Association Between Breastfeeding Evaluation and Growth Velocity of Infants Assisted at the Human Milk Bank in São Luís – MA

Associação Entre Avaliação da Mamada e Velocidade de Crescimento dos Lactentes Assistidos no Banco de Leite Humano Em São Luís – MA

Asociación Entre la Evaluación de la Lactancia y la Velocidad de Crecimiento de los Lactantes Atendidos en el Banco de Leche Humana de São Luís – MA

RESUMO

Objetivo: Estabelecer relação da avaliação da mamada com a velocidade de crescimento dos lactentes frequentadores do Banco de Leite Humano em São Luís – MA. **Método:** Coorte prospectiva com 101 pares nutrizes-lactentes acompanhados no BLH do Hospital Universitário no município de São Luís, no período de novembro de 2017 a novembro de 2018. Foram aferidos peso e comprimento dos lactentes. A velocidade de ganho de peso e a velocidade de ganho de comprimento dos lactentes foram calculadas do nascimento ao sexto mês de vida. A avaliação da mamada segundo a pega, sucção e posição do bebê foi classificada em scores bom, regular e ruim. Foi aplicado o teste de ANOVA para verificar a associação entre avaliação da mamada e velocidade de crescimento. O nível de significância foi de 0,05. **Resultados:** Predomínio de comportamentos favoráveis à amamentação e maior velocidade de crescimento para os lactentes com boa avaliação da mamada dentre todos os aspectos analisados. **Conclusão:** Verificou-se alta prevalência de resultados favoráveis a amamentação. Entre os pares com avaliações de scores regulares e ruim, observou-se que as dificuldades iniciais foram superadas e as suas médias de ganho de peso e comprimento ficaram próximas às médias de avaliação com score bom.

DESCRITORES: Aleitamento materno; crescimento; lactente.

ABSTRACT

Objective: To establish the relationship between breastfeeding assessment and the growth rate of infants attending the Human Milk Bank (HMB) in São Luís – MA. **Method:** Prospective cohort study of 101 nursing mother-infant pairs followed at the HMB of the University Hospital in São Luís, Brazil, from November 2017 to November 2018. Infants' weight and length were measured. Infants' weight and length gain rates were calculated from birth to six months of age. Breastfeeding assessments based on latch, sucking, and positioning were classified as good, fair, or poor. ANOVA was used to assess the association between breastfeeding assessment and growth rate. The significance level was set at 0.05. **Results:** Predominance of breastfeeding-supportive behaviors and greater growth velocity among infants with a good breastfeeding evaluation across all analyzed aspects. **Conclusion:** A high prevalence of favorable outcomes for breastfeeding was observed. Among the pairs with regular and poor score assessments, initial difficulties were overcome, and their mean weight and length gains were close to those of the good score assessment group.

DESCRIPTORS: Breastfeeding; Growth; Infant.

RESUMEN

Objetivo: Establecer la relación entre la evaluación de la lactancia y la velocidad de crecimiento de los lactantes que asisten al Banco de Leche Humana en São Luís – MA. **Método:** Estudio de cohorte prospectiva con 101 pares madre–lactante acompañados en el Banco de Leche Humana del Hospital Universitario del municipio de São Luís, en el período de noviembre de 2017 a noviembre de 2018. Se midieron el peso y la longitud de los lactantes. La velocidad de ganancia de peso y la velocidad de ganancia de longitud de los lactantes se calcularon desde el nacimiento hasta el sexto mes de vida. La evaluación de la lactancia, según la sujeción, la succión y la posición del bebé, se clasificó en puntuaciones buena, regular y mala. Se aplicó la prueba ANOVA para verificar la asociación entre la evaluación de la lactancia

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y la velocidad de crecimiento. El nivel de significación fue de 0,05. **Resultados:** Se observó un predominio de comportamientos favorables a la lactancia materna y una mayor velocidad de crecimiento en los lactantes con buena evaluación de la lactancia en todos los aspectos analizados.**Conclusión:** Se verificó una alta prevalencia de resultados favorables para la lactancia materna. Entre los pares con puntuaciones regulares y malas, se observó que las dificultades iniciales fueron superadas y que sus promedios de ganancia de peso y longitud fueron similares a los del grupo con puntuación buena.
DESCRIPTORES: Lactancia materna; Crecimiento; Lactante.

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INTRODUCTION

Breastfeeding is much more than just feeding a child. It is a process that involves deep interaction between mother and child, with repercussions on the mother's nutritional status, defenses against infections, physiology, and cognitive and emotional development, as well as her long-term health[1]. Consequently, breastfeeding is directly linked to a reduction in the incidence of respiratory infections, allergies, and diarrhea, as well as a lower risk of obesity, hypertension, high cholesterol, and diabetes.[2]

Unique and unmatched, breast milk is the ideal food for children, as it is fully adapted to their needs in the first years of life[1,4] . It is specific to the human species and has a complex biology[3] . With these factors in mind, the essentiality of breastfeeding for the proper development of the infant's nutritional status in an integrated manner is evident.

In addition to the benefits related to the baby's health, breastfeeding has several positive effects on the mother's mental and physical health, helping to prevent certain diseases and reducing the chances of developing breast, ovarian, and uterine cancer and type 2 diabetes in the future.

According to the World Health Organization (WHO), breastfeeding is the process by which infants receive breast milk regardless of whether they consume other foods, with exclusive breastfeeding being when the baby receives only the mother's milk. The practice of BF is recommended by both the WHO and the Brazilian Ministry of Health, exclusively until six months of age, and its use should be extended until at least two years as a complementary food, since breast milk has the ideal nutritional characteristics for children at this stage of life.[5,6]

Exclusive breastfeeding in the first six months can increase the interval between births, aid in uterine involution, reduce the risk of postpartum depression, stress, and anxiety, and influence the improvement of the mother's body image. In the long term, it reduces the risks of metabolic syndrome, hypertension, and cardiovascular disease in the mother.

On the other hand, within this scenario, when it comes to the mother, there are other biological, psychological, and social factors that can negatively affect breastfeeding and, consequently, the nutritional status of the newborn, such as initial difficulties with the feeding technique, which can become one of the main reasons for early weaning.[8] The correct positioning of the mother-infant pair during breastfeeding is an essential step for proper latching, avoiding possible nipple injuries that hinder breastfeeding or even interrupt it prematurely.

The prevalence of EBF among children under four months of age was

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59.7% in Brazil, while among children under six months of age it was 45.8%, according to the results of the ENANI-2019 survey, conducted with 14,558 children in 12,524 households distributed across 123 municipalities in the 26 states of the Federation and the Federal District. In the four- to five-month age group, 23.3% of children in Brazil were on formula feeding. The Northeast region had the lowest prevalence rates in the survey among children under six months and in the 4- to 5-month age group, registering 57.3% and 12.9%, respectively.

These data reflect the impacts of biological, social, and psychological factors on the breastfeeding process, demonstrating that BF indicators, despite significant increases over time, still fall far short of recommendations regarding the duration of EBF. It should be noted that the figures obtained from the survey still represent a reality that is far from the WHO targets for 2030: 70% EBF in the first six months, 80% in the first year, and 60% at two years of age.

The success of breastfeeding and EBF, as well as their prevalence rates, as already mentioned, stem from extremely important biological factors, such as the instinctive act of sucking. Although sucking is a reflex action in newborns, they need to learn how to extract milk from the breast efficiently. When the baby latches on to the breast properly, the ideal "latch" occurs, which is essential for breastfeeding to take place properly. [1]

With this in mind, it is important to note that an inappropriate position of the mother and/or baby during breastfeeding will consequently hinder the correct positioning of the baby's mouth in relation to the mother's nipple and areola, resulting in what is called a "poor latch." Poor latching makes it difficult to empty the breast, which can lead to decreased milk production and the baby not gaining the expected weight despite spending a long time at the breast. [1] In addition to making it difficult to remove milk, poor latching will consequently hurt the mother's nipples, causing breast engorgement, mastitis, nipple fissures or wounds, as well as pain and the formation of breast abscesses.

To guide this practice of breastfeeding, the United Nations Children's Fund (UNICEF) and the World Health Organization (WHO) have developed a Breastfeeding Observation Form, used in Breastfeeding Counseling courses, with the aim of training health professionals to develop clinical skills in lactation management and thus promote successful breastfeeding. This form allows for the assessment of desirable behaviors in mothers and babies and other indicators of problems. It contains a series of items classified as favorable to breastfeeding or suggestive of difficulties, referring to the body position of the mother and baby, their responses when starting to feed, sucking efficiency, and emotional involvement between the mother and her child, among others.

Considering that observing the mother-infant dyad during this phase of breastfeeding, especially in the first days of life, is essential for supporting and assisting in BF and identifying difficulties in this process, as well as preventing and treating them, addressing the relationship between the assessment of infant feeding and the growth rate of newborns is of great importance in understanding how BF affects the nutritional status of babies.

Thus, this study aims to establish the relationship between feeding assessment and the growth rate of infants attending the Human Milk Bank in São Luís, MA.

METHOD

This study used the database from the research entitled "Monitoring the Nutritional Status of Lactating Women and Infants Served by a Human Milk Bank at a University Hospital in Maranhão," which was a prospective cohort study in which nursing pairs were evaluated at the Human Milk Bank of the University Hospital in the municipality of São Luís, from November 2017 to November 2018. This HMB is located in a Baby-Friendly Hospital, whose goal is to protect, promote, and support breastfeeding. [12]

The study participants were assisted by the BLH Childcare Program. This program encourages exclusive breastfeeding by promoting infant care, monitoring growth in the first six months of life, and providing assistance to mothers who have difficulties with breastfeeding.

For the present study, all infants up to six months of age who were breastfed and sought assistance at the BLH were included. Children who did not have data on weight, length, and feeding observation were not included in the investigation.

The children were evaluated from the first to the sixth month of life, according to the BLH's monthly pediatric follow-up schedule. A total of 267 infants who agreed to participate in the study at the first consultation were included, but for the present study, data from 101 pairs of infants and nursing mothers were used, as they had all the data on the nutritional status of the infants and breastfeeding observations of the nursing mothers during the first six months of life.

The maternal variables used for this study were: age (≤19, 20 to 34, or ≥35), self-reported skin color (white, black, or brown/yellow oriental), marital status (with partner or without partner), years of schooling (less than 9, 9 to 11, or 12 to 16), and whether employed (yes or no). The child variables used were: gestational age, sex, skin color, birth weight, and birth length.

The measurements were taken at

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all assessments (from the first to the sixth month of the child's life), according to the techniques standardized by the WHO[24]. Weight was measured using an electronic and digital scale (Welmy – pediatric class), with a maximum capacity of 15 kg and a minimum capacity of 100 grams, with the child undressed. Length was measured using a wooden infant anthropometer with a graduated ruler from 0 to 100 cm, with an accuracy of 1 mm.

The rate of weight gain (g/day) and length (cm/month) of infants was calculated from birth to six months of age using the following calculations:

Weight gain rate (g/day) = (weight at 1, 2, 3, 4, 5, and 6 months - birth weight) / age in days

Length gain rate (cm/month) = (length at 1, 2, 3, 4, 5, and 6 months - length at birth) / age in months

To evaluate breastfeeding, the protocol proposed by UNICEF/WHO (2003) was used, which is objective and calculated by scores that allow the evaluation of breastfeeding performance as a criterion for discharge from the maternity ward.

The responses to the breastfeeding observation questionnaire were divided into signs favorable to breastfeeding and signs of possible difficulties, which presented four main topics that should be observed.

The first topic observed aspects related to the appearance of the mother, the breast, and the support of the breast in relation to the fingers. The second topic observed the position of the baby in relation to the mother's body, whether the baby's head and body were aligned and close to the mother's body, whether the baby was facing the breast with the nose turned toward the nipple, and whether the baby was well supported.

The third topic observed aspects related to latching, such as whether more areola was visible above the baby's upper lip, whether the baby's mouth was wide open with the lower lip turned outwards, and whether the baby's chin touched the breast. The fifth and final topic looked at aspects related to sucking, such as whether the baby's sucking was slow and deep with pauses, whether the baby released the breast after finishing feeding, whether the mother noticed milk ejection, and whether the breasts felt lighter after feeding.

In Table 1, good, fair, and poor scores were used to evaluate the results, and the number of behaviors unfavorable to breastfeeding, which demonstrated some difficulty in establishing lactation, was calculated.

Tabela 1. Aspectos demográficos e socioeconômicos das nutrizes de um programa de puericultura de um banco de leite humano. São Luís, MA, 2017-2018.

Topics Evaluated	Number of unfavorable behaviors observed	Classification of scores by number of behaviors observed		
		Good	Fair	Poor
Mother's general appearance	4	0-1	2	3-4
Position of the baby	4	0-1	2	3-4
Hold	4	0-1	2	3-4
Suction	4	0-1	2	3-4

Adapted from Carvalhares and Corrêa[13]

This study was approved by the Research Ethics Committee–CEP-HUUFMA, in accordance with the duties defined in CNS Resolution No. 466/2012, under opinions No. 2,341,252 on October 20, 2017, and No. 2,673,595 on May 24, 2018. All mothers signed the Free and Informed Consent Form for their participation and that of their infants in the study.

For descriptive analysis, qualitative variables (maternal age group, maternal skin color, maternal education, maternal employment, marital status, child's sex, and child's skin color) were described as percentages in the tables. The Shapiro-Wilk test was used to assess the normality of the quantitative variables. Quantitative variables with normal distribution (birth weight and birth length) were described as mean and standard deviation.

The ANOVA test was used to analyze the association between the classification of breastfeeding observation and growth velocity in the first six months of the infant's life. The level of significance adopted was 5%.

RESULTS

Table 1 shows the evaluation of 101 pairs of nursing mothers and infants for whom all data on weight and height were recorded. Regarding the demographic and socioeconomic aspects of the nursing mothers, there was a higher frequency in the 20-34 age group (68.3%), self-reported white skin color (100.0%), with a partner (71.3%), with 12 to 16 years of schooling (80.2%), and who were employed or engaged in some form of work (70.0%).

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Tabela 1. Aspectos demográficos e socioeconômicos das nutrizes de um programa de puericultura de um banco de leite humano. São Luís, MA, 2017-2018.

Variables	n	%
Age		
<19 years	10	9,9
20 to 34 years	69	68,3
≥ 35 years old	22	21,8
Self-reported mother's skin color	101	100,0
White		
Marital status	72	71,3
With partner	29	28,7
No partner		
Years of education	10	9,9
<9	10	9,9
9 to 11	81	80,2
12 to 16		
Works or has some kind of job*	30	30,0
Yes	70	70,0
No	101	100,0

*Sample size <101 due to lack of data

Table 2 shows the characteristics of the infants, with a higher frequency of full-term gestational age (85.2%), male sex (50.5%), non-white skin color (67.3%), and adequate birth weight (62.4%).

Table 2. Characteristics of infants in a childcare program at a human milk bank. São Luís, MA, 2017– –2018 .

Variables	n	%
Gestational age classification		
Moderate preterm	11	10,9
Term	86	85,2
Post-term	4	3,9
Gender		
Male	51	50,5
Female	50	49,5
Color		
Did not respond	3	3,0
White	30	29,7
Non-white	68	67,3

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Birth weight classification		
Adequate weight	63	62,4
Low weight	8	7,9
Insufficient weight	22	21,8
Macrosomia	8	7,9
Total	101	100,0

In Table 3, when evaluating unfavorable observations, it was noted that most of the nursing-infant pairs had a good score (91.09%), indicating a satisfactory start to breastfeeding based on the aspects analyzed. Infants with a fair score represented 7.92% and those with a poor score represented 0.99%. Regarding the observation of the baby's position, a higher frequency of good scores (76.24%) was observed, and when analyzing the fair and poor scores, the frequency of pairs with behaviors suggestive of difficulties in the initiation of breastfeeding was 16.83% and 13.86%, respectively. Within the category of unfavorable observations on latching, there was a higher incidence of good scores (69.31%), while fair and poor scores occurred in 16.83% and 13.86% of cases, respectively. The results regarding unfavorable observations on sucking showed a higher prevalence of good scores (82.18%), while fair and poor scores were 16.83% and 0.99%, respectively.

Table 3. Observation of factors related to infant breastfeeding in a child-care program of a human milk bank. São Luís, MA, 2017–2018.

Variables	n	%
Unfavorable observations		
Good	92	91,09
Fair	8	7,92
Poor	1	0,99
Unfavorable comments about the position		
Good	77	76,24
Fair	16	15,84
Poor	8	7,92
Unfavorable comments about the handle		
Good	70	69,31
Fair	17	16,83
Poor	14	13,86
Unfavorable observations about suction		
Good	83	82,18
Fair	17	16,83
Poor	1	0,99
Total	101	100,0

In Table 4, when analyzing the association between weight gain velocity and breastfeeding assessment regarding unfavorable observations, it was found that, in the first six months of life, infants with scores indicating good performance had higher mean weight gains, while those with scores indicating poor performance had lower means. In the first 30 days, among peers who had a good breastfeeding assessment, represented by a good score, when determining aspects related to unfavorable observations, their infants had a higher average weight gain (36.6±16.4g) compared to those infants who had indications of breastfeeding complications, represented by a poor score (33.3±0.0g). During the first 180 days of the infant's life, the situation repeats itself, with an average weight gain associated with a good breastfeeding assessment of 32.2±9.9g at 90 days, and a poor as-

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sessment corresponding to 25.3±0.0g. In the analyses of breastfeeding assessment according to the baby's position, latch, and sucking, the same growth pattern was observed, where the average weight gain is higher for infants with a score indicative of a good breastfeeding assessment and lower for infants with a score indicative of complications. From 150 days of age onwards, the average daily weight gain of infants classified with good and fair assessment scores is similar, at 27.4±8.3g and 27.0±6.2g, respectively, suggesting that the difficulties encountered during the breastfeeding process were overcome. The same is observed at 180 days of life, where the average daily weight gain for infants classified with a good score is 25.9±5.1g and for those classified with a poor score is 25.1±5.1g.

Tabela 4 – Associação dos scores de velocidade de ganho de peso com a avaliação da mamada dos lactentes acompanhados no Banco de Leite Humano no primeiro semestre de vida. São Luís, MA, 2017 – 2018.

Avaliação da mamada	Média de peso ± DP 30 dias	Média de peso ± DP 60 dias	Média de peso ± DP 90 dias	Média de peso ± DP 120 dias	Média de peso ± DP 150 dias	Média de peso ± DP 180 dias
Observações desfavoráveis						
Bom	36,6±16,4	35,4±9,8	32,2±9,9	30,6±6,4	27,4±8,3	25,9±5,1
Regular	33,7±15,8	30,8±10,8	28,7±8,4	27,8±6,9	27,0±6,2	25,1±5,1
Ruim	33,3±0,0	29,0±0,0	25,3±0,0	21,0±0,0	20,8±0,0	20,4±0,0
P valor	0,873	0,380	0,496	0,184	0,720	0,534
Posição do bebê						
Bom	37,2±17,4	36,1±10,1	32,6±10,3	31,0±6,1	27,6±8,5	26,1±4,8
Regular	33,3±12,7	31,4±7,9	30,2±7,1	28,4±6,3	26,9±5,5	24,7±4,6
Ruim	34,2±10,9	30,9±10,0	28,1±9,0	26,8±9,4	25,3±9,7	24,0±8,4
P valor	0,637	0,104	0,344	0,093	0,736	0,351
Pega do bebê						
Bom	38,1±17,3	35,6±10,6	31,8±10,7	30,3±6,5	27,2±8,9	25,9±5,0
Regular	29,3±12,1	31,8±6,3	30,6±7,2	29,4±6,4	27,0±5,7	24,9±5,0
Ruim	35,7±13,8	35,3±9,3	33,8±7,5	31,0±7,1	28,4±7,1	26,0±6,2
P valor	0,144	0,383	0,661	0,804	0,860	0,791
Sucção do bebê						
Bom	36,8±16,9	35,6±10,1	32,1±10,3	30,5±6,5	28,2±5,4	25,9±4,9
Regular	34,9±13,3	32,0±8,7	31,0±7,1	28,9±6,8	22,8±15,3	24,7±6,3
Ruim	28,0±0,0	36,1±0,0	33,0±0,0	32,8±0,0	31,4±0,0	29,9±0,0
P valor	0,796	0,406	0,917	0,579	0,034	0,497

Table 5 shows the relationship between the rate of length gain and the assessment of infant feeding, with regard to the variable unfavorable observations. Higher average daily length gains were observed in infants with a good score and lower gains in those classified with a poor score, which represents a length gain directly proportional to the positive assessment of feeding. In the first month of life, the average length gain associated with a good score is 4.4±1.7 cm, while that of a poor score corresponds to 3.0±0.0 cm. From the second month of life onwards, the averages for good, fair, and poor scores were similar, corresponding to 3.6±0.9 cm, 3.5±0.9 cm, and 3.3±0.0 cm, respectively, continuing this pattern until the sixth month. On the other hand, it was observed that the relationship between growth and feeding assessment according to the analysis of the baby's position presented a different growth pattern, where initially the average length gain associated with the good score was 4.4±1.7 cm and with the poor score was 4.8±1.6 cm. From the second month of life, the average length of infants categorized with good, fair, and poor scores corresponded to 3.6±0.8 cm, 3.6±1.0 cm, and 3.5±0.6 cm, respectively. When evaluating feeding according to the baby's grip, infants with a good score had an average daily length gain of 4.4±1.6 cm in the first month of life, and those with a score indicative of complications, represented by a poor score, had an average of 3.9±1.5 cm. During the first six months of life, these averages also became equal.

Also in Table 5, in the assessment of feeding according to the baby's sucking, a more significant difference was noted between the average length gains associated with good and poor scores in the first month of life. The average length gain for infants with a good score was 4.3±1.6 cm and for those with a poor score was 2.5±0.0 cm, demonstrating that infants with sucking difficulties had a much lower length gain than those without this difficulty. During the first six months of life, a decrease in the difference between these averages was noted. At three months, the good and poor scores were 3.3±0.5 cm and 3.3±0.0 cm, respectively, demonstrating that the infant's sucking complications were overcome and the average length gains were equalized, with the averages for good, regular, and poor scores were 2.7±0.3 cm, 2.8±0.2 cm, and 2.8±0.0 cm, respectively.

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Tabela 5 – Associação dos scores de velocidade de ganho de comprimento com a avaliação da mamada dos lactentes acompanhados no Banco de Leite Humano no primeiro semestre de vida. São Luís, MA, 2017 – 2018.

Avaliação da mamada	Média de comprimento ± DP Mês 1	Média de comprimento ± DP Mês 2	Média de comprimento ± DP Mês 3	Média de comprimento ± DP Mês 4	Média de comprimento ± DP Mês 5	Média de comprimento ± DP Mês 6
Observações desfavoráveis						
Bom	4,4±1,7	3,6±0,9	3,4±0,5	3,2±0,4	3,0±0,4	2,7±0,3
Regular	4,5±1,5	3,5±0,9	3,4±0,5	3,2±0,4	3,1±0,4	2,8±0,4
Ruim	3,0±0,0	3,3±0,0	3,7±0,0	3,0±0,0	2,8±0,0	2,8±0,0
P valor	0,695	0,877	0,842	0,831	0,447	0,899
Posição do bebê						
Bom	4,4±1,7	3,6±0,8	3,4±0,5	3,2±0,4	3,0±0,3	2,7±0,3
Regular	4,2±1,5	3,6±1,0	3,2±0,5	3,1±0,4	3,1±0,5	2,8±0,3
Ruim	4,8±1,6	3,5±0,6	3,5±0,3	3,2±0,4	2,9±0,4	2,7±0,3
P valor	0,683	0,962	0,310	0,774	0,320	0,600
Pega do bebê						
Bom	4,4±1,6	3,6±0,9	3,7±0,5	3,2±0,4	3,0±0,4	2,7±0,3
Regular	4,7±2,1	3,6±0,9	3,4±0,6	3,3±0,5	3,0±0,5	2,8±0,4
Ruim	3,9±1,5	3,6±0,7	3,5±0,4	3,3±0,4	3,0±0,3	2,8±0,2
P valor	0,416	0,984	0,571	0,392	0,780	0,325
Sucção do bebê						
Bom	4,3±1,6	3,6±0,9	3,3±0,5	3,2±0,4	3,0±0,4	2,7±0,3
Regular	4,7±1,7	3,6±0,8	3,4±0,4	3,2±0,4	3,0±0,3	2,8±0,2
Ruim	2,5±0,0	2,0±0,0	3,3±0,0	3,1±0,0	2,8±0,0	2,8±0,0
P valor	0,333	0,170	0,991	0,912	0,864	0,834

Although a tendency toward faster growth was observed in both weight and length gain in breastfeeding pairs with a good score, no statistically significant difference was found ($p>0.05$).

DISCUSSION

This study showed the predominance of behaviors favorable to breastfeeding and, consequently, greater weight and length gain for these infants with good feeding scores, among the aspects analyzed. In contrast, those who had fair or poor assessments had lower weight and length gains. Although there was no statistical significance, a positive relationship was observed between good breastfeeding assessment and better infant development.

The frequency of initial breastfeeding difficulties in this study was lower than that reported by Carvalhaes et al., who also used the breastfeeding observation form to calculate the frequency of behaviors unfavorable to breastfeeding in women treated at a public maternity hospital. In their study, 50 mother-infant pairs were evaluated, and it was found that 18 to 34% had some difficulty with the initiation of breastfeeding in at least one of the aspects of breastfeeding observed.[13] In the present study, the percentages indicating difficulty among mother/infant pairs, within the observations of factors related to infant feeding, were 7.92% (with a fair score) and 0.92% (with a poor score). This can be attributed to the fact that the feeding observation made by this study was at around one month of age, which may have prevented the early detection of feeding problems, a period when difficulties are usually more common.

Regarding the anthropometric indicators analyzed in this study, the growth rate gradually decreased until the 6th month of life. This behavior reflects the temporal variability in anthropometric parameters that begins with a phase of acceleration followed by deceleration. The deceleration of weight gain, for example, is a natural physiological phenomenon that should not be confused with growth failure, which could lead to the early introduction of complementary foods in healthy children with a good growth rate.[14]

In light of these results, it was observed that even with this decrease in growth velocity, the weight and length gain of the infants monitored was within the expected parameters. The average weight gain per quarter in the first 12 months, expected for full-term newborns (NB) appropriate for gestational age and with weight in the 50th percentile, is 25 to 30 g/day in the first quarter, 20 g/day in the second, 15 g/day in the third, and 10 g/day in the fourth quarter. From birth to the third month of life, there is an increase of 3.5 cm/month in length, 2 cm/month between 4 and 6 months, 1.5 cm/month between 7 and 9 months, and 1.2 cm/month between 10 and 12 months. By the end of the first year of life, the infant should have increased its birth height by 50%.[15]

Regarding the demographic and socioeconomic aspects of nursing mothers, most mothers were between 20 and 34 years old (68.3%), characterizing a young group. It is known that adolescent mothers breastfeed their children less than other mothers and have more difficulty initiating breastfeeding.[16,17] Considering that most mothers were young adults, it is believed that they had an easier time breastfeeding.

In addition, and mong the nursing mothers in the study, 71.3% had partners, which may also have favored breastfeeding. In a study conducted in a state maternity hospital in the midwest region of Brazil, among the aspects mentioned by fathers that fa-

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cilitated their participation in breastfeeding, support for their wives was considered the most important, and the attitudes that favored breastfeeding were predominantly being able to be with their partners during the breastfeeding process and helping them to position the newborn in their arms [18]. According to Oliveira et al., paternal validation and help with breastfeeding makes women feel more confident and secure to continue breastfeeding, as it is a time of great vulnerability, where women experience mood swings and sleep deprivation, and if they do not have their partner's cooperation, early weaning may occur.[19] Thus, it is believed that the presence of the partner may have favored the breastfeeding process.

Another positive factor for breastfeeding is that most of the nursing mothers studied had 12 to 16 years of schooling (80.2%), since an intrinsic relationship between breastfeeding and maternal education has been pointed out in the literature.[20] Women with higher levels of education tend to be more motivated to breastfeed for longer, perhaps because they have greater access to information about the benefits and advantages that breastfeeding provides to both mother and child.[19] It is possible that women with higher levels of education are also more motivated to take care of their breasts during pregnancy and, consequently, women with lower levels of education would have more breast problems in the early stages of breastfeeding.

With regard to the characteristics of the infants, 82.5% were full-term and 62.4% had an adequate birth weight. These data indicate that most babies had physiological characteristics favorable to successful breastfeeding. This statement is based on the fact that the relationship between gestational age and baby weight and breastfeeding occurs because prematurity and low weight cause difficulties in achieving an adequate latch, resulting in problems with the mother's breasts. This difficulty occurs due to neurological and physiological immaturity and difficulty in coordinating sucking, swallowing, and breathing.[21]

In observing the factors related to infant feeding, the present study showed that most mother/baby pairs had good evaluations based on the aspects analyzed. In pairs that presented evaluations indicative of breastfeeding difficulties (fair and poor scores) in the first 30 days of the infants' lives, there were more evident differences in weight and length gain compared to infants with good evaluations.

As observed, these initial difficulties that led to these differences in growth rate were overcome during the first six months of the infants' lives, indicating that the mother/baby pairs continued breastfeeding without further complications. Thus, when associating the feeding assessment with the rate of weight and length gain, it was observed that this success can be attributed to the fact that the demographic and socioeconomic aspects of most mothers were favorable to breastfeeding, as were the characteristics of gestational age and birth weight of the infants.

In the analyses of breastfeeding assessment associated with weight and length gain, according to the baby's latch and sucking, it was observed that the growth pattern showed higher averages for infants with a score indicative of good assessment in the aspects analyzed and lower weight gain for infants with a score indicative of complications and that, as in the breastfeeding assessment, these difficulties were overcome .

In the unfavorable observations on the baby's position, most mothers also had positive evaluations (good score) (76.24%) and adequate weight gain, 16.83% had a regular score, and 13.86% had a poor score. In contrast, as observed, the relationship between length gain and breastfeeding assessment according to the aspect analyzed showed a different growth pattern, where initially the average length gain associated with the good score was 4.4±1.7cm and with the poor score was 4.8±1.6cm. One possible explanation for this is that, in their efforts to promote breastfeeding, mothers do not give up breastfeeding even when experiencing pain and discomfort, continuing to breastfeed their babies with the proper support and advice from a health professional.

In this context, it is necessary for health professionals to be able to advise mothers with good communication skills. These include tools with basic skills useful for successful breastfeeding, such as active listening and encouraging mothers to overcome difficulties, building self-confidence, providing information specific to the problem, and suggesting ways to alleviate difficulties and support nursing mothers in the breastfeeding process.

In this scenario, the importance of the role of the BLH is observed. Studies have already shown that BLHs play an important role in supporting breastfeeding, with positive repercussions for the mother and child.[23] Such maternal strength and support received to overcome these initial challenges can be seen as early as the second month of life, where the average length of infants categorized with good, regular, and poor scores corresponded to 3.6±0.8cm, 3.6±1.0cm, and 3.5±0.6cm, respectively, pointing once again that the difficulties were overcome, leading to a convergence between the average length gains.

Within the category of unfavorable observations on the grip, there was a higher incidence of good scores (69.31%) and adequate weight gains, with fair and poor scores occurring in 16.83% and 13.86% of cases, respectively. Associating these scores with length gain, as already observed, in-

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fants with a good score had an average daily length gain of 4.4±1.6 cm in the first month of life, and those with a score indicative of complications, represented by a poor score, had an average of 3.9±1.5 cm.

Classically, the most prevalent problems with the puerperal breast, i.e., breast engorgement and nipple lesions, are attributed to inadequate breastfeeding position and/or latching of the baby to the breast. In a case-control study conducted with women admitted to a university hospital in the state of São Paulo, in pairs where the children showed a twisted neck, chin away from the breast, and lower lip turned inward, there was a 1.9 times, 2.9 times, and 4.2 times greater chance of nipple trauma during breastfeeding, respectively, compared to pairs without these characteristics.[25] Such difficulties lead to complications in breastfeeding and, consequently, compromise infant growth .

With regard to infant sucking, the results referring to unfavorable observations on sucking showed a higher prevalence of good scores (82.18%) and, consequently, adequate weight gain, while the assessments of fair and poor scores, as seen, were 16.83% and 0.99%, respectively. When associating the assessment of infant sucking with length gain, a more significant difference was noted between the means of the good and poor scores in the first month of life. The average length of infants with a good score was 4.3±1.6cm and that of infants with a poor score was 2.5±0.0cm, demonstrating that infants with sucking difficulties had lower length gain than those without this difficulty.

This significant difference in length gain among these infants can be explained by the dynamics of sucking and extracting breast milk, which, when done correctly, facilitates breast emptying and leads to adequate breast milk production. Inadequate breastfeeding technique contributes to several difficulties in breastfeeding, such as nipple injuries, nipple infections, mastitis, decreased milk production, and consequent inadequate weight and length gain in the baby.[26] The concentration of fat in milk increases during a feeding, so the milk at the end of the feeding (called hindmilk) is richer in energy (calories) and better satisfies the child, hence the importance of the child emptying the breast well with proper suction. [27]

The results presented in this study, regarding the incidence of factors related to breastfeeding difficulties, were also lower than those found in the study by Mosele et al., who also applied the UNICEF assessment protocol. Their research showed, based on the analysis of 152 mother-infant pairs hospitalized in shared accommodation, that 55% of the pairs had at least one difficulty in breastfeeding, the main difficulties being: "mother with tense shoulders and leaning over the baby," "baby does not maintain the areola grip," "breast tissue with abrasions, nipple lesions, or redness," and "sucking: mouth almost closed, forming a forward pout, lower lip turned inward, baby's tongue not visible, and tense or sunken cheeks."[28]

These results highlight the importance of using the breastfeeding assessment form to help identify problems with breastfeeding technique, especially those related to improper latching and sucking, the baby's response to breast contact, and breast problems. Thus, this validated and easy-to-use tool serves as a way to assist in health education and care provided at the BLH, suggesting to professionals, based on a score, the necessary focus in counseling and clinical management regarding breastfeeding, minimizing risks for early weaning.[29]

It is believed that there was no statistically significant difference due to the fact that the group of nursing mothers/infants analyzed was homogeneous and without a predominance of factors associated with breastfeeding difficulties. The study has the limitation of the difficulty of comparing the data analyzed with studies in the literature, since there were no studies with the same objective as this one.

However, this study is longitudinal, has a considerable sample size, uses the breastfeeding observation form recommended by UNICEF, and appears to be pioneering in relating breastfeeding observation to infant growth in the first six months of life. This brings to light a topic of great importance for the development of more public policies focused on maternal and child health and interventions in the problems involved in the breastfeeding process.

CONCLUSION

Based on the analyses performed in this study, a high prevalence of favorable breastfeeding outcomes was found. Among peers with fair and poor scores, it was observed that initial difficulties were overcome and their average weight and length gains were close to the average scores for good.

Guidance on the benefits of breast milk for the mother-child dyad and the disadvantages of stopping breastfeeding are necessary to increase the duration of breastfeeding, as well as being of great importance for maternal education on the subject. Recent research highlights the importance of health team engagement in monitoring breastfeeding practices. It is also essential to train professionals to properly guide mothers, correcting mistakes and offering techniques for solving breastfeeding problems.

This study shows that the use of a breastfeeding technique assessment tool, such as the form proposed by UNICEF, promotes the proper management of the breastfeeding process. The assessment of the breastfeeding

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technique of the mother/baby pair in the hospital environment can allow for the early identification of difficulties, which enables the establishment of interventions that can reduce obstacles and prolong the duration of exclusive breastfeeding.

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