

Original article

Sociodemographic and gynecobstetric factors associated with exclusive breastfeeding in El Salvador

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Factores sociodemográficos y ginecobstétricos asociados a la lactancia materna exclusiva en El Salvador

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Abstract

Introduction. Breast milk is the ideal food for newborns, providing all the energy and nutrients a child needs in the first months of life. **Objective.** Determine the sociodemographic and gynecological-obstetric factors that promoted exclusive breastfeeding before six months of age in children with mothers aged 15 to 49 in El Salvador during 2021. **Methodology.** Analytical cross-sectional study of the 2021 National Health Survey of El Salvador. Children aged zero to five months were included. Descriptive and bivariate analytical statistics were applied for the analysis. **Results.** Of the 344 participants aged zero to five months, only 69.8 % were exclusively breastfed, 2.1 % received care during childbirth in private centers, 33.7 % did not have early attachment, and 9.2 % had a very high wealth index. **Conclusion.** The factors that were beneficial for exclusive breastfeeding were living in a rural area, receiving medical attention during delivery, and initiating breastfeeding within one hour of birth. The study population did not benefit from exclusive breastfeeding because they received delivery care in a private center, did not achieve early attachment, and had a very high wealth index.

Keywords

Breast Feeding, Human Milk, Newborn Infant.

Resumen

Introducción. La leche materna es el alimento ideal para los recién nacidos, además, proporciona toda la energía y los nutrientes que un niño necesita en los primeros meses de vida. **Objetivo.** Determinar los factores sociodemográficos y ginecobstétricos que promovieron a la lactancia materna exclusiva, antes de los seis meses, en niñas y niños con madres de 15 a 49 años en El Salvador, durante el año 2021. **Metodología.** Estudio transversal analítico de la Encuesta Nacional de Salud de El Salvador, del año 2021. Se incluyó a los niños de cero a cinco meses de edad. Se aplicó para el análisis estadística descriptiva y analítica bivariada. **Resultados.** De los 344 participantes, de cero a cinco meses, solo al 69,8 % recibieron lactancia materna exclusiva, el 2,1 % tuvo atención del parto en centros privados; el 33,7 % no tuvo apego precoz y el 9,2 % tenía un índice de bienes muy alto. **Conclusión.** Los factores que resultaron beneficiosas para brindar lactancia materna exclusiva fueron ser residente en área rural, durante el parto haber sido atendido por personal médico y el haber iniciado la lactancia materna en menos de una hora de nacido. La población del estudio no fue beneficiada con lactancia materna exclusiva por tener una atención del parto en un centro privado, por no haber cumplido el apego precoz y tener un índice de bienes muy alto.

Palabras clave

Lactancia Materna, Leche Humana, Recién Nacido.

Introduction

Breast milk is the ideal food for newborns. It provides all the energy and nutrients an infant needs during the first months of life, ensures half of the required nutrition during the second half of the first year, and more than one-third during the second year.^{i,ii} However, nearly

two-thirds of infants under one year of age do not receive exclusive breastfeeding (EBF) during the recommended first six months—a rate that has not improved in 20 years.ⁱⁱⁱ The United Nations Children's Fund (UNICEF) and the World Health Organization (WHO) recommend EBF during the first six months of life, starting within one hour after birth.ⁱ

According to UNICEF, in 2022, the global percentage of newborns breastfed within the first hour of life was 40 %, while 59 % of neonates were breastfed within the first 48 hours. The prevalence of early initiation of breastfeeding in Eastern Europe and Central Asia was nearly twice as high as in South Asia and East Asia and the Pacific.^{ii-iv} The Pan American Health Organization (PAHO) reports that only 38 % of babies in the Americas are exclusively breastfed at six months, and only 32 % continue breastfeeding at 24 months.^v

These percentages reflect a combination of factors that either facilitate or hinder breastfeeding practices. Among the facilitators are maternal age, previous breastfeeding experience, the mother's level of education, informed decision-making before birth, maternal education, supportive hospital environments, and a supportive postpartum setting.^{vi-x} Known harmful factors include smoking, maternal return to work, inadequate hospital practices, early bottle feeding, cesarean delivery, maternal or neonatal illness, premature birth, low birth weight, and adolescent motherhood, which can lead to delayed or absent breastfeeding initiation.^{xi-xviii}

Methodology

The study design was analytical and cross-sectional, based on data from the 2021 National Health Survey (NHS) conducted in El Salvador. This survey provided national-level data on health, education, and social conditions for women of reproductive age, infants, and adolescents. It represents an investment aimed at supporting authorities, organizations, and society in strengthening the health system in El Salvador.

The survey collected information from more than 16 500 households across the country. It was organized into four questionnaires: household, women of reproductive age, children and adolescents, and children under five years of age. For this study, data were taken from 6494 mothers or caregivers interviewed, each corresponding to one infant analyzed in this research. Infants aged zero to five months were included. To differentiate between those who received EBF and those who did not, the following definition was used: any infant who, during the first six months of life, was fed exclusively with breast milk, without receiving other liquids or solids, except for prescribed vitamins, minerals, or medications.^{xiv-xvi}

The questionnaires completed on households, women of reproductive age, and children under five years of age present

26 variables relevant to the analysis, distributed across sociodemographic and gynecological-obstetric factors. Of these, 15 variables were taken directly from the survey questions, including maternal marital status, area of residence, health region, sex of the children, health insurance, and last delivery attended at a health facility. Four variables were constructed based on the questions in the instrument, and for better analysis, access to technology, asset index, exclusive breastfeeding, and infant illness in the two weeks prior to the survey were added.

Seven variables were reclassified and grouped as discrete non-continuous quantitative variables: maternal age group, household members, number of births, week of prenatal registration, early registration (registration before 12 weeks), number of prenatal checkups, facility where the last birth took place, and health personnel who participated in the delivery. This last variable allowed multiple responses since more than one professional could participate in the same delivery (for example, physician and nurse).

The database was processed using Microsoft Excel 2019. For descriptive statistical analysis, frequency and proportion tables were constructed, and 95 % confidence intervals for proportions were calculated. For continuous quantitative variables, such as family size, maternal age, number of births, and number of prenatal checkups, the Anderson-Darling normality test was applied. For bivariate analytical statistics, two by two tables were constructed, and the Prevalence Odds Ratio (POR) with 95 % confidence intervals was used as a measure of association, with a significance level of $p < 0.05$.

The POR was interpreted as follows: $POR = 1$, no association between the factor and EBF; $POR > 1$, the factor increases the likelihood of EBF; $POR < 1$, the factor decreases the likelihood of EBF. All statistical processing was performed using the Epi Info™ software.^{vii}

The study protocol was submitted to the Ethics Committee of the National Institute of Health. The study was considered minimal risk since it did not involve direct contact with the patients. Therefore, ethical principles of justice, respect, and beneficence, as proposed by the Council for International Organizations of Medical Sciences (CIOMS), the Declaration of Helsinki and Belmont, were followed. To protect participants' personal information, data were anonymized beforehand, that ensures that the individuals could not be linked to the information presented in the final report.

Results

A total of 344 children aged zero to five completed months were included in the study. Data distribution showed a higher proportion in urban areas, accounting for 54.1 % (186). The asset index was concentrated mainly in the “very low” category, with 32.6 % (112). The median (Me) number of household members was five, with an interquartile range (IQR) of 4-6. Among the families represented, at least 98.5 % (339) had some access to technology. The median maternal age was 25 years, with an IQR of 22-30 years. Most mothers (75 %, $n = 258$) were married or living with a partner, and 25.6 % (88) had secondary education as the most frequent educational level. The majority of the data came from the Paracentral region (25 %, $n = 86$). Male infants accounted for 53.2 % (183), and 80.2 % (276) of mothers lacked medical insurance coverage (Table 1).

Among gynecologic-obstetric factors, most mothers had a median of two deliveries (IQR = 1-3). Regarding the most recent pregnancy, 88.1 % (303) had early prenatal registration; the number of prenatal checkups (PNC) had a median of six (IQR = 1-8). As for the place of delivery, the majority occurred in a health facility (91.6 %, $n = 315$), predominantly under the Ministry of Health (MINSAL) with 76.7 % (264). 53.5 % (314) had their last delivery vaginally. The most common healthcare professional attending deliveries was a physician (91.3 %, $n = 314$), followed by nursing staff (33.4 %). Early skin-to-skin contact was reported in 58.4 % (201), and 43.6 % (119) initiated breastfeeding within one hour after birth. 76.5 % (263) of children with mothers in the postpartum period received breastfeeding counseling, and 95.1 % (327) were breastfed at least once (Table 2).

Analytical Statistics

Of the 344 children aged zero to five months, only 69.8 % (240) (Table 2) received exclusive EBF. Regarding sociodemographic factors, most families were of medium size, representing 67.9 % (163). The families' asset index was 35.4 % (85); however, infants from households with a very high asset index showed a non-beneficial effect for receiving EBF (POR 0.33, 95 % CI 0.17-0.63; $p < 0.01$). Moreover, 98.3 % (236) had access to at least one technological device. Maternal age was mainly distributed within the 24-35-year group (53.8 %, $n = 129$). At the time of the interview, 77.5 % (186) of mothers were married or living with a partner. The highest maternal education level was secondary school (27.5 %, $n = 66$); however, having

higher education showed a non-beneficial effect on EBF (POR 0.25, 95 % CI 0.10-0.60; $p < 0.01$), as did the absence of any formal education (POR 0.11, 95 % CI 0.03-0.34; $p < 0.01$) (Table 3).

A total of 86.3 % (207) of the mothers lacked health insurance coverage (Salvadoran Social Security Institute, teachers' welfare, military health service, private insurance provided by employer, other private insurance, or school medical insurance). Interestingly, this lack of insurance was found to have a beneficial effect on providing EBF (POR 3.19, 95 % CI 1.83-5.50; $p < 0.01$). Likewise, 50 % (120) of infants lived in rural areas, which also had a positive effect on EBF (POR 1.73, 95 % CI 1.08-2.78; $p = 0.02$). The region with the highest EBF rates was the Eastern region, with 25 % (62). Male infants were slightly more frequent, representing 53 % (128).

Regarding gynecologic-obstetric factors, most mothers had two or more deliveries (73.8 %, $n = 177$). During the most recent pregnancy, early registration occurred in 91.7 % (220), and most mothers had six or more prenatal checkups (53.3 %, $n = 128$). Most had their last birth in a health facility, with 96.3 % (231) predominantly in the MINSAL with 86.7 % (208), where a beneficial effect was seen in giving LME (ORP 3.83, 95 % CI 2.16-6.79; $p < 0.01$); conversely, deliveries attended by the Social Security Institute (ISSS) (POR 0.24, 95 % CI 0.12-0.46; $p < 0.01$) and private centers (POR 0.21, 95 % CI 0.05-0.77; $p < 0.01$) had a non-beneficial effect on EBF (Table 3).

Most mothers had vaginal deliveries, accounting for 59.2 % (142). The professional most frequently present or attending the delivery was a physician (95.4 %, $n = 229$), which showed a beneficial effect on providing EBF (POR 4.65, 95 % CI 2.12-10.1; $p < 0.01$). Children who experienced early skin-to-skin contact (66.3 %, $n = 159$) had a favorable effect on receiving EBF (POR 2.19, 95 % CI 1.33-3.60; $p < 0.01$), whereas the absence of early contact had a non-beneficial effect (POR 0.45, 95 % CI 0.27-0.74; $p < 0.01$). Initiation of breastfeeding within one hour of birth (43.3 %, $n = 104$) showed a positive association with EBF (POR 3.05, 95 % CI 1.65-5.69; $p < 0.01$), followed by initiation within 24 hours (POR 2.08, 95 % CI 1.14-3.79; $p = 0.02$) and after 24 hours (POR 0.17, 95 % CI 0.09-0.30). Among mothers, 81.7 % (196) received postpartum breastfeeding counseling, and only 15.8 % (38) of infants had been ill in the two weeks preceding the survey (diarrhea, fever, cough, or some other respiratory problem, for which they had to suspend EBF).

Table 1. Sociodemographic factors of children from zero to five months in relation to exclusive breastfeeding in El Salvador, year 2021

Characteristics	Population from 0 to 5 months			Urban			Rural		
	n: 344	%	95 % CI	n: 186	%	95 % CI	n: 158	%	95 % CI
Mother	344			186			158		
Mean Age (IQR)		25 (22-30)			26 (22-30)			25 (21-30)	
Marital status									
Married or cohabitating	258	75.0	(70.1-79.28)	136	73.1	(66.1-79.3)	122	77.2	(69.8-83.5)
Not married	74	21.5	(17.5-26.1)	42	22.6	(16.7-29.2)	32	20.3	(14.2-27.3)
ND	3.5	3.5	(2.01-6.00)	8	4.3	(1.87-8.30)	4	2.5	(0.69-6.35)
Schooling									
Preschool	1	0,3	(0.05-1.63)	1	0.5	(0.01-2.96)	0	0.0	(0.00-2.31)
Primary	82	23,8	(19.6-28.6)	27	14.5	(9.79-20.41)	55	34.8	(27.4-42.7)
Secondary	88	25,6	(21.2-30.4)	41	22.0	(16.3-28.6)	47	29.7	(22.7-37.5)
General high school	75	21.8	(17.7-26.4)	49	26.3	(20.1-33.2)	26	16.5	(11.0-23.1)
Vocational high school	47	13.7	(10.4-17.7)	29	15.6	(10.7-21.6)	18	11.4	(6.89-17.4)
University education	23	6.7	(4.50-9.83)	18	9.7	(5.84-14.8)	5	3.2	(1.04-7.23)
Non-university higher education	7	2.0	(0.99-4.14)	7	3.8	(1.53-7.60)	0	0.0	(0.00-2.31)
Not study	21	6.1	(4.03-9.15)	14	7.5	(4.18-12.3)	7	4.4	(1.80-8.92)
Children									
Region									
Paracentral	86	25.0	(19.6-28.6)	43	23.1	(17.2-29.8)	43	27.2	(20.4-34.8)
Eastern	82	23.8	(20.7-29.8)	57	30.6	(24.1-37.8)	25	15.8	(10.5-22.4)
West	73	21.2	(17.2-25.8)	27	14.5	(9.79-20.4)	46	29.1	(22.1-36.8)
Metropolitan	58	16.9	(13.2-21.1)	43	23.1	(17.2-29.8)	15	9.5	(5.41-15.1)
Central	45	13.1	(9.92-17.06)	16	8.6	(5.00-13.5)	29	18.4	(12.6-25.2)
Sex									
Male	183	53.2	(47.9-58.4)	96	51.6	(44.1-58.9)	87	55.1	(46.9-62.9)
Female	161	46.8	(41.5-52.0)	90	48.4	(41.0-55.8)	71	44.9	(37.0-53.0)
Health insurance									
No	276	80.2	(75.7-84.1)	139	74.7	(67.8-80.8)	137	86.7	(80.4-91.5)
Yes	68	19.8	(15.9-24.3)	47	25.3	(19.2-32.1)	21	13.3	(8.42-19.6)
Household members									
Access to technology									
Some device	339	98.5	(96.6-99.3)	184	98.9	(96.1-99.8)	155	98.1	(94.5-99.6)
No access	5	1.5	(0.62-3.36)	2	1.1	(0.13-3.83)	3	1.9	(0.39-5.45)
Family size									
Members Me (RIQ)		5 (4-6)			5 (4-6)			5 (4-6)	
Index of goods									
Very low	112	32.6	(27.8-37.6)	41	22.0	(16.3-28.6)	71	44.9	(37.0-53.0)
Low	78	22.7	(18.5-27.3)	40	21.5	(15.8-28.1)	38	24.1	(17.6-31.4)
Half	66	19.2	(15.3-23.6)	37	19.9	(14.4-26.3)	29	18.4	(12.6-25.2)
High	42	12.2	(9.16-16.0)	29	15.6	(10.7-21.6)	13	8.2	(4.45-13.6)
Very high	46	13.4	(10.1-17.38)	39	21.0	(15.3-27.5)	7	4.4	(1.80-8.92)

Note: Me: median; IQR: interquartile range; ND: no data or no response.

Table 2. Gynecological and obstetric factors in mothers aged 15 to 49 years, with children aged zero to five months, in El Salvador, during 2021.

Factors	Children from 0 to 5 months			Urban			Rural		
	n: 344	%	95 % CI	n: 186	%	95 % CI	n: 158	%	95 % CI
Number of births Me (RIQ)			2 (1-3)			2 (1-3)			2 (1-3)
Prenatal Registration									
Early	303	88.1	(84.2-91.0)	158	84.9	(78.9-89.7)	145	91.8	(86.3-95.5)
Late	9	2.6	(1.38-4.90)	5	2.7	(0.88-6.16)	4	2.5	(0.69-6.35)
ND	32	9.3	(6.67-12.84)	23	12.4	(8.00-17.9)	9	5.7	(2.64-10.5)
Prenatal checkups									
Number of CPN MD (RIQ)			6 (5-8)			6 (5-8)			6 (5-8)
About the last birth									
Attention in health facility									
Yes	315	91.6	(88.1-94.0)	166	89.2	(83.8-93.3)	149	94.3	(89.4-97.3)
No	14	4.1	(2.44-6.71)	9	4.8	(2.24-8.99)	5	3.2	(1.04-7.23)
ND	15	4.4	(2.66-7.07)	11	5.9	(2.99-10.34)	4	2.5	(0.69-6.35)
Establishment									
Ministry of Health	264	76.7	(72.0-80.9)	131	70.4	(63.3-76.8)	133	84.2	(77.5-89.4)
ISSS	46	13.4	(10.1-17.3)	29	15.6	(10.7-21.6)	17	10.8	(6.39-16.6)
Private	13	3.8	(2.22-6.36)	11	5.9	(2.99-10.34)	2	1.3	(0.15-4.50)
Outpatient	5	1.5	(0.62-3.36)	4	2.2	(0.59-5.41)	1	0.6	(0.02-3.48)
Community clinic	1	0.3	(0.05-1.63)	0	0.0	(0.00-1.96)	1	0.6	(0.02-3.48)
ND	15	4.4	(2.22-6.36)	11	5.9	(2.99-10.3)	4	2.5	(0.69-6.35)
Type of delivery									
Vaginal	184	53.5	(48.2-58.6)	92	49.5	(42.0-56.8)	92	58.2	(50.1-66.0)
Caesarean section	123	35.8	(30.8-40.9)	72	38.7	(31.6-46.1)	51	32.3	(25.0-40.1)
ND	37	10.8	(7.90-14.47)	22	11.8	(7.56-17.3)	15	9.5	(5.41-15.1)
Personnel who attended the birthⁱ									
Doctor	314	91.3	(87.8-93.8)	167	89.8	(84.5-93.7)	147	93.0	(87.8-96.4)
Nursing	115	33.4	(28.6-38.5)	57	30.6	(24.1-37.8)	58	36.7	(29.1-44.7)
Lic, Maternal and Child	5	1.5	(0.62-3.36)	3	1.6	(0.33-4.64)	2	1.3	(0.15-4.50)
Health promoter	1	0.3	(0.05-1.63)	1	0.5	(0.01-2.96)	0	0.0	(0.00-2.31)
Others	2	0.6	(0.16-2.09)	2	1.1	(0.13-3.83)	0	0.0	(0.00-2.31)
Early attachment									
Yes	201	58.4	(53.1-63.5)	97	52.2	(44.7-59.5)	104	65.8	(57.8-73.1)
No	128	37.2	(32.2-42.4)	78	41.9	(34.7-49.3)	50	31.6	(24.4-39.5)
ND	15	4.4	(2.66-7.07)	11	5.9	(2.99-10.3)	4	2.5	(0.69-6.35)
Beginning of breast-feeding maternal									
Less than 1 hour	119	34.6	(29.7-39.7)	58	31.2	(24.6-38.3)	61	38.6	(30.9-46.6)
Less than 24 hours	108	31.4	(26.7-36.4)	59	31.7	(25.1-38.9)	49	31.0	(23.9-38.8)
More than 24 hours	88	25.6	(21.2-30.4)	51	27.4	(21.1-34.4)	37	23.4	(17.0-30.8)
ND	29	8.4	(5.93-11.8)	18	9.7	(5.84-14.8)	11	7.0	(3.53-12.1)

Postpartum BF Counseling									
Yes	263	76.5	(71.6-80.6)	135	72.6	(65.5-78.8)	128	81.0	(74.0-86.8)
No	65	18.9	(15.3-23.6)	40	21.5	(15.8-28.1)	26	16.5	(11.0-23.1)
ND	15	4.4	(2.33-7.07)	11	5.9	(2.99-10.3)	4	2.5	(0.69-6.35)
Feeding them first three days of life									
Yes	247	71.8	(66.8-76.3)	125	67.2	(59.9-73.9)	122	77.2	(69.8-83.5)
No	69	20.1	(16.1-24.6)	43	23.1	(17.2-29.8)	26	16.5	(11.0-23.1)
ND	28	8.1	(5.69-11.5)	18	9.7	(5.84-14.8)	10	6.3	(3.08-11.3)
Child breastfed at least once									
Yes	327	95.1	(92.2-96.8)	176	94.6	(90.3-97.3)	151	95.6	(91.0-98.2)
No	17	4.9	(3.11-7.77)	10	5.4	(2.61-9.66)	7	4.4	(1.80-8.92)
He has been sick for the last 2 weeks									
Yes	286	83.1	(78.8-86.7)	155	83.3	(77.1-88.3)	131	82.9	(76.1-88.4)
No	58	16.9	(13.2-21.1)	31	16.7	(11.6-22.8)	27	17.1	(11.5-23.8)
Exclusive breastfeed-ing									
Yes	240	69.8	(64.7-74.3)	120	64.5	(57.1-71.3)	120	75.9	(68.5-82.3)
No	104	30.2	(25.6-35.2)	66	35.5	(28.6-42.8)	38	24.1	(17.6-31.4)

Note: Me: median; IQR: interquartile range; NA: no data or no response; CPN: prenatal care.

Table 3. Bivariate analysis of factors associated with exclusive breastfeeding in El Salvador, 2021.

Variables	LME			No LM			ORp	95 % CI	p
	n: 240	%	95 % CI	n: 104	%	95 % CI			
Members	240			240					
Family size									
Small (1-3)	33	13.8	(9.66-18.7)	9	8.7	(4.03-15.7)	1.68	(0.77-3.65)	0.25
Medium (4-6)	163	67.9	(61.6-73.7)	72	69.2	(59.4-77.9)	0.94	(0.57-1.54)	0.90
Large (>6)	44	18.3	(13.6-23.8)	23	22.1	(14.5-31.3)	0.89	(0.44-1.39)	0.50
Index of goods									
Very low	85	35.4	(29.3-41.8)	27	26.0	(17.8-35.4)	1.56	(0.93-2.60)	0.11
Low	60	25.0	(19.6-30.9)	18	17.3	(10.5-25.9)	1.59	(0.88-2.86)	0.15
Half	46	19.2	(14.3-24.7)	20	19.2	(12.1-28.1)	0.99	(0.55-1.78)	1.00
High	27	11.3	(7.55-15.9)	15	14.4	(8.30-22.6)	0.75	(0.38-1.48)	0.51
Very high	22	9.2	(5.83-13.5)	24	23.1	(15.3-32.3)	0.33	(0.17-0.63)	<0.01
Access to technology									
Some device	236	98.3	(95.7-99.5)	103	99.0	(94.7-99.9)	0.57	(0.02-4.62)	1.00
No access	4	1.7	(0.46-4.21)	1	1.0	(0.02-5.24)	1.74	(0.16-86.7)	1.00
Mother									
Age									
From 15 to 23 years old	93	38.8	(32.5-45.2)	28	26.9	(18.6-36.5)	1.44	(0.86-2.41)	0.19
From 24 to 35 years old	129	53.8	(47.2-60.1)	54	51.9	(41.9-61.8)	0.81	(0.50-1.33)	0.49
From 36 to 49 years old	18	7.5	(4.51-11.5)	10	9.6	(4.71-16.9)	0.66	(0.29-1.49)	0.44
ND	0	0.0	(0.00-1.53)	12	11.5	(6.11-19.2)	NA	NA	NA

Marital status									
Married or accompanied	186	77.5	(71.6-82.6)	72	69.2	(59.4-77.9)	0.95	(0.53-1.71)	<0.01
Not married	54	22.5	(17.3-28.3)	20	19.2	(12.1-28.1)	1.04	(0.58-1.86)	<0.01
ND	0	0.0	(0.00-1.53)	12	11.5	(6.11-19.2)	NA	NA	NA
Schooling									
Preschool	1	0.4	(0.01-2.30)	0	0.0	(0.00-3.48)	NA	NA	NA
Primary	63	26.3	(20.8-32.3)	19	18.3	(11.3-27.0)	1.33	(0.74-2.38)	0.41
Secondary	66	27.5	(21.9-33.6)	22	21.2	(13.7-30.2)	1.17	(0.66-2.05)	0.67
General high school	56	23.3	(18.1-29.2)	19	18.3	(11.3-27.0)	1.13	(0.62-2.04)	0.78
Vocational high school	34	14.2	(10.0-19.2)	13	12.5	(6.83-20.4)	0.97	(0.48-1.94)	1.00
University education	10	4.2	(2.02-7.53)	13	12.5	(6.83-20.4)	0.25	(0.10-0.60)	<0.01
Non-university higher education	5	2.1	(0.68-4.79)	2	1.9	(0.23-6.77)	0.93	(0.14-9.99)	1.00
Not study	5	2.1	(0.68-4.79)	16	15.4	(9.06-23.7)	0.11	(0.03-0.34)	<0.01
Covered by health insurance									
Yes	33	13.8	(9.66-18.7)	35	33.7	(24.6-43.5)	0.31	(0.18-0.54)	<0.01
No	207	86.3	(81.2-90.3)	69	66.3	(56.4-75.3)	3.19	(1.83-5.50)	<0.01
Area of residence									
Urban	120	50.0	(43.5-56.5)	66	63.5	(53.4-72.6)	0.57	(0.35-0.92)	0.02
Rural	120	50.0	(43.5-56.5)	38	36.5	(27.3-46.5)	1.73	(1.08-2.78)	0.02
Region									
Eastern	62	25.8	(20.4-31.8)	20	19.2	(12.1-28.1)	1.46	(0.82-2.57)	0.23
Paracentral	57	23.8	(18.5-29.6)	29	27.9	(19.5-37.5)	0.80	(0.47-1.35)	0.49
West	53	22.1	(17.0-27.8)	20	19.2	(12.1-28.1)	1.19	(0.66-2.11)	0.65
Metropolitan	34	14.2	(10.0-19.2)	24	23.1	(15.3-32.3)	0.55	(0.30-0.98)	0.06
Central	34	14.2	(10.0-19.2)	11	10.6	(5.40-18.1)	1.39	(0.67-2.87)	0.46
Children									
Sex									
Male	128	53.3	(46.8-59.7)	55	52.9	(42.8-62.7)	1.01	(0.64-1.61)	1.00
Female	112	46.7	(40.2-53.1)	49	47.1	(37.2-57.1)	0.98	(0.61-1.55)	1.00
Prenatal care									
Number of births									
1 birth	63	26.3	(20.8-32.3)	29	27.9	(19.5-37.5)	0.74	(0.44-1.26)	0.34
≥2 births	177	73.8	(67.7-79.2)	61	58.7	(48.5-68.2)	1.3	(0.78-2.26)	0.34
ND	0	0.0	(0.00-1.53)	14	13.5	(7.56-21.5)	NA	NA	NA
Prenatal Registration									
Early	220	91.7	(87.4-94.8)	83	79.8	(70.8-87.0)	NA	NA	NA
Late	9	3.8	(1.73-7.00)	0	0.0	(0.00-3.48)	NA	NA	NA
ND	11	4.6	(2.31-8.05)	21	20.2	(12.9-29.1)	NA	NA	NA
Prenatal checkups									
From 1 to 5	98	40.8	(34.5-47.3)	30	28.8	(20.3-38.5)	1.35	(0.80-2.27)	0.31
≥ 6	128	53.3	(46.8-59.7)	53	51.0	(40.9-60.9)	0.73	(0.43-1.24)	0.31
ND	14	5.8	(3.23-9.59)	21	20.2	(12.9-29.1)	NA	NA	NA
About the last one delivery									
Birth in health facility									
Yes	231	96.3	(93.0-98.2)	84	80.8	(71.8-87.8)	1.52	(0.39-5.24)	0.53
No	9	3.8	(1.73-7.00)	5	4.8	(1.58-10.8)	0.65	(0.21-2.00)	0.53
ND	0	0.0	(0.00-1.53)	15	14.4	(8.30-22.6)	NA	NA	NA

Establishment									
Ministry of Health	208	86.7	(81.7-90.7)	56	53.8	(43.8-63.6)	3.83	(2.16-6.76)	<0.01
ISSS	21	8.8	(5.50-13.0)	25	24.0	(16.2-33.4)	0.24	(0.12-0.46)	<0.01
Private	5	2.1	(0.68-4.79)	8	7.7	(3.38-14.6)	0.21	(0.05-0.77)	<0.01
Outpatient	5	2.1	(0.68-4.79)	0	0.0	(0.00-3.48)	NA	NA	NA
Community clinic	1	0.4	(0.01-2.30)	0	0.0	(0.00-3.48)	NA	NA	NA
ND	0	0.0	(0.00-1.53)	15	14.4	(8.30-22.6)	NA	NA	NA
Type of delivery									
Caesarean section	86	35.8	(29.7-42.2)	37	35.6	(26.4-45.5)	0.68	(0.41-1.15)	0.19
Natural	142	59.2	(52.6-65.4)	42	40.4	(30.8-50.4)	1.45	(0.86-2.43)	0.19
ND	12	5.0	(2.61-8.57)	25	24.0	(16.2-33.4)	NA	NA	NA
Staff who attended birth									
Doctor	229	95.4	(91.9-97.6)	85	81.7	(72.9-88.6)	4.65	(2.12-10.1)	<0.01
Nursing	86	35.8	(29.7-42.2)	29	27.9	(19.5-37.5)	1.44	(0.87-2.38)	0.18
B.S. in Maternal Child Health	1	0.4	(0.01-2.30)	4	3.8	(1.06-9.56)	0.10	(0.00-1.08)	0.03
Health promoter	1	0.4	(0.01-2.30)	0	0.0	(0.00-3.48)	NA	NA	NA
Other*	2	0.8	(0.10-2.98)	0	0.0	(0.00-3.48)	NA	NA	NA
Postpartum									
Early attachment									
Yes	159	66.3	(59.8-72.2)	42	40.4	(30.8-50.4)	2.19	(1.33-3.60)	<0.01
No	81	33.8	(27.7-40.1)	47	45.2	(35.4-55.2)	0.45	(0.27-0.74)	<0.01
ND	0	0.0	(0.00-1.53)	15	14.4	(8.30-22.6)	NA	NA	NA
Beginning of breastfeeding maternal									
Less than 1 hour	104	43.3	(36.9-49.8)	15	14.4	(8.30-22.6)	3.05	(1.64-5.69)	<0.01
Less than 24 hours	91	37.9	(31.7-44.3)	17	16.3	(9.82-24.8)	2.08	(1.14-3.79)	0.02
More than 24 hours	45	18.8	(14.0-24.2)	43	41.3	(31.7-51.4)	0.17	(0.09-0.30)	<0.01
ND	0	0.0	(0.00-1.53)	29	27.9	(19.5-37.5)	NA	NA	NA
Postpartum BF Counseling									
Yes	196	81.7	(76.1-86.3)	67	64.4	(54.4-73.5)	1.46	(0.81-2.61)	0.25
No	44	18.3	(13.6-23.8)	22	21.2	(13.7-30.2)	0.68	(0.38-1.22)	0.25
ND	0	0.0	(0.00-1.53)	15	14.4	(8.30-22.6)	NA	NA	NA
Feeding them first three days of life									
Yes	0	0.0	(0.00-1.53)	69	66.3	(56.4-75.3)	NA	NA	NA
No	240	100	(98.4-100)	7	6.7	(2.75-13.3)	NA	NA	NA
ND	0	0.0	(0.00-1.53)	28	26.9	(18.6-36.5)	NA	NA	NA
Breastfed child at least once									
Yes	240	100	(98.4-100)	87	83.7	(75.1-90.1)	NA	NA	NA
No	0	0.0	(0.00-1.53)	17	16.3	(9.82-24.8)	NA	NA	NA
He fell ill the last few days 2 weeks									
Yes	38	15.8	(11.4-21.0)	20	19.2	(12.1-28.1)	0.79	(0.43-1.43)	0.53
No	202	84.2	(78.9-88.5)	84	80.8	(71.8-88.1)	1.26	(0.69-2.30)	0.53

*Midwives, practicing medical personnel (students), untrained persons, or the patient herself.

Discussion

This analysis provides valuable insight into the factors associated with exclusive breastfeeding (EBF) in El Salvador, focusing on infants aged zero to five months. The findings identify key aspects influencing mothers' decisions to breastfeed exclusively, contributing to a better understanding of national barriers and facilitators to this practice. Continuous health and nutritional counseling, particularly through technological devices, is a beneficial factor for maintaining breastfeeding up to six months of age.^{xiii,xx} However, in this study, despite the high rate of access to smart or technological devices, no significant association with breastfeeding was found. Most mothers were between 24 and 35 years old. However, no association was observed between maternal age and EBF, contrary to other studies suggesting that this age group has greater experience and knowledge regarding breastfeeding.^{xvii,xx} Nonetheless, it is acknowledged that increasing maternal age is a determining factor in breastfeeding practices.^{xi,xvi}

Marital status (being single, widowed, divorced, or unpartnered) has been recognized as a risk factor for discontinuing breastfeeding;^{vii} however, this analysis found no such association, even among married or partnered mothers. Maternal education contributes positively to breastfeeding, particularly at the secondary and higher levels.^{vii,xi} However, in this analysis, higher education was not beneficial for maintaining breastfeeding, and mothers without formal education also showed no favorable association.^{xi}

Evidence from randomized controlled trials evaluating the effect of prenatal counseling on breastfeeding self-efficacy suggests that prenatal care increases both the frequency and self-efficacy of breastfeeding up to four months postpartum.^{xiv,xx} Nonetheless, in this study, although most mothers began prenatal care early, no significant association with EBF was observed.

According to UNICEF, early skin-to-skin contact, hospital deliveries that support breastfeeding, and care provided by trained personnel are contributing factors to breastfeeding initiation.ⁱⁱ The limitation of the study is that, as it is a bivariate analysis, possible confounding variables were not measured. This was confirmed in the present analysis, highlighting that the public health sector is likely the most capable of promoting EBF before, during, and after delivery.

The results of this study show variations compared with other research but remain plausible and coherent within the

analytical context. Factors negatively influencing EBF included the absence of early skin-to-skin contact, a very high asset index, and delivery in private healthcare centers. Understanding these influencing factors is crucial because, globally, breastfeeding is estimated to prevent 823 000 deaths among children under two years of age and 20 000 maternal deaths annually, while saving approximately USD 300 billion in healthcare costs related to malnutrition in mothers and children.^{vii} Accurately identifying such factors will help reduce costs worldwide by improving breastfeeding promotion. Further investigation through longitudinal designs, following children at 6, 12, and 24 months^{xviii}, would be valuable for targeting specific aspects of EBF.

Conclusion

Living in rural areas, being attended by a physician during delivery, and initiating breastfeeding within one hour after birth increased the likelihood of providing EBF. These are key protective and supportive aspects that align with the national health system's efforts to promote early breastfeeding practices. Conversely, having a very high asset index, lack of maternal education, medical insurance coverage, delivery in a private healthcare center, and absence of early skin-to-skin contact reduced the probability of exclusive breastfeeding.

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