breastfed at the time of the survey; 58.9% were fed with breast milk  $\geq 6$  months. A higher maternal age and African origin were positively associated with breastfeeding  $\geq 6$  months, although the relation to the region of origin was moderated by education level. Migration to escape war, unrest or other violence and the child's birth in France were inversely associated with breastfeeding  $\geq 6$  months. Any breastfeeding by these homeless mothers seems influenced predominantly by their cultural origin and complicated by a difficult migration trajectory. The

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possible influence of poor material circumstances and cumulative hardship should encourage interventions targeted at homeless mothers that emphasize social/family support with a commitment to improving the family's living conditions.

#### KEYWORDS

breastfeeding, homeless, migrants, poverty

## 1 | INTRODUCTION

Breastfeeding has many beneficial effects for the health of children and mothers (Horta et al., 2018; Victora et al., 2016). The World Health Organization (WHO) thus recommends exclusive breastfeeding for the first 6 months of life, and continuation of breastfeeding until 2 years of age or more, along with adequate complementary feeding starting at 6 months (World Health Organization, 2002). Breastfeeding practices vary across the world with higher initiation rates and longer durations observed in sub-Saharan Africa, South Asia and parts of Latin America (Victora et al., 2016). In the general population of high-income countries, maternal factors have been positively associated with both breastfeeding initiation and duration, including age, education level, income, employment, social support, a normal weight status (compared to obesity) and immigrant status (Brown et al., 2010; Dennis, 2002; Dennis et al., 2019; Ibanez et al., 2012; Victora et al., 2016; Yourkavitch et al., 2018). In England and Wales, Brown et al. (2010) showed that neighbourhood deprivation remained a strong predictor of shorter breastfeeding duration, beyond other demographic and socioeconomic measures.

There is, however, only scarce evidence on the factors that influence breastfeeding practices in the most disadvantaged families of high-income countries (Brown et al., 2010). In particular, homeless families have scarcely been studied, despite their increasing numbers in the United States since the mid-1980s and in Europe since the late 1990s (Baptista et al., 2017; Fazel et al., 2014; Richards et al., 2011). In Metropolitan France, people experiencing homelessness, either roofless or sheltered, were estimated at 141,500 in 2012 (Yaouancq et al., 2013). Families represent the fastest growing segment of the homeless population (FEANTSA, 2010). In this context, the 'Observatoire du Samusocial de Paris' conducted the ENFAMS survey ('Enfants et familles sans logement') (Vandentorren et al., 2016) among homeless children and families sheltered in the Greater Paris area in 2013, to investigate their living conditions and health status. This survey reported that nearly all these women (94%) were born outside of France (63% in Africa); 94% lived below the poverty level; and about half in single-parent families. The survey highlighted major health problems in both mothers and their children, such as high rates of food insecurity, malnutrition and mental health disorders (Arnaud et al., 2018; Martin-Fernandez et al., 2018; Roze et al., 2018, 2016; Vandentorren et al., 2016).

Increasing knowledge about the specific factors contributing to breastfeeding variation in these vulnerable families would help

### Key messages

- Although breastfeeding has been shown to be positively associated with socioeconomic position in the general population of high-income countries, less is known about it and the factors associated with it among homeless families, an extremely disadvantaged and understudied population.
- Our findings showed that rates of breastfeeding practices were quite high, as 86% (95% confidence interval [CI] 81.7–90.3) of homeless mothers initiated breastfeeding and 58.9% (CI 52.4–65.4) breastfed for 6 months or more (any breastfeeding).
- Breastfeeding practices were influenced predominantly by the mother's cultural origin and challenged by a difficult migration trajectory. In particular, migration to escape from war, unrest or other violence and the child's birth in France were inversely associated with breastfeeding  $\geq 6$  months.

increase the effectiveness of breastfeeding support actions. This is important because the absence of breastfeeding in homeless populations has substantial consequences, beyond health. From a budgetary perspective, given the high cost of infant formula, breastfeeding represents a major economic benefit to the household (Association of Women's Health, Obstetrics, and Neonatal Nurses [AWHONN], 2015; Spatz, 2020). It can also be more convenient and safer when there are practical barriers to preparing formula (water supply and facilities for sterilizing bottles). Further, despite the particularly difficult living conditions, breastfeeding may also be a source of well-being for mother and child and enhance the mother's self-efficacy and increase mother-child attachment (AWHONN, 2015; Edwards et al., 2017; Gibbs et al., 2018; Spatz, 2020). Given the high proportion of homeless mothers with psychosocial issues, such as family problems, post-traumatic disorders, depression, anxiety, substance abuse and violence (Bassuk & Beardslee, 2014; Bassuk et al., 2001; Edwards et al., 2017), these possible beneficial effects to the mother-child relationship are particularly valuable.

We hypothesized that living conditions and cultural origins might influence breastfeeding practices in homeless mothers. On the one

hand, extremely poor living conditions may serve as barriers to breastfeeding initiation and duration (Brown et al., 2010). On the other hand, the families' cultural origins could facilitate them, as women of African origin living in France are reported to have relatively high breastfeeding rates and duration than the majority population (Bonet et al., 2008; Girard et al., 2016; Kersuzan et al., 2018; Salanave et al., 2012; Wagner et al., 2015, 2019).

The first objective of this study was to describe the distribution of any breastfeeding in sheltered homeless families. The second objective was to investigate the demographic and socioeconomic factors associated with breastfeeding practices, that is, breastfeeding initiation and any breastfeeding for 6 months or longer, while taking into account the potential moderating effect of the mothers' cultural origins (Girard et al., 2016; Vanderlinden et al., 2015).

## 2 | METHODS

### 2.1 | Survey design and participants

The ENFAMS survey (Vandentorren et al., 2016) used a three-stage random sampling design (shelter, family and child). The research team created an exhaustive list of all facilities housing homeless families and collected data on the number of families sheltered and the number of minor children within each facility by a telephone survey. First, shelters were randomly selected. Then, families were selected by simple random sampling within each selected shelter. At the third stage, one child was randomly chosen in each family. The study included 801 homeless families accommodated in emergency shelters, long-term rehabilitation shelters, social hostels and shelters for asylum seekers in the Greater Paris area in 2013. To be eligible, families had to include at least one parent, have at least one child younger than 13 years, speak one of the 17 languages considered in the survey and be able to provide informed consent. The participation rate was 79%. Nonparticipants were younger than participants (mean age: 33 vs. 38 years) and more frequently had >2 children sheltered with them (32% vs. 23%).

### 2.2 | Measurements

Interviewers administered two face-to-face questionnaires to one parent, preferably the mother (more likely to be able to answer questions about the perinatal period and breastfeeding). The first questionnaire focussed on demographic and socioeconomic characteristics, living conditions and health of both the parent and the household. The second concerned the sampled child's nutrition and health. Nurses measured the mother's weight and height, with an adult weighing scale and a stadiometer, with a precision respectively of 0.1 kg and 0.1 cm. The child's birth weight was reported from his/her health booklet, when available.

### 2.3 | Study population

This analysis includes 456 children aged 0.5 years (6 months) to 5 years. We excluded families in which the sampled child was younger than 6 months ( $n = 56$ ) or older than 5 years ( $n = 239$ ), or the respondent parent was the father ( $n = 29$ ), or with missing data regarding breastfeeding ( $n = 25$ ).

### 2.4 | Conceptual framework

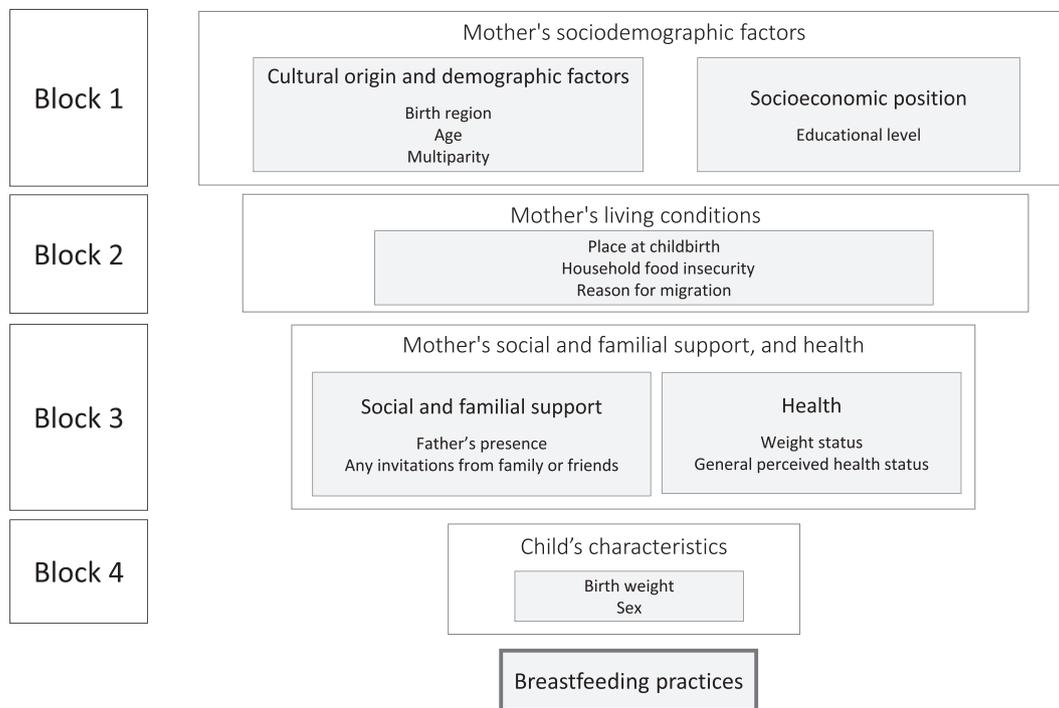
The variables anticipated to influence breastfeeding practices were structured from the most distal to the most proximal, within a framework derived from both socioecological models (Campbell et al., 2010) and hierarchical approaches (H. J. Lee, Elo, et al., 2009; Victora et al., 1997) (Figure 1). These variables were selected from the available literature on the demographic and contextual determinants of breastfeeding described above. The hierarchical diagram was organized in four nested blocks, with the first three concerning the mother: Block 1, cultural origin (i.e., region of birth) and demographic and socioeconomic factors; Block 2, living conditions; and Block 3, social environment and health. Block 4 covered the child's characteristics. In the multivariable analysis, each variable of a given block was interpreted within the first model in which it was included (i.e., Model A for Block 1 variables; B for Block 2 variables; C for Block 3 variables; and D for Block 4 variables) (Victora et al., 1997), regardless of its performance in the subsequent model(s) (Victora et al., 1997). This approach sought to ensure that intermediate variables did not affect the relation of the distal variables to the outcome variable (breastfeeding).

### 2.5 | Dependent variables

Children were considered breastfed if they had ever received breast milk, regardless of the type of breastfeeding (exclusive or partial) and of the introduction of foods or non-milk drinks (if any). Any breastfeeding duration was calculated from the response to the following question: 'How old was the child when breastfeeding was permanently stopped?' If the child was still being breastfed at the time of the survey, breastfeeding duration was censored to the child's age at that moment. Two binary outcomes were studied: breastfeeding initiation (yes/no) and any breastfeeding for 6 months or longer (yes/no).

### 2.6 | Independent variables

Maternal cultural origin, along with demographic and socioeconomic factors, included the mother's birth region (countries in sub-Saharan Africa; African countries not-sub-Saharan, mostly North Africa; and other countries from all other continents, including Europe and France); mother's age (<23; 23 to <32; and  $\geq 32$  years); parity, more specifically defined as multiparity (yes/no) at the birth of the child



**FIGURE 1** Conceptual model derived from a hierarchical framework, adapted from Victora et al., 1997

(i.e., this child was not her first liveborn child); and education level (defined based on the highest educational certificate obtained, that is, less than high school certificate; high school certificate; and tertiary level certificate) (Figure 1). Living conditions covered the mother's place of residence at that birth (abroad or in France); the household's level of food insecurity during the year before the survey (secure or mildly insecure; moderately to severely insecure), measured with the Household Food Security Scale Measure (HFSSM) (Radimer & Radimer, 2002); and the mother's reason for migration (violence, i.e., escape from war, political unrest, ethnic conflict or other criminal or domestic violence, vs. other reasons, mainly economic or for family reunification). Familial and social support were assessed by whether the father had ever lived with the child (yes/no), and if the family had been invited at least once to a party or celebration at someone's home during the year before the survey (yes/no). Health characteristics included the mother's weight, defined in three categories according to the WHO thresholds, that is, underweight or normal ( $<25 \text{ kg/m}^2$ ), overweight ( $25.0$  to  $<30 \text{ kg/m}^2$ ), obese ( $\geq 30 \text{ kg/m}^2$ ), or pregnant; and perceived health (good or very good; medium bad or very bad). The child's characteristics included sex and birth weight in two categories ( $<2.8 \text{ kg}$  and  $\geq 2.8 \text{ kg}$ ).

## 2.7 | Statistical analyses

We handled missing data for all independent variables by performing multiple imputations by chained equations, assuming that data were missing data at random. Percentages of missing data for each variable are presented in Table S1. Using the fully conditional specification

method, we ran all main analyses with 10 imputed datasets and then computed pooled effect estimates.

Families with a child aged  $\leq 5$  years included in the analysis ( $n = 456$ ) were compared with those excluded ( $n = 110$ ) to assess possible selection bias. We then estimated the prevalence of any breastfeeding (none; [0;6]; [6; 12]; [12; 18]; [18; 24]; and  $\geq 24$  months) in children aged 6 months to 5 years, overall and by mother's region of birth. We described the factors under study (reported in Figure 1) according to the child's breastfeeding status at 6 months (i.e., not breastfed or ever breastfed  $< 6$  months vs. breastfed  $\geq 6$  months). Two separate robust multivariable Poisson regression models were run to determine the factors associated with breastfeeding initiation for the first model and breastfeeding  $\geq 6$  months for the second. These models also estimated prevalence ratios and their 95% CIs (Lee et al., 2009; Zou, 2004).

For each of these two outcomes, four models (A, B, C and D) gradually included the different blocks of variables (1, 2, 3 and finally 4) from the conceptual diagram (Figure 1). The interaction between maternal education level and birth region was tested in Model A. Although interaction was not significant for breastfeeding initiation ( $p = 0.33$ ), it was for breastfeeding  $\geq 6$  months ( $p = 0.034$ ). Consequently, we included an interaction term in all four models (A, B, C and D) only for breastfeeding  $\geq 6$  months as an outcome. Five sensitivity analyses were performed: the first concerned breastfeeding initiation in the expanded sample that also included children aged  $\leq 6$  months ( $n = 512$ ), two others were run on the complete case sample ( $n = 285$ ) for both breastfeeding initiation and duration outcomes. We also conducted the same two analyses on the subsample of 237 mothers who were homeless and living in France at the time of

the child's birth and assessed their breastfeeding rates (initiation and breastfeeding  $\geq 6$  months). All analyses took the sampling design into account and were performed with Stata v15.1 (StataCorp, College Station, TX, USA). The significance level was set at 0.10 for the interaction tests and 0.05 otherwise.

## 2.8 | Ethical considerations

The study protocol was approved by the national authority for the protection of personal data (CNIL, n. DR-2013-147) and by two Ethics Committees (CPP, Ref 2012 02 06, 22 August 2012, and CCTIRS, n. 12.471, 17 September 2012). To be eligible, families had to be able to provide informed consent for study participation.

## 3 | RESULTS

### 3.1 | Participation and characteristics of the study population

Families included in the analysis marginally differed from those excluded: 20% of the included mothers were obese (vs. 41%,  $p = 0.001$ ) and 43% of included children were boys (vs. 56%,  $p = 0.047$ ). Table 1 summarizes the characteristics of the study sample. The children's mean age was 2.6 years (2.4–2.8).

Among the mothers interviewed, 86% (95% CI 81.7–90.3) were breastfeeding or had breastfed their child, 58.9% (CI 52.4–65.4) of them for 6 months or more (Figure 2). Overall, mothers born in Africa (sub-Saharan or elsewhere in Africa) appeared both more likely to initiate breastfeeding and to breastfeed for a longer duration, compared with non-African mothers: 90% of mothers from both sub-Saharan Africa and elsewhere in Africa initiated breastfeeding (vs. 80% in non-African mothers); 70% of mothers from sub-Saharan Africa, and 56% of those from elsewhere in Africa breastfed their child  $\geq 6$  months (vs. 50% in non-African mothers).

### 3.2 | Factors associated with breastfeeding

#### 3.2.1 | Univariate analysis

Breastfeeding  $\geq 6$  months was more frequent in mothers born in sub-Saharan or elsewhere in Africa, in those who migrated for reasons other than violence, or with a sample child born outside of France, or who perceived their health as good or very good (although the latter relation was only close to significant,  $p = 0.08$ ) (Table 1).

#### 3.2.2 | Multivariable analyses

No factor was significantly associated with breastfeeding initiation (Table 2). For any breastfeeding duration, in Model A, the mother's

age was positively associated with breastfeeding  $\geq 6$  months (Table 3). For those mothers who had not graduated high school, birth in sub-Saharan Africa was associated with breastfeeding  $\geq 6$  months more often than birth in countries outside Africa. For mothers with a high school diploma, those born elsewhere in Africa were more likely to breastfeed  $\geq 6$  months than those born outside Africa. There was no such difference by maternal region of birth for the highest education level (i.e., tertiary level certificate degree). Among living conditions (Block 2, Model B), the child's birth before migration was positively associated with breastfeeding  $\geq 6$  months. Conversely, migration to escape war, unrest or other violence was inversely associated with this breastfeeding outcome, compared with migration for other reasons. Among the mother's familial and social support and health characteristics (Block 3) and the child's characteristics (Block 4), no significant association was observed in Models C and D, though less favourable perceived health tended to be associated with less frequent breastfeeding  $\geq 6$  months ( $p = 0.11$ ). Results from the five sensitivity analyses were consistent with those of the main analysis (not shown but available upon request).

## 4 | DISCUSSION

This study provides new knowledge about associations between any breastfeeding in homeless families and the mother's cultural origins as well as her demographic and socioeconomic factors, an understudied, though increasing vulnerable population. In this extremely disadvantaged population, breastfeeding practices had rates relatively high than those in the general population; they were influenced predominantly by the mother's cultural origin and challenged by a difficult migration trajectory. Our findings confirmed the applicability to this population of some factors known to be associated with favourable breastfeeding practices, such as higher maternal age and the mother's region of origin, although the latter was moderated by education level. Other factors appeared more specific with a strong migration component intricately linked to social deprivation. In particular, migration to escape from war, unrest or other violence and the child's birth in France were inversely associated with any breastfeeding for 6 months or more.

Breastfeeding rates were relatively high in this homeless population, for both initiation (86%) and breastfeeding  $\geq 6$  months (59%). Although no published data allow comparisons with mothers of foreign origin living in France, housed but in extreme situations of deprivation, these rates were higher than in the French general population, in which about 72% of the infants born in 2011/2012 were breastfed at all, and less than 25% for  $\geq 6$  months (Kersuzan et al., 2014; Salanave et al., 2012; Wagner et al., 2015). The relatively high breastfeeding rates observed are partly explained by the culturally diverse profiles and migration trajectories of the homeless families: these mothers came mostly from countries where breastfeeding is a culturally and socially normative and predominant behaviour (Bernard et al., 2016; Kersuzan et al., 2018; Victora et al., 2016). In France, Kersuzan et al. (2018) showed that both the

**TABLE 1** Description of the study sample, according to breastfeeding status at 6 months ( $n = 456$ ) (values are % [95% CI]); the ENFAMS study

Variables	Whole sample ( $n = 456$ )	Breastfeeding $\geq 6$ months		p value <sup>a</sup>
		No ( $n = 192$ )	Yes ( $n = 264$ )	
Mother's socioeconomic and sociodemographic characteristics				
Age (in years)				0.096
<23	22.8 (17.1, 28.5)	24.7 (16.7, 32.7)	21.4 (14.0, 28.9)	
[23–31]	51.7 (45.2, 58.2)	55.7 (46.4, 65.0)	48.9 (41.3, 56.6)	
$\geq 32$	25.5 (19.2, 31.9)	19.6 (12.5, 26.8)	29.6 (21.9, 37.3)	
Multiparity at childbirth				0.40
Yes	31.5 (25.6, 37.4)	35.7 (24.5, 44.8)	29.4 (22.9, 35.8)	
No	68.5 (62.6, 74.4)	65.3 (55.2, 75.5)	70.6 (64.2, 77.1)	
Birth region				0.022
Sub-Saharan Africa	35.0 (28.8, 41.2)	43.4 (34.9, 51.8)	30.4 (22.9, 37.9)	
Elsewhere in Africa	29.3 (23.3, 35.2)	25.4 (17.2, 33.6)	41.7 (34.3, 49.2)	
Other countries	35.7 (30.0, 41.4)	31.2 (23.1, 39.4)	27.9 (20.9, 34.9)	
Degree level				0.48
Less than high school certificate	65.7 (60.2, 71.2)	61.5 (52.3, 70.6)	68.6 (61.6, 75.7)	
High school certificate	19.1 (14.4, 23.9)	23.2 (15.4, 30.9)	16.3 (10.1, 22.4)	
Tertiary level certificate	15.2 (10.5, 19.8)	15.4 (9.3, 21.4)	15.1 (9.4, 20.8)	
Mother's living conditions				
Reason for migration				0.026
To escape from violence <sup>b</sup>	26.7 (20.9, 32.6)	34.0 (25.3, 42.8)	21.6 (15.1, 28.1)	
Other reasons	73.3 (67.4, 79.1)	66.0 (57.2, 74.7)	78.4 (71.9, 84.9)	
Abroad at childbirth				0.012
Yes	27.7 (22.9, 33.6)	20.1 (12.9, 27.2)	33.1 (25.7, 40.4)	
No	72.3 (66.4, 78.1)	79.9 (72.8, 87.1)	66.9 (59.6, 74.3)	
Food insecurity				0.85
Secure or slightly insecure	47.4 (41.0, 53.8)	46.7 (38.0, 55.5)	47.9 (40.0, 55.8)	
Moderately to severely insecure	52.6 (46.2, 59.0)	53.3 (44.5, 62.0)	52.1 (44.2, 60.0)	
Mother's social environment and health characteristics				
Father ever having lived with the child				0.53
Yes	66.0 (59.9, 72.1)	63.4 (53.7, 73.2)	67.7 (60.1, 73.4)	
No	34.0 (27.9, 40.1)	36.6 (26.8, 46.3)	32.3 (24.6, 39.9)	
Any invitations to mother from family or friends during the past 12 months				0.79
Yes	56.0 (50.1, 61.9)	56.9 (49.1, 64.8)	55.4 (47.7, 63.1)	
No	44.0 (38.1, 49.9)	43.1 (35.2, 50.9)	44.6 (36.9, 52.3)	
Weight status				0.68
Underweight or normal	35.1 (29.4, 40.9)	37.0 (27.7, 46.3)	33.8 (26.6, 41.0)	
Overweight	32.8 (26.0, 39.6)	29.1 (20.5, 37.7)	35.3 (26.7, 43.9)	
Obese	20.4 (14.6, 26.2)	22.7 (13.9, 31.5)	18.8 (12.1, 25.5)	
Pregnant	11.7 (6.2, 17.2)	11.2 (4.1, 18.3)	12.1 (6.3, 17.9)	
Perceived health				0.081
Good or very good	54.7 (47.6, 61.8)	48.1 (37.6, 58.5)	59.4 (51.8, 66.9)	
Medium, bad or very bad	45.3 (38.2, 52.4)	51.9 (41.5, 62.4)	40.6 (33.1, 48.2)	

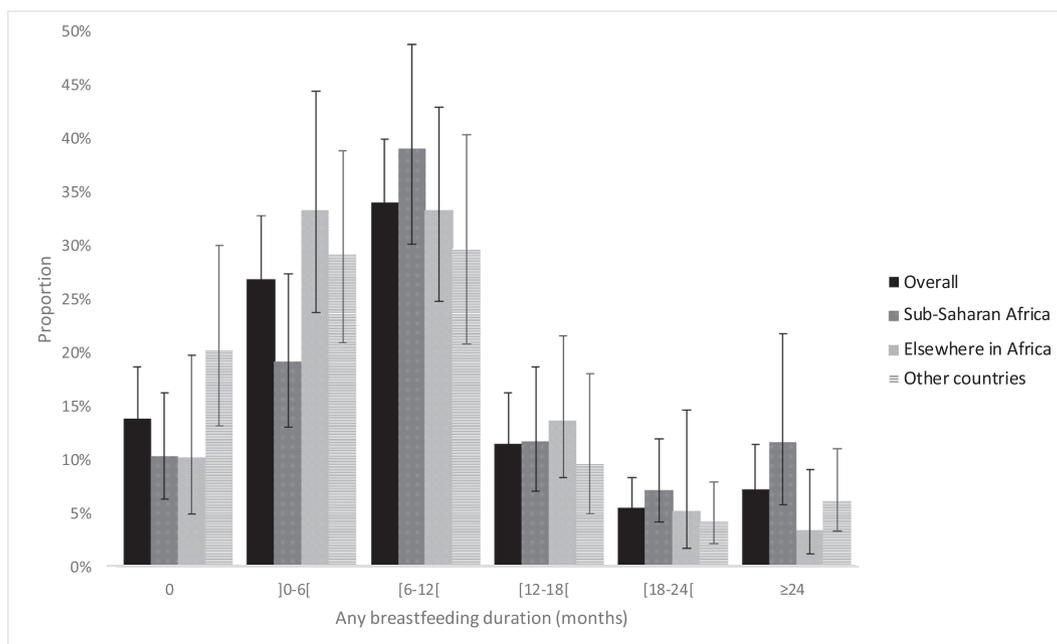
**TABLE 1** (Continued)

Variables	Whole sample (n = 456)	Breastfeeding $\geq 6$ months		p value <sup>a</sup>
		No (n = 192)	Yes (n = 264)	
Child's characteristics				
Sex				
Male	43.3 (37.9, 48.8)	44.5 (36.3, 52.8)	42.5 (35.5, 49.5)	0.73
Female	56.7 (51.2, 62.1)	55.5 (47.2, 63.7)	57.5 (50.5, 64.5)	
Birth weight				
<2.8 kg	18.9 (13.5, 24.4)	24.1 (15.3, 33.0)	15.3 (8.8, 21.8)	0.18
$\geq 2.8$ kg	81.1 (75.6, 86.5)	75.9 (67.0, 84.7)	84.7 (78.2, 91.2)	

<sup>a</sup>p value of Wald test of univariate Poisson regression parameters between variables and breastfeeding  $\geq 6$  months.

<sup>b</sup>Violence: war, unrest or other violence.

Abbreviation: CI, confidence interval.



**FIGURE 2** Distribution of breastfeeding duration by the mother's birth region. Legend: Percentages of mothers who breastfed their child  $\geq 6$  months: 59% in the overall sample; 70% of mothers born in sub-Saharan Africa; 56% of mothers born elsewhere in Africa; 50% of mothers born in other countries

mother's and father's origins were associated with breastfeeding practices. In particular, mothers born in sub-Saharan and North Africa breastfed their children more frequently and for a longer time. A progressive acculturation to the host country's social norms is suggested by the attenuation of this effect in the second generation of immigrants, as acculturation has been shown to be inversely linked to breastfeeding practices (Dennis, 2002; Dennis et al., 2019; Jones et al., 2015). The frequent use of formula in France (de Lauzon-Guillain et al., 2018) may also be experienced as a sign of integration (Kersuzan et al., 2018).

Our results have further shown that the association between mothers' birth region and breastfeeding  $\geq 6$  months was modified by their education level. Mothers with less than tertiary education breastfed their child  $\geq 6$  months more frequently when they came

from Africa than did their non-African counterparts. Previous findings based on qualitative research (Gojard, 2010) suggest that the transition into motherhood of women of higher socioeconomic position follows a 'scholarly model' (compliance with childcare standards set by institutional or medical prescribers who are socially close to them). Conversely, mothers of lower socioeconomic position preferred to turn to the so-called 'family model', sensitive to the inter-generational transmission of social norms, especially during the perinatal period, one steeped with rich cultural practices (Dennis et al., 2019; Negin et al., 2016; Wagner et al., 2019). Contrary to higher income countries, in most African countries, breastfeeding is inversely associated with education level: the underlying sociocultural norms and representations seem therefore to be reflected in the less educated homeless population under study.

**TABLE 2** Prevalence ratios (95% CI) of the robust multivariable Poisson regression analyses, with breastfeeding initiation as the dependent variable ( $n = 456$ ); the ENFAMS study

Models	Variables	Prevalence ratio (95% CI)	$p$ value <sup>a</sup>
Model A	Mother's educational level (ref: high school certificate)		0.76
	Less than high school certificate	1.05 (0.92, 1.19)	
	Tertiary level certificate	1.02 (0.88, 1.18)	
	Mother's birth region (ref: outside Africa)		0.24
	Sub-Saharan Africa	1.13 (0.98, 1.31)	
	Elsewhere in Africa	1.11 (0.95, 1.30)	
	Mother's age at childbirth (ref: [23–31] years)		0.09
	<23 years	0.99 (0.84, 1.16)	
	≥32 years	1.10 (0.98, 1.23)	
Model B <sup>b</sup>	Mother's multiparity at childbirth, Yes (ref: no)	0.97 (0.86, 1.09)	0.59
	Mother's reason for migration, to escape from violence <sup>c</sup> (ref: other reasons)	0.90 (0.78, 1.04)	0.14
	Mother abroad at childbirth, yes (ref: no)	1.09 (0.98, 1.20)	0.11
Model C <sup>d</sup>	Mother's food insecurity, moderately to severely insecure (ref: secure or slightly insecure)	1.02 (0.92, 1.14)	0.64
Model C <sup>d</sup>	Father ever having lived with the child, yes (ref: no)	0.94 (0.83, 1.06)	0.31
	Any invitations to mother from family or friends during the past 12 months, yes (ref: No)	1.05 (0.95, 1.16)	0.32
	Mother's weight status (ref: underweight or normal)		0.64
	Overweight	1.00 (0.89, 1.12)	
	Obese	0.91 (0.76, 1.10)	
	Pregnant	0.92 (0.76, 1.10)	
	Mother's perceived health, medium bad or very bad (ref: good or very good)	0.93 (0.84, 1.04)	0.21
Model D <sup>e</sup>	Child's sex, female (ref: male)	0.97 (0.89, 1.05)	0.48
	Child's birth weight, <2.8 kg (ref: ≥2.8 kg)	0.85 (0.68, 1.05)	0.13

<sup>a</sup> $p$  value of Wald test for multivariable Poisson regression parameters.

<sup>b</sup>Model B: adjusted for mother's education level, birth region, age at childbirth and multiparity.

<sup>c</sup>Violence: war, unrest or other violence.

<sup>d</sup>Model C: adjusted for mother's education level, birth region, age at childbirth, multiparity, reason for migration, abroad at child's birth and food insecurity.

<sup>e</sup>Model D: adjusted for mother's educational level, birth region, age at childbirth, multiparity, reason for migration, abroad at child's birth, food insecurity, father ever having lived with the child, invitations from family or friends during the last 12 months and perceived health.

Abbreviation: CI, confidence interval.

The association between breastfeeding practices and maternal age was overall consistent with that in other studies (Betoko et al., 2013; Dennis et al., 2014; Girard et al., 2016; Salanave et al., 2012; Wagner et al., 2015). Multiparity was not, however, associated with breastfeeding practices, although positive associations with both more frequent initiation and a shorter duration of both predominant or any breastfeeding have been documented in France (Bonet et al., 2007; Salanave et al., 2012; Wagner et al., 2015).

The child's birth in France and migration instigated by violence were both negatively associated with breastfeeding ≥6 months. Because the vast majority of homeless women were born abroad, giving birth in France probably reflects a rupture with the mother's traditional environment (including postpartum rituals), roots, and community, as well as the beginning of a succession of hardships, resulting in homelessness; it also indicates conflicting cultural norms

(Bernard et al., 2016; Hohl et al., 2016; Jones et al., 2015). Flight from threats or violence adds to her emotional vulnerability and there is evidence that breastfeeding during forced migration is compromised by high stress levels, lack of safety, absence of prenatal and postnatal care and increased access to infant formula (Bayram Deger et al., 2020). The inverse association observed in this analysis of both the child's birth in France and migration instigated by violence with any breastfeeding duration suggests that hardships, along with disrupted family and social support, may be barriers to breastfeeding. Of note, Dennis et al. (2014) found that among migrant women living in Canada, refugee status was associated with a lesser likelihood of exclusive breastfeeding at 16 weeks postpartum. Likewise, Schmieid et al. (2012) concluded that migrant women who valued, but did not have access to, traditional postpartum practices were more likely to cease breastfeeding. Women reported a clash between their

**TABLE 3** Prevalence ratios (95% CI) of the robust multivariable Poisson regression analyses, with breastfeeding  $\geq 6$  months as the dependent variable ( $n = 456$ ); the ENFAMS study

Models	Variables	Prevalence ratio (95% CI)	<i>p</i> value <sup>a</sup>
Model A	Mother's birth region (ref: Outside Africa)		
	Mothers with less than high school certificate degree		0.010
	Sub-Saharan Africa	1.47 (1.06, 2.03)	
	Elsewhere in Africa	0.89 (0.60, 1.32)	
	Mothers with high school certificate degree		0.003
	Sub-Saharan Africa	1.06 (0.58, 1.94)	
	Elsewhere in Africa	2.24 (1.32, 3.81)	
	Mothers with tertiary level certificate degree		0.71
	Sub-Saharan Africa	0.93 (0.58, 1.49)	
	Elsewhere in Africa	1.15 (0.75, 1.76)	
	Mother's age at childbirth (ref: [23–31] years)		0.08
	<23 years	1.01 (0.78, 1.32)	
$\geq 32$ years	1.24 (1.02, 1.51)		
Mother's multiparity at childbirth, yes (ref: no)	0.90 (0.73, 1.11)	0.35	
Model B <sup>b</sup>	Mother's reason for migration, to escape from violence <sup>c</sup> (ref: Others reasons)	0.78 (0.62, 0.98)	0.038
	Mother abroad at childbirth, yes (ref: No)	1.39 (1.14, 1.68)	0.001
	Mother's food insecurity, moderately to severely insecure (ref: secure or slightly insecure)	0.93 (0.79, 1.11)	0.44
Model C <sup>d</sup>	Father ever having lived with the child, yes (ref: no)	0.91 (0.71, 1.16)	0.45
	Any invitations to mother from family or friends during the past 12 months, yes (ref: no)	0.98 (0.82, 1.18)	0.86
	Mother's weight status (ref: underweight or normal)		0.70
	Overweight	1.01 (0.81, 1.25)	
	Obese	0.86 (0.63, 1.18)	
	Pregnant	1.04 (0.79, 1.35)	
	Mother's perceived health, medium bad or very bad (ref: good or very good)	0.85 (0.70, 1.04)	0.11
Model D <sup>e</sup>	Child's sex, female (ref: male)	1.02 (0.86, 1.22)	0.81
	Child's birth weight, <2.8 kg (ref: $\geq 2.8$ kg)	0.84 (0.61, 1.16)	0.28

<sup>a</sup>*p* value of Wald test for multivariable Poisson regression parameters.

<sup>b</sup>Model B: adjusted for mother's education level, birth region, age at childbirth and multiparity.

<sup>c</sup>Violence: war, unrest or other violence.

<sup>d</sup>Model C: adjusted for mother's education level, birth region, age at childbirth, multiparity, reason for migration, abroad at child's birth and food insecurity.

<sup>e</sup>Model D: adjusted for mother's education level, birth region, age at childbirth, multiparity, reason for migration, abroad at child's birth, food insecurity, father ever having lived with the child, invitations from family or friends during the last 12 months and perceived health.

Abbreviation: CI, confidence interval.

individual beliefs and practices and the dominant practices in their new country. Household food insecurity, also sometimes supposed to illustrate very difficult living conditions that can make breastfeeding more challenging (Gross & Mendelsohn, 2019), was not associated with it, as shown in a population-based sample in Canada (Wong et al., 2019). Nonetheless, we cannot rule out the possibility that a lack of financial resources can impede access to infant formula and thus leave the mother with no other alternative.

Although previous publications have reported that familial and social support promote breastfeeding practices (Anderson et al., 2004; AWHONN, 2015; Goksen, 2002; Singh et al., 2007), this study did not

observe that either the father's presence or any invitations by friends or family influenced breastfeeding. These indicators do not, however, encompass all the dimensions of social support. In contrast to other studies (Kersuzan et al., 2014; Salanave et al., 2012; Wagner et al., 2015), weight status, especially obesity, was not clearly associated with breastfeeding practices. This difference might partly reflect cultural differences in our population of migrants, who have more positive representations of a larger body size in the transition to motherhood (Cohen et al., 2017; Holdsworth et al., 2004). On the other hand, women with negative perceptions of their health tended to be less likely than their more positive counterparts to breastfeed

≥6 months. This psychosocial factor may partly reflect stressful life circumstances, thus supporting the previous hypothesis that cumulative hardships are barriers to the practice of breastfeeding (Jones et al., 2015), along with a lower self-confidence in breastfeeding (Dennis, 1999; AWHONN, 2015). Subsequent anxiety about ability to produce sufficient milk can lead to cessation of breastfeeding, because in this case women do not consider their own milk of high value (Gross & Mendelsohn, 2019; Richards et al., 2011; Schmied et al., 2012).

Some limitations must be acknowledged in the interpretation of our findings. Any breastfeeding was collected retrospectively, and recall bias, which may have impaired the precision of the outcome measure, cannot be excluded. We studied any breastfeeding, without the possibility of distinguishing between exclusive and partial; the findings would probably have been different for exclusive breastfeeding (Wagner et al., 2019). It is especially relevant that partial breastfeeding (i.e., the provision of both breast milk and formula) is a common practice observed in France among mothers of sub-Saharan African origin (Gojard, 2010); thus, there are cultural subtleties that deserve further investigation in the development of supportive actions targeted to homeless families. The cross-sectional design of the study does not allow causal inference. Some of the factors we investigated (food insecurity, mother's social support, perceived health and weight status) were measured at the time of the survey, thus after the breastfeeding event (if any). We therefore cannot rule out changes in the mother's situation between the child's birth and the survey (including various migration trajectories and homelessness). The latter, however, took place at most 5 years after the child's birth, and we can reasonably assume that the socioeconomic position and living conditions of the mother were already rather poor or critical, even if she had still been living in her country of origin. This assumption is further supported by the robust findings of the sensitivity analysis conducted among the subsample of 237 mothers who were homeless in France at the time of the child's birth. Reverse causation may also have limited our capacity to show the hypothesized relations. Moreover, the sample size has limited statistical power to show significant associations for analyses of breastfeeding initiation, given that the proportion of women who did not breastfeed their child at all was relatively small. Importantly, despite this lack of power, effect sizes and trends were on the whole consistent for the associations shown for both breastfeeding outcomes (initiation and duration), as well as in sensitivity analyses. This robustness across analyses thus provides context to the findings, demonstrating the relevance of those that are only close to statistical significance. Another important strength of this project is that it is the first epidemiological study in France to focus on homeless families, use a random sampling design and offer interpreters for a wide range of languages. The relatively high participation rate offers a fairly representative snapshot of the living conditions, lifestyle and health of homeless families. We acknowledge that this research may seem relatively dated given the rapid changes that have occurred since the ENFAMS study, in terms of numbers, proportion of families and countries of origin (Baptista et al., 2017), with these characteristics likely impacted by the various migration flows and, more

recently, by the COVID-19 pandemic. Such vulnerable populations are however difficult to study, which not only means hard to sample but also hard to identify, hard to reach, hard to persuade, hard to interview and hard to follow-up (Tourangeau et al., 2014).

These original findings are valuable information to help develop interventions promoting breastfeeding among homeless or extremely socially vulnerable families. In particular, foreign-born women who give birth in France are likely to experience specific barriers to their feeding practices and require tailored, positive and respectful support from professionals (Edwards et al., 2017; Schmied et al., 2012; Spatz, 2020). The influence of cultural origins suggests that such interventions should acknowledge the representations and beliefs around this practice, beyond stereotypes, adapting to the mothers' cultural origins and social norms (Sauvegrain, 2013). Additional qualitative research is nonetheless needed to investigate and understand these representations, which vary considerably across these highly heterogeneous populations (Schmied et al., 2012; Vandentorren et al., 2016). The potential influence of poor material circumstances and cumulative hardship should also guide these interventions so that they offer an effective social/family support component, committed to improving living conditions. Efforts to help mothers intending to breastfeed in the most socially deprived situations so that they can overcome some of the barriers they face in meeting personal feeding goals may well have a meaningful impact on the future health of mother and child (Edwards et al., 2017; Spatz, 2020).

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#### CONFLICTS OF INTEREST

The authors had no conflict of interests relevant to this article to disclose.

#### CONTRIBUTIONS

P.F., S.V. and S.L. conceived and designed the work. P.F. analyzed the data with advice from S.V., A.A., C.V. and S.L. P.F. and S.L. drafted and revised the manuscript. S.V. conceptualized and led the ENFAMS survey. All authors interpreted the data and criticized the manuscript for important intellectual content. All authors have read and approved

the final version of the manuscript. This article is the work of the authors. P.F. serves as guarantor for the contents of this article. All authors had full access to all of the data (including statistical reports and tables) in the study and take the responsibility for the integrity of the data and the accuracy of the data analysis. All researchers are independent of the funding bodies.

#### DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available upon request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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## SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of this article.

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