



## Influence of the type of breastfeeding in the growth and morbidity of children up to 6 months of age

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### ABSTRACT

Breastfeeding is a process that has repercussions on the nutritional status of the child, and their ability to defend themselves against infections, as well as their growth. Taking into account the parameters of growth assessment of children such as age-appropriate weight and morbidity was intended with this research, analyse the influence of the type of breastfeeding received up to six months on the growth of children. A descriptive, quantitative study involving 199 mothers and children of both sexes, aged 6 months at the consultation of the healthy child, at CS 1º Maio, between March and April 2014 showed that of the 199 mothers, 100 were exclusively breastfeeding (EBF) and 99 Mixed Breastfeeding (MBF), the mothers were mostly between the ages of 20 and 24 and were mostly domestic. In the bivariate analysis and correlation tests of qui quadrado, a positive association was found for the growth factors, diarrhea occurrence, mothers occupation, mother provenance and HIV status, with the practice of EBF. The study concluded that EBF in the first 6 months remains the best option for growth and protection of diarrhea and that occupation of mothers away from home constitutes a barrier to EBF. The lack of triangulation of some variables in this research may contribute to some confusion bias, which presupposes that more studies on the growth factors of breastfed children should be made.

**KEYWORDS** : Breastfeeding, growth, morbidity

### Introduction

Influence of the type of breastfeeding on the growth and morbidity of children up to 6 months of age Breastfeeding (BF) is the means of nutrition for children through breast milk, which should be practiced from the child's birth to at least 2 years of age (MISAU, 2011). EBF is a type of BF which means not giving the child any other food or drink, not even water, besides breast milk. The World Health Organization (WHO), recommends since 2008, that this should be the means of nutrition for children in the first six months of life, both for developed countries and for developing countries.

In the Cochrane 2012 reports on the optimal duration of EBF, Kramer MS and Kakuma R (2012) after discussions on the optimal duration of AME in which some authors argued that EBF up to 4 months and introduction of liquids and some solids as of the third or fourth month could bring benefits to the children, evidence on this practice was not found. However, in these reviews, the authors showed that EBF during the first six months of life is better because it provides a lower risk of morbidity due to gastrointestinal infections, as well as better growth.

Although they have not found evidence that EBF up to six months is involved in the prevention of certain long-term health changes, such as obesity, lower risk of infections or even cognitive effects, the authors consider that policies UNICEF and WHO in recommending the implementation of the EBF during the first six months for developing countries.

More recent data from Cochrane systematic reviews have also found that there is insufficient evidence to change current recommendations for EBF practice up to six months of life although some studies point to increased resistance to formulas allergies in children in which formulas are introduced as of the fourth month, however, there was no nutritional advantage or less morbidity due to this practice (Smith HA and Becker GE, 2016).

Therefore, there are several studies that establish the association between BF and improvement of children's health status. Caminha Filho, MB, Serva VB, Arruda IG, Figueira JN and Lira PIC (2010), reported in their findings that breastfeeding has repercussions on the nutritional status of children, preventing them from respiratory infections and diarrhea and Still, implications on their cognitive and physical development.

In their review studies, Novaes JF, Lamounier JA, Franceshine SCC and Priore SE (2009) established an association in morbidity patterns in children younger than six months, with the lack of EBF, due to diarrhea, obesity and others. In addition, Augusto and Sousa (2007) reported that in developing countries (where Mozambique appears), EBF establishes significant differences in morbidity and mortality patterns in children by preventing them from diseases of nutritional deficiency and infections.

The BF and EBF up to six months in Mozambique is widely promoted, actions for its increase are also taken into account through education campaigns, promotion and encouragement for the BF for all mothers regardless of their socioeconomic and health status, including HIV/AIDS mothers are being encouraged to practice the EBF. Although there has been no evidence of health education about aspects of breastfeeding among health professionals or other non-health personnel, it is clear to health promoters that education messages on health aspects, and especially on health, should be conducted considering the Intercorrective sociocultural factors in the target population in order to improve women's adherence to BF.

In the context of the Baby Friendly Hospital initiative, early and permanent contact between mother and child for at least 24 hours is one of the fundamental steps to allow a closer relationship between mother and child and is a simple strategy for mothers Without complications of childbirth. However, the effectiveness of the interventions should continue in the focus of the studies in order to find better strategies of action in the promotion of the BF.

Despite all these actions, data from the 2011 Demographic and Health Survey (IDS) point to very low percentages of BF and EBF, varying according to the age of the children.

The IDS (2011) indicates that in Maputo City, BF and EBF rates are the lowest compared to other Provinces. Still disturbing fact is the variation of the practices of the BF and the introduction of complementary foods within the first six months of life.

In the first month of life the rate of EBF is higher, around 58%, this is lowering, between 4-5 months of life there is lower rates of EBF, about 14%. Therefore, the MBF presents a worrying scenario as the age of the children increases, the number of children fed with breast milk supplemented with other foods within the first six months of

life is increasing. Up to the first month of life, they are about 17%, and in the 2-3 months they are about 23% and between the 5-6 months the number is about 51%.

If on the one hand we mention that breastfeeding is a means of nutrition for children in the first months of life and this influences their growth and protection against infections, on the other hand we find low rates of breastfeeding. It is pertinent to study the association between the type of breastfeeding practiced up to six months of life of the children and the growth and morbidity of these children. So that with the results of the research, it is possible to reinforce the arguments and contributions in the redefinition of the local strategies and actions of education, incentive and promotion of the best practice of Breastfeeding.

The research was based on these two types of breastfeeding, since the data from Maputo pointed to low rates of BF in the first months of life and low rates of EBF practice in the same period, with the first six months being considered the period of Impact of measures to promote breastfeeding, especially the EBF in children's health.

**Question**

What influence does the type of breastfeeding given to children up to six months have on their growth and morbidity?

**General Objective**

To analyse the influence of BF type and other factors on the growth and morbidity of children from 0 to 6 months of age, attended at CS 1 de Maio between March and April 2014.

**Specific objectives**

Determine the weight/age of EBF-fed and MBF-fed children in the Consultations of Healthy Children (CCS).

To analyse the frequency of the occurrence of diarrheal diseases in children from 0 to 6 months of age fed by EBF and those fed by MBF.

Relate the occurrence of diarrhea in children with vulnerability factors (residence and hygiene habits).

To relate the socioeconomic and health status of the mother to the type of breastfeeding practiced and the morbidity and growth of the children.

To relate the knowledge of the mothers about the advantages of breastfeeding and the type of breastfeeding practiced.

**Research methodology**

A descriptive cross-sectional survey was carried out at CS 1 de Maio between 1 March and 30 April 2014. The choice of place was intentional because it was a primary level Sanitary Unit where the Follow-up consultations for children after birth up to 5 years of age, the so-called Healthy Child Consultations (CCS). The sample consisted of 199 mothers/children aged 6 months, who attended consultations in Healthy Child Consultations (CCS), at CS 1 de Maio during the study period and who gave BF.

**Sampling:** The mothers who consented, after verifying the clinical processes of the mothers / children, where the age of the children were verified, the type of BF and some criteria for the participation of the children, such as full term birth, adequate weight for the age, absence of anomaly at birth, absence of disease at the time of the study, and others.

The procedure was performed during the two months of study, and at the end of the first month the data saturation was verified. Being a routine monthly consultation, the same mothers/children were frequently found, making little new subjects of study and leading to interruption by saturation. Next, the completed questionnaires were separated into two groups of 100 EBF and 99 MBF.

**Techniques and instruments:** The questionnaire was used as a

data collection tool in the mothers and information was available for data regarding the children, and the semi-structured questionnaire for the mothers and the child's health card were used as instruments for the information regarding the children.

**Data analysis:** The SPSS statistical package was used to analyze the variables and for bi-varied comparisons and associations the chi-square test was applied in order to allow statistical inferences and reduction of confounding.

For the present research, the evaluation of the Weight and the adequate percentile for age, according to the standards already established in the Children's Health card, were considered as growth assessment criteria. The occurrence of diarrhea was considered for the evaluation of morbidity.

**Results**

1. Socioeconomic demographic and health characteristics of the study mothers / children

The mothers participating in the study were between 18 and 48 years of age and the most prevalent age group in the two analysis groups was 20-24 years with the frequencies of 43% for mothers who practiced EBF and 45% for mothers Who practiced MBF. Regarding the marital status of the mothers, married marital status predominated, in which 76% were the mothers of the EBF and 79% were the mothers of the MBF. Regarding the level of schooling, both the mothers of the EBF and those of the MBF had in the majority the secondary level in 48% and 41% respectively.

Regarding the occupation of these mothers away from home, the majority, 63% of the mothers of the EBF had no occupation outside the home, suggesting that they spent more time indoors, while the mothers of the MBF the majority, 62% were employed outside the home.

**Table 1. Association between mother's occupation and type of BF given to the children**

|                      |        |        | without occupation | With occupation | Total |
|----------------------|--------|--------|--------------------|-----------------|-------|
| Grupo de aleitamento | EBF    | n= 100 | 63                 | 27              | 100   |
|                      |        |        | 63%                | 27%             | 100%  |
|                      | MBF    | n=99   | 37                 | 62              | 99    |
|                      |        |        | 37%                | 62%             | 99%   |
| Total                | n= 199 | 100    | 99                 | 199             |       |

The test  $\chi^2=$  with a significance level of 0.0005 <0.05 (statistically significant), suggests an association between the absence of out-of-home occupation with the EBF practice.

Regarding advice on feeding health and disease and breastfeeding, most of the mothers of the MBF (73%) and the EBF (63%) had information on all health matters at the Health Unit of BF. No statistically significant difference was found between the information source and the type of BF practiced.

It was found in this study that 14% of mothers who practice EBF are HIV positive, and that 12% of mothers who practice MBF are HIV positive. In this study HIV status in the mother was associated with the practice of EBF.

**Table 2- Association between the type of BF and mother status of HIV**

|            | HIV Positive | other condition | Total |     |
|------------|--------------|-----------------|-------|-----|
| Type of BF | AME n=100    | 14              | 86    | 100 |
|            | AMM n=199    | 12              | 87    | 99  |
| Total      | 26           | 173             | 199   |     |

$\chi^2=10.691$   
sig=0.014

2. Results about growth, development and morbidity of the children

Regarding the variables of the studied children, the mean weight up to six months was found to be the mean weight of the children at six months, higher in the EBF children than the MBF children. The difference between the two was statistically significant, suggesting that the type of BF practiced influences children's weight.

**Table 3 – Weighth average of the children and type of BF**

|       | n   | Aver age | Desviat ion standar d | Desviat ion averag e | 95% Confidence interval |                 | Minim un weight | Maxi mum weig ht |
|-------|-----|----------|-----------------------|----------------------|-------------------------|-----------------|-----------------|------------------|
|       |     |          |                       |                      | Limit mínimu m          | Limite máximu m |                 |                  |
| AME   | 100 | 7856.50  | 1224.428              | 122.443              | 7613.55                 | 8099.45         | 1000            | 10400            |
| AMM   | 99  | 7517.17  | 971.013               | 97.590               | 7323.51                 | 7710.84         | 4400            | 9900             |
| Total | 199 | 7687.69  | 1115.891              | 79.103               | 7531.70                 | 7843.68         | 1000            | 10400            |

Teste 056.6=t, 05.0000.0<=sig (estatistically significant).

The following table shows the percentage of percentile ranges reached by children up to six months of age. In it, it is observed that between the P97 and P50, which is ideal, was reached by the majority of the EBF group, while below the inappropriate P30 was mostly reached by the MBF group. The reach of P97 translates the growth assessment of children as age-appropriate, while staying at P30 translates to insufficient growth for age. Already below P30, translates to a serious condition.

**Table 4. Percentile reached by children by type of BF**

| Percentiles  | EBF (n=100) |             | MBF (n=99) |            |
|--------------|-------------|-------------|------------|------------|
|              | Fa          | Fr          | Fa         | Fr         |
| P97-P50      | 67          | 67%         | 38         | 38,30%     |
| P50-P30      | 30          | 30%         | 55         | 55,60%     |
| Above P30    | 3           | 3%          | 6          | 6,10%      |
| <b>Total</b> | <b>100</b>  | <b>100%</b> | <b>99</b>  | <b>99%</b> |

The next table show the association between the type of BF and the morbidity of children, in this content the occurrence of diarrhoea.

**Table 5- Association between occurrence of diarrhoea and the type of BF**

|                      |             | Diarrhoea occurrence |            | Total |
|----------------------|-------------|----------------------|------------|-------|
|                      |             | Yes                  | No         |       |
| Grupo de aleitamento | EBF (n=100) | 42 (42%)             | 58 (58%)   | 100%  |
|                      | MBF (n=99)  | 58 (58%)             | 41 (41%)   | 99%   |
| <b>Total</b>         | <b>100</b>  | <b>99</b>            | <b>199</b> |       |

The value of  $\chi^2 = 5.47$  significance of  $0.019 < 0.05$  (statistically significant), allows a positive association between the two variables, and the occurrence of diarrhea suggests to be associated with MBF practices.

**Tabela 6- Association between residences of the children's mothers and occurrence of diarrhoea.**

| Children's mothers residence | Diarrhoea disease AMM n=99 | FR  | AME n=100 | FR | Total |
|------------------------------|----------------------------|-----|-----------|----|-------|
| 25 d junnho                  | 1                          | 1%  | 0         | 0% | 1%    |
| c.sol                        | 1                          | 1%  | 0         | 0% | 1%    |
| guava                        | 0                          | 0%  | 0         | 0% | 0     |
| Kumbeza                      | 0                          | 0%  | 0         | 0% | 0     |
| laulane                      | 2                          | 2%  | 0         | 0% | 2%    |
| magoanine                    | 1                          | 1%  | 0         | 0% | 1%    |
| mahotas                      | 0                          | 0%  | 1         | 1% | 1%    |
| malhangalene                 | 3                          | 3%  | 0         | 0% | 3%    |
| maxaquene                    | 1                          | 1%  | 2         | 2% | 3%    |
| Maxaquene                    | 49                         | 49% | 7         | 7% | 56%   |
| moamba                       | 1                          | 1%  | 0         | 0% | 1     |

|            |    |     |    |     |     |
|------------|----|-----|----|-----|-----|
| Polana     | 24 | 24% | 6  | 6%  | 30% |
| Zona verde | 1  | 1%  | 0  | 0%  | 1%  |
| Total      | 84 | 84% | 16 | 16% | 100 |

The association values ( $\chi^2 = 116, p < 0.0001$ ) are statistically significant, suggesting an association between the children's residence and the occurrence of diarrheal episodes. In this case, the occurrence of more episodes of diarrhea in children whose origin comes from the neighborhoods of Maxaquene and Polana Caniço was more observed.

**Discussion**

The findings found in the present study demonstrate the benefits of EBF practice compared to MBF in the first six months. The education given to mothers about BF and the incentive for the practice of EBF by mothers HIV AIDS, as well as the issues related to the association between the occupation of the mothers and the type of breastfeeding practiced as well as the association between the type of BF practiced and occurrence of diarrheal diseases in the first six months of life were questions studied by some researchers who carried out somewhat similar studies and sought to establish association between the practice of BF and the growth and morbidity of children.

Novaes et al. (2009) report that there are advantages of breastfeeding counselling highlighting favourable outcomes in the growth of breastfed infants if mothers were given guidance on how to breastfeed properly.

The present study did not show that counseling and the source of information on breastfeeding influenced the choice of breastfeeding type. A similar result was found in Cochrane systematic reviews described by Balogun OO, O'Sullivan EJ, McFadden A, Ota E, Gavine A, Garner CD, Renfrew MJ, and MacGillivray S (2016) in which they found no evidence that women's practice of BF resulted from education by health professionals or non-professionals, however, sociocultural factors and other barriers to breastfeeding should be taken into consideration in BF education.

In the same way as the study by Victora CG, Matijasevich A, Santos IS, Barros AJD, Horta BL and Barros FC (2008), performed in Pelotas in which it was verified that low income favors the EBF, of artificial milk by the parents who have a professional occupation, the present study shows evidence that the lack of occupation, which presupposes a low purchasing power of infant formulas, causes the mothers to choose the EBF, contrary to the mothers employed, who opt for the MBF, for purchasing power, and lack of opportunity to breastfeed during the time they are away from home.

A few years ago the EBF was not encouraged for HIV AIDS women in Mozambique, and for this group it was suggested as a best practice artificial feeding. Based on evidence, EBF in the first six months proved to be the best option for all women, including HIV-positive women, and their practice and promotion was guided by MISAU since 2011.

There are studies that establish association between BF and children's growth and morbidity. Although in different contexts, some similarities are found in the results, highlighting the study conducted in Brazil by Barros FAB, Barbieri MA, Santoro JR and Bettiol H. (1996), comparing 365 infants weighing 2500g or more and who had breastfeeding and a breastfeeding group, in relation to the weight of these children, the study concluded that for both boys and girls the weight of the children who received breastfeeding was higher in relation to the children who received mixed breastfeeding. In another study, with the same approach, Marques RFSV, Lopez VA and Braga JAP (2004), involved 184 children of both sexes who were exclusively fed and followed up until the sixth month, intending to evaluate the evolution of their growth and also the similarity of The present study concluded that exclusive breastfeeding infants reached 6 months of age with an average weight above the 50th percentile of the National Center for Health Systems (NCHS), confirming the nutritional advantages of exclusive

breast milk.

Victora CG, Vaughan JP, Lombardi C, Fuchs SMC, Giant LP and Smith PG (1992) Evaluating morbidity in children hospitalized for dehydration concluded that there is an association between lack of breastfeeding and increased risk of dehydration in children, Late similar result was found in a study on infant mortality in non-breastfed children and breastfed infants, where findings of 14.2 and 3.6 greater risk of dying from diarrhea and respiratory diseases in non-breastfed children.

The issue of evidence of benefits of EBF practice in the first six months in relation to MBF continues to be discussed, updated data resulting from systematic reviews 2012 and 2016 on BF benefits and duration of EBF point out that children who receive EBF up to six Months, have a better growth in weight and are more likely to be protected against gastrointestinal and respiratory infections, although long-term protection remains controversial, Kramer MS and Kakuma R (2012); Smith HA, Becker GE (2016).

Although, the studies carried out, although with some differences regarding the sample and methodologies applied, these are similar in the objectives of establishing some association between the practice of BF and morbidity of children, the results found in the present study and in the studies described previously, Based on the results and conclusions drawn.

### Conclusion

The present study, which aimed to establish an association between the type of breastfeeding given to children and the growth and occurrence of diseases, pointed out that there is some association between the type of BF and child growth and morbidity, if considered as growth evaluated by age-appropriate weight, evaluation of the growth curve (percentile) and morbidity, evaluated in the occurrence of episodes of diarrhea in children. The study also allowed us to state that children fed EBF presented better chances of good growth and less risk for diarrheal diseases compared to children fed by MBF.

This study concluded that the occupation of the mother outside the house dictated the option to practice the EBF. The lack of occupation outside the home and consequently more time at home, proved to be an opportunity for the practice of.

The study also concluded that the serological HIV status of the mother influenced the greater number of women who practice EBF. It was not possible, through this study, to conclude that the occurrence of episodes of diarrhea in children may be related to their origin in the neighborhoods of Maxaquene and Polana Caniço, since both the EBF and MBF children come mainly from these two neighborhoods. Even though the association between their provenance and the occurrence of diarrhea has shown some association, the risk of confusion appears to prevail, since the diarrhea factor was verified in children and the factor of origin in the mother.

It was also not possible to show from this research that the practices of the mothers about the BF were the result of the messages received in the Health Unit on matters related to the BF and its practice.

Although with all the findings and conclusions of the study, these do not allow generalization for the entire population of the study region, since the sample and the sampling form are not representative and conclusive for the entire population of mothers and children of 6 months Who do Bf and attended the 1 de Maio Health Center.

The methodology applied for sampling and the lack of clear procedures in the collection of confounding factors does not allow to establish precise associations on the factors that influence the growth and morbidity of children from 0 to 6 months, and other studies should be conducted in order to evaluate all factors of

growth and morbidity and how each factor can influence the state of health in children receiving BF.

### Recomendations

To the nurses of maternal and child health and other health personnel: To Continue to educate, promote among women, parents and the community the practice of breastfeeding, especially the EBF until six months, even if they are working mothers and even being HIV/AIDS mothers in a way to provide their children with better growth and health.

**To the Health Ministry:** To redefine strategies so that messages about the importance of BF and EBF can reach effectively taking into account sociocultural issues and other barriers that may interfere in MCA practices. Implement the simple actions of the Child-Friendly Hospital Initiative, such as early and permanent mother-child contact to allow for changes and adoption of safe practices to BF and EBF.

At the level of employers, along with Health Ministry, and Labor **Regulatory Institutions:** To define policies, laws so that working mothers can have the opportunity and conditions to breastfeed their children at work, in order to make effective the practice of EBF during the first 6 months.

**To the Municipal Council:** To intensify environmental sanitation actions in affected neighborhoods to help the population live in a clean and safe environment, reducing the vulnerability of neighborhoods to diarrheal diseases.

**To the researchers:** To continue exploratory, prospective studies, evaluating all the growth factors and morbidity in children who are breastfed in the first six months of life, as well as exploratory studies on strategies to increase adherence of women to BF and EBF.

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