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Breastfeeding initiation, knowledge, attitudes and breastfeeding practices of users of three private health services in Mexico

Inicio de la lactancia, conocimientos, actitudes y prácticas en lactancia en usuarias de tres servicios de salud privados en México

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ABSTRACT

Skin-to-skin contact and breastfeeding initiation during the first hour of life are associated with exclusivity and duration of breastfeeding. No peer-reviewed studies were found in Mexico on the knowledge, attitude, and breastfeeding practice of mothers who attended private health services. A descriptive cross-sectional study was performed collecting data through validated questions. Mothers who reported skin-to-skin contact with the newborn during the first hour of life were recorded as group A, while the rest were classified as group B. The breastfeeding knowledge and practice score was categorized as adequate or inadequate. A total of 143 mothers were included; 46.2 % were in group A and 53.8 % in group B. The 41.3 % initiated breastfeeding in the first hour of life. The 80 % had adequate knowledge and 60.8 % had a positive attitude towards breastfeeding; there were no differences between the groups. Positive attitudes towards breastfeeding and skin-to-skin contact were associated with the initiation of breastfeeding during the first hour of life. In the design of interventions to promote breastfeeding, maternal attitude toward breastfeeding is crucial.

KEY WORDS: Breastfeeding, knowledge, attitude, practice, private health services.

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RESUMEN

El contacto piel con piel y el inicio de la lactancia materna durante la primera hora de vida se asocian con la exclusividad y duración de la lactancia materna. No se encontraron estudios en México revisados por pares acerca del conocimiento, actitud y práctica de la lactancia en madres atendidas en servicios de salud privados. Estudio transversal descriptivo que recopiló datos usando preguntas validadas. Las madres que refirieron contacto piel con piel con su recién nacido durante la primera hora de vida conformaron el grupo A, el resto el grupo B. La puntuación sobre conocimiento y práctica en lactancia se clasificó en adecuada y no adecuada. Se incluyeron 143 madres; el 46.2 % conformó el grupo A y el 53.8 % el grupo B. El 41.3 % inició la lactancia materna en la primera hora de vida. El 80 % tuvo conocimiento adecuado y el 60.8 % una actitud positiva hacia la lactancia, no existieron diferencias entre los grupos. La actitud positiva hacia la lactancia y el contacto piel con piel se asociaron con el inicio de la lactancia materna durante la primera hora de vida. En el diseño de intervenciones para el fomento de la lactancia la actitud materna hacia la lactancia es clave.

PALABRAS CLAVE: Lactancia, conocimiento, actitud, práctica, servicios de salud privados..

Introduction

The World Health Organization recommends that breastfeeding should commence within the first hour of life, be exclusive for the initial six months, and thereafter, safe and adequate complementary feeding should be introduced while continuing breastfeeding until at least two years of age (OMS, 2023). In Mexico in 2018, it was estimated that 12.8 % of infants were exclusively breastfed until six months of age with breastfeeding typically lasting 9.8 months (INEGI, 2023). Breastfeeding practices are crucial for achieving sustainable development goals such as preventing hunger, improving nutrition, and reducing child mortality (Al Ketbi *et al*., 2018; WABA, 2023).

The initiation, exclusivity, and duration of breastfeeding can be influenced by hospital practices, as well as by various sociocultural factors (Budiati & Setyowati, 2019; Nuño-Martínez *et al.,* 2021; Swigart *et al.,* 2017). A pioneering report published in 1990 concluded that skin-to-skin contact between mother and newborn should occur within the first hour of life to facilitate the first breastfeeding (Righard & Alade, 1990). In Mexico, in a tertiary care hospital, it was reported that skin-to-skin contact from the first hour of life favored newborns being exclusively breastfed in the operating room or delivery room (García May *et al.,* 2017).

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Knowledge, attitude, and practice surveys ascertain what people know, how they feel, and how they behave regarding a particular issue (Observatorio de la Infancia y Adolescencia de Andalucía, 2023). According to *Save the Children* UK, the results of knowledge, attitude, and practice surveys can be used to "strengthen planning and program design, advocacy, social mobilization, analysis and evaluation in the field of child protection" (Save the Children, 2023).

Knowledge, attitudes, and practices regarding breastfeeding vary among women across different countries (Al Ketbi *et al.,* 2018; Altamimi *et al.,* 2017). In Mexico, peer-reviewed studies on the knowledge, attitudes, and practices of breastfeeding women are limited (Hernández-Cordero *et al.,* 2020; Swigart *et al.,* 2017). No peer-reviewed studies were found that investigated breastfeeding knowledge, attitudes, and practices among users of private health services in Mexico. Therefore, this study aimed to determine whether there is an association between breastfeeding knowledge, attitudes, and practices with skin-to-skin contact and the initiation of breastfeeding within the first hour of life among breastfeeding women attending private health services.

Material and Methods

The study employed a cross-sectional, descriptive, and retrospective design with minimal risk. It was conducted in private clinics from November 2022 to October 2023, with users being invited to participate. Inclusion criteria comprised mothers of legal age with breastfeeding infants seeking breastfeeding support at private health services. These services were overseen by a physician specialized in gynecology-obstetrics with training in breastfeeding, a healthcare physician who is an International Board Certified Lactation Consultant (IBCLC), and a Pharmaceutical Chemist Biologist who is also an IBCLC Consultant. Exclusion criteria included maternal diagnosis of acquired immunodeficiency syndrome (AIDS) and infants born before 37 weeks of gestation. A convenience sample size of ≥100 participants was selected.

Using the WhatsApp application, an informed consent form and a Google Forms questionnaire were sent to mothers who agreed to participate in the study. The questionnaire included inquiries to explore the general characteristics of the population, as well as breastfeeding knowledge, attitudes, and practices. General characteristics such as age, education level, prenatal care, delivery care, and hospital practices in the immediate postpartum period were determined through questions designed and validated in a nationally representative survey (ENADID 2018) in Mexico (INEGI, 2023). Breastfeeding attitudes were assessed using the Iowa Infant Feeding Attitudes Scale (IIFAS), translated and validated in the Mexican population (Aguilar-Navarro *et al.,* 2016). Breastfeeding knowledge and practices were determined by five and four questions, respectively, which were validated in this study.

1. Could you tell me if breastfeeding reduces the risk of sudden infant death? Yes / No / I don't know.

The expected answer was: Yes.

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2. Could you tell me if breastfeeding reduces the risk of developing breast and ovarian cancer in the mother? Yes / No / I don't know.

The expected answer was: Yes.

3. After birth, according to the World Health Organization, when is breastfeeding recommended to start? Specify hours, days, weeks, or months.

If you don't know, answer "I don't know." *The expected answer was: During the first hour of life.*

4. Do you know how long the World Health Organization recommends exclusive breastfeeding, meaning only breast milk is provided to the infant without any other liquid or food, including water? Specify hours, days, weeks, months, or years.

If you don't know, answer "I don't know." *The expected answer was: The first six months of life.*

5. Do you know how long the World Health Organization recommends breastfeeding to continue after the introduction of solid foods? Specify hours, days, weeks, months, or years. If you don't know, answer "I don't know."

The expected answer was: Until at least two years of age.

6. How old was your son or daughter when you started breastfeeding or nursing? Specify hours, days, weeks, or months.

The expected answer was: Less than one hour old.

7. Before six months of age, did you feed your last living child any of the following foods: water, tea, juices, broths, porridges, purees, gruels, cereals, bread, or egg? Yes / No.

The expected answer was: No.

8. Have you fed your son or daughter with infant formula, powdered milk, cow's milk, or almond milk? Yes / No.

If you answered Yes, the following question was asked.

9. How many days or months old was your son or daughter when you started feeding them with infant formula, powdered milk, cow's milk, or almond milk? Specify hours, days, weeks, or months.

The expected answer was: Older than six months.

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The nine questions designed in this study on breastfeeding knowledge and practice underwent content validation by expert judgment using the methodology outlined by Galicia Alarcón *et al*. (2017). The group of breastfeeding experts consisted of three IBCLC consultants: Dr. Argelia E. Rojas Mayorquín, Psychologist Edith Nava Bustos, and Dr. Katia Andrea Contreras Garduño. Additionally, a pilot test (n=20) was conducted to detect errors or omissions.

Each correct answer on breastfeeding knowledge (questions 1-5) was assigned one point, and the score was classified as either adequate (5-4 points) or inadequate (0-3 points). Concerning breastfeeding practice, each expected answer in questions 6 and 7 was assigned one point. The other point was assigned to the answer “No” in question 8 or to the answer “Yes” in question 8 and the answer “Older than six months” in question 9. The breastfeeding practice score was classified as adequate (3 points) or inadequate (0-2 points).

The study groups were formed using two questions:

- After the birth of your son or daughter, was the baby placed on your bare chest in direct skin-to-skin contact? Yes / No.

The expected answer was: Yes.

If you answered Yes, the following question was asked.

- Was the skin-to-skin contact with your baby within the first hour of life? Yes / No.

The expected answer was: Yes.

Categorical variables were described through absolute frequencies and percentages. Proportions were compared using the chi-square test. Means or medians were compared by Student’s t-test or Mann-Whitney U-test, respectively. The Spearman-Rho coefficient was employed to analyze the correlation between knowledge, attitude, and practice. A multivariate analysis was conducted to identify the association between breastfeeding initiation during the first hour of life with breastfeeding knowledge, attitude, and practice. Four models were constructed, with covariates including type of delivery, receiving an explanation of breastfeeding after birth, and skin-to-skin contact during the first hour of life. The Odds ratio (OR) and its 95 % confidence interval were calculated using logistic regression methods. A value of $p < 0.05$ was considered statistically significant. EpiDat version 3.1, SigmaStat 3.5, and IBM-SPSS Statistics, version 21.0 were used to perform the analyses. During the preparation of the protocol and this manuscript, no artificial intelligence tools were used for writing the text or preparing the tables.

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Results

General characteristics of the encompassed population

A total of 160 mother-child pairs were invited to participate in the study; the response rate was 94 % (n=147). Four mother-child pairs were excluded because the birth occurred before 37 weeks of gestation (n=143). Sixty-six (46.2 %) mother-child pairs formed group A, reporting skin-to-skin contact during the first hour of life; the rest of the pairs [77 (53.8 %)] were assigned to group B.

Overall, the average age of the mothers was 33.9 ± 4.9 years, there were no differences between groups [group A: average 34.5 ± 5.1, group B: average 33.4 ± 4.6, p = 0.205]. Overall the median age of the infants was 16 months (P25 12, P75 23), and there were no differences between groups [group A: 19 months (P25 13, P75 23), group B: 16 months (P25 11, P75 22), p = 0.079]. Most of the mothers reported having more than a high school education, having one child, perceived adequate health of the mother-child pair, prenatal consultations, and birth occurred in private health services, and received an explanation of breastfeeding after birth (Table 1). Other characteristics of importance are shown in Table 1.

Table 1. General characteristics of mother-child pairs.

Characteristic	Overall n=143		Group A n=66		Group B N=77	
	n	%	n	%	n	%
Education level						
None	1	0.7	1	0.7	0	0
Up to high school	2	1.4	0	1.4	2	2.6
Beyond high school	140	97.9	65	97.9	75	97.4
Number of children						
1	102	71.3	51	71.3	51	66.2
2	36	25.2	14	25.2	22	28.6
3	5	3.5	1	3.5	4	5.2
Perception of maternal-child health						
Adequate	140	97.9	66	100	74	96.1
Not adequate	3	2.1	0	0	3	3.9
Prenatal visits						
Yes	142	99.3	66	100	76	98.7
No	1	0.7	0	0	1	1.3
Type of prenatal care						
Private	128	89.5	65	98.5	63	81.8

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Continuation

Table 1. General characteristics of mother-child pairs.

Characteristic	Overall n=143		Group A n=66		Group B N=77	
	n	%	n	%	n	%
Public	13	9.1	0	0.0	13	16.9
Private and public	1	0.7	1	1.5	0	0.0
Lost data	1	0.7	0	0.0	1	1.3
Prenatal complication						
High blood pressure	11	7.7	3	4.5	8	10.4
Gestational diabetes	5	3.5	1	1.5	4	5.2
Others	7	4.9	2	3.0	5	6.5
None	119	83.2	60	90.9	59	76.6
Lost data	1	0.7	0	0.0	1	1.3
Birthplace						
Private	107	74.8	56	84.8	51	66.2
Public	33	23.1	7	10.7	26	33.8
Home	3	2.1	3	4.5	0	0
Type of delivery						
Cesarean	109	76.2	45	68.2	64	83.1
Vaginal	34	23.8	21	31.8	13	16.9
Birth complications						
No	108	75.5	59	89.39	49	63.64
Yes	36	25.2	7	10.61	29	37.66
Explanation of breastfeeding after birth						
No	66	46.2	22	33.3	44	57.1
Yes	77	53.8	44	66.7	33	42.9

The percentage corresponds to the column. Source: own elaboration.

Breastfeeding knowledge

Overall, approximately 80 % of the lactating women achieved a knowledge score categorized as adequate. There were no differences between the groups (Table 2).

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Table 2. Breastfeeding knowledge.

Variable	Overall n=143		Group A n=66		Group B n=77		*P*-value
	n	%	n	%	n	%	
Sudden infant death							
Unknown	23	16.1	11	16.7	12	15.6	0.564
Knows	120	83.9	55	83.3	65	84.4	
Cancer							
Unknown	11	7.7	5	7.6	6	7.8	0.180
Knows	132	92.3	61	92.4	71	92.2	
Breastfeeding Initiation							
Unknown	35	24.5	13	19.7	22	28.6	0.246
Knows	108	75.5	53	80.3	55	71.4	
Exclusive breastfeeding							
Unknown	16	11.2	6	9.1	10	13.0	0.597
Knows	127	88.8	60	90.9	67	87.0	
Continued breastfeeding							
Unknown	41	28.7	22	33.3	19	24.7	0.271
Knows	102	71.3	44	66.7	58	75.3	
Knowledge category							
Inadequate	31	21.7	12	18.2	19	24.7	0.418
Adequate	112	78.3	54	81.8	58	75.3	

The percentage corresponds to the column. Source: own elaboration.

Breastfeeding attitude

Overall, 87 (60.8 %) mothers had a positive attitude, 56 (39.2 %) had a neutral attitude, and none had a negative attitude towards breastfeeding. Between groups, there were no differences in the proportions of mothers with a positive attitude towards breastfeeding [group A: 38 (57.6 %), group B: 49 (63.6 %), $p = 0.284$].

Breastfeeding practice

Overall, less than half of the mother-child pairs initiated breastfeeding during the first hour of life (Table 3). There were differences among groups in the proportions initiating breastfeeding (Table 3) and no differences were found in the introduction of commercial formula and other breast milk substitutes (Table 3). Most mother-child pairs had a practice score categorized as adequate (Table 3). Generally, 25.6 % of infants >6 months initiated breastfeeding within the first hour of life

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and were not given water, tea, juices, broths, porridges, purees, atoles, cereals, bread, egg, infant formula, powdered milk, cow milk, or almond milk before 6 months of age. Between groups, there were no differences in the proportions of initiation of breastfeeding during the first hour of life and introduction of breast milk substitutes before 6 months of life [group A: 18 (29.5 %), group B: 15 (22.1 %) p = 0.332].

Table 3. Breastfeeding practice.

Variable	Overall n=143		Group A n=66		Group B n=77		*P*-value
	n	%	n	%	n	%	
Breastfeeding first hour of life							
Yes	59	41.3	36	54.5	23	29.9	0.004
No	84	58.7	30	45.5	54	70.1	
Commercial formula <6 months							
Yes	70	49.0	30	45.5	40	51.9	0.503
No	73	51.0	36	54.5	37	48.1	
Other substitutes <6 months							
Yes	4	2.8	3	4.5	1	1.3	0.335
No	139	97.2	63	95.5	76	98.7	
Practice Category							
Inadequate	38	26.6	20	30.3	18	23.4	0.448
Adequate	104	72.7	45	68.2	59	76.6	

The percentage corresponds to the column. Source: own elaboration.

Correlation between breastfeeding knowledge, attitude, and practice

There was a correlation between the scores obtained in attitude and breastfeeding practice; no correlation was identified in the rest of the variables (Table 4).

Table 4. Correlation between breastfeeding knowledge, attitude, and practice scores.

	Attitude		Practice	
	Coefficient*	***P*-value**	**Coefficient***	***P*-value**
Knowledge	0.158	0.059	0.076	0.368
Attitude	NA	NA	0.357	0.001

n=143. *Spearman's Rho. NA: Not applicable. Source: own elaboration.

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Variables associated with breastfeeding initiation during the first hour of life

It was found that breastfeeding attitude and skin-to-skin contact during the first hour of life were associated with the initiation of breastfeeding during the first hour of life after birth; the rest of the variables analyzed had no association (Table 5).

Table 5. Multivariate model of factors associated with breastfeeding initiation during the first hour of life.

Covariates	OR	95 % CI	*P*-value
Model 1			
Breastfeeding attitude	0.370	0.178-0.769	0.008
Breastfeeding knowledge	1.429	0.601-3.401	0.419
Model 2			
Breastfeeding attitude	0.362	0.173-0.756	0.007
Breastfeeding knowledge	1.457	0.608-3.490	0.399
Delivery type	0.585	0.261-1.308	0.191
Model 3			
Breastfeeding attitude	0.361	0.173-754	0.007
Breastfeeding knowledge	1.458	0.612-3.523	0.390
Delivery type	0.592	0.264-1.328	0.203
Explanation of breastfeeding after birth	0.852	0.425-1.710	0.852
Model 4			
Breastfeeding attitude	0.308	0.142-0.670	0.003
Breastfeeding knowledge	1.328	0.535-3.295	0.541
Delivery type	0.710	0.306-1.648	0.425
Explanation of breastfeeding after birth	1.115	0.531-2.345	0.773
Skin-to-skin contact during the first hour of life*.	3.180	1.484-6.815	0.003

OR, Odds ratio. CI Confidence interval. * Study groups. A, referred to skin-to-skin contact during the first hour of life, the rest of the pairs were assigned to group B. Source: own elaboration.

Discussion

Although most of the mothers in this study correctly answered questions on breastfeeding knowledge (78.3 %) and had a positive attitude towards breastfeeding (60.8 %), less than half of the mother-child pairs had skin-to-skin contact during the first hour of life (46.2 %). It should

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be noted that, due to the inclusion criteria, all mothers were still breastfeeding at the time of the interview, and the median age of their breastfed infants, 16 months, exceeded the reported average duration of breastfeeding in Mexico in 2018 of 9.8 months (INEGI, 2023). On the other hand, there was a correlation between the attitude score and the breastfeeding practice score; however, the breastfeeding knowledge score was not correlated with practice, nor with attitude towards breastfeeding. Breastfeeding attitude and skin-to-skin contact during the first hour of life were associated with the initiation of breastfeeding during the first hour of life after birth.

Despite evidence suggesting that knowledge, beliefs, and social norms can influence the decision of mothers to breastfeed and that in Mexico breastfeeding has been recognized as the most cost-effective public health strategy, there are few peer-reviewed studies on breastfeeding knowledge, attitudes, and practices (Zielińska *et al*., 2017; Dukuzumuremyi *et al*., 2020; Suárez-Cotelo *et al*., 2019).

In Mexico, there are no studies on mothers attending private health services including at least 100 participants. However, Hernández-Cordero *et al*. (2020) in a study that included mothers who delivered in the public health sector (n=476) or in the private sector (n=67), identified a higher percentage of exclusive breastfeeding at one month postpartum in those who were attended in the public sector (48.03 %), compared to the private sector (21.05 %). Additionally, mothers who delivered in a private hospital were 52 % less likely to practice exclusive breastfeeding at one month postpartum. Interestingly, those who initiated breastfeeding during the first hour of life and had access to information on breastfeeding during the prenatal period had a higher probability of practicing exclusive breastfeeding at one month postpartum (Hernández-Cordero *et al.,* 2020). This study found a higher percentage of breastfeeding initiation, 41 %, compared to the 32 % reported in Mexican private health institutions in 2015 (UNICEF, 2023). However, the breastfeeding initiation observed in this study is lower than that of Mexican public-type health institutions (54 %) reported for 2015 (UNICEF, 2023).

The findings suggest an association between skin-to-skin contact during the first hour of life and the initiation of breastfeeding during that same period after birth, which aligns with existing literature. The first hour after birth is a sensitive period for the mother-infant binomial, it has been proposed that a better understanding of the instinctive behavior of the newborn allows evidence-based hospital practices aimed at overcoming barriers and facilitating breastfeeding (Widström *et al.,* 2019). Immediate skin-to-skin contact between the mother and child promotes breastfeeding, resulting in breast milk being the first food in 99.2 % of cases, reducing the need for substitutes, and extending the duration of breastfeeding (Karimi *et al*., 2019; García May *et al*., 2017).

It has been suggested that the level of breastfeeding competence among mothers may influence the exclusivity and duration of breastfeeding. Therefore, assessing breastfeeding knowledge has been deemed valuable for designing intervention strategies to promote breastfeeding. In Spain, knowledge in women in the prenatal stage has been categorized as “regular” (Suárez-Cotelo *et al*., 2019). In UAE, breastfeeding knowledge has been reported as “good”, only 5.5 % was classified at the “low” level, although infant feeding practices have been categorized as suboptimal (Al Ketbi *et al.,* 2018). In this study, breastfeeding knowledge

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was adequate, but it was not associated with the initiation of breastfeeding in the first hour of life. Additionally, there was no correlation between knowledge and breastfeeding practices and attitudes.

Attitude serves as a predictive indicator of feeding method choice, and in lactating women, it has been linked to the duration of breastfeeding (Jessri *et al.,* 2013; Scott *et al.,* 2006). In Mexico, few studies have explored attitudes using the Iowa Infant Eating and Attitude Scale, which was translated and validated in Mexican pregnant women in 2016 (Aguilar-Navarro *et al.,* 2016). In that study, 16.3 % of pregnant women displayed a positive attitude toward breastfeeding, 82.2 % held a neutral attitude, and only 16 % expressed an intention to provide exclusive breastfeeding (Aguilar-Navarro *et al.,* 2016). The findings of Aguilar Navarro *et al*. (2016) differ significantly from those of this study, 60.8 % of the mothers had a positive attitude, 39.2 % a neutral attitude and none had a negative attitude; these differences are probably due to the design of the study, as it exclusively included breastfeeding mothers seeking support from private health services.

The present study encountered several limitations. Firstly, there was a lack of information regarding the intention of mothers to offer exclusive breastfeeding, the level of knowledge, and the breastfeeding attitude that the mothers may have had during the prenatal period and the immediate postpartum period. Secondly, the study lacked precision in determining the specific timing, whether prenatal or postpartum, when mothers sought breastfeeding support in private health services. Thirdly, due to the study design, the data apply only to a narrow population and are not representative of all users of private health services in Mexico. However, the study also had notable strengths. These include the utilization of a locally validated scale to assess attitudes (Aguilar-Navarro *et al.,* 2016), as well as the development and implementation of a concise questionnaire to evaluate breastfeeding knowledge and practices. Furthermore, the questionnaire underwent review by expert consultants in breastfeeding, who are IBCLC-certified and possess over 42 years of clinical experience in human lactation.

Conclusions

This study shows that in breastfeeding mothers who attended private health services, both skin-to-skin contact and a positive attitude towards breastfeeding were linked to initiating breastfeeding within the first hour of life. It is recommended that interventions to promote breastfeeding should consider, in addition to favoring skin-to-skin contact immediately at birth, determining the attitude toward breastfeeding.

Authors' contribution

Work conceptualization: AVS, CLSR, MCAG, MVC, and NISM. Methodology development: AVS, CLSR, MCAG, MVC, NISM, MCOL, HM, RZC, GERE, NGNG, and SVH. Software management: AVS, CLSR, and MCOL. Experimental validation: AVS, CLSR, MCAG, MVC, and MCOL. Analysis of results: AVS, CLSR, and MCOL. Data management: AVS and CLSR.

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Manuscript writing and preparation: AVS and CLSR. Drafting, revising, and editing: AVS, CLSR, MCAG, MVC, NISM, MCOL, HM, RZC, GERE, NGNG, and SVH. Project management: CLSR.

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Ethical statements

The authors of this study declare that the research was conducted responsibly and ethically, in compliance with research codes and relevant legislation. Approval for this study was obtained from the research committee of the Instituto de Salud Pública of the Universidad Veracruzana (1/142/2021) and the ethics committee of the Instituto de Ciencias de la Salud of the Universidad Veracruzana (CEI-ISP-UV-R0/2022).

Statement of Informed Consent

Informed consent was obtained from all subjects involved in the study.

Conflict of interest

The authors declare that they have no conflicts of interest.

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