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Perceptions of Breastfeeding in Mothers of Babies Born Preterm in Comparison to Mothers of Full-Term Babies

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The purpose of the present study was: a) to describe the theme of verbalizations about breastfeeding in mothers' pre-term (M-PT) and full-term (M-FT) infants; b) to examine the association between these themes and mother's anxiety and depression indicators and socio-demographic characteristics and, neonatal characteristics of the infants. The sample consisted of 50 M-PT and 25 M-FT. The mothers were assessed through State-Trait Anxiety Inventory and Beck Depression Inventory and were interviewed using a Guide focusing breastfeeding issues. The M-PT group had significantly more mothers with clinical symptom of anxiety than the M-FT group. The M-PT reported more uncertainties and worries about breastfeeding and figured out more obstacles for the successful breastfeeding than the M-FT. These reports were associated positively with the infants' risk neonatal status; lower birth-weight, higher neonatal clinical risk, and more length time stay in NICU were associated with more mothers' worries and seeing obstacles for breastfeeding. In conclusion, the strategies to enhance the breastfeeding rate in the preterm population have to take into account the mothers' psychological status and their ideas in addition to offering information about the advantages of breastfeeding for child development.
Keywords: breastfeeding, anxiety, depression, preterm infant.

La presente investigación pretende: (a) ahondar en el tema de las verbalizaciones sobre amamantamiento en madres de niños prematuros y no prematuros; (b) evaluar la relación entre amamantamiento e indicadores de ansiedad y depresión en las madres, así como características socio-demográficas y neonatales de los niños. En el estudio participaron 50 madres de niños prematuros y 25 madres de niños llegados a término. Como herramientas de evaluación se utilizaron el Inventario Ansiedad-Rasgo y el Inventario de depresión de Beck; asimismo, se entrevistó a las madres siguiendo una guía específica para el tema del amamantamiento. Los resultados sugieren que las madres con más síntomas de ansiedad fueron las del grupo de bebés prematuros. Quienes, además, mostraron mayor inseguridad, preocupación y esperaban encontrar más obstculos para desarrollar con éxito el amamantamiento que las madres de niños llegados a término. Estos informes se relacionaron con riesgo neonatal en los niños. Por otra parte, factores como bajo peso al nacer, alto riesgo clínico al nacer, y estancias más largas en la UCI neonatal, se relacionaron con un mayor número de madres preocupadas y que preveían más obstáculos para el amamantamiento. En conclusión, las estrategias para aumentar la tasa de amamantamiento en madres de niños prematuros deben considerar el estado psicológico de las madres, sus ideas sobre el mismo, y ofrecer más información sobre las ventajas del amamantamiento en el desarrollo infantil.
Palabras clave: amamantamiento, ansiedad, depresión, bebés prematuros.

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Breast milk is composed of a unique nutritional combination and provides unquestionable benefits with regard to immunological, psychological and economic aspects (Nascimento & Issler, 2004). Since the 1980s, the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) have invested in a series of programmatic activities for the implementation of breastfeeding (Lamounier, 1996; Rea, 1998). Between 1996 and 1997, the American Academy of Pediatrics instituted a work group on breast feeding to assess the scientific evidence on the subject (Rea, 1998). The final report from this task force was based on scientific evidence, which highlighted the advantages of breast feeding and human mother's milk for the health, growth, and development of the child, as well as the benefits of breast feeding for the mother's health. From this report, the American Academy of Pediatrics began recommending that pediatricians and other health professionals support and promote conditions for breast feeding.

In the early 1990's in a meeting organized by WHO and UNICEF, a strategy called the "Baby-Friendly Hospital Initiative" (BFHI) was conceived, which was subsequently implemented in several countries with the goal of supporting, encouraging, and protecting the practice of breastfeeding (Lamounier, 1996). The implementation of this initiative significantly increased the rate of breast feeding in Brazilian hospitals (Lamounier, 1996; Caldeira & Gonçalves, 2007).

Direct and indirect contributions of breast milk were observed in the neurobehavioral and cognitive development in the children, especially in vulnerable, preterm infants with low birth weight (Anderson, Johnstone, & Remley, 1999; Feldman & Eidelman, 2003; Lucas, Morley, & Cole**,** 1998; Lucas, Morley, Cole, Lister, & Leeson-Payne, 1992; Pinelli, Saigal, & Atkinson, 2003; Vohr et al., 2006;) in mother-infant interaction (Feldman & Eidelman, 2003). While the baby is hospitalized and the mother cannot assume complete care of the child, maintaining milk production can bring greater satisfaction to the mother, so that she does not feel excluded, minimizing her insecurities, and allowing her to participate more in contributing to the care of the baby (Miracle, Meier, & Bennett, 2004). Thus, for preterm infants with low birth weight, the recommendation for breast feeding is based on evidence of the immunological properties of the mother's milk, in its role in gastrointestinal maturation, and strengthening of the mother/child bond, in addition to contributions to better neurobehavioral performance (Camelo Jr. & Martinez, 2005; Nascimento & Issler, 2004).

Despite evidence of the advantages of breast feeding for the development of premature babies, and for the mother's own wellbeing, low rates of breast feeding are found with babies who are hospitalized in the Neonatal Intensive Care Unit, after discharge from the hospital (Chaves, Lamounier, & César, 2007; Furman, Minich, & Hack, 1998; Nascimento & Issler, 2004; Xavier, Jorge, & Gonçalves, 1991). In the same hospital in which this study was conducted, the persistence of low rates of breast feeding was observed between prematurely born infants with birth weight below 1700 g, with more than half (60%) already being weaned in their first post-discharge consultation (Rocha, Martinez, & Jorge, 2002).

Many mothers want to and plan to breast feed their babies, however, the premature birth with low birth weight can cause complications in the establishment and maintenance of effective lactation for some mothers (Schanler, Hurst, & Lau, 1999). A study conducted in Malaysia showed that most mothers of infants with low birth weight (92%) interviewed a week prior to the infant's discharge had planned to breast feed their babies in the prenatal period. However, less than half of such mothers (45%) effectively breast fed, either exclusively or in combination with other methods (Boo & Goh, 1999). Another study indicated that, of 39 mothers of infants with low birth weight that chose to express milk, 19 were doing so at the time of the baby's discharge, and only 8 successfully transitioned to breast feeding (Furman et al., 1998).

On the other hand, some mother chose to use formula to feed their babies from the beginning. According to a study conducted in 2004, the main reasons behind such a decision were the fear of pain and discomfort, and fear of changes in the daily routine due to breast feeding and, largely, the lack of a model or ignorance of persons who had breastfed. However, the mothers changed their decisions, due to interaction between external and internal factors, such as, the provision of individualized guidance on the nutritional superiority of breast milk, and the perception of the vulnerability of the baby, for whom their milk would be a protective factor. This, they developed a sense of personal responsibility due to such guidance (Miracle et al., 2004).

In mothers of infants born full-term, socio-demographic factors, such as educational level (Boo & Goh, 1999), the mother's age (Espy & Senn, 2003; Furman et al., 1998) and marital status (Furman et al., 1998), seem to be associated with the success or failure of breast feeding. Among the factors particular to premature births with low birth weight that may influence breastfeeding are the specific clinical conditions for the infant, and, consequently, precocity or lateness of beginning enteral feeding of the child (Boo & Goh, 1999; Furman et al., 1998). Other factors that may hinder breastfeeding of premature infants include: prolonged separation of the baby and mother due to lengthy hospitalization, apprehension over qualitative and quantitative inadequacy of breast milk, maternal anxiety over the clinical condition and prognosis for the baby, maternal insecurity in providing care, impatience with breastfeeding, and misinformation and unpreparedness in the mothers (Schanler et al., 1999). Additionally, several physical and structural factors may be obstacles to the effectiveness of implementing breastfeeding, such as the lack of a private location reserved for mothers to express milk in high risk neonatal units (Nascimento & Issler, 2004). The mother's intention to breastfeed their child may influence the success or failure of exclusively breastfeeding for a prolonged period (Chaves et al., 2007).

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However, the success of breastfeeding appears to be a complex, and multidimensional process, resulting in mutual satisfaction for the mother and the baby's needs (Leff, Gagne, & Jefferis, 1994), and subject to the influence of several factors (Faleiros, Trezza, & Carandina, 2006; Giugliani et al., 1992; Procianoy, Fernandes Filho, Lázaro, & Sartori, 1982; Thome, Alder, & Ramel, 2006; Xavier et al., 1991).

Few studies, however, are found in the literature on maternal conceptions and expectations regarding breastfeeding, especially in regard to mothers of premature babies, and those that make possible to focus largely on the period after the infant's release from the hospital (Kavanaugh, Mead, Meier, & Mangurten, 1995; Kavanaugh, Meier, Zimmermann, & Mead, 1997). This period is characterized by a decrease in maternal anxiety (Padovani, Linhares, Carvalho, Duarte, & Martinez, 2004; Zanardo & Freato, 2001), due to the infant's survival and clinical improvement, and by the mother's active participation in the baby's care, which increases their self-esteem and security, and strengthens their bond with their baby. To date, maternal perceptions and expectations regarding breastfeeding and breast milk in mothers of preterm children, during the period of hospitalization, have not been thoroughly studied.

The purpose of this study was: (a) To characterize verbal content expressed by mothers of preterm infants with low birth weight, regarding breastfeeding, during the period of the infant's hospitalization, and that of mothers of infants born at full-term; (b) To examine the relationships between such content and verbal, maternal reports, and indicators of maternal anxiety and depression, maternal socio-demographic data, and the neonatal characteristics of the infants.

Method

Participants

The sample for this study was composed of 75 mothers, divided into two groups. The *Preterm (PT) Group* included 50 mothers of infants born preterm (< 37 weeks from gestational age) with low birth weight (1500 gs at birth). The *Full-term (FT) Group* was composed of 25 mothers of infants carried to term, with birth weight equal to or greater than 2500 gs.

The PT Group was formed by selection according to inclusion criteria, from 90 eligible participants in a sample of 167 births, occurring within the data collection period (April 2001 to May 2002). The 90 mothers were all mothers of preterm infants, whose babies were hospitalized in the Neonatal Intensive Care Unit (NICU) and the Neonatal Intermediate Care Unit at the Hospital of Clinics of the Faculty of Medicine at Ribeirão Preto, University of São Paulo (HCFMRP-USP). Twenty-nine mothers (32%) were excluded from this sample, due to: psychiatric antecedents (n = 6), illiteracy (n = 4), HIV positive (n = 1), postpartum clinical complications (n = 1), or stillbirth (n = 17). Of the remaining 61 mothers, 11 chose not to participate in the study. The final sample for the *PT Group*, however, was composed of 50 mothers interviewed during hospitalization of the baby.

The *FT Group*, in turn, was formed from an initial sample of 52 mothers, who gave birth in the Airport Complex Maternity Ward in the period from April 2002 to October 2004, 2 (4%) of which were excluded for having psychiatric antecedents. Of the 50 eligible mothers, 25 (48%) refused to participate in the study, stating that they did not have the time, or were not interested. As such, the final sample for the *FT Group* was composed of 25 mothers.

Location and Context of the Study

The study was conducted in the Hospital of Clinics (HCFMRP-USP), and in the Maternity Ward of the Airport Complex, MATER, both university hospitals in Ribeirão Preto, SP, Brazil. The HCFMRP-USP is a university hospital, affiliated with the Faculty of Medicine of Ribeirão Preto, University of São Paulo, and tertiary, being an important hospital for Ribeirão Preto and the surrounding region for high risk and highly complex cases.

At the HCFMRP-USP, during the hospitalization of the baby, the mothers of the preterm infants with low birth weight received routine care from the medical staff at the Neonatal Intensive Care Unit (NICU), and the Neonatal Intermediary Care Unit, composed of physicians, nurses, psychologists, social workers, speech therapists, and physical therapists. The interventions conducted by the psychologists contracted followed a routine minimum protocol, which included: (a) visit with the mother monitored by NICU psychologists, for the purpose of helping to strengthen the mother-baby bond, focusing on encouraging breastfeeding and baby care; (b) psychological support group for the mothers; (c) psychological support in the communication of the diagnosis or medical intervention between the mother and the medical team.

After release from the hospital, the mother and infant are invited to participate in the "Longitudinal Follow-up Program for Preterm Infants with Low Birth Weight", in which the babies are monitored by a psychologist (follow-up) to assess their development, and to continue providing guidance to the mothers. This program is routinely offered in the hospital in question, in the Pediatric Psychology Department, linked to the Neonatal Pediatrics Department of the HCFMRP-USP.

The MATER, in turn, is a philanthropic maternity ward, with an agreement with the Faculty of Medicine at Ribeirão Preto, USP and with the Ribeirão Preto School at Nursing, USP. This maternity ward focuses on low risk pregnancies and deliveries. As part of routine care protocols at MATER,

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mothers and babies are cared for by nurses in a puerperal consultation held between the 10th and 15th days following birth, in which they are given guidance on breastfeeding, baby care and family planning.

Instruments and Measures

- *Interview* Guide (Carvalho, 2005). The interview guide included questions on the perceptions, expectations, concerns, and doubts that the mothers had about breastfeeding, using seven questions: *"What do you think about the quality of breast milk?"; "And your milk?"; "What does breastfeeding mean to you?"; "What are the positive points that help you to breastfeed your baby?"; "What are the negative points that hold you back?"; "What are your expectations in relation to breastfeeding?"; "What concerns and doubts do you have in regard to breastfeeding your child?"*. In addition to these questions about breastfeeding, the guide included questions about the sample's socio-demographic data.
- *Structured Clinical Interview for DSM III – R - SCID/Non-patient* (Spitzer, Williams, Gibbon, & First, 1989, translated to Portuguese (Brazil) by Del Ben, Personal communication, December 10, 1995) – in order to identify mothers with psychiatric history and exclude them from the final sample.
- *STAI - State Trait Anxiety Index* (Spielberger, Gorsuch, & Lushene, 1970; Brazilian version by Biaggio & Natalício, 1979), to assess situational and trait anxiety.
- *BDI - Beck's Depression Inventory* (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961; translated and adapted for Brazil by Cunha, 2001), to assess dysphoria or depression.
- *Infants' medical records*, for collection of the following data on the baby's neonatal risk factors: birth weight (grams), gestational age (weeks), and length of hospitalization in the NICU. The Clinical Infant Risk for Babies (CRIB) (Cockburn et al., 1993), the Apgar score at 5 minutes, and ratings linking birth weight and gestational age were also used to assess the intensity of neonatal risk. The CRIB is a scale composed of six items (birth, gestational age, deformity, blood acidosis, minimal and maximal oxygenation), from which is generated a score, the cut off point being a score of 6 points, meaning, scores of six or more points are indicative of greater neonatal risk with prognosis of mortality or morbidity.

Procedure

Data collection

This is a cross-sectional study. After approval from the Research Ethics Committee at HCFMRP-USP, and signing of the free and clear consent from the participants, the SCID/Non-Patient was applied in order to identify mothers with psychiatric history, who were excluded from this study. Then, the evaluation of emotional indicators for anxiety and depression was administered with psychometric scales (STAI and BDI), and the interviews were conducted with the mothers in both groups, individually. For the *PT Group* the evaluation of indicators for anxiety and depression and the interview were conducted in two sessions, during the infant's hospitalization at HCFMRP-USP. For the *FT Group*, then, the evaluation of indicators for anxiety and depression and the interview were conducted in one session, between the 10th and the 15th day of the baby's life. The interviews for both groups followed the interview script and were audio recorded. Finally, specifically in the *PT Group*, a documentary analysis of the babies' medical records was executed in order to collect information regarding the gender of the baby and the neonatal conditions.

Data analysis

Primarily, after correction of the tests for anxiety and depression, symptoms were identified at the clinical level, using the following criteria: a) The cut-off score on the STAI was equal to or greater than the 75th percentile; b) in the BDI, suggested criteria for non-diagnosed patients, being > 15 for dysphoria, and > 20 for depression (Gorenstein & Andrade, 2000).

Then, analysis was conducted of the socio-demographic data, and the indicators for maternal anxiety and depression in the two groups were compared (PT *vs*. AT). For this analysis, the Mann-Whitney Test was used for two independent samples for the continuous numeric variables, and the Chi-Squared test and the Fisher's Exact Test for the categorical variables.

The Quantitative-Interpretative system for analysis of data, proposed by Biasoli-Alves (1998), was adopted for analysis of the content of the interview. Initially, literal transcriptions of the verbal responses to the interview questions from each of the mothers in the *PT Group* and the *FT Group* were made. Next, we developed a system for analysis of the mother's statements, using the following steps: (a) definition of the analysis units, considering thematic sections representative of the mother's responses to the interview questions; (b) identification of the content in the verb units, considering the principal keywords representative of the expressed verbal content; (c) grouping of keywords with content in order to form cohesive thematic categories that share similar content; (d) revision of the groupings made by two other researchers, both familiar with the mothers' statements; (e) definition of examples of thematic categories and subcategories. The category system created is described in Figure 1.

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CATEGORIES	SUB-CATEGORIES	DEFINITION	SUB-TYPES
Expectations of breastfeeding	Positive Expectations	Refers to mother's expectations that assign a positive value to breastfeeding, justified specifically or not	Specific • Acceptance of breastfeeding by the baby • Quantity / quality of breast milk • Desire to breastfeed Generic
	Negative Expectation	Refers to mother's expectations that attribute a negative value to breastfeeding, stated specifically or not	Specific • Expression of refusal to breastfeed • Limited availability to breastfeed Generic
	Conflicting Expectations	Refers to mother's expectations that exhibit ambivalence towards breastfeeding	
	No expectations	Does not express expectations in response to the question	
Perceptions of breastfeeding	Positive Conception	Refers to the manner in which the mothers perceives and understands, attributing a positive aspect to breastfeeding and breast milk.	Specific • Healthy growth and development of the baby • Nutritional quality of milk • Mother-infant bond • Maternal emotion • Practicality and economy Generic
	Negative Perception	Refers to the manner in which the mothers perceives and understands, attributing a negative aspect to breastfeeding and breast milk.	
	Conflicting Perception	Refers to the manner in which the mother perceives and understands, attributing ambivalent values to breastfeeding.	
	Ignorance	Refers to the mother's ignorance on the subject approached in the question	
Description of breastfeeding		Refers to the statements relative to the description of breastfeeding, focusing on the quantity and quality of their milk, and/or current or prior experience with breastfeeding.	• Focused on quantity • Focused on quality • Focused on the experience of breastfeeding

Figure 1. System of categories and subcategories of maternal verbal content.

Identification of factors that influence breastfeeding	Factors that Help	Refers to identification of the factors that influence breastfeeding, helping performance thereof	• Emotional well-being / maturity / positive thinking • Baby's behavioral characteristics • Appropriate nutritional/alimentary behaviors • Effort / responsibility / maternal desire • Positive feelings towards the baby • Psychosocial support / Environmental Resources • Thinking of the child's health and development • Nonspecific • Doubt or ignorance • Lack of helping aspects
	Factors that Interfere/Hinder	Refers to identification of factors that influence breastfeeding, hinder the performance thereof	• Lack of psychosocial support / environmental resources • Baby's behavioral characteristics • Unrelated comments • Inadequate nutritional/alimentary behaviors • Emotional stress • Lack of interest or desire • Negative feelings towards the baby • Breastfeeding problems with the breast / milk / proper way to breastfeed • Employment outside the home • Drowsiness / fatigue • Doubt or ignorance • Absence of hindering aspects
Concerns and Questions about Breastfeeding	Information / knowledge about breastfeeding	Refers to the absence of questions and concerns about breastfeeding due to clarifications or guidance received.	• Received guidance
	Concerns about breastfeeding	Refers to identification of concerns or questions in regards to: a) milk drying up, running out, or being insufficient; b) the baby's acceptance or adaptation to breastfeeding; c) the type of breast milk substitute and the baby's acceptance of this formula; d) to maternal care of the baby in relation to breastfeeding; e) the aesthetics of the breasts	• Milk drying up / running out / being insufficient • Baby's acceptance / adaptation to breastfeeding • Breast milk substitute (formula) • Maternal care of the baby in relation to breastfeeding
	Absence of questions and/or concerns	Refers to the absence of questions and concerns regarding breastfeeding	
Other and Unrelated			

Figure 1 (cont.). System of categories and subcategories of maternal verbal content.

Then, we established a reliability index between evaluators, using the data from the interviews of the 20 mothers, which came to 27% of the sample. Each verbal unit was categorized by two independent evaluators, familiar with the categorization system, and, then, they were checked for agreement between the evaluators. We obtained the reliability index between evaluators using the following formula: agreement/agreement + disagreement X 100, the result obtained being 96%.

We conducted quantitative and descriptive analysis of the data collected, by applying the categorization system, in terms of frequency and percentage in the content of the mother's statements. The frequency of each category or subcategory corresponded to the number of times that particular elements were expressed by the mothers. The percentage for each category was calculated dividing the total frequency of the mother's statements in the category by the total frequency of statements expressed during the interview, multiplied by 100. The percentage for each subcategory was calculated dividing the frequency of the statements referring to a specific subcategory by the total frequency of maternal statements of the corresponding category, multiplied by 100.

Finally, a Spearman correlation test was conducted for each group of participants between the categories of expressed verbal content and the following maternal variables: STAI score (State-Anxiety and Trace-Anxiety subscales), BDI score, age, years of education, number of children, marital status, and employment outside the home. In the *PT Group*, in addition to these relationships, the correlations between the categories of expressed verbal content and the following variables for the neonatal baby were assessed: gender, birth weight, gestational age, duration of hospitalization in the NICU, Apgar score at 5 minutes, and clinical, neonatal risk index.

The *Statistical Package for Social Sciences* (SPSS) version 12.0 was used for statistical treatment of the data. The significance level used for this study was 5% ($p \leq .05$).

Results

Characteristics of the sample

In Table 1, the *PT* and *FT Groups* were checked for significant differences in regards to the mother's sociodemographic characteristics, or to determine if the groups were comparable between themselves. Both groups were composed of young mothers, with ages around 20 years, with median educational level of elementary school (1st to 8th grade), in the majority, and with a stable marriage or relationship. Most of the mothers stayed at home and were not gainfully employed outside the home. The majority of those who did work outside the home worked at blue collar professions. Most of the mothers in both groups were first time mothers, and, thus, the number of children was low.

In relation to the maternal emotional indicators, the incidence of mothers in the *PT Group* that had scores indicative of clinical symptoms of anxiety of the state type was significantly greater than in the *FT Group*. A tendency was noted, as well, towards higher incidence of scores indicative of clinical symptoms of depression in the *PT Group* compared to the *FT Group*. There was no significant difference between the two groups in relation to the incidence of mothers with scores indicative of anxiety-trait at a clinical level.

Table 2 shows that the average gestational age of the babies in the *PT Groups* was 31 weeks, with an average birth weight of 1,114 grams. The evaluation in the first hours of

Table 1
Socio-demographic characteristics and clinical emotional symptoms of anxiety (State- and Trait-Anxiety), dysphoria and depression in the PT Group and the FT Group

Sociodemographic characteristics	PT Group (n = 50)	FT Group (n = 25)	p-Value
Age (years)[1] - median (minimum value - maximum value)	23 (14 – 43)	21 (16 – 29)	0.26
Education (years)[1] - median (minimum value - maximum value)	8 (1 – 12)	9 (4 – 12)	0.28
Employed[2] - frequency (percentage)	20 (40%)	9 (36%)	0.74
Occupational level[1] [4] - median (minimum value - maximum value)	1 (1 – 3)	2 (1 – 4)	0.28
Single mothers [2] - Frequency (percentage)	13 (26%)	6 (24%)	0.85
First time mothers[2] - frequency (percentage)	30 (60%)	17 (68%)	0.50
Number of children[1] - median (minimum value - maximum value)	1 (1 – 5)	1 (1 – 4)	0.56
Emotional symptoms at the clinical level			
State Anxiety (STAI) [2] - Frequency (percentage)	16 (32%)	1 (4%)	0.006**
Trait Anxiety (STAI) [3] - Frequency (percentage)	7 (14%)	4 (16%)	1.00
Dysphoria (BDI) [3] - Frequency (percentage)	5 (10%)	2 (8%)	1.00
Depression (BDI) [3] - Frequency (percentage)	7 (14%)	0 (0)	0.09

Note [1] Mann-Whitney Test. [2] Chi Square Test. [3] Fisher's Exact Test. [4] Classification according to Soares and Fernandes (1989): 1= Non-qualified; 2= Low qualifications; 3= Average qualification; 4= Upper-Middle Qualification. ** $p \leq .01$

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Table 2
Characteristics of preterm babies with very low birth weight (PT Group)

Neonatal characteristics of the babies	PT Group (*n* =50)
Gestational age (weeks) - average (standard deviation)	31 (± 2)
Birth weight (grams) - average (standard deviation)	1,114 (± 246)
Appropriateness for gestational age (SGA) - frequency (percentage)	39 (78%)
Apgar at 5th minute (score) – median (range)	9 (5 – 10)
Neonatal clinical risk index [CRIB] (score) – median (range)	2 (0 – 9)
Duration of interment in NICU (days) - median (range)	13.5 (0 – 92)
Total duration of hospitalization (days) - median (range)	53 (20 – 146)
Chronological age of the babies at the time of evaluation (days) - median (range)	24 (3 – 55)

Note. SGA= Small for gestational age

life showed that the median for Apgar scores in the 5th minute was high (9 points) and the median score on the CRIB was low (2 points), indicating low clinical risk conditions for mortality and morbidity and a good prognosis in their clinical development. On the other hand, the median time of internment in the NITU (13.5 days) and total time that the baby was hospitalized (53 days), were high, which indicates that their clinical development, after the first hours, required intensive care with procedures to ensure their survival.

The mother's statements regarding breastfeeding

Table 3 shows, in order of occurrence, the frequency and percentage of occurrence of the categories and subcategories of content of the mother's statements regarding breastfeeding in the *PT* and *FT Groups*. Additional data will be included in the comments about the data in the table, in terms of the proportion, presented in parenthesis, of the subcategories and respective examples of maternal statements, in order to specify and illustrate the various categories found.

According to Table 3, the most frequent statements in both groups were related to the interview script questions, which related, essentially, to the perceptions and expectations regarding breastfeeding and identification of the factors that encouraged or discouraged it. In addition to these kinds of statement, in the two groups, statements were also observed relating to descriptions of breastfeeding and related to concerns or questions about breastfeeding and nutrition.

Table 3
Categories and subcategories of maternal verbal content in the PT and FT Groups - frequency (f) and percentage (%)

Categories and subcategories of maternal verbal content	PT (*n* = 50)		FT (*n* = 25)	
	f	%	f	%
Perceptions of breastfeeding	**181**	**27**	**85**	**31**
Positive Maternal *Perception*	143	79	68	80
Negative Maternal *Perception*	31	17	10	12
Ignorance	5	3	1	1
Conflicting Maternal *Perception*	2	1	6	7
Identification of factors that influence breastfeeding	**151**	**23**	**67**	**24**
Factors that *Interfere/Hinder*	79	52	31	46
Factors that *Help*	72	48	36	54
Expectations on breastfeeding	**120**	**18**	**44**	**16**
Positive Maternal *Expectation*	115	96	43	98
Negative Maternal *Expectation*	4	3	0	0
Conflicting Maternal *Expectations*	0	0	1	2
No expectations	1	1	0	0
Description of breastfeeding	**104**	**16**	**45**	**16**
Concerns and questions about breastfeeding	**63**	**9**	**26**	**9**
Other	**45**	**7**	**10**	**4**
TOTAL	**664**	**100**	**277**	**100**

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Below, we present additional data referring to the subcategories relative to the categories, perceptions, expectations, and descriptions, which were similar in both groups. Both, in the *PT* and the *FT Group*, there was a predominance of positive perceptions of maternal breast milk and breastfeeding, especially non-specific concepts related to the generic quality of milk and of breastfeeding (*PT* = 36%; *FT Group* = 29%), as in the following statements: *"Ah, I think breast milk is awesome, isn't it?!" (PT 4)* and *"I think that breastfeeding is the most beautiful thing!" (PT 8).* A high frequency of specific, positive perceptions of breastfeeding and breast milk were also observed in relation to the baby's healthy growth and development (*PT Group* = 13%; *FT Group* = 18%), for example: *"Because every baby that I know, until now, was breast fed, I never saw one sick like that... It's always a health baby!" (PT 24).*

Mother's expectations in both groups were predominately positive in relation to intentions to breastfeed (*PT Group* = 49%; *FT Group* = 75%). In both groups, this kind of statement is followed by positive maternal expectations related to the quantity or quality of breast milk (*PT Group* = 18%; *FT Group* = 12%), as in the statement: *"Ah, I wish I had more milk, you know?! So I wouldn't have to give him other milk." (FT 12).*

As for the descriptions, both groups predominately expressed statements on the quantity of their own milk (*PT Group* = 52%; *FT Group* = 38%), as in this example: "*Ah, in respect to my milk, I think, well, you know, that... If I don't... My milk, I think it's not enough, you know?! But, the doctor said, no, that's it's not too little, that it's because she didn't begin to feed yet, you know?!" (PT 1).* In the *PT Group*, the descriptions focused on the quantity of the milk were followed by descriptions of the quality of their own milk (31%), while in the *FT Group,* they were followed by descriptions focused on the experience of breastfeeding (31%). Considering that the mother's statements in the *PT* and *FT Groups* were different in terms of the factors that influenced breastfeeding, and, in regards to the concerns and questions about milk production and breastfeeding, the results referring to these categories are detailed below.

Table 4
Subcategories of maternal verbal content relating to the category Identification of Factors Influencing Breastfeeding in groups PT and FT - frequency (f) and percentage (%)

Factors influencing breastfeeding	PT (n = 50)		FT (n = 25)	
	f	%	f	%
Factors that Interfere/Hinder	**79**	**52**	**31**	**46**
Emotional stress	26	18	3	4
Breastfeeding problems with the breast / milk / proper way to breastfeed	14	9	11	17
Absence of hindering aspects	9	6	8	12
Lack of interest or desire	7	5	0	0
Lack of maturity / negative thinking	5	3	0	0
Lack of psychosocial support / environmental resources	5	3	0	0
Comments from other	3	2	0	0
Inadequate nutritional/alimentary behaviors	3	2	0	0
Baby's behavioral characteristics	2	1	0	0
Ignorance	2	1	0	0
Employment outside the home	2	1	6	9
Negative feelings towards the baby	1	1	0	0
Drowsiness / fatigue	0	0	3	4
Factors that Help	**72**	**48**	**36**	**54**
Appropriate nutritional/alimentary behaviors	15	10	3	4
Emotional well-being / maturity / positive thinking	12	8	5	8
Effort / responsibility / maternal desire	11	7	9	14
Positive feelings towards the baby	10	7	4	6
Psychosocial support / Environmental Resources	9	6	6	9
Baby's behavioral characteristics	5	3	3	4
Ignorance	3	2	4	6
Nonspecific	3	2	0	0
Thinking of the child's health and development	2	1	2	3
No employment outside the home	1	1	0	0
Lack of helping aspects	1	1	0	0
TOTAL	**151**	**100**	**67**	**100**

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Table 4 displays the frequency and percentage of the occurrence of the subcategories of content in the mother's statement referring to the category of Identification of Factors that Influenced Breastfeeding in the *PT* and *FT Groups*. This table showed that in the *PT Group* there was a predominance of statements on factors that interfered with breastfeeding, while in the *FT Group* factors that helped were more prominent. Among the various aspects that hindered breastfeeding identified by the *PT Group*, the statements referred predominately to emotional stress, such as in: *"Ah, if you get really nervous, you know?! They say it's not good, you know, when we're breastfeeding, you pass on the anxiety. They say it dries the milk up. So, it's not very good!" (PT 1)*. Contrarily, in the *FT Group* statements referring to the identification of problems in breastfeeding were predominant, such as those referring to the breast, describing pain when the baby suckles, issues with the milk, or the proper way to breastfeed. The following example refers to this type of statement: *"It's just that little bit of pain...! The pain in the nipple" (FT 1)*.

In reference to the aspects that helped breastfeeding, the *PT Group* largely referred to appropriate feeding behaviors and nutrition, such as in the statement: *"Ah, to eat well, you know?! Vitamins... Uh, the doctor explained enough to me, that I would have to eat enough vegetables and fruit, you know?! And, now, he said I have to drink plenty of water in order to give enough milk!" (PT 11)*. In the *FT Group*, in turn, the effort, responsibility, and maternal willingness were the most cited.

Table 5 shows the frequency and percentage of occurrence of the subcategories of content from the mothers' statements referring to the category of Concerns and Questions about breastfeeding in the *PT* and *FT Groups*.

In the *PT Group*, the mothers expressed more concerns and doubts in relation to breastfeeding than in the *FT Group*, especially in regards to the breast milk drying up, running out, or being insufficient to satisfy the baby, such as in: *"Well, since he's to tiny, you know, I keep thinking: 'Do you suppose it filled his little tummy? Is he going to need more milk like that, without it being mine? A supplement' That's what I keep wondering, if my milk is going to be enough" (PT 25)*. In the *PT Group*, as well, the mothers expressed concerns and doubts about the baby's acceptance of and adaptation to the milk, about substitutes to mother's milk, if it's not sufficient, and in relation to maternal care of the baby.

In the *FT Group*, the vast majority (85%) of the mothers reported not having doubts or concerns about breastfeeding, or said that they had received information and guidance on the subject (11%). Only one mother in the *FT Group* expressed worry about the breast milk drying up, running out, or being insufficient to satisfy the baby.

Table 6 presents the statistically significant Spearman correlation coefficients between the verbal content categories that were different between the groups of mothers of preterm babies, and those born full-term ("Identification of factors that influence milk production and breastfeeding" and "Concerns and doubts about breastfeeding") and, respectively, the maternal variables in the *PT* and *FT Groups* and the neonatal variables in the babies in the *PT Group*.

According to the data in Table 6, in the *PT Group*, the older the mothers, the greater the proportion of statements expressing questions and concerns. On the other hand, there was an association between the age and marital status of the mother and an absence of questions and concerns about breastfeeding; younger mothers and single mothers expressed more of this type of statement. Regarding the associations between the mother's statements and the neonatal characteristics of the babies, the data showed that the lower the baby's birth weight, the greater the neonatal, clinical risk index, and the longer the baby is hospitalized in the NICU, the greater the proportion of statements about factors that interfere with breastfeeding. Simultaneously, it was observed that the greater the neonatal, clinical risk index,

Table 5
Subcategories of maternal verbal content, and concerns regarding the category Questions and Concerns about breastfeeding in the PT and FT groups - frequency (f) and percentage (%)

Concerns and questions about breastfeeding	PT (n = 50)		FT (n = 25)	
	f	%	f	%
Absence of concerns and questions	**26**	**41**	**22**	**85**
Information / knowledge about breastfeeding	**8**	**13**	**3**	**11**
Received guidance	8	13	3	11
Concerns about breastfeeding / lactation (Related to…)	**29**	**46**	**1**	**4**
milk drying / running out / be insufficient	20	32	1	4
the baby's acceptance and adaptation to breastfeeding	6	9	0	0
breast milk substitute	2	3	0	0
maternal care of the baby	1	2	0	0
TOTAL	**63**	**100**	**26**	**100**

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Table 6
Spearman correlation coefficients (r) between the categories of verbal content and the maternal and neonatal variables, respectively, in the PT Group

Categories of verbal content	Maternal/infant variables	*r*	*p*-Value
	Maternal variables		
Questions and concerns about Breastfeeding	– Age	.33	.02
Absence of Concerns and Questions about Breastfeeding	– Age	–.28	.05
	– Marital Status	–.29	.04
	Infant variables		
Identification of Factors That Affect Breastfeeding	– Weight at birth	–.33	.02
	– Length of stay in NICU	.37	.01
	– CRIB score	.36	.01
Concerns and Questions about Breastfeeding	– CRIB score	.39	.01

the greater the proportion of statements expressing concerns and questions about breastfeeding.

In the *FT Group,* no statistically significant correlations were verified between the mothers' statements about factors that influenced milk production and breastfeeding and concerns and questions about breastfeeding and the maternal characteristics analyzed.

Discussion

The results of the present study showed that, despite positive perceptions and expectations in both groups towards breastfeeding, the mothers of premature babies expressed more doubts and concerns, while mothers of babies carried to term reported more factors that interfered with maternal milk production.

Both mothers of preterm babies with low birth weight, and mothers of babies carried to full term, were aware of the importance of breastfeeding. Despite this knowledge, many could not explain it, expressing so in their nonspecific, positive perceptions. In addition to positively evaluating breastfeeding and breast milk, the mothers of both groups expressed a desire to breastfeed the baby, a result similar to findings from a study conducted by Goh and Boo (1999), in which 92% of mothers had planned to breastfeed their babies in the prenatal period. In this study, only two mothers of preterm infants expressed refusal to breastfeed or limited willingness to do so, which is not the case of mothers of babies born full-term. One could assume that the attention of the mothers of the premature infants was more focused, during the baby's hospitalization, on the baby's survival and clinical improvement than on breastfeeding, itself.

In addition to the desire to breastfeed, the mothers also demonstrated positive expectations in relation to the quantity and quality of mother's milk, or, they expressed a desire to produce enough milk, and for it to be sufficient and adequate for their babies. The mothers of premature infants also displayed positive expectations in regards to acceptance of breastfeeding by the baby, since most of these mothers, due to the premature birth and hospitalization of the baby, had not yet started breastfeeding. These positive maternal perceptions and expectations about breastfeeding, in part, reflect the health team's exhaustive investment in guidance and encouragement of breastfeeding, verified in the hospitals in which the study was conducted, being Baby Friendly Hospitals. It is possible that these mothers had incorporated the ideas conveyed about the importance of breastfeeding, and felt the need and desire to breastfeed, even if they did not clearly understand the benefits of breastfeeding. Thus, they often fail to precisely explain the importance of breastfeeding and breast milk.

In the present study, the mothers of babies born full-term were, in fact, breastfeeding their babies, while the majority of the mothers of the premature babies, due to the premature birth and hospitalization of the baby, had not yet begun breastfeeding. Therefore, since most mothers in both groups were first time mothers, many of the mothers in the PT Group had never experienced breastfeeding before, and their perceptions were based on related idealizations and assumptions.

On the contrary, in a study conducted by Kavanaugh et al. (1997), 20 mothers were interviewed a month after their babies were released from the NICU, and, of these 20, 17 were breastfeeding at the time of the interview, although 10 mothers had already breastfed previously. Despite the efforts and sacrifices associated with breastfeeding the premature baby, identified by the mothers, the opportunity to breastfeed was evaluated as a rewarding experience. These mothers not only assess the experience of breastfeeding as positive, but specified its principle advantages. The specificities of the responses in that study,

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unlike this current study, may be related to the fact that the interview was conducted after the baby was released from the hospital, when several mothers were already breastfeeding, and the fact that some of them had already had experience with breastfeeding.

On the other hand, despite both groups showing positive perceptions and expectations in relation to breastfeeding, the mothers of premature babies identified more factors that hindered the initiation and maintenance of breastfeeding, and showed more doubts and concerns in relation thereto. These results appear to reflect distinct maternal experiences in relation to breastfeeding, arising from the premature birth of the baby and consequent hospitalization in the NICU. The premature babies with low birth weight were hospitalized at the time of the interview. Most of these mothers were not yet breastfeeding, and not actively participating fully in the care of their babies. Breastfeeding may be influenced by the biological immaturity and consequent physiological limitations of a premature baby (Boo & Goh, 1999; Espy & Senn, 2003; Furman et al., 1998; Rocha et al., 2002; Serra & Scocchi, 2004; Xavier et al., 1991), fears and anxieties due to the premature baby's fragility, and the anxiety inducing environment of the NICU (Serra & Scocchi, 2004), and prolonged separation of the mother and baby caused by the long period of hospitalization (Schandler et al., 1999). The later initiation of breastfeeding, in turn, has been shown to be associated to less time breastfeeding (Chaves et al., 2007).

In fact, the baby's vulnerability at birth appears to permeate stories of mothers of premature babies, in agreement with the results in relation to the verified associations. According to these results, the lower the baby's birth weight, the greater the neonatal, clinical risk factor, and the longer the duration of the baby's hospitalization in the NICU, the greater the proportion of statements about the factors that interfere with the mothers of premature babies breastfeeding. The greater the baby's clinical, neonatal risk index, and, therefore, the greater the neonatal gravity, the higher the rate of concerns and doubts about breastfeeding.

The mothers of premature babies, unlike the mothers of babies born full-term, and specifically in relation to the factors that interfere with breastfeeding, predominately reported emotional stress, which may reflect the emotional state of these mothers, who showed higher levels of situational anxiety arising form the baby's premature birth and concern over their improvement and survival. Emotional factors may influence a mother's decision to breastfeed, even in the case of term births (Procianoy et al., 1982; Thome et al., 2006; Xavier et al., 1991), and a premature birth appears to add emotional difficulties that hinder mothers from effectively breastfeeding (Serra & Scocchi, 2004; Xavier et al., 1991).

As such, it may be expected for mothers with higher depression and anxiety indexes to report emotional stress more frequently as a factor that hinders breastfeeding. However, no significant associations were observed between the mothers' statements and the anxiety and depression levels in mothers of preterm babies with low birth weight, in this study. A study was conducted with 196 mothers of babies born with low birth weight, for the purpose of assessing whether mothers who initially choose to feed their babies with formula are different in terms of stress and anxiety levels from those who planned to breastfeed their babies. The results showed that the mothers' stress and anxiety levels were similar during their babies' hospitalization, and that the decline in the anxiety state occurred regardless of the mothers' choices regarding feeding of their babies. The authors concluded that this decline may reflect the emotional adjustment expected for a premature birth (Sisk, Lovelady, Dillard, & Gruber, 2006).

The most frequent doubts and concerns that mothers of preterm babies with low birth weight related were in reference to the baby's acceptance of and adaptation to the feeding. These results are similar to those described by Kavanaugh et al. (1995), who observed that the main concern of the mothers of preterm infants in the post-discharge period were related to the consumption of an adequate volume of milk during feeding, by the baby, which implies a synchronicity between the mother's milk production and the baby suckling correctly. In the present study, however, these two aspects are in distinct subcategories.

In agreement with a review of the literature on the factors that can influence a mother's decision to breastfeed, the duration of breastfeeding, and the principal reasons for weaning; these concerns are not unique to mothers of premature babies. Although mothers generally express the notion of the advantages in breastfeeding, the "lack of milk", the "insufficient milk", mammary problems, and the baby's refusal to take the nipple are all indicated as relevant problems in continuing to breast feed (Faleiros et al., 2006). In a study on the practice of breastfeeding in children under two years of age, attending public and charity child care facilities in the City of São Paulo, among the most cited reasons for weaning are the child's rejection of the breast milk and "milk drying up" (Fuente, Klava, Ribeiro, & Taddei, 2006).

Unexpectedly, in the present study, the older mothers of premature babies, likely more experienced with breastfeeding, have expressed more worries and doubts about breastfeeding. These results seem to contradict the literature, in which the younger maternal age has been associated with shorter duration of breastfeeding and breastfeeding failure, in the situation of premature birth (Espy & Senn, 2003), as well as in the case of full-term births (Clark et al., 2007; Faleiros et al., 2006). According to observations from Porter and Sobong (1990), the youngest mothers may feel less competent, due to their inexperience, and less prepared to be care for their babies when they take them home. However, the findings from this study

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may be supported by those from a study with mothers of preterm babies with birth weight under 2500 gs., in which many mothers were observed to present the same difficulties in relation to breastfeeding with more than one child, especially those related to psychological factors, such as a lack of maternal confidence in breastfeeding, and low self-esteem (Giugliani et al., 1992).

One may speculate, thus, that the older mothers, who have likely had other children, and, therefore, more experience in child care, would be more attentive to the particularities in relation to breastfeeding of a premature infant, which would cause them to have more questions and concerns in relation to breastfeeding. The younger, less experienced mothers, on the other hand, had few questions in relation to breastfeeding due to not having begun the process of breastfeeding their babies. One might suppose, consequently, that when the mothers begin to breastfeed, questions will arise from real difficulties they then encounter.

It was also noted that single mothers of premature babies in this study expressed having few questions or concerns in relation to breastfeeding. However, the literature indicates that the marital status and support of a husband are positively associated with the duration of breastfeeding (Faleiros et al., 2006; Furman et al., 1998; Giugliani et al., 1992).

The findings from this study suggest the need for special attention to mothers of preterm infants in relation to guidance and encouragement to breastfeed, considering the short- and long-term benefits thereof (Alfaya & Schermann, 2005). In addition to the widely recognized immunological, psychological and economic advantages in breastfeeding (Camelo Jr. & Martinez, 2005; Nascimento & Issler, 2004), among the care necessary for the health and growth of premature babies with low birth weight, provision of breast milk, even if initially administered artificially, has proven effective, easily available, inexpensive, and free from additional risks (Miracle et al., 2004). Moreover, considering that the mothers of premature babies seem less sensitive to their babies' signals, not capable of perceiving, interpreting, and responding appropriately to their needs, breastfeeding appears to facilitate the establishment of favorable maternal sensitivity (Alfaya & Schermann, 2005), and, consequently, contributing to interaction and the establishment of a mother-baby bond (Feldman & Eidelman, 2003).

Encouragement to breastfeed premature babies with low birth weight requires, however, adaptation to the conditions found from a clinical standpoint, as well as evaluation of the emotional aspects for the mothers and their perceptions of breastfeeding. The incentive to breastfeed provided to mothers of babies with low birth weight appears to increase their rate of lactation and breastfeeding, without adding stress and anxiety that these mothers have already demonstrated (Sisk et al., 2006; Santoro Jr. & Martinez, 2007).

According to the findings of the present study, it is necessary to identify these mothers' specific perceptions, expectations, questions, and concerns. Encouraging the establishment and continuation of lactation by manual milking, the mother's emotions should be considered in so far as these mothers are in a psychologically vulnerable situation. The health team must look for the words and phrases used in the guidance provided to mothers of premature babies with low birth weight regarding breastfeeding, so that they do not feel coerced or guilty in their decision making (Miracle et al., 2004). Information should be shared with the mother in a respectful manner, including, simultaneously, provision of information based on scientific evidence and free from value judgments.

An informative stage must be included in measures intended to encourage mothers to begin and continue breastfeeding, however, without losing sight of the need for psychological support intervention for the mothers. It is not enough for the rate of breastfeeding of premature babies to increase; It's imperative to conduct activities intended to prevent early weaning in the first few months of life. The study by Clark et al. (2007) shows the impact of the mother's will on the breastfeeding of the babies; the shorter period of exclusively breastfeeding occurred in mothers who expressed intentions, at the maternity ward, to breastfeed their babies for less than two years.

The findings from the current study must be understood in light of the context of the hospitals that have policies and strategies for guidance and encouragement for breastfeeding by the nursing staff, according to a 10 step protocol from the Baby Friendly Hospital.

Some limitations of this study should also be pointed out. First, it is necessary to highlight the difference in sample size between the PT and FT Groups, due to difficulty in finding mothers of full-term infants willing to participate in the study. Second, the fact that data collection for the FT Group was conducted after the mother and baby were discharged from the hospital, further hindering the mothers' continued participation in the study, constituted a second limiting factor for this study. However, the context of the full-term birth gives a different meaning upon release from the hospital, not having in itself, an aspect of improvement of the preterm baby's adverse clinical condition. Additionally, considering that most of the mothers in the PT Group were evaluated after the first 15 days of the baby's life, the assessment of the FT Group mothers, within the first 15 days of the baby's life, may be considered precocious and comparable to the assessment of the PT Group.

In addition to the aspects already mentioned in this study, it was not possible to collect data from the FT Group in the same hospital as the PT Group. However, both hospitals, located in the same city, were coordinated by the same health team, and follow the same protocols, minimizing the differences between the groups, in relation to these aspects. As such, despite the data collection for the PT and FT Groups having been conducted in different hospitals, the homogeneity of the characteristics of the context of the health care offered to the mothers should be considered.

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Analysis of the mothers' perceptions and expectations regarding breastfeeding would be necessary after the clinical improvement of the preterm babies with low birth weight, and their subsequent discharge, when their mothers would have the actual option of breastfeeding them. The cross-sectional study conducted does not allow conclusion in this respect, future studies being necessary. However, the question of whether there are differences in the statements from mothers on breastfeeding between the hospitalization period and after discharge still remains to be investigated.

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