INFANT FEEDING AND FACTORS RELATED TO BREASTFEEDING

ALIMENTAÇÃO DOS LACTENTES E FATORES RELACIONADOS AO ALEITAMENTO MATERNO

ALIMENTACIÓN DE LOS LACTANTES Y FACTORES RELACIONADOS CON LA LACTANCIA MATerna

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This study aimed to investigate the feeding and the factors related to breastfeeding of infants in the city of Picos-PI, Brazil. This is a descriptive cross-sectional study conducted in four Family Health Units, in April-May 2011, with 90 children under 12 months, whose mothers attended the units to vaccinate them. We used a form to obtain socioeconomic data of the family and the child and data on the food offered. The rates of exclusive breastfeeding and predominant breastfeeding were 57.8% and 47.8% respectively, and exclusive breastfeeding had a median duration of 1 month. The duration of exclusive breastfeeding presented a statistically significant (p<0.05) and positive association with: having been breastfed in the first hour of birth, maternal age, and mother’s level of education. We concluded that the feeding practices studied were inappropriate for children under one year.

Descriptors: Feeding; Infant; Nursing; Breast Feeding.

The objective was to investigate the lactation and the factors related to lactation in the mother of lactants in Picos-PI, Brazil. The study was descriptive and transversal, carried out with 90 children aged 12 months, whose mothers attended the units to vaccinate them, and who used a form to collect data about socioeconomic data of the family and of the child and data on the food offered. The rates of exclusive breastfeeding and predominant breastfeeding were 57.8% and 47.8% respectively, and exclusive breastfeeding had a median duration of 1 month. We presented a relation statistically significant (p<0.05) and positive association with: duration of breastfeeding exclusive, mother’s level of education, and age of the child at the time of breastfeeding. We concluded that the feeding practices studied were inappropriate for children under one year.

Descriptors: Alimentation; Lactate; Nursing; Breast Milking.

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INTRODUCTION

Healthy eating for infants can provide them a proper growth and development. Breast milk is the appropriate food for children under six months, for it offers protection against many common diseases in the first year of life and meets all the nutritional needs of the child. After six months, other foods should be offered to infants and is recommended to maintain breastfeeding up to two years of age.

Breastfeeding is the ideal food for the growth and development of children and recommended as exclusive food until the sixth month of life, being complemented with the introduction of other foods over time up to two years of age or older. With that, we meet the nutritional, immunological and psychological needs of the newborn, being extremely important for child survival\(^4\).

According to the Pan American Health Organization (PAHO), exclusive breastfeeding (EBF) reduces infant mortality caused by common childhood illnesses such as diarrhea and pneumonia, besides helping their recovery. Children breastfed have a satisfactory weight gain from birth to six months of life. Additionally, breast milk has no cost and does not offer any risk of contamination by bacteria, such as may occur in bottle feeding and formula milk\(^1\).

According to the World Health Organization (WHO), in 2010, only 34.8% of children up to six months of life worldwide were exclusively breastfed\(^2\). As reported by a study conducted by the Ministry of Health (MH), 41% of children under six months were exclusively breastfed, and among the regions of Brazil, the Northeast presented the worst situation in exclusive breastfeeding (37.0%). From 1999 to 2008, the prevalence of breastfeeding in children aged from 9 to 12 months went from 39.3% to 59.1% in the Northeast, representing a significant increase, however still well below the recommended\(^3\).

With regard to complementary feeding (CF), it consists of the feeding when other foods or liquids are offered to the child, in addition to breast milk\(^4\). Complementary foods consist of any food other than breast milk offered to the breastfed child\(^5\). Many are the benefits of timely introducing complementary feeding, which ideally should not begin before six months of life, since early introduction of such foods can negatively affect the infant’s health, such as risk for obesity and future cardiovascular diseases\(^6\).

Therefore, we highlight the nursing professional who participates in the promotion of healthy eating for infants, since they are responsible for teaching mothers about the importance of breastfeeding, from prenatal to postpartum, as well as inform about the correct introduction of complementary foods during childcare.

The relevance of this study lies on the need to know the factors that contribute to early weaning and the food given to infants. The results are important for establishing strategies to encourage healthy eating for children under one year and reduce rates of early weaning.

This study aimed to investigate the eating and factors related to breastfeeding of infants in the city of Picos-PI, Brazil.

METHOD

A descriptive cross-sectional study conducted in four Family Health Units (FHU) in the city of Picos-PI, Brazil, located in the districts of Junco, São Vicente, Malvinas and Centro. These units have vaccination room, which justifies a greater flow of infants.

To calculate the sample size, we used the formula for cross-sectional studies with finite population\(^7\). As parameters, we established the confidence coefficient of 95% (1.96), the sampling error of 10%, and a population of 1,231 children living in the city of Picos in 2009\(^8\). The proportion of the phenomenon considered was 50%, since we did not find a study that presented proportion related to the topic under study (p=0.5). Based on the formula, we found 90 children, which we
divided equally between those units that have vaccination room and selected consecutively with mothers who attended FHUs during the period of data collection. As inclusion criteria, we used children under 12 months accompanied by their mothers at the time of vaccination.

Data collection happened from April to May 2011 in the FHUs in pre-scheduled times by contacting the staff of the Family Health Strategy (FHS) and using the form for information on infant feeding. The instrument, with 27 items, contained information about the type of delivery, number of prenatal consultations, child’s gender, age of mother and child, anthropometric data, and food offered to the child since birth, besides socioeconomic data of the child’s family.

To construct the database, we used the Excel for Windows and, for statistical analysis, the SPSS version 17.0. Data analysis happened through descriptive and inferential statistics. We calculated the Kolmogorov-Smirnov test to assess the normality of the data. To correlate the categorical variables with the numerical, we used the Mann-Whitney test. To verify the correlation between two numerical variables, we calculated the Spearman’s Rho correlation coefficient test, since data showed an asymmetric distribution. In all tests, we applied the statistical significance value of p<0.05.

The Research Ethics Committee of the Universidade Federal do Piauí, in accordance with the precepts of Resolution 196/96 of the National Health Council (NHC), approved the research project under protocol No. 0468.0.045.000-11. For children of mothers under 18 years old, the person responsible signed the consent form.

### RESULTS

Initially, we present the results on the socio-demographic characteristics of children and their mothers, and then data on infant feeding.

<table>
<thead>
<tr>
<th>Variables</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paid activity</td>
<td>18</td>
<td>20.0</td>
</tr>
<tr>
<td>Housewife</td>
<td>72</td>
<td>80.0</td>
</tr>
<tr>
<td>Type of delivery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vaginal</td>
<td>21</td>
<td>23.3</td>
</tr>
<tr>
<td>Caesarean section</td>
<td>69</td>
<td>76.7</td>
</tr>
<tr>
<td>Prenatal consultations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 6 months</td>
<td>16</td>
<td>17.8</td>
</tr>
<tr>
<td>Six or more</td>
<td>74</td>
<td>82.2</td>
</tr>
<tr>
<td>Mother’s guidance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Importance of breastfeeding</td>
<td>84</td>
<td>93.3</td>
</tr>
<tr>
<td>Importance of complementary feeding</td>
<td>65</td>
<td>72.2</td>
</tr>
<tr>
<td>Child’s gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>49</td>
<td>54.4</td>
</tr>
<tr>
<td>Male</td>
<td>41</td>
<td>45.6</td>
</tr>
<tr>
<td>Family income</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean (US$)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mother’s age</td>
<td>0.328</td>
<td>24.76</td>
</tr>
<tr>
<td>Mother’s years of education</td>
<td>0.072</td>
<td>10.13</td>
</tr>
<tr>
<td>Family income (US$)</td>
<td>0.000</td>
<td>369.0</td>
</tr>
<tr>
<td>Child’s age (months)</td>
<td>0.069</td>
<td>5.67</td>
</tr>
<tr>
<td>Current weight (gr)</td>
<td>0.817</td>
<td>7.580.83</td>
</tr>
<tr>
<td>Current height (cm)</td>
<td>0.365</td>
<td>63.80</td>
</tr>
<tr>
<td>Birth weight (gr)</td>
<td>0.069</td>
<td>3.285.05</td>
</tr>
<tr>
<td>Height at birth (cm)</td>
<td>0.029</td>
<td>49.10</td>
</tr>
</tbody>
</table>

KS – Kolmogorov-Smirnov test. *Interquartile range (IQR). **R$545.00 (US$ 1.00 = R$ 2.35) n=90

In Table 1, there was a prevalence of homemaker mothers, with cesarean section, who performed six prenatal consultations, and received guidance from a health professional about the importance of breastfeeding and complementary feeding.

The mean age of mothers was 24.7 years (+6.2) with 10.13 years of education (+3.3). There was prevalence of female children, average age of 5.7 months (+3.55), with values ranging from 1 to 12 months. The current average weight was 7,580g (+2,359.24) and height of 63.8cm (+8.40). The average birth weight was 3,285g (+438.32) and average height at birth was 49 cm (+2.98).
According to Table 2, the majority of children were exclusively breastfed and almost half were predominantly breastfed. EBF had an average duration of 1 month. Regarding the use of pacifiers, feeding bottles and nipples, most mothers said their children had used at least one of them. As regards to the beginning of complementary feeding, it was prevalent with less than four months of age.

Table 3 - Association between duration of exclusive breastfeeding and age at introduction of complementary feeding with the variables of the first day of the child’s life. Picos, PI, Brazil, 2011

<table>
<thead>
<tr>
<th>Variables</th>
<th>Breastfed in the first hour of life</th>
<th>Average posts</th>
<th>P value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration of EBF</td>
<td>Yes</td>
<td>73</td>
<td>48.09</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>17</td>
<td>34.38</td>
</tr>
<tr>
<td>Age at CF**</td>
<td>Yes</td>
<td>73</td>
<td>46.55</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>17</td>
<td>41.00</td>
</tr>
<tr>
<td>Variables</td>
<td>Water in the first day of life</td>
<td>n</td>
<td>Average posts</td>
</tr>
<tr>
<td>Duration of EBF</td>
<td>Yes</td>
<td>4</td>
<td>19.00</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>86</td>
<td>46.73</td>
</tr>
<tr>
<td>Age at CF</td>
<td>Yes</td>
<td>4</td>
<td>52.75</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>86</td>
<td>45.16</td>
</tr>
</tbody>
</table>

*Mann-Whitney test; **Age at CF: age at beginning of complementary feeding. n=90

There was an 81.1% prevalence of children breastfed in the first hour of life. On the first day of life, mothers offered liquids such as tea, water and non-maternal milk. We verified a statistically significant association (p=0.043) between children breastfed in the first hour of life and time of EBF, showing that this group had longer duration of EBF (Table 3). Children who received water on the first day of life presented shorter duration of EBF (p=0.035).
According to Table 4, we found a positive and significant association, that the higher the mother’s age and education level, the greater duration of EBF. Furthermore, there was a significant positive association between age of introduction of complementary foods and current weight and height of children.

Table 5 lists the foods given to children before and after six months of age. Before six months, the most consumed liquid foods were water, tea, and milk formula. With regard to bland foods, the most consumed were gruel, homemade porridge, and industrialized porridge. The most consumed solid foods were fruits, biscuits, followed by snacks, rice, instant noodles (ramen noodles kind), and noodles. Some children under six months consumed honey.

Regarding the food offered to children from six months of age, the sample size consisted of only 36 children. The most consumed liquid foods were water, fruit juice, and tea. The bland foods were gruel, homemade porridge, and industrialized porridge. The solid foods were fruits, rice and biscuit.
There was correlation between duration of EBF, the age of introduction of complementary feeding, and other variables such as type of delivery, use of pacifiers, nipples or bottle feeding, consumption of non-maternal milk or tea on the first day of life, gender, working mother, and height and weight at birth. Nevertheless, we did not find any statistically significant associations.

**DISCUSSION**

The results enabled to draw a profile of infant feeding in the city of Picos-PI. In the present study, we observed that 57.8% of infants were exclusively breastfed, and this percentage was above the average of Brazil and of Teresina, Piauí’s capital, with 41.0% and 43.7%, respectively, among children under six months according to the National Survey conducted by the Ministry of Health in 2008. Additionally, we found that the average duration of exclusive breastfeeding was one month, therefore much lower than recommended by the MH³.

The values found are similar to a study conducted in Araçatuba-SP, Brazil, where indicators of EBF were also lower than recommended. From 0 to 30 days of life, 75.5% infants were exclusively breastfed, in the fourth month this proportion falls to 45.1%, and in the sixth month to only 22.2%¹⁰. The increase of obesity in infants results from early and incorrect weaning caused by dietary errors during the first year of life, especially in urban populations that stop breastfeeding and replace it with excessive supply of carbohydrates in quantities greater than necessary for their growth and development¹¹.

Data from this study showed that health professionals guided the majority of mothers (93.3%) about the importance of breastfeeding and yet the rates of exclusive breastfeeding and duration are lower than expected.

The median monthly family income of the interviewees was US$ 231.91 (US$ 1.00 = R$ 2.35), the minimum wage in the period. This value was below the national average monthly income of US$ 470.64 and below the average monthly income of Piauí, of US$ 268.08¹². In this research, we did not find any statistically significant association between this indicator and the duration of EBF and age at beginning of complementary feeding.

Nonetheless, a research conducted in Votuporanga-SP showed that the average duration of EBF was 3.9 months among infants whose families earned less than one minimum wage and 5.3 months in families with incomes greater than ten minimum wages¹⁰, and usually mothers with higher incomes have higher schooling. A study conducted in São José dos Calves-SP found different results, where the rate of early weaning was 37.9% among children whose mothers earned less than one minimum wage and 57.1% among those who earned more than two minimum wages¹³. EBF is essential especially for low-income families, since breast milk does not bring any additional cost to the family budget, as well as provides greater immunity to infants, preventing diseases and avoiding potential costs of hospitalization and medication.

Studies show that the use of pacifiers and bottles can negatively influence breastfeeding, as well as offer contamination risks to infants¹¹,¹³. The results of this study showed that the majority of children (61.1%) had used at least one of these items. A study related the use of pacifiers to early weaning and concluded that there was no association between these variables, since 52.4% of children in early weaning did not use pacifiers and 47.6% were using them¹¹.

Most mothers (72.2%) reported receiving guidance on complementary feeding, and yet we still observed inadequate feeding practices. Regarding the age at onset of complementary feeding, a small share of the children (13.3%) started this practice at six months of age, however 54.4% of the children started complementary feeding before six months.
Mother’s age and level of education are characteristics often associated with early weaning and for this reason deserve increased attention. The average age of mothers was 24.76 years, ranging from 15 to 41, and the higher the mother’s age, longer the duration of EBF. The literature shows that, although there was no significant association between maternal age and type of infant feeding in the fourth month of life \( (p=0.6272) \), no child of mothers under 20 years old was in EBF\(^{14}\).

According to a study conducted in Volta Redonda-RJ, among the infants over six months, the breast milk offer to the children of adolescent mothers was significantly lower than among children of adult women, 49.2% and 66.0%, respectively. Also according to the study, there was an increased use of pacifier among children of adolescent mothers\(^{15}\).

Regarding the mother’s level of education, they had on average 10.13 years \( (\pm 3.3359) \) of education, which corresponds to incomplete high school, with a significant correlation \( (p=0.014) \) between this indicator and the duration of EBF, the greater the level of maternal education, the longer the duration of EBF. With respect to this variable, another study found that mothers with higher schooling are more likely to exclusively breastfeed their children\(^{16}\). Thus corroborating the findings of this study.

We noticed that liquid foods were offered to infants on their first day of life, especially tea (11.1%), water (4.4%) and non-maternal milk (3.3%). An investigation in Cuiabá-MT observed a consumption greater than 20% of water and teas right after birth\(^{16}\). The study also showed that children who receive these liquids on the first day of life have a lower duration of EBF. Scientific findings suggest that early weaning probably happens, among other reasons, due to the introduction of water, milk powder, and teas\(^{17}\).

Furthermore, we identified that many foods were offered to infants under six months, including sugary food like chocolate milk, yogurt, biscuit and honey. Instant noodles were also offered, which besides the low nutritional value contains too much salt, not being recommended for infants. According to the results of a research conducted in Guarapuava-PR, in the first month of life of breastfed children, 2.9% received water, 20% sugar water, 8.6% tea, 1.4% fruit juice, and 15.7% artificial milk\(^{18}\).

A research conducted in Campinas-SP observed that the introduction of complementary foods was inadequate, because they offered treats and other inappropriate foods to the children’s diet. The study results show that infants were already receiving liquids, especially water and tea, in the first month of life. Treats with sugar and honey were introduced before 10 months of life, while snacks, sweets and candies were introduced at one year of age\(^{17}\).

The results of this study showed that the most frequent food consumed by six month old infants or older, were water (100%), fruit juice (86.1%), fruits (86.1%), rice (80.5%), biscuit (77.7%), tea (75.0%), gruel (72.2%), homemade porridge (72.2%) and noodles (72.2%). Many of the foods offered to infants should be avoided, such as instant noodles (55.5%), snacks (36.1%), soft drinks (19.4%), honey (16.6%) and coffee (13.8%). The Ministry of Health recommends not offering sugar, sweets, chocolates, soft drinks and fries to children under ten months\(^{19}\).

One element that is often present in the context of ineffective breastfeeding and relates to excessive weight gain in infants is the use of artificial milk formulas. Early cessation of breastfeeding at the expense of adopting artificial feeding increases the energy consumption in children by 15% to 20% when compared to that of exclusively breastfed children\(^{20}\).

**CONCLUSION**

This study enabled us to investigate the infant feeding and the factors related to breastfeeding in the city of Picos-PI. The results of this research showed
inadequate feeding practices in children under one year, among them: early offering of complementary feeding, offering food supply of low nutritional value and unfit for their age. Furthermore, there was unsatisfactory duration of EBF in the children surveyed.

Another important fact was that most mothers reported receiving guidance from a health professional about the importance of breastfeeding and complementary feeding, and yet we observed many inadequate practices related to infant feeding, especially early offering of complementary foods. Based on the data obtained in this study, it is necessary that health professionals review the way to advise mothers about breastfeeding and complementary feeding.

COLLABORATIONS

Araújo NL contributed to conception of the study, data collection, analysis and interpretation, and writing of the article. Lima LHO contributed to conception of the study, analysis and interpretation of data, writing of the article and final approval of the version to be published. Oliveira EAR, Duailibe FT and Formiga LMF contributed to the writing of the article and final approval of the version to be published. Carvalho ES contributed to data collection, analysis and interpretation, and writing of the article.

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