BMC Public Health

RESEARCH

Open Access

Factors influencing exclusive breastfeeding in Sub-Saharan Africa: analysis of demographic and health surveys

Munawar Harun Koray[1*], James Njuguna Wanjiru[2], Johnson Socrates Kerkula[3], Theophile Dushimirimana[4], Sudue Epaphroditus Mieh[5], Tanya Curry[6], John Mugisha[8] and Lucas K. Kanu[7,8]

Abstract

Background Low rates of exclusive breastfeeding (EBF) contribute to high child mortality rates. This study aimed to identify the prevalence and factors influencing EBF in SSA using nationally representative data from the Demographic Health Survey program (DHS).

Methods A cross-sectional study design using the most recent DHS data of 25 SSA countries from 2010 to 2023. A total of 17,431 women aged 15–49 years with infants below six months were included. Pearson's chi-square and multivariable logistic regression tests were used to test the association and predictors of EBF at a 95% confidence interval (CI) at a significance level of $p \leq 0.05$.

Results The pooled prevalence of EBF across 25 Sub-Saharan African countries was 49%, ranging from 83% in Burundi to 19% in Gabon. Multivariable logistic regression revealed that older infants aged 2–3 months (AOR = 0.511, 95% CI: 0.458–0.570) and 4–5 months (AOR = 0.176, 95% CI: 0.156–0.198) had significantly lower odds of EBF compared to newborns (0–1 month). Overweight infants (AOR = 0.800, 95% CI: 0.647–0.987) and those experiencing fever (AOR = 0.805, 95% CI: 0.704–0.921) or diarrhea (AOR = 0.799, 95% CI: 0.683–0.935) were also less likely to be exclusively breastfed. Mothers with higher education (AOR = 0.700, 95% CI: 0.516–0.948) had reduced EBF odds. Wealthier households demonstrated higher odds (middle: AOR = 1.411, 95% CI: 1.185–1.681; richer: AOR = 1.539, 95% CI: 1.254–1.889; richest: AOR = 1.455, 95% CI: 1.119–1.892). Rural, the East (AOR = 2.588, 95% CI: 2.162–3.099) or West Africa (AOR = 3.018, 95% CI: 2.464–3.697) significantly increased EBF odds compared to urban areas and Central Africa, respectively.

Conclusion This study highlights key factors influencing EBF in 25 Sub-Saharan African countries. The findings provide complex interplay of individual and community factors influencing EBF. To improve EBF, targeted interventions should focus on: supporting mothers of older infants, integrating counseling into child health services, addressing wealth gaps, and implementing region-specific strategies. Strengthening health systems and community engagement is crucial to overcome barriers and promote equitable breastfeeding practices.

Keywords Exclusive breastfeeding, sub-Saharan Africa, Demographic health survey, Multilevel analysis, Predictors

*Correspondence:
Munawar Harun Koray
gbanglin@rocketmail.com

Full list of author information is available at the end of the article

Introduction

Exclusive breastfeeding (EBF) is the feeding practice where infants are exclusively fed with breastmilk without anything else for the first 6 months of life [1]. It benefits both the mother and child as it protects the child from childhood illness, enhances child's cognitive capacity and reduces the risk of overweight and obesity in adulthood; lactating women also benefit from reduced risk of cardiovascular disease, breast and ovarian cancer and type 2 diabetes and ameliorate child spacing [2–4]. Breastmilk contains bioactive compounds like antibodies, probiotics, and microbiome responsible for specific and nonspecific immunity against infectious (diarrheal and respiratory diseases), chronic diseases and obesity from the first few months throughout breastfeeding period and later in life [5–9].

A recent study conducted in Cameroon revealed that children who were exclusively breastfed had lower prevalence of malaria parasite (16.2%) than non-breastfed children (61.3%) [10]. According to UNICEF, WHO, and World Bank report of 2023, children born in SSA are 18 times more likely to die compared to those born in Australia and New Zealand. Also, 4 in 5 under-five child deaths occurred in SSA and Southern Asia, and only 3 in 5 live births occurred in these regions in 2022 [10, 11]. According to this report SSA and Southern Asia contributed to 57% (2.8 million) and 26% (1.3 million) of global under five mortalities, respectively [11]. These two regions carried unacceptably high newborn mortality rate accounting for 46% (1.1 million) in SSA and 34% (0.8 million) in Southern Asia [11].

It is estimated that 16% of children die each year due to inadequate breastfeeding globally [2]. Research also showed that non-breastfed children were 14 times more likely to die from childhood illness and 8 times more likely to die from infectious disease than exclusively breastfed infants from 0 to 5 months [12]. In 2023, the global prevalence of EBF was 48% among infants aged 0–5 months which is close to the WHO target of 50% by 2025 [2], which was shifted to the 2030 global target that 70% of children will be exclusively breastfed up to 6 months [13]. If this universal breastfeeding recommendation is successfully met, 820,000 lives of children will be saved globally and 20,000 lives of children will be saved in LMICs [14].

A study conducted in 57 LMICs through 2010–2018, showed that the global prevalence of breastfeeding was 51.9% for early initiation of breastfeeding while EBF under 6 months, 4–5 months accounted for 45.7% and 32% respectively [15]. It was also shown that upper middle-income countries (UMICs) had poor performance of EBF in children less than 6 months (38.4%) than LMICs (47.4%) [15]. However, in SSA, the prevalence of EBF in children under 6 months was still low accounting for 34% in the period of 2000 to 2018 compared to the WHO target, and the prevalence of early initiation of breastfeeding was estimated at 47%, respectively [16].

In SSA, inappropriate EBF has led to the 55–75% of child deaths and this mortality contributed to the loss of 6% of GDP in SSA countries. However, variability in prevalence (early initiation and under 6 months children) exist in SSA countries, ranging from 5% in Chad to 86% in Rwanda [16]. The said variability is attributable to multiple factors influencing breastfeeding practices. These include but not limited to sociodemographic factors like age, education, marital status, occupation, wealth index, region of residence, sex of the child, and parity; health facilities utilization such as antenatal care (ANC) visits, place and mode of delivery; environmental and cultural factors [17–24].

The low prevalence of EBF (34%) is an alarming public health concern that requires robust interventions to save lives of children and economy in SSA as it has the highest child mortality (55–75%) attributable to poor EBF [16]. To the best of our knowledge, there is limited research about the drivers of inappropriate EBF in SSA. It is in this regard our study aims to find out the factors influencing EBF in SSA using a nationally representative data from the Demographic Health Survey (DHS) program.

Study objectives

To assess the prevalence and predictors of EBF in SSA using DHSs.

Methods and materials

Study design and data source

A cross-sectional study design using the most recent DHS data of 25 SSA countries from 2010 to 2023. This data set is a representative survey usually conducted in an interval of 5- years in low - and middle-income countries (LMICs) globally [25]. Respondents of these surveys are recruited using a multistage random sampling method and samples are generally representative at the national, residential (urban-rural) and regional (counties, cities, etc.) levels. This comprehensive data collection strategy used by the DHS programme has been detailed in the DHS website (https://www.dhsprogram.com/Methodology/Survey-Types/DHS-Methodology.cfm) and in a previous study [25].

Study population and sample

The study included 17,431 (weighted sample = 17000) youngest living children aged below 6 months and living with their mother and their respective mothers. The data were obtained from the DHS website's children record (labelled KR file) [26]. Supplementary Table 1 shows the distribution of the samples by countries.

Study variables

The outcome variable for this study was EBF of infants less than 6 months of age. EBF is a feeding practice where infants are exclusively fed with breastmilk without anything else for the first 6 months of life [1]. The EBF was coded as 0 "No EBF" and 1 "EBF". The guide to recoding the EBF variable is described in literature [27].

The independent variables for the study were classified into child factors, maternal factors and community level factors. The child factors only focused on the youngest child age 0–5 months living with the mother. These include child age, child's sex, birth weight, birth order, child had fever or diarrhoea two weeks prior to the survey. Maternal factors included maternal age, religion, marital status, parity, birth interval, maternal educational level, maternal occupation, wealth index, age at ANC registration, number of ANC visits, frequency of listening to radio, frequency of reading newspaper/magazine, frequency of watching television, and overall exposure to any form of traditional media. These variables were considered because of their statistically significant relationships with EBF factors in previous studies [28–30].

The community level factors include place of residence, community level of education, community level of poverty, community media exposure, and SSA subregion. The DHS do not collect data that can directly be described as community level data except for place of residence. Therefore, the community-level data were generated using the individual level responses within a cluster and the average used for categorization [31]. For instance, suppose in one cluster, the average years of education is 8 years. If a woman's education level is below 8 years, she is coded as part of a "low-education" community. If her education level is 8 years or higher, she is coded as part of a "high-education" community. Again, let's say the average wealth index in a community is 2.5 on a scale of 1 to 5, where a lower score indicates lower poverty. If a woman's wealth index is 2.6 or higher, she is in a "high wealth" community. If her index is below 2.5 or lower, she falls into a "low-wealth" community.

Data analysis

The study analysis used multi-step approach including a univariate, bivariate and multivariate analysis. In the first step of the analysis, frequencies and proportions were used to summarize the prevalence of EBF among the demographic groups. Pearson's chi-square test was used test the association between EBF at a 95% confidence interval (CI) at a significance level of $p \leq 0.05$.

In the third step, binary logistic regression was used to identify the individual predictor variables of EBF in the form of crude odds ratio (cOR). Adjusted Odds Ratio (aOR) was used to adjusted for confounders in the study. Findings from the aOR, significant at 95% CI, were reported.

The data was analysed using STATA MacOS version 18, and the figures and tables were created using Microsoft Excel. In the analysis, the 'svy' command in STATA was used to allow for adjustments for the cluster-sampling design of the data collection and weight. This was also done to account for selection bias in the study.

Missing data

By default STATA uses pairwise deletion methods to control missing data at random. We used this method to address the missing data in the study.

Model diagnostics

Due to the complexity of the study sampling design, the hierarchical nature of the fitted model, and the categorical nature of the outcome variable, the collinearity of the model was assessed using generalized variance inflation factor (GVIF). To obtain the GVIF of the independent variables, first the variance inflation factor was obtained through post-estimation result [32]. The GVIF was then computed using:

$$GVIF = VIF^{[1/(2*df)]} \quad (1)$$

where df: degree of freedom = 18.

Supplementary Table 2 present the GVIF. Number of ANC visits was removed due to collinearity.

Hosmer Lemeshow (HL) test was used to test the goodness-of-fit for the logistic regression model. The HL results shows that the model was fit (chi- square $\chi 2 = 1.45$ and p-value = 0.16). Likelihood Ratio (LR) test (LR chi2 = 2613.29 and $p < 0.0001$) explains a statistically significant model.

Results

Prevalence of exclusive breastfeeding

The pooled prevalence of EBF in SSA was 49% [95% CI: 42 – 55%,], with the highest EBF prevalence recorded in Rwanda (79% [95% CI: 74 – 82%]) and Burundi (83% [95% CI: 79 – 82%]). The lowest EBF prevalence was observed in Gabon (19% [95% CI: 16 – 23%]) and Guinea (25% [95% CI: 21 – 30%]). Evidence of a significant heterogeneity was observed ($I^2 = 98.71\%$, $p < 0.0001$), suggesting a very high variability of prevalence of EBF between each country. This is presented in Fig. 1.

Table 1 presents the prevalence of EBF by demographic characters and the factors associated with EBF. Several child-related factors were significantly associated with EBF, except for the sex of the child ($p = 0.910$) and birth order ($p = 0.099$). One of the strongest predictors of EBF was child age ($p < 0.0001$), as the prevalence of EBF decreased significantly as the child grew older. Among

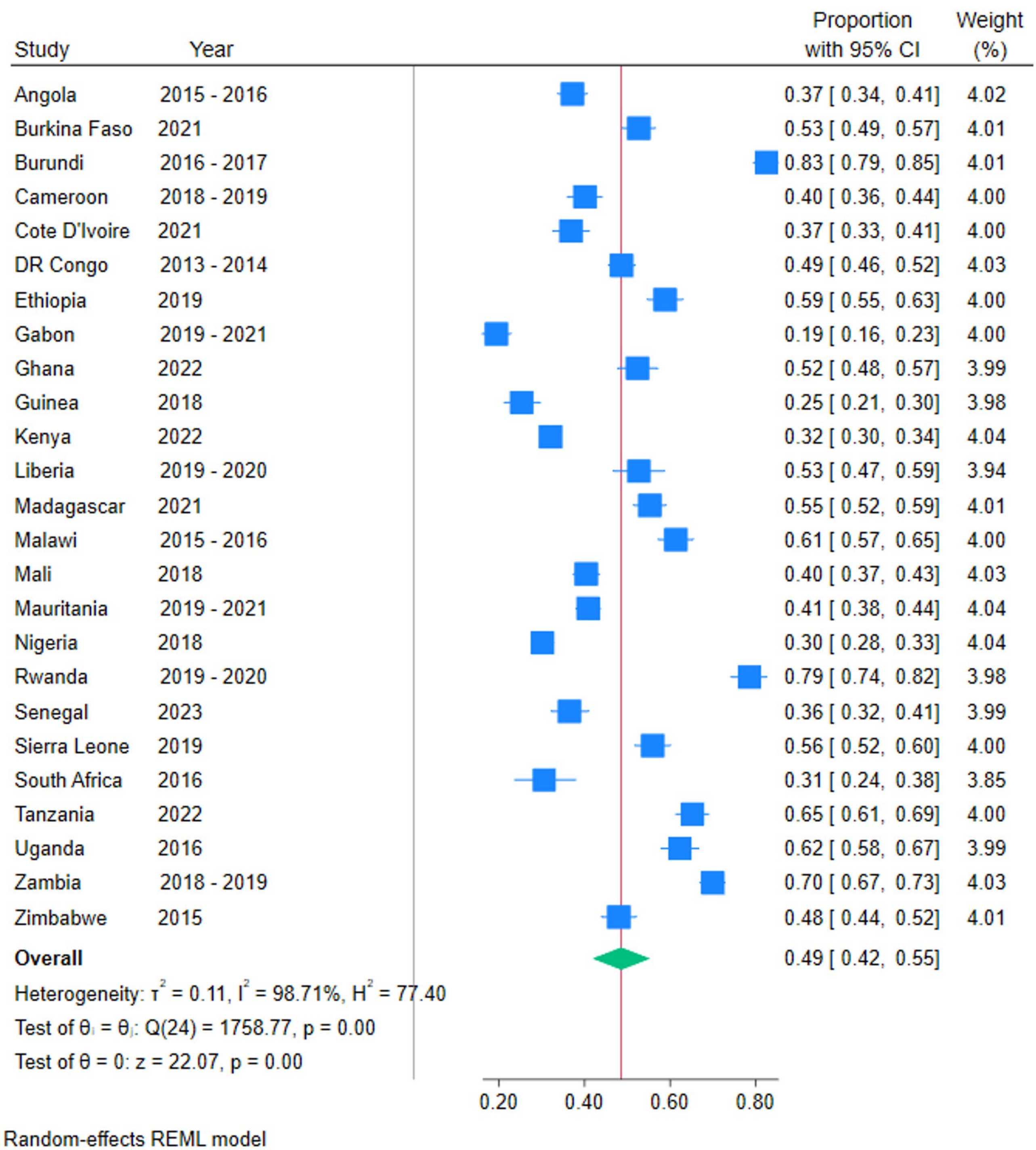

Fig. 1 Pooled prevalence of exclusive breastfeeding in SSA

0–1 month-old infants, 64.8% were exclusively breastfed, while among 4–5 month-old infants, only 27.8% were exclusively breastfed.

Birth weight also influenced EBF practices ($p < 0.0001$). Underweight babies (49.0%) had a higher prevalence of EBF than overweight babies (43.4%), while normal-weight infants had the highest prevalence at 53.1%. Child illness was another significant factor ($p < 0.0001$). Infants who had fever (36.8%) or diarrhea (3.9%) had much lower EBF rates than those without these illnesses (48.4% and 48.8%, respectively).

Most maternal factors were significantly associated with EBF, except for maternal age ($p = 0.793$), marital status ($p = 0.324$), parity ($p = 0.208$), and birth interval

Table 1 Prevalence and factors associated with EBF in SSA

Variables	Weight		Exclusive breastfeeding		Chi-square value	P-value
	Frequeny	Percent	No	Yes		
Child Factors						
Child age					511.42	**< 0.0001**
0–1 months	5451	32.1	35.2	64.8		
2–3 months	5685	33.4	50.2	49.8		
4–5 months	5864	34.5	72.2	27.8		
Sex of child					0.013	$p = 0.910$
Male	8563	50.4	53.1	46.9		
Female	8437	49.6	52.9	47.1		
Birth weight (kg)					138.85	**< 0.0001**
Underweight	969	6.2	51.0	49.0		
Normal weight	8559	54.7	46.9	53.1		
Overweight	6110	39.1	56.6	43.4		
Birth order					2.31	$p = 0.099$
First	3883	22.8	54.9	45.1		
2–3	6306	37.1	52.6	47.4		
4 or more	6812	40.1	52.3	47.7		
Child had fever					113.28	**< 0.0001**
No	14,036	85.4	51.6	48.4		
Yes	2403	14.6	63.2	36.8		
Child had diarrhoea					112.88	**< 0.0001**
No	14,611	88.9	46.2	42.8		
Yes	1816	11.1	7.2	3.9		

($p = 0.116$). Maternal education was a strong predictor, where women with higher education (2%) had the lowest EBF rate, whereas those with primary education (16.9%) had the highest prevalence. Maternal occupation also influenced EBF, as women working in agriculture (54.2%) and manual labor (51.7%) had significantly higher EBF rates, while professional women (41.0%) and those not working (45.5%) had lower EBF rates. Media exposure played a role as well, with women who listened to the radio almost every time (59.7%) having a higher EBF prevalence than those who did not listen at all (46.7%) ($p < 0.001$). Similarly, reading newspapers and watching TV frequently were also associated with increased EBF rates. This is presented in Table 1 continue.

Community factors were significantly associated with EBF ($p < 0.0001$ for all variables). Urban mothers (40.2%) had a lower EBF prevalence compared to rural mothers (50.6%). Community education level also played a role, with lower community education levels associated with higher EBF (48.0%), compared to higher community education (43.5%). Community poverty level showed that women in poorer communities (48.8%) had higher EBF rates than those in wealthier communities (45.1%). The SSA sub-regions also showed significant variation in EBF prevalence. West Africa had the highest EBF prevalence (63.6%), while Central Africa had the lowest (37.9%). This is presented in Table 2.

Multivariable logistic regression

Table 3 presents the multivariable logistic regression analysis of factors influencing EBF in this study. The odds of EBF decline significantly as the child ages. Compared to infants aged 0–1 months, those aged 2–3 months have 48.9% lower odds of EBF (aOR: 0.511, 95% CI: 0.458–0.570), while infants aged 4–5 months have 82.4% lower odds (aOR: 0.176, 95% CI: 0.156–0.198). Religion was found to be signficant predictor of EBF, with mothers belonging to the Islamic faith (aOR: 0.732, 95%CI: 0.634–0.844) or nor no religion (aOR: 0.632, 95% CI: 0.489–0.818) having lower odds of EBF compared to mothers in the Christian faith. Maternal education plays a role, with mothers who have higher education (aOR: 0.700, 95% CI: 0.516–0.948) showing lower odds of EBF compared to those with no education. Compared to the poorest households, those in the middle (aOR: 1.411, 95% CI: 1.185–1.681), richer (aOR: 1.539, 95% CI: 1.254–1.889), and richest (aOR: 1.455, 95% CI: 1.119–1.892) quintiles have significantly higher odds of EBF. Early ANC registration improves EBF odds. Mothers who registered at <4 months (aOR: 1.608, 95% CI: 1.320–1.960), 4–5 months (aOR: 1.550, 95% CI: 1.277–1.882), or 8+ months (aOR: 1.625, 95% CI: 1.093–2.415) have higher odds of EBF than those with no ANC. Whilst reading newspapers/magazines weekly increases EBF odds (aOR: 1.114, 95% CI: 1.003–1.238), watching TV weekly decreased the odds of EBF (aOR: 0.816, 95% CI: 0.721–0.924).

Table 1 Continue prevalence and factors associated with EBF

Variables	Weight		Exclusive breastfeeding		Chi-square value	*P*-value
	Frequeny	Percent	No	Yes		
Maternal Factors						
Maternal age					5.1	$p = 0.793$
15–19	2249	13.2	7.2	6		
20–24	4244	25	13.2	11.8		
25–29	4449	26.2	13.8	12.4		
30–34	3135	18.4	9.9	8.5		
35–39	2055	12.1	6.3	5.8		
40–44	736	4.3	2.2	2.1		
45–49	133	0.8	0.4	0.4		
Religion					167.5	**< 0.0001**
Christianity	9807	65.1	49.2	50.8		
Islam	4661	31	60.5	39.5		
Other	228	1.5	54.9	45.1		
No religion	361	2.4	55.3	44.7		
Marital status					4.124	$p = 0.324$
never in union	1664	9.8	53.9	46.1		
in union	14,604	85.9	53	47		
divorced/seperated/widowed	732	4.3	49.6	50.4		
Parity					7.391	$p = 0.208$
One	3880	65.1	54.8	45.2		
Two	3451	31	52.6	47.4		
Three	2851	1.5	52.4	47.6		
Four or more	6817	2.4	52.3	47.7		
Birth interval (in months)					11.938	$p = 0.116$
8–24	2095	12.3	6.6	5.7		
25–35	3788	22.3	11.7	10.6		
36–59	4583	27	14.1	12.9		
≥ 60	2609	15.3	7.9	7.5		
first child	3925	23.1	12.7	10.4		
Maternal education					70.033	**< 0.0001**
No education	5272	31.1	16.9	14.1		
Primary	5624	33.1	16.2	16.9		
Secondary	5194	30.6	16.5	14		
Higher	910	5.4	3.4	2		
Maternal occupation					146.367	**< 0.0001**
Not working	6653	39.1	54.5	45.5		
Professional	662	3.9	59.0	41.0		
clerical	107	0.6	69.5	30.5		
Sales/business	2276	13.4	56.4	43.6		
Agriculture	4100	24.1	45.8	54.2		
Household/domestics services	1453	8.5	56.4	43.6		
Manual works	675	4	48.3	51.7		
Others	1073	6.3	56.9	43.1		
Wealth index					44.09	**< 0.0001**
poorest	3945	23.2	53.5	46.5		
poorer	3625	21.3	51.8	48.2		
middle	3463	20.4	50.3	49.7		
richer	3211	18.9	52	48		
richest	2758	16.2	58.2	41.8		
Age of gestation at ANC registration					87.961	**< 0.0001**
No ANC	1585	9.3	62.2	37.8		

Table 2 (continued)

Variables	Weight		Exclusive breastfeeding		Chi-square value	P-value
	Frequeny	Percent	No	Yes		
< 4 months	6181	36.4	52.9	47.1		
4–5 months	5938	34.9	50.8	49.2		
6–7 months	2839	16.7	52.2	47.8		
8 + months	363	2.1	49.3	50.7		
Don't know	94	0.6	74.8	25.2		
Number of ANC visits					84.304	**< 0.0001**
None	1585	9.3	62.2	37.8		
< 4	5544	32.6	51.4	48.6		
4–8	8969	52.8	51.7	48.3		
9 or more	612	3.6	57.5	42.5		
Don't know	290	1.7	63.0	37.0		
Frequency of listening to Radio					40.67	**< 0.001**
Not at all	14,134	83.1	53.3	46.7		
atleast once a week	2282	13.4	54.1	45.9		
almost everytime	585	3.4	40.3	59.7		
Frequency of reading newspaper/magazine					27.887	**< 0.01**
Not at all	7812	46.0	53.5	46.5		
atleast once a week	8309	48.9	53.4	46.6		
almost everytime	880	5.2	44.5	55.5		
Frequency of watching television					225.98	**< 0.0001**
Not at all	9284	54.6	48.8	51.2		
atleast once a week	6653	39.1	60	40		
almost everytime	1063	6.3	45.2	54.8		

Table 2 Prevalence and factors associated with EBF (Community-level factors)

Variables	Weight		Exclusive breastfeeding		Chi-square value	P-value
	Frequeny	Percent	No	Yes		
Community-level Factors						
Place of residence					170.563	**< 0.0001**
Urban	5820	34.2	59.8	40.2		
Rural	11,181	65.8	49.4	50.6		
Community level of education					24.634	**< 0.001**
Low	13,234	77.8	52.0	48.0		
High	3767	22.2	56.5	43.5		
Community level of poverty					24.516	**< 0.001**
Low	8798	51.8	51.2	48.8		
High	8202	48.2	54.9	45.1		
SSA sub-region					507.264	**< 0.0001**
Central	2346	13.8	62.1	37.9		
East Africa	5581	32.8	45.9	54.1		
West Africa	1704	10.0	36.4	63.6		
South Africa	7370	43.4	59.2	40.8		

Regarding community and regional factors, our findings also show that rural residence increases EBF odds by 39.5% (aOR: 1.395, 95% CI: 1.191–1.633) compared to urban areas. High community poverty reduces EBF odds (aOR: 0.814, 95% CI: 0.697–0.950). East Africa (aOR: 2.588, 95% CI: 2.162–3.099) and West Africa (aOR: 3.018, 95% CI: 2.464–3.697) have 2.5-3 times higher odds of EBF than Central Africa. Southern Africa shows a modest increase (aOR: 1.270, 95% CI: 1.057–1.525).

Discussion

This study assesses the prevalence and predictors of EBF among 25 countries SSA. The analysis reveals that the pooled prevalence of EBF in SSA is 49%. The age of child, birthweight, child having fever diarrhoea were found to

Table 3 Multivariable logistic regression model

Variables	Crude Odds Ratio	Adjusted Odds Ratio
	cOR (95% CI)	aOR (95% CI)
Individual Factors		
Child age		
0–1 months	Ref	Ref
2–3 months	0.54 (0.493–0.593)***	0.509 (0.457–0.568)***
4–5 months	0.21 (0.190–0.232)***	0.175 (0.155–0.198)***
Birth weight (kg)		
Underweight	Ref	Ref
Normal weight	1.18 (0.989–1.407)	0.995 (0.813–1.219)
Overweight	0.797 (0.666–0.953)*	0.801 (0.648–0.989)*
Child had fever		
No	Ref	Ref
Yes	0.621 (0.554–0.696)***	0.804 (0.703–0.919)**
Child had diarrhoea		
No	Ref	Ref
Yes	0.583 (0.514–0.661)***	0.798 (0.682–0.934)**
Religion		
Christianity	Ref	Ref
Islam	0.633 (0.576–0.695)***	0.733 (0.635–0.847)***
Other	0.797 (0.571–1.112)	0.838 (0.570–1.233)
No religion	0.784 (0.617–0.997)*	0.633 (0.490–0.818)***
Maternal education		
No education	Ref	Ref
Primary	1.242 (1.130–1.366)***	0.881 (0.773–1.003)
Secondary	1.015 (0.921–1.119)	0.849 (0.722–0.999)*
Higher	0.710 (0.584–0.863)**	0.693 (0.511–0.940)*
Maternal occupation		
Not working	Ref	Ref
Professional	0.831 (0.668–1.035)	1.010 (0.774–1.317)
clerical	0.525 (0.319–0.866)*	0.657 (0.344–1.252)
Sales/business	0.926 (0.811–1.057)	1.020 (0.875–1.188)
Agriculture	1.418 (1.283–1.567)***	1.318 (1.162–1.494)***
Household/domestics services	0.926 (0.802–1.069)	1.087 (0.916–1.291)
Manual works	1.281 (1.041–1.577)*	1.184 (0.935–1.498)
Others (part-time jobs)	0.908 (0.746–1.106)	0.540 (0.399–0.730)***
Wealth index		
poorest	Ref	Ref
poorer	1.070 (0.962–1.190)	1.060 (0.927–1.211)
middle	1.134 (1.017–1.264)*	1.413 (1.186–1.683)***
richer	1.059 (0.937–1.197)	1.537 (1.252–1.887)***
richest	0.827 (0.723–0.945)**	1.459 (1.122–1.897)**
Age of gestation at ANC registration		
No ANC	Ref	Ref
< 4 months	1.463 (1.250–1.713)***	1.661 (1.070–2.579)*
4–5 months	1.591 (1.362–1.860)***	1.645 (1.059–2.555)*
6–7 months	1.508 (1.273–1.786)***	1.565 (0.995–2.462)
8 + months	1.691 (1.247–2.293)**	1.864 (1.069–3.251)*
Don't know	0.554 (0.321–0.955)*	0.594 (0.278–1.271)
Frequency of listening to Radio		
Not at all	Ref	Ref
atleast once a week	0.970 (0.862–1.092)	0.957 (0.815–1.124)
almost everytime	1.694 (1.320–2.173)***	3.469 (0.859–14.002)
Frequency of reading newspaper/magazine		

Table 4 (continued)

Variables	Crude Odds Ratio	Adjusted Odds Ratio
	cOR (95% CI)	**aOR (95% CI)**
Not at all	Ref	Ref
atleast once a week	1.494 (1.326–1.684)***	1.115 (1.003–1.238)*
almost everytime	1.378 (1.028–1.848)*	1.024 (0.704–1.490)
Frequency of watching television		
Not at all	Ref	Ref
atleast once a week	0.637 (0.588–0.691)***	0.819 (0.723–0.927)**
almost everytime	1.159 (0.946–1.421)	1.007 (0.741–1.367)
Community Factors		
Place of residence		
Urban	Ref	Ref
Rural	1.524 (1.387–1.674)***	1.405 (1.200–1.646)***
Community level of education		
Low	Ref	Ref
High	0.833 (0.757–0.918)***	1.087 (0.915–1.292)
Community level of poverty		
Low	Ref	Ref
High	0.860 (0.794–0.932)***	0.807 (0.691–0.942)**
SSA sub-region		
Central	Ref	Ref
East Africa	1.932 (1.671–2.233)***	2.590 (2.162–3.103)***
West Africa	2.861 (2.401–3.408)***	3.040 (2.481–3.726)***
South Africa	1.127 (0.976–1.301)	1.259 (1.046–1.516)*

*: p-value ≤ 0.05, **: p-value < 0.001, *** p-value < 0.0001

be significant predictors of EBF. Also, maternal factors like religion, maternal level of education, wealth index, gestational age at ANC registration, number of ANC visits, and media exposure were found to be significant predictors of EBF. Community level factors; place of residence, community level of poverty, and the sub-region were also found to be significantly associated with the prevalence of EBF.

Among the countries studied, Burundi (83%) and Rwanda (79%) reported the highest EBF prevalence. In contrast, Gabon (19%) and Guinea (25%) reported the lowest EBF. These results indicate a significant heterogeneity among the countries, as shown by heterogeneity value of 98.71% and a p-value of less than 0.0001. This high heterogeneity value suggests a substantial variation in EBF prevalence rates across the different countries in the region. The significant heterogeneity implies that the differences in EBF prevalence are not due to random chance but are likely influenced by various country-specific factors, such as cultural practices, healthcare infrastructure, socioeconomic conditions, and policy implementations related to breastfeeding. Moreover, regional variations indicated that mothers in East and West Africa had higher odds of practicing EBF compared to those in Central Africa, pointing to regional differences in breastfeeding practices, healthcare infrastructure, and cultural influences.

Age of child was found to be negatively associated with EBF, with older children less likely to be EBF. This finding corresponds with several earlier studies [33–35]. This finding could be explained as the age of the infant increases mothers often initiate early complementary feeding. Some mothers hold the view that breast milk alone may not meet the nutritional and water need of the growing infant. Additionally, working mothers may resume work as the infant grow older. This could result in mothers not having enough time to breastfeed the infant.

The study also found that mothers with overweight children were less likely to give EBF. Studies have demonstrated that children born to overweight or obese mothers are at a higher risk of being overweight themselves [36]. Other researchers further argued that overweight mothers had lower rates of breastfeeding [37]. Our study finding therefore suggest an interplay between maternal weight and child breastfeeding status. Therefore, addressing maternal obesity and supporting breastfeeding initiation and continuation could be pivotal strategies in promoting healthier weight outcomes for both mothers and their children.

The study also found that infants who had fever or diarrhoea were less likely to be on EBF. This finding aligns with studies conducted in Ethiopia [33], and Egypt [38]. When a child has a fever, they may experience a decreased appetite, fatigue, or discomfort, which can make breastfeeding less frequent or less efficient.

Similarly, diarrhoea can lead to dehydration, which might discourage breastfeeding as the child may experience stomach discomfort or nausea, making them less likely to feed. Mothers of such infants may perceive that breastmilk is not sufficient to give energy to the child and also build their immunity against other infections.

The study found that religion significantly influenced EBF practices in SSA. Muslim mothers and those with no religion were less likely to practice EBF compared to Christians. This aligns with previous studies suggesting that cultural and religious norms may shape infant feeding practices [39, 40]. Some Muslim communities favor mixed feeding due to traditional beliefs or early complementary feeding practices. Further research is needed to explore how religious teachings and community norms influence breastfeeding behaviors in different SSA contexts.

Maternal education showed higher education reduced the likelihood of EBF in our study. This contrasts with an earlier study that higher education typically promotes better health practices [17]. A possible explanation is that educated mothers in SSA have, over the years, gained active workforce participation. This may limit their ability to exclusively breastfeed due to work constraints. Alternatively, they may have greater exposure to formula marketing, influencing feeding choices. This finding suggests that workplace breastfeeding support policies are crucial, particularly for educated working mothers.

Maternal occupation also played a key role, with agricultural workers more likely to practice EBF compared to non-working mothers. This may be due to flexible work environments that allow mothers to breastfeed while working, unlike formal sector jobs with rigid schedules. Conversely, clerical and part-time workers had lower EBF rates, likely due to job demands and lack of breastfeeding-friendly workplaces. These findings highlight the need for maternity protection policies and on-site childcare support to enable EBF among working mothers.

The wealth index revealed an unexpected pattern. Increased wealth index improved EBF among mothers. This suggests that wealth linearly improve EBF practices. This corresponds with studies from other regions where wealth positively correlates with EBF [33]. Wealthy mothers may have access to quality ANC and PNC that has been found to improve EBF [41].

Gestational age at ANC registration was also found to be significant predictor of EBF in our study. Mothers who registered ANC before the fourth month were more likely to give EBF, compared to mothers who did not register for ANC. This finding corresponds with earlier studies [42, 43]. In contrast to this finding, an earlier study reported no significant relationship between EBF and ANC timing [44]. Early exposure to maternal and child health education during ANC visits helps mothers understand the importance of exclusive breastfeeding, thereby promoting healthier breastfeeding practices [42]. Early registration could also provide opportunities for addressing potential breastfeeding challenges, leading to greater confidence and success in initiating and maintaining EBF.

Mothers who listen to radio, watch television or read newspaper/magazine at least once a week or almost every time had high odds for EBF compared to mother who do media not at all. An Indian study reported that women who are exposed to radio, television or newspaper were at a high odds of practicing optimum Infant and Young Child Feeding practices (IYCF), including EBF [45]. Media exposure provides information and awareness on the importance of EBF, influencing maternal behavior. The implication is that increasing media campaigns about breastfeeding can promote EBF. Therefore, public health initiatives should focus on using media to educate and support breastfeeding practices, targeting wider audience reach through frequent and accessible channels.

The study found that several community-level factors significantly predicted EBF. For instance, rural mothers were more likely to practice EBF compared to their urban counterparts. Rural mothers are more likely to engage in informal or agricultural work, which allows for greater flexibility in breastfeeding compared to urban mothers in rigid formal employment. Limited access to and affordability of commercial formula in rural settings further reinforce reliance on breastfeeding. Urban mothers, meanwhile, face higher exposure to formula promotion, workplace constraints, and perceived social stigma around public breastfeeding, all of which may discourage EBF. This urban-rural divide highlights how structural and cultural environments shape infant feeding practices. This study's findings suggest that rural mothers are more likely to practice EBF due to limited access to alternatives.

The study also found that community level of poverty increased EBF rate. This finding could be related to the urban-rural divide discussed in the previous paragraph. Most rural areas have reduced level of wealth. Also, communities with high level of poverty could also present a reduced access to formula, thereby increasing their reliance on EBF. Interventions promoting EBF should therefore be targeted at urban and wealthier communities. This would address the availability and convenience of alternatives like formula feeding. Additionally, programs should leverage rural communities' strong breastfeeding traditions and provide support to educated mothers, encouraging continued EBF despite work or societal pressures.

Strengths and limitations

There was adequate statistical power because of the large dataset used in this study. The study's use of nationally representative data from 25 SSA nations' Demographic and Health Surveys improves the findings' generalizability. Regression models were rigorously examined in order to guarantee the reliability and validity of the study's analysis. Because of the cross-sectional nature of the research design, it is challenging to determine causal links. There is also a possibility of recall bias, as the data collection necessitated that the participant recalls prior events.

Conclusion

This study highlights the prevalence and predictors of EBF across 25 countries in SSA. The pooled prevalence of EBF in SSA was found to be 49%, with significant variations across countries, suggesting the influence of cultural, healthcare, and socioeconomic factors. The study identified several individual and community-level predictors of EBF, including child age, birthweight, child health (fever, diarrhoea), maternal education, wealth index, and media exposure. Community factors, such as place of residence, poverty levels, and education, also significantly affected EBF practices.

The study's findings underscore the importance of early ANC registration, media exposure, and community support in promoting EBF. It also highlights the need for tailored interventions addressing urban and wealthier communities, where the availability of formula and work pressures may discourage EBF. Furthermore, rural communities, which often have stronger breastfeeding traditions, can serve as a valuable source for promoting breastfeeding practices with the right support. The heterogeneity in EBF prevalence across SSA calls for region-specific strategies that take into account cultural, economic, and healthcare differences. Therefore, interventions to promote EBF should be multifaceted, addressing maternal, child, and community-level factors, while emphasizing the role of media and education in supporting breastfeeding practices across the region.

Abbreviations

ANC	Antenatal care
aOR	adjusted odds ratio
cOR	crude odds ratio
CI	confidence interval
DHS	Demographic Health Survey
EBF	Exclusive Breastfeeding
GVIF	Generalized Variance Inflation Factor
IYCF	Infant and Young Child Feeding
LMIC	Low-and-Middle Income Country
PNC	Postnatal care
SSA	sub-Saharan Africa

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12889-025-23045-z.

Supplementary Material 1

Supplementary Material 2

Acknowledgements

We wish to acknowledge the Demographic Health Survey Program for permitting us to use the data for our study.

Author contributions

Conceptualization - MHK, TD; Methodology – MHK, TC & SEM; Data Curation: JSK, JNW & LKK; Formal analysis – MHK, TD & SEM; Writing of Original draft – JNW, LKK & TD; Writing review & editing – LKK, TC & SEM; Supervision & Validation – JSK & JM.

Funding

No funding was received for conducting this study.

Data availability

Data for this study is freely available in the Demographic and Health Survey website (https://www.dhsprogram.com/Data/).

Declarations

Ethics approval and consent to participate

This research made use of the DHS database, a five-year survey carried out in LMIC. Following subject registration and submission via their website, ICF International approved access and usage of the dataset. The DHS website has thorough information on the approach and ethical issues. Since the used data for this study were secondary data and publicly accessible, individual consent to participate in the study was not required. The study obtained DHS Programme approval. All data were carefully managed guaranteeing privacy all through the processing and analysis stages.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

Author details

[1]Upper West Regional Health Directorate, Wa, Ghana
[2]The Technical University of Kenya, Nairobi, Kenya
[3]African Methodist Episcopal University, Monrovia, Liberia
[4]Rugarama Health Centre, Kigali, Rwanda
[5]Rally Time Hospital, Grand Cess, Liberia
[6]National Public Health Institute of Liberia, Monrovia, Liberia
[7]University of Makeni (UNIMAK), Makeni, Sierra Leone
[8]Southern Medical University, Guangzhou, China

Received: 20 July 2024 / Accepted: 5 May 2025
Published online: 15 May 2025

References

1. World Health Organization; UNICEF. Global Nutrition Targets 2025: Breastfeeding Policy Brief, WHO/NMH/NHD/14.7. 2012;14.7.
2. Global Breastfeeding Collective; UNICEF; World Health Organization. Global Breastfeeding Scorecard 2023: Rates of Breastfeeding Increase Around The World Through Improved Protection and Support. available at https://www.who.int/publications/i/item/WHO-HEP-NFS-21.45. 2023.
3. Louis-Jacques AF, Stuebe AM. Enabling breastfeeding to support lifelong health for mother and child. Obstet Gynecol Clin N Am. 2020;47(3):363–81.
4. Victora CG, Bahl R, Barros AJ, França GV, Horton S, Krasevec J, et al. Breastfeeding in the 21st century: epidemiology, mechanisms, and lifelong effect. Lancet (London England). 2016;387(10017):475–90.
5. Boix-Amoros A, Collado MC, Van't Land B, Calvert A, Le Doare K, Garssen J, et al. Reviewing the evidence on breast milk composition and immunological outcomes. Nutr Rev. 2019;77(8):541–56.
6. Bernardo L, Horta CGV. Short-term effects of breastfeeding: a systematic review on the benefits of breastfeeding on diarrhoea and pneumonia mortality. 2013.
7. Dong TS, Gupta A. Influence of early life, diet, and the environment on the Microbiome. Clin Gastroenterol Hepatol. 2019;17(2):231–42.

8. Lee MK, Binns C. Breastfeeding and the risk of infant illness in Asia: A review. Int J Environ Res Public Health. 2019;17(1).
9. North K, Gao M, Allen G, Lee AC. Breastfeeding in a global context: epidemiology, impact, and future directions. Clin Ther. 2022;44(2):228–44.
10. Asoba GN, Sumbele IUN, Anchang-Kimbi JK, Metuge S, Teh RN. Influence of infant feeding practices on the occurrence of malnutrition, malaria and anaemia in children =5 years in the Mount Cameroon area: A cross sectional study</at. PLoS ONE. 2019;14(7):e0219386.
11. UNICEF; WHO; World Bank Group UN. Levels & Trends in Report 2023, Child Mortality: The United Nations Inter-agency Group for Child Mortality Estimation (UN IGME). 2024.
12. Sankar MJ, Sinha B, Chowdhury R, Bhandari N, Taneja S, Martines J et al. Optimal breastfeeding practices and infant and child mortality: a systematic review and meta-analysis. Acta paediatrica (Oslo, Norway: 1992). 2015;104(467):3–13.
13. World Health Organization; UNICEF. The Extension of the 2025 Maternal, Infant and Young Child Nutrition Targets to 2030-WHO/UNICEF. 2021.
14. UNICEF. Infant and young child feeding, Breastfeeding: Available at: https://data.unicef.org/topic/nutrition/breastfeeding/ 2023 [Available from: https://data.unicef.org/topic/nutrition/breastfeeding/
15. Zong X, Wu H, Zhao M, Magnussen CG, Xi B. Global prevalence of WHO infant feeding practices in 57 LMICs in 2010–2018 and time trends since 2000 for 44 LMICs. EClinicalMedicine. 2021;37:100971.
16. Pretorius CE, Asare H, Genuneit J, Kruger HS, Ricci C. Impact of breastfeeding on mortality in sub-Saharan Africa: a systematic review, meta-analysis, and cost-evaluation. Eur J Pediatr. 2020;179(8):1213–25.
17. Yalçin SS, Berde AS, Yalçin S. Determinants of exclusive breast feeding in sub-Saharan Africa: A multilevel approach. Paediatr Perinat Epidemiol. 2016;30(5):439–49.
18. Zewdie A, Taye T, Kasahun AW, Oumer A. Effect of maternal employment on exclusive breastfeeding practice among mothers of infants 6–12 months old in wolkite town, Ethiopia: a comparative cross-sectional study. BMC Womens Health. 2022;22(1):222.
19. Asemahagn MA. Determinants of exclusive breastfeeding practices among mothers in Azezo district, Northwest Ethiopia. Int Breastfeed J. 2016;11:22.
20. Mundagowa PT, Chadambuka EM, Chimberengwa PT, Mukora-Mutseyekwa F. Determinants of exclusive breastfeeding among mothers of infants aged 6 to 12 months in Gwanda district, Zimbabwe. Int Breastfeed J. 2019;14:30.
21. Ejie IL, Eleje GU, Chibuzor MT, Anetoh MU, Nduka IJ, Umeh IB, et al. A systematic review of qualitative research on barriers and facilitators to exclusive breastfeeding practice in sub-Saharan African countries. Int Breastfeed J. 2021;16(1):44.
22. Ogbo FA, Eastwood J, Page A, Efe-Aluta O, Anago-Amanze C, Kadiri EA, et al. The impact of sociodemographic and health-service factors on breast-feeding in sub-Saharan African countries with high diarrhoea mortality. Public Health Nutr. 2017;20(17):3109–19.
23. Mohammed S, Yakubu I, Fuseini AG, Abdulai AM, Yakubu YH. Systematic review and meta-analysis of the prevalence and determinants of exclusive breastfeeding in the first six months of life in Ghana. BMC Public Health. 2023;23(1):920.
24. Kayode OO, Oyedeji AS, Alabi QK. Factors affecting exclusive breastfeeding practices among working-class women in Osun State, Nigeria. J Public Health Afr. 2023;14(6):2191.
25. Corsi DJNM, Finlay JE. Subramanian SJIjoe. Demographic and health surveys: a profile. 2012;41(6):1602-13.
26. Program TDaHS. 2024 [Available from: https://www.dhsprogram.com/
27. Pullum TW, Gribble K, Mihrshahi S, Borg B. Estimating the prevalence of exclusive breastfeeding with data from household surveys: measurement issues and options. Front Nutr. 2023;10:1058134.
28. Inano H, Kameya M, Sasano K, Matsumura K, Tsuchida A, Hamazaki K, et al. Factors influencing exclusive breastfeeding rates until 6 months postpartum: the Japan environment and children's study. Sci Rep. 2021;11(1):6841.
29. Mekuria G, Edris M. Exclusive breastfeeding and associated factors among mothers in Debre Markos, Northwest Ethiopia: a cross-sectional study. Int Breastfeed J. 2015;10(1):1.
30. Tampah-Naah AM, Kumi-Kyereme A. Determinants of exclusive breastfeeding among mothers in Ghana: a cross-sectional study. Int Breastfeed J. 2013;8(1):13.
31. Wasswa R, Kabagenyi A, Ariho P. Multilevel mixed effects analysis of individual and community level factors associated with modern contraceptive use among married women in Uganda. BMC Public Health. 2021;21(1):1457.
32. Mare KU, Aychiluhm SB, Sabo KG, Tadesse AW, Kase BF, Ebrahim OA, et al. Determinants of anemia level among reproductive-age women in 29 Sub-Saharan African countries: A multilevel mixed-effects modelling with ordered logistic regression analysis. PLoS ONE. 2023;18(11):e0294992.
33. Tsegaw SA, Ali Dawed Y, Tadesse Amsalu E. Exploring the determinants of exclusive breastfeeding among infants under-six months in Ethiopia using multilevel analysis. PLoS ONE. 2021;16(1):e0245034.
34. Ogbo FA, Dhami MV, Awosemo AO, Olusanya BO, Olusanya J, Osuagwu UL, et al. Regional prevalence and determinants of exclusive breastfeeding in India. Int Breastfeed J. 2019;14:1–12.
35. Musse O. Determinants of exclusive breast feeding practices among mothers of infants aged under six months in Jigjiga town, Eastern Ethiopia: a cross-sectional study. Int J Sciences: Basic Appl Res. 2019;46(2):62–74.
36. Gilley SP, Harrall KK, Friedman C, Glueck DH, Cohen CC, Perng W et al. Association of maternal BMI and rapid infant weight gain with childhood body size and composition. Pediatrics. 2023;151(5).
37. Bever Babendure J, Reifsnider E, Mendias E, Moramarco MW, Davila YR. Reduced breastfeeding rates among obese mothers: a review of contributing factors, clinical considerations and future directions. Int Breastfeed J. 2015;10:21.
38. Kandeel WA, Rabah TM, Zeid DA, El-Din EMS, Metwally AM, Shaalan A, et al. Determinants of exclusive breastfeeding in a sample of Egyptian infants. Open Access Macedonian J Med Sci. 2018;6(10):1818.
39. Bensaid B. Breastfeeding as a fundamental Islamic human right. J Relig Health. 2021;60(1):362–73.
40. Stroope S, Rackin HM, Stroope JL, Uecker JE. Breastfeeding and the role of maternal religion: results from a National prospective cohort study. Ann Behav Med. 2018;52(4):319–30.
41. Benova L, Siddiqi M, Abejirinde IO, Badejo O. Time trends and determinants of breastfeeding practices among adolescents and young women in Nigeria, 2003–2018. BMJ Glob Health. 2020;5(8).
42. Alebel A, Tesma C, Temesgen B, Ferede A, Kibret GD. Exclusive breastfeeding practice in Ethiopia and its association with antenatal care and institutional delivery: a systematic review and meta-analysis. Int Breastfeed J. 2018;13:31.
43. Woolley E, Buck G, Jackson J, Bowman R, Fox L, Gallagher S et al. Exclusive breastfeeding at discharge in regional new South Wales, Australia: the role of antenatal care (2011–2020). Int J Environ Res Public Health. 2023;20(12).
44. Islam MJ, Zobair KM. Do timing and frequency of antenatal care make a difference in maternal micronutrient intake and breastfeeding practices? Insights from a multi-country study in South Asia. PLOS Global Public Health. 2024;4(3):e0002993.
45. Dhawan D, Pinnamaneni R, Viswanath K. Association between mass media exposure and infant and young child feeding practices in India: a cross-sectional study. Sci Rep. 2023;13(1):19353.

Publisher's note