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Social determinants of health and exclusive breastfeeding in Yopal, Colombia

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Keywords:
breastfeeding; predominant breastfeeding; exclusive breastfeeding; social determinants of health; prevalence; Colombia (source: MeSH-NLM).

ABSTRACT

Objectives. To analyze the structural and intermediary social determinants of health (SDH) and their relationship with exclusive breastfeeding (EBF). **Methods.** An analytical cross-sectional study based on records from the Food and Nutrition Epidemiological Surveillance System (SISVAN, by its Spanish acronym); the population comprised all records of infants aged 0 to 6 months. Variables were analyzed using descriptive statistics, estimating the prevalence and median age of EBF. Pearson's chi-square test was used to determine significant associations between SDH and EBF. **Results.** A sample of 1,149 records was analyzed; 95.5 % of children were receiving breastfeeding, and the prevalence of EBF at 5 months was 75.6 %. Overall, 97.3 % of infants had health insurance coverage, 86.3 % resided in urban areas, and 0.2 % were registered as belonging to an ethnic group. An association was found between the intermediary SDH related to access to the health system, specifically "other" affiliation type (OR = 6.58; 95 % CI: 2.92-14.83; p = 0.001), compared with the contributory regime. **Conclusions.** The intermediary SDH related to access to the health system (type of affiliation) influences the practice of EBF in the municipality of Yopal.

Determinantes sociales en salud y lactancia materna exclusiva en Yopal, Colombia

Palabras clave:
lactancia materna; lactancia materna predominante; lactancia materna exclusiva; determinantes sociales de la salud; prevalencia; Colombia (fuente: DeCs-BIREME).

RESUMEN

Objetivos. Analizar los determinantes sociales de la salud (DSS) estructurales e intermediarios y su relación con la lactancia materna exclusiva (LME). **Métodos.** Estudio transversal analítico con base en los registros del Sistema de Vigilancia Epidemiológica Alimentaria y Nutricional (SISVAN); la población correspondió a todos los registros de niñas/os de 0 a 6 meses. Las variables fueron analizadas mediante estadística descriptiva, siendo estimadas la prevalencia y la mediana de edad de la LME. Fue usada la prueba de chi-cuadrado de Pearson para determinar relación significativa entre los DSS y la LME. **Resultados.** Fue analizada una muestra de 1149 registros, el 95,5 % de los niños estaban con LM; la prevalencia de la LME a los 5 meses fue de 75,6 %. El 97,3 % de las/os niñas/os contaba con afiliación al régimen en salud, el 86,3 % eran residentes en el área urbana y el 0,2 % estaba inscrito con pertenencia étnica. Se halló asociación entre los DSS intermediario acceso al sistema de salud, en tipo de afiliación "otro" (OR = 6,58; IC 95 %: 2,92-14,83; p = 0,001) respecto al régimen contributivo. **Conclusiones.** Se establece que el DSS intermediario relacionado con el acceso al sistema de salud (tipo de afiliación) incide en la práctica de la LME en el municipio de Yopal.

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INTRODUCTION

Breastfeeding (BF) is the practice of feeding human infants with their own mother's milk, which provides the appropriate and essential components for healthy growth and development while also strengthening the emotional bond between mother and child. Likewise, it has been recommended by the World Health Organization (WHO) [1,2] as the sole food during the first 180 days of life and, together with complementary foods, until two years of age or beyond. In addition to being more nutritious than foods such as infant formulas, human milk is crucial for preventing the "triple burden of chronic conditions such as obesity, infectious diseases, mortality, and malnutrition" [2].

Despite the multiple benefits recognized by international organizations such as WHO, the United Nations Children's Fund (UNICEF), and scientific evidence, López de Aberásturi et al. [3] indicate that exclusive breastfeeding (EBF) rates worldwide are low (43 %), with a similar pattern in Latin America and the Caribbean (42.6 %) [4].

In Colombia, according to the National Survey of Nutritional Status (ENSIN), the prevalence in 2015 was 36.1 %, a figure lower than that reported in countries such as Peru (2021), with 63.9 %, but relatively higher than that of countries such as Mexico (2019), with 28.3 %, and Panama (2013), with 21.5% [4-7]. According to the 2015 ENSIN results, in the Colombian Orinoquía and Amazon region, 41.9% of children received EBF, a significantly higher value for an Indigenous population; well above the Atlantic region with 20.5 %, the Andean region with 36.2%, and the Eastern region with 41.3 %, but lower than Bogotá with 45.6% and the Pacific region with 45.9 %. It should also be noted that prevalence in the Indigenous population was 49.4 %, whereas in the population without ethnic affiliation it was 36.6 % [5].

At the local level, according to a report from the Health Secretariat of Casanare, Colombia, the prevalence in the department of Casanare in 2022 was 63.8 % [8]. No reports or research studies specifying rates for the municipality of Yopal were found.

Regarding the factors affecting BF practice, WHO and several studies highlight structural factors such as social and economic policies, education, and social stratification, including ethnicity or area of residence, while also recognizing the characteristics of the mother–child dyad, such as affiliation and access to the health system, as well as family, workplace, and community support networks [2,9-11]. These determinants may affect both the decision to breastfeed and the duration and success of breastfeeding [12–16].

A Colombian study analyzing the BF situation and the social determinants of health (SDH) by department found that both individual and structural conditions influence the duration of EBF, and that aspects related to access to health services may either promote or limit BF discontinuation [6].

In the municipality of Yopal (Colombia), no studies have been conducted on SDH and their relationship with breastfeeding practice, nor on its prevalence. Therefore, identifying which intermediary and structural SDH are associated with the practice of EBF in the municipality of Yopal justifies this research. Accordingly, the aim of this research was to analyze both intermediary and structural social determinants of health and their relationship with exclusive breastfeeding.

METHODS

Study type and area

A cross-sectional analytical study was conducted based on the review and analysis of data from the Food and Nutrition Epidemiological Surveillance System (SISVAN, by its Spanish acronym) of the municipality of Yopal (Colombia) during the period from January to December 2023.

Population and sample

Of the total 17,127 records of children under 5 years of age in the Yopal SISVAN database, 11.9 % (2,033/17,127) corresponded to infants younger than 6 months. Of these, 884 (43.5 %) were excluded because they had incomplete, missing, or blank records. A total of 1,149 (56.5 %) records met the criteria for analysis, namely residence in Yopal and having attended a consultation during 2023. Thus, the sample consisted of 1,149 children younger than 180 days of age (0 to 5 months).

Study variables

The sociodemographic variables and social determinants of health (SDH) were classified according to the WHO conceptual framework on SDH and the reviewed literature. Accordingly, the following variables were included: age in months, calculated using the number of days elapsed between the date of birth and the date of assessment recorded in SISVAN; sex; health insurance affiliation; ethnic affiliation; and area of residence [2,9]. The units of measurement for each variable are shown in Table 1.

Table 1. Sociodemographic variables and their classification as social determinants of health

Variable	SDH classification	Unit of measurement
Age group in days	Intermediary (biological/demographic factor)	1. Less than one month (0-29 days) 2. One month (30-59 days) 3. Two months (60-89 days) 4. Three months (90-119 days) 5. Four months (120-149 days) 6. Five months (150-179 days)
Sex	Intermediary (biological factor)	1. Female 2. Male
Type of health insurance affiliation	Intermediary (access to health services)	1. Contributory 2. Subsidized 3. *Other
Ethnic affiliation	Structural (social stratification)	1. With ethnic affiliation 2. Without ethnic affiliation
Area of residence	Structural (geographic context)	1. Urban area 2. Dispersed rural area

*Other: special, prepaid, private, uninsured.

For the breastfeeding (BF) variable, the definitions established by WHO and UNICEF were used. Exclusive breastfeeding (EBF) was defined as feeding the infant exclusively with human milk during the first 180 days of life, without the inclusion of other liquids or solids; this definition allows the administration of mineral supplements, vitamin drops or syrups, and oral rehydration salts, among other treatments. Mixed breastfeeding (MBF), in turn, was defined as feeding the infant with human milk in combination with other food products, such as infant formulas [17]. BF practices were recorded dichotomously at the time of consultation: EBF (yes/no) and MBF (yes/no). The dependent variable of the study was EBF.

Data collection techniques and procedures

The database was provided by the Health Secretariat of Casanare, which is responsible for compiling the data submitted by municipal governments regarding child healthcare and SISVAN reporting in the municipality of Yopal. SISVAN allows the disaggregation of information on children's nutritional status, including EBF [8,18].

Data analysis

The variables were analyzed using descriptive statistics; qualitative variables were analyzed through frequency distributions expressed as percentages, while measures of central tendency were used for quantitative variables. The prevalence of EBF and its duration up to 5 months (179 days of age) were calculated [16,17].

The chi-square test was used to determine the association ($p \leq 0.05$) between the SDH under study and EBF. Variables associated with EBF were included in a logistic regression model. The final model included variables with a p-value ≤ 0.05. IBM SPSS Statistics version 27 was used.

Ethical considerations

The data used for the analysis in this study were obtained from secondary sources, derived from an anonymized database provided by the Health Secretariat of Casanare. The study complied with the ethical principles of the Declaration of Helsinki and those established in Resolution 8430 of 1993 of the Ministry of Health, which sets forth the scientific, technical, and administrative standards for health research in Colombia, and whose Article 11, section b, classifies this type of study as minimal risk. Additionally, the study received a favorable ethical approval from the Research Ethics Committee of the International University of La Rioja (UNIR), issued on December 17, 2025, under code PI: 138/2024.

RESULTS

The analysis included 1,149 records of infants under six months of age. Regarding intermediary SDH of a biological and demographic nature, the mean age of the infants at the time of care was 3.2 months (SD 1.4 months), with a median of 3.1 months (similar for the EBF subgroup). The age range was between 0.4 and

Table 2. Sociodemographic characteristics and their classification as social determinants of health in the study population, 2023

	n = 1,149	%
Intermediary social determinants of health		
Sex		
Female	552	48.0
Male	597	52.0
Age at assessment		
Less than one month (0-29 days)	43	3.7
One month (30-59 days)	210	18.3
Two months (60-89 days)	281	24.5
Three months (90-119 days)	227	19.8
Four months (120-149 days)	253	22.0
Five months (150-179 days)	135	11.7
Type of health insurance affiliation		
Subsidized	917	79.8
Contributory	200	17.4
*Other	32	2.8
Structural social determinants of health		
Area of residence		
Urban area	960	83.6
Dispersed rural area	189	16.4
Ethnic affiliation		
With ethnic affiliation	2	0.2
Without ethnic affiliation	1147	99.8

*Includes: special, prepaid, private, uninsured.

5.9 months, with the highest concentration of records in the 2-month age group (60 to 89 days).

Regarding sex, more than half of the sample corresponded to females. For the intermediary SDH related to the health system, 97.3 % (1,118) of the infants were affiliated with some type of health insurance scheme. Concerning structural SDH related to health inequities, in the geographic context, 83.6 % (960) resided in urban areas, while in terms of social stratification related to ethnicity, only 0.2 % (2) of the infants belonged to an ethnic group (see Table 2).

At the time of consultation, 95.5 % (1,097) of the children were being breastfed; 81.5 % (934) were exclusively breastfed and 14.2 % (163) were receiving mixed breastfeeding (see Table 3). The prevalence of BF in infants younger than one month was 88.4 %, and for EBF it was 76.7 %; however, it increased by the fourth and fifth months to 96.0 % and 92.6 % for BF, and to 81.4 % and 75.6 % for EBF, respectively (see Table 3).

In Pearson's chi-square test, statistical significance was found for access to the health system (type of affiliation) in relation to EBF (p = 0.001), whereas no statistical significance was found for sex (p = 0.720) or area of residence (p = 0.170). The ethnic affiliation variable did not meet the criterion for running the test, since the expected frequency was 1, that is, less than 5.

The binomial logistic regression model showed a statistically significant association between the type of health insurance affiliation and the absence of exclusive breastfeeding in infants younger than 6 months. Compared with the contributory affiliation (reference category), infants belonging to the "other" group (which includes special, prepaid, private, and uninsured) had 6.58 times higher odds of not receiving exclusive breastfeeding (OR = 6.58; 95 % CI: 2.92–14.83; p = 0.001). Likewise, no statistically significant association was observed between the subsidized affiliation and the absence of exclusive breastfeeding (OR = 0.91; 95 % CI: 0.61-1.36; p = 0.643) (see Table 4).

Table 3. Breastfeeding status in the study population, 2023

Variable	< 1 month		1 month		2 months		3 months		4 months		5 months		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Current breastfeeding (at the time of consultation)														
Yes	38	88.4	205	97.6	269	95.7	217	95.6	243	96.0	125	92.6	1,097	95.5
No	5	11.6	5	2.4	12	4.3	10	4.4	10	4.0	10	7.4	52	4.5
Exclusive breastfeeding														
Yes	33	76.7	170	81.0	234	83.3	189	83.3	206	81.4	102	75.6	934	81.3
No	10	23.3	40	19.0	47	16.7	38	16.7	47	18.6	33	24.4	215	18.7
Mixed breastfeeding														
Yes	5	11.6	35	16.7	35	12.5	28	12.3	37	14.6	23	17.0	163	14.2
No	38	88.4	175	83.3	246	87.5	199	87.7	216	85.4	112	83.0	986	85.8

DISCUSSION

The influence of social determinants of health (SDH) on exclusive breastfeeding (EBF) manifests in a context-specific manner. In this population, when analyzing intermediary SDH of a biological nature in infants younger than six months, a slight predominance of males was observed, concentrated in the 2-month age group (60 to 89 days), which is lower than that reported by Arocha et al. [6]. This situation may be attributed to attendance at the scheduled 2-month growth and development check-up, which leads to registration in SISVAN [18].

Regarding the intermediary SDH related to access to the health system, affiliation with the subsidized scheme predominated, reflecting the low socioeconomic stratification of the studied population and the lack of formal employment conditions [19,20]. Some studies indicate that lack of financial resources or pressure to return to work may act as structural barriers that compromise breastfeeding practices [2,12,21].

Concerning structural SDH related to geographic context, almost all children resided in urban areas, similar to findings by Finnie et al. [10], who suggest that living in urban areas may act as a protective factor for accessing health services and seeking help to address breastfeeding-related difficulties [11]. On the other hand, it may also become a barrier, exposing mothers to aggressive marketing by the pharmaceutical and food industries, particularly infant formula products. The reviewed literature indicates that this situation may weaken mothers' confidence, affecting the exclusivity and continuity of EBF [2,22,23].

The SDH related to social stratification (ethnic affiliation), with only two records, limits any causal interpretation. This is likely due to the geographic distribution of Indigenous reserves in other municipalities of Casanare (Támara, Paz de Ariporo, Orocué, Hato Corozal, and Sácama), rather than a factor of exclusion from the local health system [24].

The prevalence of EBF among infants younger than six months in this study reached a notable 75.6%. This value is higher than that reported for the Department of Casanare (63.8 %) [8] and greatly exceeds national rates in Colombia (36.1 %), Mexico (28.3 %), and Brazil (45.8 %) [4,5,25]. These discrepancies may be explained by the characteristics of the study population, the data source (secondary), or breastfeeding practices [15].

Table 4. Binomial logistic regression model for SDH and EBF in infants younger than 6 months, 2023

Variables associated with EBF	OR	95% CI		*p*-value
		Lower	Upper	
Type of health insurance affiliation				
Contributory	1	Reference		
Subsidized	0.91	0.61	1.36	0.643
Other	6.58	2.92	14.83	0.001

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Among infants younger than one month, 11.6 % were receiving mixed breastfeeding, similar to what was reported by Ramiro González et al. [15], and slightly lower than that reported by López de Aberásturi et al. (13.1 %) [3]. In the 5-month group, the highest percentage was observed (17.0 %), although still well below that reported in a study conducted in Bizkaia, Spain [3].

The municipality of Yopal approaches WHO and UNICEF guidelines recommending EBF up to 180 days (under 6 months) [17]. Furthermore, it exceeds the target proposed by the World Health Assembly for 2030 (70 %), as well as the 45.0 % target established by the Colombian Decennial Plan for Breastfeeding and Complementary Feeding (PDLMAC, by its Spanish acronym) for 2025 [26].

In 2022, the primary-level public hospital that serves most of the population of Yopal (including the subsidized affiliation) achieved certification under the Baby-Friendly Hospital Initiative (BFHI), known in Colombia as the Integrated Women- and Child-Friendly Institutions Strategy (IAMII, by its Spanish acronym) [27,28]. Hospitals implementing these initiatives have been shown to increase breastfeeding rates [2,6,10].

However, differences in the median duration of EBF (3.1 months) compared with other departments (e.g., Risaralda: 5 months) [28] reinforce the idea that structural barriers (occupational, socioeconomic) act as limiting factors, even in the presence of strong health system support, leading to early discontinuation of exclusive breastfeeding before six months.

The logistic regression analysis determined that access to the health system, according to type of affiliation, was the only SDH with a statistically significant association with EBF. Specifically, infants classified in the "other" category (including special affiliations, prepaid, private, or uninsured) had nearly seven times higher odds of not receiving EBF compared with those in the contributory affiliation. This disparity suggests that the contributory affiliation and its structured follow-up act as key protective factors. The increased risk observed in the "other" category reflects two opposing dynamics: on one hand, the extreme social vulnerability of uninsured individuals who lack continuous follow-up; on the other hand, potentially lower adherence to EBF-promoting initiatives (such as IAMII) within the private sector (prepaid/private), factors that significantly compromise the exclusivity and continuity of breastfeeding in the municipality of Yopal.

The use of the Casanare SISVAN as a secondary data source imposed certain limitations. The absence of essential maternal variables for a more comprehensive analysis of SDH—such as socioeconomic status, educational level, and maternal age—was noted.

The need to clean the database resulted in a potential exclusion bias, as 884 records (equivalent to 43.5% of the total 2,033 infants younger than six months) were removed for not meeting the quality or completeness criteria required for analysis. Therefore, it is recommended that responsible stakeholders strengthen SISVAN data recording and quality processes; this includes standardizing the collection of key maternal variables that function as SDH (education, age, socioeconomic status) for future analyses.

Given the nature of SISVAN data (secondary source) and the absence of behavioral variables that would help explain the protective mechanisms behind the high prevalence of EBF and disparities in health system affiliation, it is recommended to conduct a cross-sectional survey on knowledge, attitudes, and practices (KAP). Such a study could quantify behavioral and attitudinal barriers (such as perceived insufficient milk production or pressure to return to work) and help identify protective mechanisms at both individual and community levels in Yopal.

Conclusions

The intermediary social determinant of health related to access to the health system (type of affiliation) was associated with the practice of exclusive breastfeeding in the municipality of Yopal. No significant association was found with intermediary determinants related to biological factors, such as sex, or with structural determinants, such as geographic context (area of residence) and social stratification (ethnic affiliation), suggesting that these determinants did not directly affect exclusive breastfeeding practices in this population.

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