

ORIGINAL RESEARCH

Breastfeeding in adolescent mothers-premature infant dyads

Josefina Gallegos-Martínez*, Jaime Reyes-Hernández

Facultad de Enfermería y Nutrición, Universidad Autónoma de San Luis Potosí, México

Received: November 9, 2022

Accepted: March 29, 2023

Online Published: April 25, 2023

DOI: 10.5430/jnep.v13n8p19

URL: <https://doi.org/10.5430/jnep.v13n8p19>

ABSTRACT

Background: Studies have shown that the duration of exclusive breastfeeding is shorter in adolescent mothers and preterm infants. The objective was to identify the prevalence of exclusive breastfeeding, its survival curve and associated factors, in adolescent mother-premature infant dyads and to compare two hospitals aligned or not with the Baby-Friendly Hospital Initiative up to 6 months.

Methods: Follow-up and comparative study. Carried out in two reference hospitals (certified as Baby-Friendly Hospital Initiative and Non-certified). The participants were 67 adolescent mothers and 69 premature infants hospitalized in Neonatal Unit where the follow-up began in all the dyads with the informed consent. Data collection was carried out in clinical files and interview of adolescent mothers in the hospitals and by telephone in the follow-up. (February 2016 to March 2017). The variables were Exclusive breastfeeding, sociodemographic, perinatal and clinical status of the premature infants. The statistical analysis was descriptive and we applied Kaplan-Meier and Pearson's r Test (significance $p \leq .05$).

Results: The exclusive breastfeeding was 27.1%, 63.8%, 66.7%, 48.1% and 26.3% in internment, discharge, 15 days post-discharge, third and sixth month of life, respectively. The exclusive breastfeeding survival: at Baby-Friendly Hospital Initiative (40%, 30 days post discharge) and Non-Baby-Friendly Hospital Initiative (30%, 15 days post discharge) ($p \leq .05$). Cessation of breastfeeding due to the perception of low milk production (15 days post-discharge, $r = .556$, $p \leq .05$).

Conclusions: The prevalence and the survival curve of exclusive breastfeeding are low, especially in Non-Baby-Friendly Hospital Initiative, and the perception of low milk production. The health system efforts are required to initiate and continue exclusive breastfeeding according with WHO recommendations.

Key Words: Breastfeeding, Premature infant, Adolescent

1. INTRODUCTION

According to WHO, in 2020 there were 21 millions of pregnant adolescents in the world^[1] and in 2018 in México there were 15.1% of births in mothers < 20 years old.^[2] The Exclusive Breastfeeding strategy is particularly important in adolescent mothers with preterm infant, because the adolescent mothers is the age group with the highest rate of abandonment of breastfeeding and their premature children

are the most clinically complicated, then, feeding them with human milk provides protection against the most frequent diseases, given that the comorbidities such as respiratory distress syndrome, hypoxia, low birth weight and infections in turn are main barriers to establishing the Exclusive Breastfeeding.^[1,3-5]

Studies have shown that the survival curve and prevalence of Exclusive Breastfeeding in preterm infant, are low^[6,7] a

*Correspondence: Josefina Gallegos-Martínez; Email: jgallego@uaslp.mx; Address: Facultad de Enfermería y Nutrición, Universidad Autónoma de San Luis Potosí, México.

prevalence and survival curve of Exclusive Breastfeeding in American adolescent mothers were of 14% at five weeks postpartum.^[8] A cohort of preterm infant from two hospitals with Baby-Friendly Hospital Initiative in Brazil, had prevalence of Exclusive Breastfeeding at the discharge of 85.2%, whilst at 30 days it was only 46.3%.^[9] In two reference hospitals in México Exclusive Breastfeeding survival curve was of 15 days and the prevalence was 47.9%, but at six months of life was only 15.9%.^[10]

In the context of few health and financial resources available for the best possible breeding, nutrition, and health of the preterm infant, there are barriers, limitations, or problems to the beginning, continuity, and maintenance of Exclusive Breastfeeding in the first six months of life,^[5] therefore, there exists the highest risk of low Exclusive Breastfeeding rates in adolescent mothers.^[5,11] One of the main problems is that Exclusive Breastfeeding is not started early,^[12] the WHO recommends that newborns be exclusively breastfed because of the great advantages it confers, and, for successful breastfeeding to begin immediately at birth or within the first hour of life, the problem is that this recommendation is rarely carried out in hospitals and especially with premature infants.^[13] On the other hand, factors concerning adolescent mothers themselves have been reported, for example when they return to school or work^[11] or when the adolescent mothers perceive inadequate milk production.^[12,14]

In a qualitative study whose objective was to reveal the social representations, that is, the form of socially elaborated knowledge that generates opinions, beliefs, and meanings that are socialized and produce an impact on practices, in this case, the social representations of mothers < 20 years with a preterm infant about Exclusive Breastfeeding, findings revealed that exclusive breastfeeding represents them that they would shorten the duration or change this option for artificial feeding, for their return to school and for some beliefs such as "the child does not fill up", the child "does not digest milk well" or "milk is harmful", nevertheless they had received information about the benefits and the recommendation of a minimum duration of six months of Exclusive Breastfeeding in the hospital, and although they believed that Exclusive Breastfeeding was the best option for their child's growth.^[15] However there is also the counterpart, that is, adolescent mothers do not receive guidance, orientation, or advice to start and continue with exclusive breastfeeding, this is associated with discontinuation or abandonment of Exclusive Breastfeeding.^[12]

In this regard, a Mexican organization the Pro-Breastfeeding Association (APROLAM) reports barriers to Exclusive Breastfeeding due to ignorance of the advantages as well

as of the practical aspects to start it,^[14] and the Mexican project (Official Standard PROY-NOM-050-SSA2-2018), for the promotion, protection, and support of Exclusive Breastfeeding, establishes that should be promoted especially in marginalized areas until the sixth month.^[16] These actions should include the preterm infant population.

Effective strategies for the promotion and support of exclusive breastfeeding would be adapted to the needs of adolescent mothers and according to the approach that the initiation of exclusive breastfeeding is the result of effective promotion and that continuity is the result of continuous support, then, the adolescent mother requires support in both of the dimensions, in emotional aspect they could develop the sense of caring and strengthen the aspect of self-esteem, in instrumental aspect, the support would be given by multidisciplinary health professionals in an informative and educational sense so that adolescent mothers improve their knowledge and articulating actions between the hospital and the primary care service, and the adolescent mothers be supported by networks (involve the mother family, boyfriend, peers, and support groups) in favor of continuing with Exclusive Breastfeeding. This could be taken into consideration by the health system to provide promotion and accompaniment to adolescent mothers to strengthen Exclusive Breastfeeding in this vulnerable population.^[6,9]

The study aimed to identify the prevalence of exclusive breastfeeding, its survival curve, and associated factors, in adolescent mother-premature infant dyads and to compare two hospitals aligned or not with the Baby-Friendly Hospital Initiative for up to 6 months.

2. METHODS

2.1 Design

Follow-up and comparative study of premature infants with adolescent mothers who signed the informed consent. The recruitment was carried out for convenience and by quota at the internment, at discharge, and follow-up after 15 days post-discharge, 3 and 6 months of extrauterine life, from February 2016 to March 2017.

2.2 Setting

Two reference hospitals of San Luis Potosí, México, one certified as Baby-Friendly Hospital Initiative. This hospital has 3,200 births annually and is Type II (in addition to basic care, provides care specialized for neonates with moderate or serious risk complications related to prematurity, disease, or treatment), and the other hospital not certified, this hospital has 3,600 births annually and is Type II too.^[17]

2.3 Participants

The global sample was 69 preterm infants and 67 adolescent mothers participants (flowchart of recruitment) (see Figure 1). Distributed in 48 dyads of the Baby-Friendly-Hospital Initiative and 21 dyads of the No-Baby-Friendly-Hospital Initiative. The equivalence of the samples from both hospitals was demonstrated in order to establish the comparison, in this way, at hospital discharge the corrected age of preterm infants was equivalent among hospitals, Baby-Friendly Hos-

pital Initiative 36.0 ± 1.9 , non-Baby-Friendly Hospital Initiative 36.1 ± 2.3 weeks (*t*-Test for Independent-Samples, $p \geq .05$). The losses of cases were caused by the return of adolescent mothers to the rural home, the refusal of parents or spouses to continue in the study, and the difficulty in establishing telephone communication during follow-up. Added to the fact that there is no systematized registry of the health system for the follow-up of the dyads from discharge to be able to establish the appropriate contact.

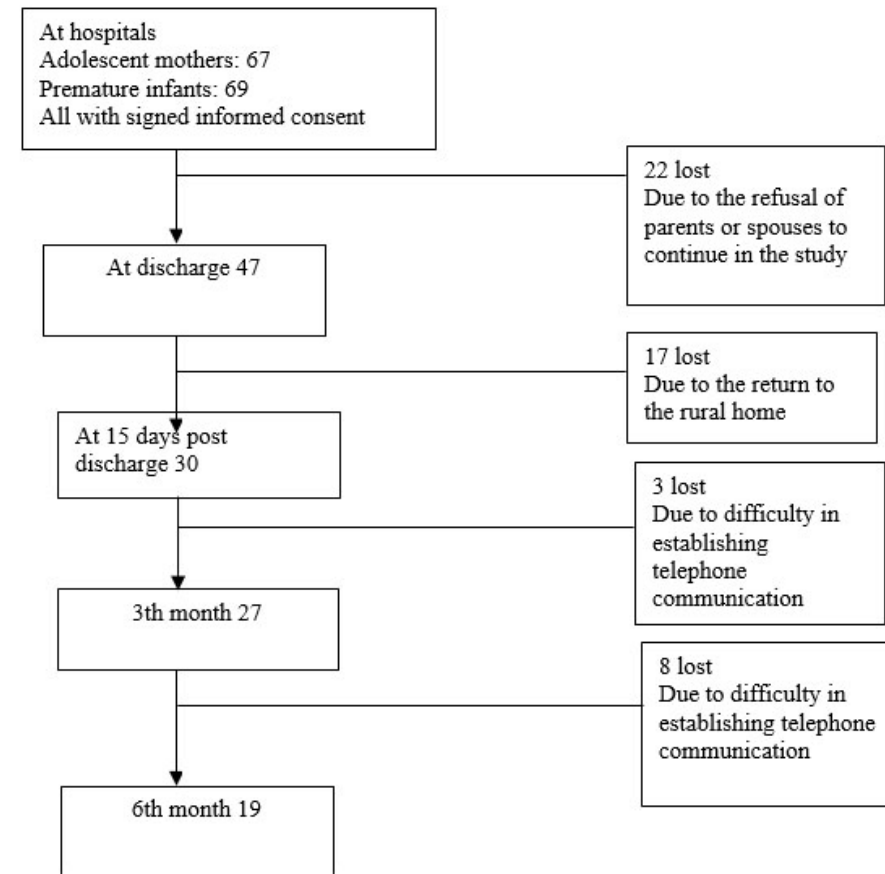


Figure 1. Study flowchart of recruitment of adolescent mothers-premature infants dyads

VandenbrouckeJP, et al. *Mejorar la comunicación de estudios observacionales en epidemiología (STROBE): explicación y elaboración. [Improving the communication of observational studies in epidemiology (STROBE): explanation and elaboration]. GacSanit.2009.doi:10.1016/j.gaceta.2008.12.001*

2.4 Instruments

Records in clinical files and survey based on the most common factors that influence the beginning and establishment of Exclusive Breastfeeding in premature infants. Sociodemographic factors (First section: occupation, monthly income, marital status, schooling, and maternal age), perinatal factors (Second section: pathologies in pregnancy and childbirth, type of delivery, number of products, 1 and 5 minutes APGAR scores, neonatal resuscitation, site and duration of hospitalization, pathologies during hospitalization, ventilatory

assistance and oxygen therapy, skin-to-skin contact, time of onset of breastfeeding, type of feeding during hospitalization and hospital discharge). Follow-up at home (Third section: continuity of or causes of abandonment of Exclusive Breastfeeding, maternal perceptions about Exclusive Breastfeeding, maternal suggestions to improve the support of the health team for Exclusive Breastfeeding in premature infants.) The survey was applied face-to-face upon internment and by telephone during follow-up. This instrument was

constructed based on a literature review and the validation and cultural adjustment were carried out through application to 12 mothers with premature children in the neonatal unit of a hospital/maternity ward in a previous study.^[10]

2.5 Analysis

Kaplan-Meier analysis was used to determine the Exclusive Breastfeeding survival curve over time, and Pearson’s r with significance $p \leq .05$ to establish the relation between Exclusive Breastfeeding with sociodemographic, perinatal, and clinical status factors of the preterm infants.

2.6 Ethic

The project was approved by the Research Ethics Committee of the Faculty of Nursing and Nutrition of the Autonomous University of San Luis Potosí (Registry CEIFE-2015-150) and of the hospitals studied, BFHI HNM/02-2016/036 and non-BFHI registry 11-16. The ethical foundations of the project were in accordance with the Declaration of Helsinki (Ethical principles for medical research in human beings),

with this protocol we seek to promote more and better therapeutic interventions for premature infants inside and outside the hospital, always subject to ethical and the legal standards when carrying it out. It is worth mentioning that the life, health, dignity, integrity, right to self-determination, privacy, and confidentiality of personal information of premature infants and their families who participated in the study were taken care of.^[18]

3. RESULTS

The perinatal data were obtained from the clinical history and the sociodemographic data, exclusive breastfeeding, and maternal opinions, from the survey through face-to-face and telephone interviews.

3.1 Sociodemographic characteristics

Most of AM lived in urban areas, had incomplete basic education, were married or in a consensual union, and engaged in household chores and with a low monthly income (see Table 1).

Table 1. Sociodemographic characteristics of the adolescent mother-premature infant dyads admitted to two referral hospitals

Factor	Total (N = 69)	BFHI (N = 48)	No-BFHI (N = 21)
	Mean/Frequency (%)		
Maternal age (years)	17.5 ± 1.6 (13-20)	17.4 ± 1.6 (13-20)	17.4 ± 1.6 (14-20)
Maternal schooling (level)			
Incomplete Basic & Complete Basic	49 (73.2)	37 (80.4)	13 (61.9)
Incomplete High School & Complete High School	18 (26.8)	9 (19.6)	8 (38.1)
Maternal occupation			
Housewives and or unemployed	50 (74.6)	34 (75.6)	18 (85.7)
Student and or employed	17 (25.4)	11 (24.4)	3 (14.3)
Maternal marital status			
Married/Domestic partnership	40 (59.7)	22 (47.8)	17 (81.0)
Single	27 (40.3)	24 (52.2)	4 (19)
Family monthly income [†] (N = 53)			
Mean	3,379.5 ± 2,224.0	4,031.2 ± 2,342.2 (N = 39)	2,860.6 ± 1,762.4 (N = 21)
< 1 minimum wage	18 (34.0)	11 (33.3) (N = 33)	7 (35.0) (N = 20)
2 - 3 minimum wage	28 (52.8)	19 (57.6)	11 (55)
> 3 minimum wages	7 (13.2)	3 (9.1)	2 (10)

Notes. F = Frequency. The mothers N = 67, Prematures N = 69. [†]Monthly income equivalent in 2017 USA 167.93 ± 110.53 (CRYPTOCURRENCY Coinbase, Inc., Access Sep 2021).

3.2 Perinatal characteristics

The adolescent mothers were mainly primiparous and the vast majority of adolescent mothers were the first child very premature or moderately premature (33.52.3± weeks). The 22.4% began breastfeeding within the first hour of life by sucking on the mother’s breast only (see Table 2).

3.3 Prevalence of dairy feeding types of preterm infants

The 27.1% received Exclusive Breastfeeding only during internment. Feeding with milk substitutes is notorious in hospitalization and the sixth month of life (see Table 3). One extremely premature, one very premature, and three moderately premature infants received Exclusive Breastfeeding up to the sixth month.

Table 2. Perinatal characteristics of the adolescent mother-premature infant dyads admitted to two referral hospitals

	Total (N = 69)	BFHI (N = 48)	No-BFHI (N = 21)
	Mean/Frequency (%)		
Type of delivery (N = 67)			
Vaginal	40 (59.7)	27 (57.4)	12 (57.1)
Cesarean section	27 (40.3)	19 (40.4)	9 (42.9)
New Born Sex (N = 65)			
Female	31 (47.7)	21 (44.7)	10 (47.6)
Male	34 (52.3)	24 (51.1)	10 (47.6)
Gestational Age (weeks) (26-36.6)	33.5 ± 2.3	33.4 ± 2.4	33.8 ± 2.4
Weight at birth (grams) (660.0-2780.0 g)	1895.6 ± 626.1	1826.1 ± 623	2047.8 ± 620
Gestational Complications	39 (58.9)	24 (51.1)	15 (71.4)
Complications at birth	28 (43.8)	17 (39.5)	11 (52.4)
Complications at hospitalization	30 (46.9)	25 (58.1)	5 (23.8)
Breastfeeding*			
Initiation breastfeeding immediately at birth/first hour by suction (N = 49)	11 (22.4)	12 (27.3)	0(0.0)
Gravity feed or syringe technique (N = 56)	39 (69.7)	31(86.1)	7 (35.0)
Bottle technique (N = 56)	12 (21.4)	0 (0.0)	12 (60.0)
Previous breastfeeding	6 (8.8)	4 (8.5)	2 (9.5)
Initiation skin to skin contact			
Immediately at birth/first hour	10 (14.5)	5 (12.5)	5 (25)
Initiation time (hours)	4.9 ± 1.6	1.7 ± 0.4	2.0 ± 0.0
Hospitalization duration (days)	14.1 ± 15.6	14.1 ± 11.4	14.2 ± 20.1
Kangaroo Mother Program	8 (21.1)	1.5 ± 0.5	1.6 ± 0.5

* N are different since some of the premature infants were in parenteral feeding.

Table 3. Types of feeding of premature infants of adolescent mothers from discharge to the sixth month of life, in two reference hospitals

	Total				BFHI [§]				No-BFHI				
	TPN [#]	EBF ^{**}	MBF [†]	AF [‡]	TPN	EBF	MBF	AF	TPN	EBF	MBF	AF	
Following	(%) ^{εζ}												
I. Hospitalization N = 69	18 (26.3)	15 (21.7)	8 (11.5)	28 (40.5)	N = 48 (35.1)	13 (27.1)	8 (16.7)	27 (47.4)	N = 21 (23.8)	5 (9.5)	2 (19.0)	4 (66.7)	14 (66.7)
II. Discharge N = 47	-	31 (66.0)**	15 (31.9)*	1 (2.1)**	N = 29 (43.8)**	-	21 (8.3)	4 (8.3)	N = 18 (8.3)	-	9 (42.9)	8 (38.1)	1 (4.8)
III. 15 days post-discharge N = 30	-	20 (66.7)	9 (30.0)	1 (3.3)	N = 21 (31.3)	-	15 (12.5)	6 (0.0)	N = 9 (23.8)	-	5 (14.3)	3 (14.3)	1 (4.8)
IV. 3 months ^ε N = 27	-	15 (55.6)**	7 (25.9)	5 (18.5)*	N = 19 (25.0)**	-	12 (8.3)	4 (6.3)	N = 8 (14.3)	-	3 (14.3)	3 (14.3)	2 (9.5)
V. 6 months N = 19	-	5 (26.3)*	6 (31.6)**	8 (42.1)	N = 17 (10.4)**	-	5 (12.5)**	6 (12.5)	N = 2 (0.0)	-	0 (0.0)	0 (0.0)	2 (9.5)

Source: Survey [#]Total parenteral feeding ^{**}Exclusive breastfeeding [†]Mixed breastfeeding [‡]Artificial feeding [§]Baby-Friendly-Hospital Initiative ^εOf life of premature infants ^ζFrequency. Predominant breastfeeding (All cut-off points=0.0) Student t-test for paired samples between cut points (I vs II; II vs III; III vs IV; IV vs V). *p ≤ .05 **p ≤ .01.

3.4 The exclusive breastfeeding survival curve

The Exclusive Breastfeeding survival curve in Baby-Friendly Hospital Initiative was higher than non- Exclusive Breastfeeding (see Figure 2).

3.5 Maternal opinions and perceptions

In the third month, all 27 adolescent mothers had had the desire to breastfeed since the birth of Exclusive Breastfeeding, some of them were on Exclusive Breastfeeding because they perceived that with Exclusive Breastfeeding they contributed

to their weight gain, and they felt happy to breastfeed, but some of them abandoning Exclusive Breastfeeding, because had difficulties to breastfeed since hospitalization, termination or low milk production and the perception that the child required a supplement.

The felt supported during hospitalization and discharge but not at home, reason why they consider that accompaniment should be provided from discharge to continue with Exclusive Breastfeeding and improve teaching to the mother during hospitalization (see Table 4).

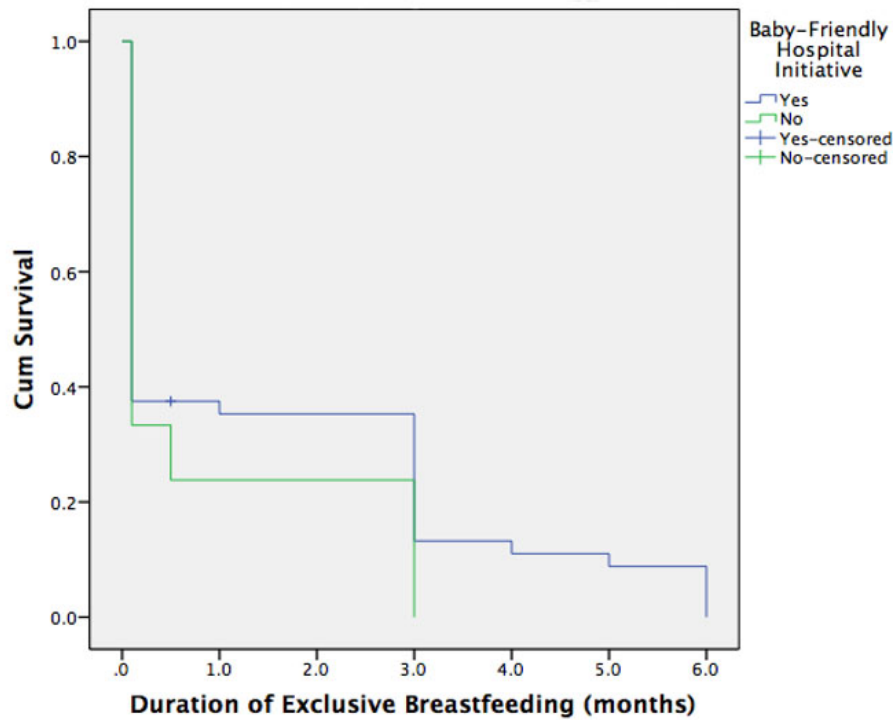


Figure 2. Survival functions

Table 4. Maternal opinions and perceptions on Exclusive Breastfeeding in the premature infants at 3 months post-hospital discharge

ITEM	Frequency (%) (N = 27)	BFHI (N = 19)	No- BFHI (N = 8)
Wanted to breastfeed	27 (100.0)	19 (100.0)	8 (100.0)
EBF [†] contributed to the weight gain of the premature	20 (74.1)	15 (78.9)	8 (100.0)
She is breastfeeding: She feels happy or good	17 (63.0)	15 (78.9)	8 (100.0)
Maternal reasons to stop breastfeeding			
“Breastfeeding problems since hospitalization”	13 (48.1)	7 (36.8)	3 (37.5)
“Breast problems”	3 (11.1)	5 (26.4)	1 (12.5)
“Her milk dried”	1 (3.7)	2 (10.5)	1 (12.5)
She received guidance for EBF upon discharge			
EBF Technique	21 (77.8)	19 (100.0)	2 (25.0)
EBF Importance and minimum to the sixth month of life to preterm infant	18 (66.6)	11 (57.8)	2 (25.0)
Breast care	11 (40.7)	10 (52.6)	1 (12.5)
Expression Technique	8 (29.6)	10 (52.6)	0 (0.0)
KMM [‡]	8 (29.6)	7 (36.8)	1 (12.5)
Signs of hunger	8 (29.6)	7 (36.8)	0 (0.0)
Alternate breast	6 (22.2)	6 (31.5)	1 (12.5)
Fluid intake and maternal nutrition	6 (22.2)	6 (31.5)	1 (12.5)
Hand washing before EBF	6 (22.2)	7 (36.8)	2 (25.0)
Baby burps	6 (22.2)	7 (36.8)	1 (12.5)
Use of cup	4 (14.8)	5 (26.3)	0 (0.0)
Feeding on demand	3 (11.1)	3 (15.7)	1 (12.5)
Sought and obtained help for post-discharge EBF			
Milk bank, nurse, or doctor	12 (44.4)	7 (36.8)	5 (62.5)
Family member	4 (14.8)	2 (10.5)	2 (25.0)

Source: Survey. [†]EBF Exclusive breastfeeding; [‡] KMM= Kangaroo Mother Method.

3.6 Adherence or abandonment of exclusive breastfeeding

The maternal perception of having little or no milk production was the most relevant factor for the abandonment of

Exclusive Breastfeeding, opting for Mixed Breastfeeding and Artificial Feeding (see Table 5).

Table 5. Factors related to the types of breastfeeding in adolescent mothers - premature infants

Factors	EBF [†]		MBF [‡]		AF ^{**}		
	15 d	3 m	15 d	3 m	D	15 d	3 m
She is not breastfeeding because							
Her milk dried/She had little milk			.556*	.255*		.434*	.434*
Due to suction difficulties since internment					.127*		.126*
She sought and obtained help for EBF							
Of the milk bank				.406*	.451*		.477*
With a nurse			.500**				
With a physician			.267*	.483*			
Breastfeeding makes her feel that							
She contributes to the child's health/weight gain	.660**	.646**					
She needs to provide a supplement							.476*

Source: Survey. [†]Exclusive breastfeeding [‡]Mixed breastfeeding ^{**}Artificial feeding, D = Discharge day, d = days, m = Month, BF = Breastfeeding. Pearson's r test, * $p \leq .05$, ** $p \leq .01$

4. DISCUSSION

4.1 Prevalence and survival of exclusive breastfeeding

This study shows that the prevalence of Exclusive Breastfeeding is low in hospitals of San Luis Potosí, since hospitalization. While it is true that premature infants are different in corrected age and weight, criteria that are commonly used to establish the beginning of Exclusive Breastfeeding, other criteria how clinical stability, state of consciousness, motor ability and coordination between sucking, swallowing, and breathing could give clinicians greater security to start this important method.^[19] Since it is a great challenge to establish and maintain Exclusive Breastfeeding in preterm infants during the internment, due to their fragility and clinical instability, which delays enteral and oral feeding.^[20]

Although our results are above the discharge prevalence (27%) observed in Italian preterm infants,^[21] it is true that we are below of two Baby-Friendly Hospital Initiative Brazilian hospitals, who had prevalence of Exclusive Breastfeeding of 85.2% and 75.0% respectively,^[9] and unfortunately, by the sixth month we had EBF around of a fourth part of preterm infants similarly to 22.5% reported in Chinese preterm infant.^[5]

The Kaplan-Meier survival curve in our study showed slight difference with regards to Baby-Friendly Hospital Initiative or non- Baby-Friendly Hospital Initiative, possibly because the survival being higher in the Baby-Friendly Hospital Initiative hospitals. Comparatively, in another countries the

survival is around the first month of life, in another Latin country, was around 32 days post discharge,^[22] as well as in American adolescent mothers with 5 weeks postpartum.^[8] It is alarming that despite current scientific evidence, the most vulnerable population does not receive Exclusive Breastfeeding, an aspect to be considered in the health policies of hospitals and health systems.

4.2 Sociodemographic factors and exclusive breastfeeding

Two-thirds of the adolescent mothers lived with their partners and were dedicated to housework, which, although due to their age is not ideal, and in our study no correlation was observed with Exclusive Breastfeeding, it could have become the support available for parenting of the premature child, which is a facilitator of Exclusive Breastfeeding, according to a predictive study, married adolescents with economic income were significant factors of Exclusive Breastfeeding at the sixth month.^[11] But, the adolescent mothers have the highest rate of health risks and abandonment of Exclusive Breastfeeding.^[23]

On the other hand, the third part that were single depended mainly on the family of origin in their maintenance and upbringing of the child, a frequent situation especially in early pregnancy (< 15 years), a factor that is reported as a major barrier to Exclusive Breastfeeding in preterm infant too.^[24] It is important the presence and participation of the couple, there are few studies that point to the father of the premature

infant as a key factor in Exclusive Breastfeeding, but when he is absent, she does not have enough family support.

4.3 Perinatal factors and exclusive breastfeeding

The health situation in adolescent mothers is a factor that complicates Exclusive Breastfeeding, in our case, there were pathological perinatal factors of adolescents, mostly primiparous with a history of non-specialized prenatal care and about half with gestational complications, in this regard these factors have been observed in other studies as barriers to establish and maintain Exclusive Breastfeeding.^[20] The longer stay of preterm infant in the hospitals in our study signifies a long separation of the mother-child dyad determines barriers for the start and establishment of Exclusive Breastfeeding,^[20] and on the other hand when the separation of the dyad is shorter, it is associated with a greater success of Exclusive Breastfeeding.^[5]

The clinical complications of prematurity at birth and during hospitalization are factors that add to the set of barriers that lead to the early termination of Exclusive Breastfeeding since despite of being an ideal strategy to reduce the risks has multiple barriers for the beginning and the continuity.^[6,25] Also these clinical conditions do not allow the early establishment of Exclusive Breastfeeding in the first hour of life, as it happened in our study population in which only a minority started in the first hour, studies show that Ethiopian mothers who started Exclusive Breastfeeding in the first hour of life have lower dropout rates compared to those who did so later^[12] and to this is added the fact that when taking corrected age as a criterion to start enteral feeding according to hospital policies that start between 32 and 36 weeks of corrected age, neonates born with a lower gestational age may not be fed with Exclusive Breastfeeding. We only had 8.9% breastfed, like the case of Brazil (7.7%), in the rest of the preterm infants breast milk was administered by tube, orally with cup or bottle techniques.^[19]

4.4 Baby-Friendly hospital initiative and Exclusive Breastfeeding

In the Baby-Friendly Hospital Initiative, a survival of Exclusive Breastfeeding was observed at 30 days of life, while in the non- Baby-Friendly Hospital Initiative hospital it was 15 days. This difference was also seen in another Exclusive Breastfeeding survival study in Mexican preterm infant of mothers of all ages.^[10]

While in Ethiopia the probability of survival of Exclusive Breastfeeding was 64.5% at sixth month because the counseling received on Exclusive Breastfeeding, was the successful factor. The Baby-Friendly Hospital Initiative could improve the prevalence of Exclusive Breastfeeding in preterm infant,

specifically the neo- Baby-Friendly Hospital Initiative that include the revised 10 steps of the original Baby-Friendly Hospital Initiative proposal, staff's attitude focusing on the mother as an individual, and the continuity of care.^[7]

In our study the prevalence of beginning feeding immediately at birth or in the first hour of life was low in less than a fourth part of milk-fed infants in an analogous way to other reports, thus not complying with the WHO recommendation, providing support to Exclusive Breastfeeding is required through the 10 steps of the BFH for the Exclusive Breastfeeding success.^[13] As the improvement in the practices of health professionals and mothers related to Exclusive Breastfeeding in neonatal units has been demonstrated with the implementation and evaluation of the Neo- Exclusive Breastfeeding intervention.^[20]

4.5 Perceptions of adolescent mothers for exclusive breastfeeding

In our findings, adolescent mothers perceived that they could contribute to the well-being and health of the child and improve their clinical condition with Exclusive Breastfeeding, factor associated with the continuity of Exclusive Breastfeeding at least until the third month of life. Similarly, Italian mothers perceived that was beneficial for the child's health.^[21]

In this study abandonment of Exclusive Breastfeeding occurred at 15 days related with the maternal perception of little or no milk production, frequent perception of Mexican mothers according to APROLAM (Pro-Breastfeeding Association),^[14] as much as in Brazilian preterm infant mothers who chose to introduce other types of food and beverages.^[9]

Similarly, results occur in Chinese mothers of very premature children,^[5] and the risk of using Artificial Feeding increases in Italian infants at discharge, when it is perceived that they require some supplement to cover their nutritional needs.^[21] However, even if the mother perceives that the milk production is insufficient, it is rare that it is a true hypogalactia.^[26] With the proper guidance and post-discharge accompaniment mothers could increase production and the feeling of self-efficacy in their ability to feed the premature child.^[9]

4.6 Difficulties and support for adolescent mothers and exclusive breastfeeding

In our study the adolescent mothers who reported difficulties with Exclusive Breastfeeding since hospitalization ended Exclusive Breastfeeding before the third month, cause of early abandonment of Exclusive Breastfeeding of adolescent mothers' children.^[8,10]

The adolescent mothers received guidance on breastfeeding

upon discharge, especially from the baby-friendly hospital, the decrease in prevalence in the first six months of life seems to indicate that they lack support to maintain it, in this regard, they suggested that accompaniment be provided from discharge to continue on Exclusive Breastfeeding, as well as improving the capabilities of human resources or health providers to support and guide in Exclusive Breastfeeding. It has been reported that health professionals may have insufficient skills to advise and assist in establishing and maintaining Exclusive Breastfeeding in Neonatal Units.^[20]

Mexican specialists of APROLAM have mentioned that studies demonstrate the advantages of Exclusive Breastfeeding on the decrease of mortality in children under 5 years of age and its protective effect approximately at one year of life, but this is not well known by health professionals and they lack the skills to initiate Exclusive Breastfeeding and support mothers who express problems with their breastfeeding, this boosted the creation of APROLAM to address the challenges for health professionals in the face of Exclusive Breastfeeding in Mexican mother-child dyads.^[14] Studies have demonstrated that Exclusive Breastfeeding counseling is associated with greater success and duration of Exclusive Breastfeeding.^[12]

4.7 Limitations of the study

This study provides evidence of a very vulnerable and growing age group in Mexico on the behavior of Exclusive Breast-

feeding, the sample of dyads is small but represents the population of the state of San Luis Potosí and surroundings assisted in 2 reference hospitals, however, we suggest increasing the sample for future studies.

In addition, self-confidence, and maternal competence to initiate and continue Exclusive Breastfeeding, among other factors according to scientific evidence were not explored and should be considered in future studies and thus expand the range of possibilities for counseling on Exclusive Breastfeeding in adolescent mothers.

5. CONCLUSION

Based on the evidence of the low rates of Exclusive Breastfeeding, the health team requires greater institutional efforts for adolescent mothers -preterm infant dyads to initiate and continue Exclusive Breastfeeding at least until the sixth month of life.

New pedagogies should be designed by the health systems according to the age and condition of the adolescent mothers so that they can develop maternal competence and continue Exclusive Breastfeeding in the preterm infant, according to the recommendations.

CONFLICTS OF INTEREST DISCLOSURE

The authors declare that there is no conflict of interest.

REFERENCES

- [1] WHO. Adolescent pregnancy. 31 Jan 2020. [Internet] Consulted 2022 Oct 17. Available from: who.int/newsroom/fact-sheets/detail/adolescent-pregnancy
- [2] INEGI-ENADID. Encuesta Nacional de la Dinámica Demográfica (ENADID) 2018. Estadísticas de natalidad 1990 -2030 [National Survey of Demographic Dynamics 2018. Birth statistics 1990 -2030]. Available from: <https://www.inegi.org.mx/T1\guilsinglr ightprogramas>
- [3] CONAPO. Estrategia Nacional para la Prevención del Embarazo Adolescente [ENAPEA] 2019. Estimaciones y Proyecciones de la Población de México 1990- 2050 [National Strategy for the Prevention of Adolescent Pregnancy 2019. Estimates and Projections of the Population of Mexico 1990- 2050]. Available from: <http://www.gob.mx/conapo/documentos/estrategia-nacional-para-la-prevencion-del-embarazo-en-adolescentes-enapea-informe-ejecutivo->
- [4] Hernández-Bringas HH, Narro-Robles J. Mortalidad infantil en México: logros y desafíos [Infant Mortality in México: Achievements and challenges]. *Pap. Poblac.* 2019; 25 (101): 17-49. <https://doi.org/10.22185/24487147.2019.101.22>
- [5] Wang Y, Briere CE, Xu WL, et al. Factors Affecting Breastfeeding Outcomes at Six Months in Preterm Infants. *J Hum Lac.* 2019; 35(1): 80–89. PMID:29723482 <https://doi.org/10.1177/0890334418771307>
- [6] Yimyan S, Khnsung P. Breastfeeding Promotion Among Adolescent Mothers. *Nursing Journal.* 2019; 46(1): 239-250.
- [7] Ericson J, Flacking R, Hellstrom-Westas L, et al. Changes in the prevalence of breast feeding in preterm infants discharged from neonatal units: a register study over 10 years. *BMJ Open.* 2016; 6: e012900. PMID:27965252 <https://doi.org/10.1136/bmjopen-2016-012900>
- [8] Sipsma HL, Magriples U, Divney A, et al. Breastfeeding behavior among adolescents: Initiation, duration, and exclusivity. *Adolesc Health.* 2013 September; 53(3): 394–400. PMID:23725911 <https://doi.org/10.1016/j.jadohealth.2013.04.005>
- [9] Lima APE, Castral TC, Leal LP, et al. Aleitamento materno exclusivo de prematuros e motivos para sua interrupção no primeiro mês pós-alta hospitalar [Exclusive breastfeeding of premature infants and reasons for discontinuation in the first month after hospital discharge]. *Rev Gaúcha Enferm.* 2019; 40: e20180406. PMID:31596342 <https://doi.org/10.1590/1983-1447.2019.20180406>
- [10] Gallegos-Martínez J, Reyes-Hernández J, Torres-Carreón FSC, et al. Factors and survival of exclusive breastfeeding in preterm infants upon discharge at six months of age. *J Nurs Educ Prac.* 2020; 10(8): 30-38. <https://doi.org/10.5430/jnep.v10n8p30>

- [11] Ngamnil N, Kaewkiattikun K. Prevalence of Exclusive Breastfeeding among Adolescent Mothers in Bangkok. *Thai J Obstet Gynaecol*. April 2019; 27(2): 79-87. <https://doi.org/10.14456/tjog.2019.11>
- [12] Beyene AM, Liben ML, Arora A. Factors associated with the early termination of exclusive breastfeeding among mother-infant dyads in Samara-Logia, Northeastern Ethiopia. *BMC Pediatr*. 2019 Nov 11; 19(1): 428. PMID:31711461 <https://doi.org/10.1186/s12887-019-1803-1>
- [13] World Health Organization. National Implementation of the Baby-friendly Hospital Initiative, 2017. Geneva: World Health Organization; 2017. Licence: CC BY-NC-SA 3.0 IGO. Cataloguing-in-Publication (CIP) data. Available from: <http://apps.who.int/iris>
- [14] Reyes-Vázquez HL, Martínez-González A. Capacitación en lactancia materna, experiencia APROLAM [Breastfeeding training, experience APROLAM]. *Pediatría de México*. 2011; 13(4): 164-169.
- [15] Gallegos-Martínez J, Reyes-Hernández J. Representaciones maternas sobre salud y lactancia del hijo prematuro en hospitales con y sin certificación de Hospital Amigo del Niño y de la Madre [Representations of mothers/fathers about health and breastfeeding of the premature child in hospitals with and without certification Baby Friendly Hospital Initiative]. *APM*. 2018; 39(2): 99-108. <https://doi.org/10.18233/APM39No2pp99-1081571>
- [16] Estados Unidos Mexicanos- Secretaría de Salud. DOF - Diario Oficial de la Federación. PROYECTO de Norma Oficial Mexicana PROY-NOM-050-SSA2-2018 Para el fomento, protección y apoyo a la lactancia materna. [PROJECT of Official Mexican Standard PROY-NOM-050-SSA2-2018 For the promotion, protection and support of breastfeeding. DOF: 02/05/2018]. https://www.dof.gob.mx/nota_detalle.php?codigo=5521251&fecha=02/05/2018&print=true
- [17] Gallegos-Martínez J, Reyes-Hernández J, Silvan-Scochi CG. La Unidad Neonatal y la participación de los padres en el cuidado del prematuro [The Neonatal Unit and the participation of parents in the care of the premature]. *ISSN0 187-5337. Rev Perinat y Reprod Humana*. 2010; 24(2): 98-108.
- [18] Shrestha B, Dunn L. The Declaration of Helsinki on Medical Research involving Human Subjects: A Review of Seventh Revision. *J Nepal Health Res Coun*. 2020 Jan 21; 17(4): 548-552. PMID:32001865 <https://doi.org/10.33314/jnhrc.v17i4.1042>
- [19] Fujinaga CI, Moraes AS, Zamberlan-Amorim NE, et al. Validação clínica do Instrumento de Avaliação da Prontidão do Prematuro para Início da Alimentação Oral. *Rev. Latino-Am. Enfermagem* [Clinical validation of the Preterm Oral Feeding Readiness Assessment Scale. *Rev. Latino-Am. Nursing*]. 2013; 21(Spec): [06 screens]. PMID:23459901 <https://doi.org/10.1590/S0104-11692013000700018>
- [20] Balaminit T, Semenic S, Haiek LN, et al. Baby-Friendly Hospital Initiative for Neonatal Wards: impact on breastfeeding practices among preterm infants. *Rev Bras Enferm*. 2021; 74(Suppl 4): e20200909. PMID:34190823 <https://doi.org/10.1590/0034-7167-2020-0909>
- [21] Gianni ML, Bezze EN, Sannino P, et al. Maternal views on facilitators of and barriers to breastfeeding preterm infants. *BMC Pediatrics*. 2018; 18: 283-290. PMID:30149811 <https://doi.org/10.1186/s12887-018-1260-2>
- [22] Beusekom IV, Vossenaar M, Montenegro-Bethancourt G, et al. Estimates of exclusive breastfeeding rates among mother-infant dyads in Quetzaltenango, Guatemala, vary according to interview method and time frame. *Food Nutr Bull*. 2013; 34(2): 160-168. PMID:23964389 <https://doi.org/10.1177/156482651303400205>
- [23] United Nations Population Fund (UNFPA). Consecuencias socioeconómicas del embarazo en adolescentes en México. Implementación de la metodología para estimar el impacto socioeconómico del embarazo y la maternidad adolescentes en países de América Latina y el Caribe [Socioeconomic consequences of pregnancy in adolescents in Mexico. Implementation of the methodology to estimate the socioeconomic impact of adolescent pregnancy and motherhood in Latin American and Caribbean countries]- Milena 1.0. Available from: https://mexico.unfpa.org/sites/default/files/pub-pdf/milena_mexico_2020.pdf
- [24] United Nations Population Fund (UNFPA). 165 million reasons. A call for investment in adolescents and youth. 2019. Available from: <https://lac.unfpa.org/sites/default/files/pub-pdf/165%20M%20-%20ENGLISH.pdf>
- [25] Zukova S, Krumina V, Buceniece J. Breastfeeding preterm born infant: Chance and challenge *International Journal of Pediatrics and Adolescent Medicine*. 2021; 8: 94e97. PMID:34084879 <https://doi.org/10.1016/j.ijpam.2020.02.003>
- [26] González-de Cosío T, Hernández-Cordero S (Editoras). Lactancia materna en México [Breastfeeding in Mexico]. Consejo Nacional de Ciencia y Tecnología- Academia Nacional de Medicina México-Intersistemas Editores- México [National Council of Science and Technology-National Academy of Medicine]. 2016. 178 pp. https://www.anm.org.mx/documentos-postura/LACTANCIA_MATERNA.pdf