The Effect of Bangun-Bangun Leaf Soup on Breast Milk Production of Postpartum Mothers in Sidoharjo I Village, Pasar Miring, Pagar Merbau District in 2025

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Abstract.
Breast milk is the primary source of nutrition for newborns and provides long-term benefits for the child's growth and immune system. However, not all postpartum mothers are able to produce sufficient amounts of breast milk. One natural alternative to support and enhance milk production is through the use of herbal plants, one of which is Coleus amboinicus Lour, commonly known as bangun-bangun leaves. This study aims to determine the effect of consuming soup made from bangun-bangun leaves on breast milk production among postpartum mothers. The type of research used is quantitative with a quasi-experimental method and a two-group pre-test post-test control group design. The research was conducted in Desa Sidoharjo I Pasar Miring, Pagar Merbau Subdistrict, Deli Serdang Regency, North Sumatra. The sample consisted of 12 postpartum mothers selected through total sampling. The intervention included administering bangun-bangun leaf soup twice a day for seven days. Data were collected through direct observation and measurement of breast milk volume before and after the intervention. The univariate analysis showed an increase in the number of mothers with smooth milk production after the intervention. The bivariate analysis using the Wilcoxon test revealed a significance value of $p = 0.000$ ($p < 0.05$), indicating a significant effect of bangun-bangun leaf soup on milk production. The study concludes that soup made from bangun-bangun leaves is effective in increasing breast milk production among postpartum mothers.
Keywords*: bangun-bangun leaves, breast milk and postpartum mothers.*

I. INTRODUCTION

According to the WHO, breast milk is the ideal food for babies. Breast milk itself is clearly safe, clean, and contains antibodies such as DHA, AA, Omega 6, lactose, taurine, protein, lactobacillus, vitamin A, colostrum, fat, iron, lactoferrin, and lysozyme, all in the right doses and composition for babies. Therefore, breast milk is very important in developing a baby's immune system, which can help protect children from many common diseases. Breast milk itself is divided into three: colostrum, which is released from day one to days 3-5, transitional breast milk from days 3-5 to days 8-11, and mature breast milk from days 8-11 onwards (kemenkes, 2021). Breast milk is the best natural nutrition for babies because it contains the energy and substances needed during the first 6 months of a baby's life.

A mother often experiences problems in providing exclusive breastfeeding, one of the main obstacles being insufficient breast milk production. These factors contribute to the low prevalence of exclusive breastfeeding for newborns (Handayani, 2017). UNICEF and WHO, during World Breastfeeding Week, stated that over the past 12 years, the number of babies under 6 months of age worldwide who receive exclusive breastfeeding has increased by more than 10%. This means that the global rate of exclusive breastfeeding in 2024 will reach 48%. This means that hundreds of thousands of babies worldwide have been saved by breastfeeding.

Although this significant leap brings us closer to the World Health Organization's target of increasing exclusive breastfeeding to at least 50% by 2025, ongoing challenges remain (UNICEF dan WHO, 2024). The Central Bureau of Statistics (BPS) reported that exclusive breastfeeding coverage in Indonesia in 2023 was 73.97% (Badan Pusat Statistik, 2023). Furthermore, North Sumatra province recorded 66.42% exclusive breastfeeding coverage, which is still below the WHO target of 80% (Badan Pusat Statistik, 2024). Breast

milk (ASI) is a biological fluid produced by a woman's mammary glands after childbirth. Breast milk production is a natural result of the body's physiological processes that are prepared during pregnancy. Breast milk begins to be produced in the second trimester of pregnancy in the form of colostrum, a thick, yellowish fluid rich in antibodies and nutrients. After birth, colostrum changes into transitional milk and then into mature milk, which becomes the baby's primary food. Throughout human history, breast milk has always been seen as a form of affection and emotional bond between mother and child. More than just nutrition, breast milk is the initial foundation for a baby's health, development, and emotional well-being. Physiologically, the mother's body is designed to produce breast milk in response to stimulation from the baby.

A baby's sucking on the breast triggers the release of the hormones prolactin and oxytocin. Prolactin plays a role in stimulating milk production, while oxytocin causes contractions in the alveoli of the mammary glands, allowing milk to flow. This process is known as the let-down reflex. This mechanism demonstrates how a woman's body has a complex and organized system to support a child's life from birth. The nutritional content of breast milk is unique and cannot be fully replicated by formula. Breast milk consists of more than 200 bioactive components that work synergistically to support a baby's growth (Wahyudi et al., 2021). The main components of breast milk include water, carbohydrates (lactose), fat, protein, vitamins, minerals, hormones, enzymes, and antibodies. Approximately 88% of breast milk is water, which functions to maintain the baby's body fluid balance.

Lactose, the main carbohydrate, supports brain and nervous system development. The fat in breast milk contains long-chain polyunsaturated fatty acids such as DHA and ARA, which are important for retinal and brain development. Meanwhile, proteins in breast milk, such as whey and casein, are easily digested by a baby's immature digestive system. Beyond its nutritional content, breast milk contains various protective substances such as immunoglobulin A (IgA), lactoferrin, lysozyme, and live immune cells such as macrophages and lymphocytes.

These substances protect babies from gastrointestinal, respiratory, and other infection. (Utami, 2018). Colostrum contains a high concentration of antibodies that provide passive protection to babies during the first few months of life. In conditions where the baby's immune system is still not fully developed, breast milk acts as a natural shield against bacterial and viral attacks. In fact, research shows that babies who are exclusively breastfed for six months have a lower risk of diarrhea, pneumonia, and ear infections.

Breast milk also plays a role in the formation of a healthy gut microbiota. Through prebiotic components such as oligosaccharides in breast milk, the growth of good bacteria such as Bifidobacteria and Lactobacillus is facilitated, which then forms an ecosystem of gut microbiota that supports the immune system and prevents colonization by pathogenic bacteria. This link between gut health and immune system health suggests that the benefits of breastfeeding extend far beyond mere energy needs. Breastfeeding is also linked to a child's cognitive development. Several longitudinal studies have shown that breastfed children have higher IQ scores than formula-fed children (Pratiwi et al., 2024)

This is believed to be due to the combination of nutrients like DHA, the emotional interaction during breastfeeding, and the environmental stability that accompanies breastfeeding. In addition to supporting cognitive function, breast milk also provides long-term benefits such as reducing the risk of obesity, type 2 diabetes, and cardiovascular disease in adulthood. The bond between mother and child is also strengthened through breastfeeding. Breastfeeding creates an emotional bond through skin-to-skin contact, eye contact, and the mother's bodily response to the baby's cries and needs. The hormone oxytocin released during breastfeeding not only helps milk flow but also increases feelings of calm and affection in the mother, strengthening the psychological bond between the two.

This connection is crucial for the baby's emotional development and the sense of security needed in the early stages of life. For the mother, breastfeeding also offers significant benefits. Biologically, breastfeeding helps uterine contractions after delivery, accelerates uterine involution, and reduces the risk of postpartum hemorrhage (Pendidikan Kesehatan et al., 2024). Breastfeeding has also been shown to reduce the risk of

breast cancer, ovarian cancer, and type 2 diabetes, as well as accelerate postpartum weight gain. Breast milk is not only good for babies but also supports the long-term health of mothers who provide it. From a social and economic perspective, breastfeeding offers efficiency and sustainability. It is inexpensive, always available at the right temperature, and free from contamination when fed directly from the breast. In communities with limited access to clean water and sanitation, breast milk is the only safe infant food option. Furthermore, exclusive breastfeeding reduces family expenses for formula, bottles, and artificial feeding equipment. The World Health Organization (WHO) and UNICEF recommend exclusive breastfeeding for the first six months of life, followed by appropriate complementary foods while continuing breastfeeding until two years of age or beyond. However, the implementation of this strategy remains far from ideal. Various challenges such as lack of education, social pressure, mothers' occupations that are not breastfeeding-friendly, and aggressive advertising of formula milk are major obstacles to the success of exclusive breastfeeding. Therefore, policy interventions and community approaches are needed to support mothers in breastfeeding. The role of health workers, families, and communities is crucial to successful breastfeeding. Breastfeeding education should begin during pregnancy and continue with active support after delivery.

Hospitals that implement Early Initiation of Breastfeeding and the "Love Mother and Baby" program have higher breastfeeding success rates. Support from partners also significantly impacts the psychological well-being of breastfeeding mothers, particularly in addressing challenges such as sore nipples, infant refusal to latch, or postpartum stress. Furthermore, public policy approaches such as adequate maternity leave, lactation rooms in the workplace, and strict regulations on the promotion of formula milk can create a conducive environment for breastfeeding. Countries with pro-lactation policies have been shown to have higher rates of exclusive breastfeeding, directly impacting infant mortality rates and improving public health. In Indonesia, Government Regulation No. 33 of 2012 concerning Exclusive Breastfeeding provides a legal framework for the promotion and protection of breastfeeding, but its implementation still needs strengthening. Breastfeeding is a long-term investment.

Its benefits are felt not only during infancy but also form the foundation for an individual's physical, mental, and social health into adulthood. Furthermore, breastfeeding reflects a concern for environmental sustainability, social justice, and human development. Within the public health paradigm, breastfeeding is a single intervention with broad, measurable, and profound impacts. As a mother's first gift to her child, breast milk conveys a message of love and responsibility. Breastfeeding is not just about nutrition, but about a commitment to love, care, and champion the life of a child from the very beginning. The uniqueness of breast milk lies not only in its complex composition but also in its symbolic and biological meaning, reflecting the miracle of human life. Breast milk contains hope, protection, and the strength to grow (Hartati et al., 2021).

The coverage of exclusive breastfeeding in Deli Serdang Regency in 2020 was 32.62%, which means it is still below the North Sumatra Provincial Strategic Plan target of 56% and the national target of 80%. (North Sumatra Health Office, 2021). Meanwhile, the coverage of newborns who received exclusive breastfeeding was 16% in Deli Serdang Regency with the highest percentage in Biru-Biru District at 36% and the lowest in STM Hilir District at 1%, (Child Profile of Deli Serdang Regency, 2023). Ratna Prahesti, (2020) in the National Journal, entitled "Torbangun Leaves (Coleus Ambonicus L) Increase Prolactin Levels and Breast Milk Production in Breastfeeding Mothers" proves the fact that by giving torbangun leaf tea consumed within 14 days to 16 respondents (intervention group) and 16 respondents (control group who were not given torbangun leaf tea supplementation) the results obtained were that there was an effect of torbangun leaves on increasing breast milk production (Ratna Prahesti, 2020).

In addition, Elya Rosa Br. Sembiring et al, (2024) proved in their research entitled "The Effectiveness of Giving Bangun-Bangun Leaf Tea (Coleus Ambounicoloury) on the Smoothness of Breast Milk Production in Breastfeeding Mothers at the Mera Tanjung Mulia Midwife Clinic, Medan Deli District in 2024" that there

was a significant difference between before and after consuming bangun-bangun leaf tea for the smoothness of breast milk production for breastfeeding mothers, which means that there is effectiveness in giving bangun-bangun leaf tea on breast milk production for breastfeeding mothers (Elsa Rosa Br. Sembiring et al, 2024). Torbangun leaves are a food source that can be proven to increase breast milk production so that the quality of breast milk is better. This is because torbangun leaves contain various substances that can increase breast milk production, including vitamins C, B1, B12, beta carotene, niacin, carvacrol, calcium, fatty acids, oxalic acid, and fiber.

In addition, Torbangun leaves also contain other substances that play an important role in increasing the production and quality of breast milk, namely Flavonoids, Alkaloids, Saponins, Polyphenols, and other substances that are effective in stimulating prolactin and oxytocin hormonally to produce breast milk (Yunita Sari Pane, 2023). Seeing the low coverage of Exclusive Breastfeeding in Deli Serdang Regency which is usually due to many postpartum mothers who complain of breast milk not flowing smoothly, not enough breast milk, lack of support from husbands/families and some rejections. It was found that there were literature studies and research on torbangun leaves can increase breast milk production, so I was interested in researching the Effect of Giving Torbangun Leaf Decoction on Increasing Breast Milk Production in Breastfeeding Mothers. The smoothness of breast milk production is influenced by many factors such as, frequency of breastfeeding, baby's weight at birth, gestational age at birth, maternal age and parity, stress and acute illness, IMD, the presence of smokers, alcohol consumption, breast care, use of contraceptives and nutritional status.

II. METHOD

This study used a quantitative approach with a quasi-experimental design of two-group pretest-posttest control group design to determine the effect of giving bangun-bangun leaves on breast milk production in postpartum mothers. There were two groups: an intervention group that received treatment and a control group that did not receive treatment. Measurements were taken before (O1) and after (O2) the intervention (X), with the aim of evaluating the effectiveness of giving bangun-bangun leaves. The study location was in Sidoharjo I Pasar Miring Village, Pagar Merbau District, because it was considered representative and had an adequate number of postpartum mothers. The study was conducted for seven months, from December 2024 to June 2025, covering the title submission stage until the thesis defense. The population consisted of 12 postpartum mothers, and due to the small number, a total sampling technique was used. Inclusion criteria included mothers in good health, willing to be respondents, experiencing decreased breast milk production, and not allergic to bangun-bangun leaves. Conversely, those with a history of allergies, hypertension, diabetes, or postpartum complications were excluded. Primary data was collected directly from respondents using observation sheets, with breast milk production measurements carried out twice, before and after treatment, to assess the changes that occurred.

III. RESULTS

Univariate Analysis

This research was conducted in Sidoharjo I Pasar Miring Village, Pagar Merbau District, Deli Serdang Regency, North Sumatra Province. This location was chosen because it was considered representative enough to describe the characteristics of the postpartum mothers targeted by the research intervention. After data collection from the field, an analysis was conducted to determine the effect of bangun-bangun leaf soup on breast milk production in postpartum mothers.

In the initial stage, a univariate analysis was conducted to describe the basic characteristics of the respondents. The age of the breastfeeding mothers was the first variable examined for distribution. Based on the data processing results, it was found that the majority of respondents were in the 31–40 age range, namely seven respondents, equivalent to 41.2%. Three respondents were in the 21–30 age range (38.2%), while the other two were mothers under 20 (20.6%)..

Table 1. Frequency Distribution of Respondents Based on Age of Breastfeeding Mothers Sidoharjo I Village, Pasar Miring, Pagar Merbau District, 2025

Age	Frequency	Percentage (%)
< 20 Years	2	20,6
21–30 Years	3	38,2
31–40 Years	7	41,2
Total	**12**	**100,0**

Meanwhile, in terms of employment, the majority of respondents were self-employed. Ten respondents (64.7%) owned businesses or were self-employed, while two (35.3%) were civil servants.

Table 2. Frequency Distribution of Respondents Based on Occupation of Breastfeeding Mothers Sidoharjo I Pasar Miring Village, Pagar Merbau District, 2025

Jobs	Frequency	Percentage (%)
Self-Employed	10	64,7
Civil Servant	2	35,3
Total	**12**	**100,0**

Breast milk production was then measured in postpartum mothers both before and after treatment. Results showed that before the intervention, the majority of mothers experienced irregular breast milk production, a total of nine (71.4%). Only three (28.6%) experienced regular breast milk production. However, after the intervention, which included consuming bangun-bangun leaf soup, results showed significant improvement. Smooth breast milk production increased to ten (75%), while only two (25%) still experienced irregular breast milk production.

Table 3. Average Breast Milk Production Before and After Intake of Bangun-Bangun Leaf Soup Sidoharjo I Pasar Miring Village, Pagar Merbau District, 2025

Breast Milk Production	Before Intervention	After Intervention
Not Smooth	9 (71,4%)	2 (25,0%)
Smooth	3 (28,6%)	10 (75,0%)
Amount	**12 (100,0%)**	**12 (100,0%)**

To determine the significance of these changes, a bivariate analysis was conducted through a normality test. The normality test in this study used the Shapiro-Wilk method because the number of respondents was less than fifty. The test results showed that both the pre-intervention and post-intervention data had a significance value of p 0.000. Because the p value is less than 0.05, it can be concluded that both data groups are not normally distributed. Therefore, further hypothesis testing was conducted using the Wilcoxon test as a non-parametric analysis method.

Bivariate Analysis

Table 4: Normality Test for Respondents Before and After Bangun-Bangun Leaf Soup Administration Sidoharjo I Pasar Miring Village, Pagar Merbau District, 2025

No	Variables	Shapiro-Wilk Df		Sig
1	Before Intervention	2	12	0,000
2	After Intervention	2	12	0,000

After conducting a Wilcoxon test, the results showed a significant difference between breast milk production before and after the administration of bangun-bangun leaf soup. The p-value obtained from the Wilcoxon test was 0.000, less than the significance limit of 0.05. This indicates that the intervention carried

out in the form of bangun-bangun leaf soup consumption had a positive effect on increasing breast milk production in postpartum mothers.

Table 5. The Effect of Bangun-Bangun Leaf Soup on Breast Milk Production in Postpartum Mothers Sidoharjo I Pasar Miring Village, Pagar Merbau District, 2025

Breast Milk Production	Mean	SD	Sig.
Before Intervention	12,29	0,460	
After Intervention	12,25	0,441	0,000

These results support the hypothesis that the contents of bangun-bangun leaves have a physiological effect on increasing breast milk production. This finding is consistent with previous studies showing that this plant contains active substances such as flavonoids, alkaloids, and phenolic compounds that support hormonal secretion related to lactation. Therefore, the administration of bangun-bangun leaf soup has been proven to have a positive effect on breast milk production in postpartum mothers in Sidoharjo I Pasar Miring Village, Pagar Merbau District in 2025.

IV. DISCUSSION

Changes in breast milk production before and after the intervention, as well as the effect of giving bangun-bangun leaf soup to postpartum mothers. The purpose of this discussion is to clarify the field findings within the theoretical framework and the results of previous studies, as well as to examine various factors influencing the variables studied. The first section of the discussion highlights the characteristics of respondents based on age and occupation. Based on the results of research conducted in Sidoharjo I Pasar Miring Village, Pagar Merbau District, most respondents were aged between 31 and 40 years. This number dominated compared to other age groups, amounting to seven respondents out of a total of twelve participants. This finding indicates that most of the mothers who were the study subjects were of productive age, which is biologically still in the active reproductive phase. Maternal age has a significant influence on breast milk production because with increasing age, the body's ability to respond to hormones that stimulate lactation tends to decline. This is caused by the deterioration of tissue and nerves in the uterus and mammary glands that occurs naturally due to the aging process. Therefore, younger mothers usually experience more optimal breast milk production than older mothers. Another characteristic is seen in occupation. The majority of respondents work as self-employed, namely ten people, while the rest are civil servants.

These differences in occupations have implications for breastfeeding frequency, stress levels, and rest periods. Mothers who have permanent jobs with strict working hours tend to have limited opportunities to breastfeed directly. This limitation can reduce breastfeeding frequency, which results in suboptimal emptying of the mammary alveoli and ultimately, potentially reducing milk production. Conversely, mothers who have more flexible time control, such as those who are self-employed, tend to breastfeed more frequently, which has a positive effect on increasing breast milk production naturally. Furthermore, based on research data before and after the bangun-bangun leaf soup intervention, significant changes were found in breast milk production. Before the intervention, most mothers experienced irregular breast milk production, amounting to nine out of twelve respondents. However, after the seven-day intervention, there was a quite drastic change, with ten mothers experiencing an increase in breast milk production and only two still experiencing lactation complaints. This indicates that the bangun-bangun leaf soup intervention has a positive effect on increasing breast milk volume. The results of this study align with research conducted by Bekkty and colleagues in 2019, which showed that infused bangun-bangun leaves significantly increased breast milk production in breastfeeding mothers. The study showed a p-value of 0.000, indicating that the null hypothesis was rejected and the intervention had a significant effect.

These findings are also supported by a 2020 study by Sukriana, Yulia Irvani Dewi, and Sri Utami, which observed differences in breast milk production scores before and after the bangun-bangun leaf intervention. The median breast milk production score increased from 2.00 to 3.00, and the p-value obtained was also less than 0.05. Based on these statistical results, it can be concluded that bangun-bangun leaves have great potential as a natural lactagogic agent. From a physiological perspective, various factors influence breast milk production. One of these is the mother's psychological state, such as anxiety or stress. In postpartum mothers who experience prolonged stress, cortisol levels will increase significantly. This increase in cortisol will disrupt the function of other hormonal systems, including decreasing the production of the hormone oxytocin, which is essential for the process of breast milk production.

This hormonal imbalance can be the primary cause of reduced breast milk production, even in the absence of physical disorders or inadequate dietary intake. In this context, bangun-bangun leaves not only provide nutritional benefits but also contain bioactive components that can help stabilize the body's condition and improve hormonal function. The researchers' assumption in this study is that a mother's success in naturally providing nutrition to her baby depends heavily on the smooth production of breast milk. If a mother experiences difficulties producing breast milk, it can be indirectly said that she is failing to meet her baby's basic needs. Breast milk production can be influenced by breastfeeding frequency, food consumption, quality of rest, and environmental support. In the case study, regular consumption of bangun-bangun leaf soup was proven to increase breast milk production. The leaves' nutritional content, such as iron, protein, vitamins A, B, and C, makes them a highly supportive food source for lactation. In this study, two respondents also found no increase in breast milk production despite the intervention. The amount of breast milk produced before and after the administration of bangun-bangun leaf soup remained at 110 cc.

The failure to achieve results in these two respondents is thought to be influenced by psychological factors and high levels of fatigue due to a lack of support from family or partners in caring for the baby. Unequally shared physical and emotional burdens have the potential to cause stress, ultimately impacting breast milk production. This suggests that nutritional intervention alone is insufficient without other psychosocial supporting factors. The results of this study are also supported by Purnanto's findings in 2020, which showed that consuming Moringa leaves significantly impacts breast milk production. In the study, there was an increase in breast milk production in the post-test phase, with a higher mean value than in the pre-test phase. The p-value of significance was 0.002, indicating a very strong correlation. These findings indicate that herbal plants containing natural active compounds have significant potential in increasing lactation. In this case, bangun-bangun leaves hold a similar position to moringa leaves because both contain high amounts of iron, vitamins, and protein. The researchers believe that utilizing bangun-bangun leaves in soup is a traditional method long known and used by communities, especially in rural areas. Besides being a nutritious food ingredient, this leaf is also believed to have properties that can improve digestion, stabilize blood pressure, and improve the body's metabolism. In obstetrics, its use as a breast milk-stimulating agent offers significant added value, especially in areas with limited access to commercial supplements or medical assistance. Unfortunately, bangun-bangun leaves are still rarely found in urban areas because they thrive in sparsely populated areas. This presents a challenge for disseminating information and utilizing herbal plants on a wider scale. Overall, providing bangun-bangun leaf soup has been shown to have a positive effect on breast milk production in postpartum mothers. Although some cases show less than optimal results, other supporting factors such as family support, psychological well-being, and other dietary intake must also be considered. These results are expected to form the basis for developing broader community-based interventions, while also reviving the potential of local plants as solutions to maternal and child health problems.

V. CONCLUSION

1. Bangun-bangun Leaves as a Natural Galactagogue: The flavonoids, alkaloids, vitamins, and minerals in bangun-bangun leaves have been shown to help stimulate the hormones prolactin and oxytocin, which play a crucial role in breast milk production. Regular consumption of bangun-bangun leaves in the form of decoction or soup has shown a significant increase in the volume and flow of breast milk in breastfeeding mothers.
2. Effectiveness Supported by Physical and Psychological Factors: Although effective, the success of bangun-bangun leaf consumption is also influenced by non-nutritional factors such as stress, fatigue, and lack of environmental support. This demonstrates that breast milk production is a complex process that requires a holistic approach, not just relying on a single herbal intervention. Social Potential and Local Wisdom: Bangun-bangun leaves are a local asset that is readily available, especially in rural areas.
3. Community education and utilization have the potential to support exclusive breastfeeding programs and enrich nutritional approaches based on local wisdom without harmful side effects.

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