

# Breastfeeding and the Benefits of Lactation for Women's Health

## *Aleitamento materno e seus benefícios para a saúde da mulher*

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Rev Bras Ginecol Obstet 2018;40:354–359.

### Abstract

The offer of the maternal breast to the baby is an unquestionable right of mothers and their children, and all efforts should be made to promote, follow and maintain exclusive breastfeeding for up to 6 months and supplement it until the child completes 2 years of age. Many publications are available in the literature about the qualities of breast milk, its benefits and health repercussions, stimulating the practice of breastfeeding and supporting campaigns for its implementation. However, although it is widely known that breastfeeding is an important step in the reproductive process of women and its practice offers benefits to both mother and child, most of the available information highlights the benefits of breast milk for children, while mention of the effects of breastfeeding on the health of the mother is usually neglected. Thus, the objective of the present study is to highlight the multiple benefits of breastfeeding for the physical and emotional health of the nursing mother. The authors consulted articles published in the databases PubMed, Virtual Health Library and Web of Science using the keywords breastfeeding, breast milk, lactation and maternal health.

### Keywords

- ▶ breastfeeding
- ▶ breast milk
- ▶ postpartum period

### Resumo

A oferta do seio materno às crianças é um direito inquestionável das mães e de seus filhos, e todos os esforços devem ser feitos no sentido de promover, acompanhar e manter o aleitamento materno exclusivo até os 6 meses e complementado até que a criança complete 2 anos de idade. A literatura apresenta incontáveis publicações acerca das qualidades do leite materno, seus benefícios e repercussões para a saúde, estimulando a prática do aleitamento materno e embasando campanhas. Porém, mesmo sendo de conhecimento geral que a amamentação é uma importante etapa no processo reprodutivo da mulher e que sua prática oferece benefícios para mãe e filho, a grande maioria das informações destacam os benefícios que o leite materno oferece às crianças, esquecendo-se de mencionar todas as repercussões que o aleitamento materno traz para a saúde da mãe. Assim, o objetivo deste artigo é destacar os inúmeros benefícios que o aleitamento materno proporciona à saúde física e emocional da lactante. Para tanto, os autores consultaram artigos publicados nas bases de dados PubMed, Biblioteca Virtual de Saúde e *Web of Science* utilizando as palavras-chave aleitamento materno, leite materno, lactação e saúde materna.

### Palavras-Chave

- ▶ aleitamento materno
- ▶ leite materno
- ▶ período pós-parto

received  
August 31, 2017  
accepted  
January 24, 2018

DOI <https://doi.org/10.1055/s-0038-1657766>  
ISSN 0100-7203.

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## Introduction

The offer of the mother's breast to her baby is a biologically and ethically unquestionable right of both mother and child and is of fundamental importance for the survival and quality of life of the nursing baby during its first years of life. Today, the benefits of breastfeeding are considered not to be limited to the duration of the practice, but to extend until adult life, with repercussions on the long-term quality of life.<sup>1</sup> Many publications are available in the literature about the qualities of breast milk, its benefits and health repercussions, stimulating the practice of breastfeeding and supporting campaigns such as the World Week of Breastfeeding. Even though it is widely known that breastfeeding is an important stage in the reproductive process of women and that its practice is beneficial for both mother and child, it can be seen that the information provided during prenatal care, puericulture practices or public health campaigns is directed at the benefits of breastfeeding for babies, while mention of all the effects of breastfeeding on the health of the mother is neglected.<sup>2</sup>

Lactation is a differential characteristic of mammals and both the synthesis and secretion of milk are complex biochemical and neuroendocrine processes that involve the sensitive terminals of the areole and the nipple and are under hormonal control. Thus, lactation is the direct and natural result of pregnancy and birth, like an integral part of reproductive process that benefits both mother and child simultaneously.<sup>3</sup> The interaction of all of these factors will culminate with the production of milk and will definitely cause changes in the maternal organism by also favoring good physical and emotional health conditions for the nursing mother extending into her future life.<sup>4,5</sup>

## Benefits for the Mother

Breastfeeding (BF) seems to be related to good physical and emotional health for the mother during the puerperium, the lactation period and all her future life. Epidemiological studies have demonstrated that, compared with women who did not breastfeed, lactating women reported seeking for medical care less often, a lower frequency of respiratory, cardiocirculatory and gastrointestinal diseases, as well as fewer symptoms related to emotional problems.<sup>6,7</sup> On this basis, it is possible to emphasize the benefits of breastfeeding for the lactating mother, as described in ► **Table 1**.

**Table 1** Benefits of breastfeeding for the mother's health

Immediate	Long-term
Uterine involution Reduced bleeding Reduced infection Lactational amenorrhea Reduced adiposity and weight Reduced postpartum depression Reduced stress and anxiety Improved body image	Reduced: cancer (breast, ovarian, endometrium) endometriosis, diabetes, osteoporosis, blood pressure and cardiovascular diseases, metabolic syndrome, rheumatoid arthritis, Alzheimer disease and multiple sclerosis

### 1. Uterine involution and reduced bleeding

Early suckling of the areal-mammillary region is one of the most important stimuli for the production of oxytocin, which is also responsible for uterine contraction, accelerating the return of the organ to its normal size and reducing the possibility of the occurrence of postpartum hemorrhage and anemia. High levels of oxytocin can increase the pain threshold, reducing maternal discomfort and thus contributing to an increased feeling of love for the baby.<sup>8</sup>

### 2. Lactational amenorrhea

During the lactation period, both progesterone and estrogen are suppressed, with the occurrence of a period of infertility. While the mother exclusively breastfeeds, her protection against pregnancy can reach 96% during the first 6 months, thus ensuring spacing between pregnancies.<sup>9,10</sup> To this end, the mother also must not have menstruated and should maintain exclusive breastfeeding on demand for at least eight times a day. Breastfeeding amenorrhea may be explained by the inhibition of ovarian activity resulting from high prolactin levels that lead to inhibition of the gonadotropin hormone and to the interruption of ovulation.<sup>11</sup> It has been estimated that, after the return of the menstrual cycles, the probability of conception is reduced by 7.4% for each additional month of breastfeeding.<sup>12</sup>

### 3. Weight and body image

During pregnancy, the body of a woman accumulates a weight of ~ 3 kg of fat that will be utilized throughout the first 6 months of breastfeeding, since this process consumes ~ 2,100 kJ/day.<sup>13</sup> On this basis, there will be a more rapid weight loss and the return to pregestational conditions, with an average monthly reduction of 450 g in the maternal weight,<sup>14</sup> since the released oxytocin also exerts its lipolytic and anorexigenic effects. A lower body mass index has been detected among mothers who breastfed for a period of 6–12 months, and those who exclusively breastfed were leaner than those who breastfed on a partial basis at the end of the first semester of life of the baby.<sup>15,16</sup> A study conducted on 314 Mexican mothers revealed that those who exclusively breastfed for at least 3 months underwent a weight reduction of 4.1 kg compared with those who did not breastfeed.<sup>17</sup> This observation confirmed the weight reducing capacity of breastfeeding, which provides a sensation of greater self-esteem and satisfaction with their body image among lactating women, reducing the possible occurrence of negative emotional factors that might interfere with milk production and with the practice of breastfeeding.

### 4. Postpartum depression

The birth of a child is usually a source of happiness and pleasure for the family. However, it is known that ~ 13% of all puerperae may develop signs and symptoms of depression within a period of 12 weeks after delivery.<sup>18</sup> Among these women, oxytocin levels have been found to be lower than those of the other new mothers. Recent studies have shown that oxytocin is a fundamental element for the stimulation of

the bond between mother and child, triggering positive effects such as vocalization with the baby, looking into its eyes, encouraging touch and caresses. Mothers have reported that they feel calmer, less aggressive and stressed, in a better mood and more interested in socializing since the first postpartum days.<sup>19</sup>

Breastfeeding may also act on a mechanism of regulation of daytime cortisol secretion, with a stable concentration of the hormone possibly reducing the risk of postpartum depression.<sup>20</sup> Recent studies have demonstrated that women who do not start or maintain BF have a higher risk of depression during the postpartum period.<sup>21-23</sup> There is an inverse association between these phenomena due to the hormonal and psychological conditions that occur during the first 6-8 weeks of puerperium, since the lactogenic hormone, oxytocin and prolactin can have anxiolytic effects. This attenuates stress via neuroendocrine responses, since BF is associated with reduced adrenocorticotrophic hormone (ACTH) and cortisol levels. Suckling at the maternal breast preceded by skin to skin contact triggers this process and the longer the duration of this contact, the lower the cortisol levels.<sup>24</sup>

#### 5. Maternal stress

Several factors can be identified as sources of stress for the puerpera. The physical task of baby care together with other household activities, the few hours of sleep, changes in body image, reduced sexual activity and the emotional pressure of trying to be a good mother and to fulfill all the expectations represent an overload that is often incompatible with the personality and ability of a woman to carry out her role as a mother. In this situation, BF may act by reducing stress levels because of its effect on the reduction of cortisol and ACTH levels, consequently reducing the levels of anxiety.<sup>25</sup> In addition, the strengthening of the mother-child bond is a potent stimulus for BF maintenance for the longest possible time, closing a virtuous cycle that tends to benefit both mother and child.

#### 6. Adiposity

The visceral or intra-abdominal fatty tissue accumulated by a woman during pregnancy is metabolically more active than the fat deposited in other areas and is related to cardiocirculatory diseases. However, these deposits can be mobilized during the lactation period, a process that continues to occur in parallel to BF, reducing the maternal weight and risk of type 2 diabetes mellitus.<sup>11,26</sup>

#### 7. Breast cancer

Mammary neoplasia is the most common gynecological cancer, quite prevalent after the fourth decade of life, although it can also occur before 40 years of age at frequencies ranging from 17-36%.<sup>27</sup> Several studies have pointed out the benefits of BF time and its consequent protective effect against the risk of breast cancer, since the reduction of estrogen levels during the lactation period reduces the rates of cell proliferation and differentiation. Tissue exfoliation and epithelial apoptosis at the end of the BF period may

contribute to the reduction of the probability of cells with mutation arising in mammary tissues.<sup>28-30</sup> It is estimated that the risk of breast cancer can be reduced by more than 4% for each year of BF.<sup>27,31-33</sup> According to UNICEF, a 16% increase in the proportion of mothers who breastfeed for 6 months can reduce the expected prevalence of breast cancer by 1.6% per year.<sup>34</sup>

#### 8. Ovarian cancer

Cancer of the ovarian epithelium is one of the neoplasias that most affect women and is usually diagnosed late, with a consequent reduction of survival prognosis. Some theories have indicated that its causes may be related to cell proliferation and uninterrupted ovulation traumas. On the other hand, the suppression of gonadotropins (luteinizing hormone in particular), the low concentration of estrogens and the consequent anovulation and amenorrhea caused by BF have been considered to be protective factors.<sup>35,36</sup> The relative risk of developing ovarian cancer is estimated to be reduced by 2% for each month of BF.<sup>37</sup> Meta-analysis studies have observed an inverse relationship between these events and have reported that protection is greater when the time of BF is longer than 10 months.<sup>38,39</sup> An analysis of prospective cohort and case-control studies has shown that women who have never breastfed had a probability of more than 30% of developing cancer of the ovarian epithelium.<sup>35,40</sup> In addition to offering a lower risk of development of ovarian cancer among lactating women, BF can also increase the life-expectancy of women who have already developed the disease.<sup>41</sup>

#### 9. Cancer of the endometrium

Over the last few years, several epidemiological studies have pointed out some relationship between cancer of the endometrium and BF and have shown that long periods of BF are associated with a reduced risk of this type of neoplasia.<sup>42-44</sup>

#### 10. Endometriosis

Endometriosis is a common gynecological disease that affects more than 10% of reproductive-aged women. Common symptoms include dysmenorrhea, dyspareunia and infertility, and women who suffer from this chronic condition may experience a wide variety of symptoms, ranging from mild pain to extremely debilitating disease.<sup>45</sup> According to Farland et al,<sup>45</sup> the duration of total and exclusive BF was significantly associated with a decreased risk of endometriosis. For every additional 3 months of total BF per pregnancy, women experienced an 8% lower risk of endometriosis, and women who breastfed for  $\geq 36$  months in total across their reproductive lifetime had a 40% reduced risk of endometriosis compared with women who never breastfed.<sup>46</sup>

#### 11. Diabetes

The prevalence of type 2 diabetes mellitus has been increasing all over the world in parallel with the dietary changes, sedentarism and obesity that affect large part of the population. In this respect, it is opportune to emphasize an important action of oxytocin, which is a reduction of insulin

resistance. Meta-analysis studies have detected a statistically significant inverse association between BF duration and risk of type 2 diabetes.<sup>47,48</sup> An important review study conducted by Perrine et al<sup>48</sup> detected an inverse and dose-dependent association between BF and type 2 diabetes, with a reduction of 4–12% of the risk of developing type 2 diabetes with each additional year of lactation. In contrast, among women who never breastfed, the risk was 50% higher compared with those who breastfed even for short periods of time ranging from 1–3 months.<sup>49,50</sup>

#### 12. Osteoporosis

Breastfeeding can contribute to the reduction of the risk of osteoporosis in future life since it has been demonstrated that lactating women have a bone mass with higher mineral density. Although the organism of women loses calcium during the BF period (with the production of 800 ml/day milk a woman can transfer as much as 200 mg calcium daily, which are recovered after weaning and with the return of menstruation), there are compensatory mechanisms that increase the intestinal and renal absorption of calcium and its mobilization from the bones, thus reestablishing bone mineral density.<sup>51–53</sup> During the lactation period there is a 4–7% bone loss, especially in the lumbar spine and femoral head, which is reversed about 1 year after weaning.<sup>54</sup> The protective effect of this mechanism of bone demineralization is directly proportional to the duration of BF.<sup>55</sup>

#### 13. Blood pressure

Studies correlating BF with blood pressure have detected lower levels of both systolic and diastolic pressure among nursing mothers during the BF period, with the observation of a long-lasting dose–response effect, even though this effect may not persist until old age.<sup>56–61</sup>

#### 14. Cardiovascular diseases

Vascular changes, such as atherosclerotic plaque, increased wall thickness and reduced arterial lumen, increase the risk of cardiovascular diseases, a fact that has raised the interest of some investigators in the study of a possible association between lactation and these vascular changes.<sup>50</sup> Women who breastfeed for long periods of time, 7–12 months after the first delivery, have a 28% lower risk to develop vascular diseases compared with women who never breastfed.<sup>50,62</sup> These findings are also associated with the weight loss and metabolic work to which the maternal organism is submitted for the daily production of milk, which may persist even after weaning, contributing to a beneficial effect on the maternal organism. Women with a total BF time of more than 2 years had a 23% lower probability of developing coronary diseases than women who never breastfed.<sup>28</sup> An inverse association has also been described between BF duration and atherosclerosis, after other confounding factors, such as smoking and obesity, are excluded, as determined by the thickness of carotid artery walls.<sup>62</sup>

#### 15. Metabolic syndrome

Metabolic syndrome (MS) is the result of several changes that include central obesity, arterial hypertension, dyslipi-

demia and insulin resistance, which, when associated, involve severe complications and high mortality rates. It is known that women who breastfeed for prolonged periods of time have a lower risk of the incidence of MS, after other factors, such as body mass index and parity, for example, are adjusted. One of the most important mechanisms involved in this occurrence is the reduced insulin resistance provided by BF, since a 12% reduction in the risk of MS development has been observed for each year of lactation.<sup>28,63,64</sup>

#### 16. Rheumatoid arthritis

A recent meta-analysis study by Chen et al<sup>65</sup> demonstrated that BF is associated with a lower risk of the onset of rheumatoid arthritis among nursing women, whether or not the duration of BF is longer than 12 months.

#### 17. Alzheimer disease

Fox et al<sup>66</sup> studied a cohort of elderly English women and observed that the risk of developing Alzheimer disease was lower among those who had breastfed, possibly owing to the hormonal effects of estrogens on brain receptors and of insulin sensitivity triggered by BF.

#### 18. Multiple sclerosis

Multiple sclerosis is a chronic autoimmune disease with a susceptibility and disease course that are influenced by reproductive factors, affects predominantly women during their childbearing years and the risk relapses is significantly diminished during pregnancy and exclusive BF. Among women who had live births, a cumulative duration of BF for  $\geq 15$  months was associated with a reduced risk of multiple sclerosis compared with 0–4 months of breastfeeding.<sup>67</sup>

## Conclusion

The benefits of BF for children have been known and reported for a long time, although the prevalence of this practice and the dissemination of its benefits for the nursing mother have been found not to be satisfactory in various parts of the world. Despite that great knowledge, relatively little progress has been made in improving BF outcomes, such as early initiation and exclusive breastfeeding for 6 months.<sup>3</sup>

Due to its individual and collective importance, the access to BF protection and support has also been framed as a human right with issues of social justice and equity becoming superlative.<sup>68</sup> Lactation plays an important role in maternal recovery from pregnancy, and can determine multiple aspects of maternal health in later life.<sup>69</sup> Therefore, informing pregnant women of the maternal health effects of lactation would strengthen their intentions to breastfeed. However, it is necessary to respect the wishes and rights of the mother, who must have autonomy to decide how to feed her child. The mother, in consultation with other family members, should be the one who decides how the child is to be fed, and in making this decision, the mother must be supported and aided by family, employers, health professionals and society.<sup>3</sup> It is also the duty of health professionals to identify the knowledge, previous experience and social

and family context of women since the prenatal period to promote educational actions directed at the introduction and maintenance of BF when she so decides.

#### Conflicts of Interest

The authors declare that there are no conflicts of interest.

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