



Effectiveness of Coleus Amboinicus Consumption Interventions in Increasing Breast Milk Production and Improving Maternal Health Status During COVID 19 Pandemic

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Abstract

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INTRODUCTION: Insufficient milk production is a major problem for mothers who have just given birth and affects the health condition of postpartum mothers. One of the actions that can be taken to increase milk production and improve the health of postpartum mothers is to consume foods that can increase breast milk production, namely ingredients that contain galactagogue substances. Several types of herbal plants that are often consumed by postpartum mothers after giving birth to increase breast milk in North Sumatra, especially the city of Medan, are making vegetables from the bangun-bangun leaves. Bangun-bangun leaves contain the main ingredients, namely carvakrol, thymol, humulene, undecanal, terpinene, cymene, caryophyllene oxide, terpineol, and salinene whose nutritional content and composition help to stimulate breast milk production.

AIM: The purpose of this study was to determine the effectiveness of the intervention of the leaves of the wake on the milk production of postpartum mothers and the health condition of postpartum mothers during the COVID 19 pandemic.

METHOD: The intervention was carried out by giving 100 g of bangun-bangun leaves and consumed three times a day starting from the time the mother gave birth until 7 days. Breast milk production was assessed from the time the first breast milk was released and the health condition of the postpartum mother was assessed by measuring vital signs and assessing health conditions while still adhering to health protocols. The study was conducted in Medan Johor, North Sumatra Province and the sample in this study consisted of 60 people consisting of 30 intervention groups and 30 control groups according to the inclusion criteria. Collecting data using a questionnaire consisting of demographic data, data on the 1st day of breastfeeding, and data on health conditions in postpartum mothers before and after the intervention. Data analysis was carried out using dependent and independent t-tests.

RESULTS: The results of the study showed that there was an effect of the intervention on the consumption of bangun-bangun leaves on breast milk production using an independent t-test with a $p = 0.010$ and intervention for consumption of bangun-bangun leaves with postpartum mother's health condition with a $p = 0.001$.

CONCLUSION: The results of this study are expected to be a solution and intervention in the care of postpartum mothers who have problems in spending milk production and can improve health conditions, especially during the COVID 19 pandemic.

Introduction

Breastfeeding is a common thing and is an obligation by every mother that must be done to fulfill the baby's survival process. Breast milk is the best food for babies and can increase immunity. Currently, only a few mothers are successful in breastfeeding exclusively and many mothers stop breastfeeding earlier than the recommended time [1]. There are many reasons related to the failure of mothers in the breastfeeding process such as inadequate milk production, breast milk does not come out and long time to spend, mothers do not understand how to breastfeed properly and correctly, as well as many myths held by families that are not in accordance with health. This condition triggers mothers and families to provide additional food/drinks for babies such as bananas, formula milk, and others.

If this is not addressed immediately, it can be one of the factors that will trigger high rates of infant morbidity and mortality due to unfulfilled nutritional elements. Based on this situation, the provision of intervention and education with food consumption can increase milk production naturally. Many herbal plants are useful for increasing breast milk production, and hence, the use of pharmacological drugs can be minimized. This is an innovative idea in postpartum maternal care in increasing breast milk production in the city of Medan through the use of herbal plants as local wisdom in North Sumatra. The ingredients and plants that will be used in this intervention are easily found in the Medan city area and are widely consumed by the community and are often used as a family vegetable menu.

The post-partum period is a critical period for mothers, partners, and families. One of the causes

of the crisis is related to the process of lactation and breastfeeding [2]. Insufficient milk production and production are major problems. Not all mothers who have just given birth can immediately expel breast milk because breastfeeding is a very complex interaction between mechanical stimuli, nerves, and various hormones that affect the release of oxytocin. In general, the hormones that affect breast milk production are the hormones oxytocin and prolactin [3]. The decrease in milk production and expenditure in the first days after giving birth can be caused by a lack of stimulation of the hormones prolactin and oxytocin as well as a lack of motivation and knowledge of the mother in the breastfeeding process [4]. Postpartum care such as breast care and education about interventions that can increase milk production, Consumption of foodstuffs should be done immediately after delivery (1–2 days) routinely. Lack of milk production is one of the reasons why mothers decide to give formula milk to their babies. UNICEF asserts that formula-fed babies are more likely to die in the 1st month of birth and that formula-fed babies are 25 times more likely to die than babies who are exclusively breastfed [5].

The release of the hormone oxytocin in addition to being influenced by the baby's sucking is also influenced by receptors located in the ductal system, when the ducts widen or become soft, oxytocin is released reflexively by the pituitary which plays a role in squeezing milk from the alveoli [6]. Constraints in breastfeeding are related to factors such as lack of information, apathy on the part of health care providers, inappropriate hospital practices such as giving water and supplements to babies without medical need, lack of follow-up care in the early postpartum period [7]. Breast milk is the best natural food for infants and is given to newborns up to 6 months of age [8]. Breast milk is also the first, main, and most important food. and the best and are natural and also contain many nutrients that are used in the baby's growth and development process [9]. Exclusive breastfeeding is breast milk that is given to babies at least until the age of 6 months, and the provision is continued until they are 2 years old [10]. Exclusive breastfeeding is breastfeeding without other additives such as formula milk, oranges, honey, water and without the addition of solid foods such as bananas, papaya, biscuits, and team rice [11]. UNICEF and WHO recommend that exclusive breastfeeding be given for a minimum of 6 months and continued until the age of 2 years with additional solid food [12].

Plants that can increase breast milk production are the provision of leaves that have been trusted by the Batak tribe and have been consumed for generations. Based on research in Simalungun, North Sumatra with interviews on postpartum mothers, it was stated that the bangun-bangun leaves were often consumed by the community to increase breast milk production. Many efforts have been developed to increase milk production, through pharmacological and non-pharmacological methods. One way to

increase breast milk pharmacologically is by giving galactagogue substances [13]. However, there are some mothers who consume herbal foods/drinks which are hereditary traditions such as the wake plant (*Coleus amboinicus* Lour) because it is believed to be able to increase breast milk secretion [14]. This plant contains Galactagogum but so far this plant has only been used based on experience and scientific research has not been carried out [6].

Many reasons were given by mothers regarding their breastfeeding process which was not successful, including inadequate milk production, or even milk did not come out at all on the 1st day of delivery [15]. In conditions when the demand for breast milk is higher than the milk production of postpartum mothers, various efforts have emerged and developed to increase milk production, through pharmacological and nonpharmacological methods [8]. Based on this, the stimulation provided through the consumption of herbal food ingredients can be a stimulus in increasing the production of postpartum mother's milk which is more practical and can minimize the use of drugs/ pharmacology [16]. Given the importance of immediate breast milk production in postpartum mothers, this study aimed to determine the effectiveness of decoction of herbal leaves such as *C. amboinicus* lour on breast milk production in postpartum mothers and the importance of improving the health status of postpartum mothers during the COVID 19 pandemic because mothers are a high-risk group for exposure or comorbidities. Therefore, researchers are interested in conducting research entitled "Effectiveness Of Consumption Interventions In Increasing Breast Milk Production And Improving Maternal Health Status During Covid 19 Pandemic."

Methods

One of the efforts to increase the rate of secretion and production of breast milk is through the use of traditional medicinal herbs such as decoction of the leaves of Bangun-bangun (*C. amboinicus* L). This leaf has been shown to have a wide range of pharmacological activities that contain a number of important nutrients. The health status of postpartum mothers also needs to be considered during the COVID- 19 pandemic because they are a risk or comorbid group, and since the COVID-19 pandemic, postpartum mothers have also not routinely carried out health checks so that their health status is at risk. This type of research is quantitative research. The design used in this research is Quasy Experimental Non-Equivalent Control Group Pretest-Posttest Design. The location of the research was conducted in the city of Medan Johor involving several maternity clinics and posyandu which will provide information/data about pregnant women who are about to give birth.

The sampling technique is non-probability sampling with a consecutive sampling method with the number of samples in the intervention group as many as 30 respondents and the number of samples in the control group as many as 30 respondents. The total of the two groups totaled 60 respondents.

The criteria for respondents based on the considerations of the researchers used in this study were postpartum mothers, giving birth to live and uncomplicated babies, the condition of the breasts being not blistered, and being willing to become research respondents by signing the consent form willing to be a respondent and participating in the intervention until it was completed.

Methods of data collection using dissemination demographic data questionnaire consisting of age, parity, education, and occupation. The first breast milk production questionnaire was assessed starting from day 1, day 2, day 3, and more than 4 days. For health conditions, it is assessed whether the health of the postpartum mother is in good condition or at risk as seen by the results of the assessment the measurement of vital signs is within normal limits and mothers apply healthy lifestyle behaviors during the COVID-19 pandemic while still complying with health protocols such as wearing masks, washing hands, maintaining distance, avoiding crowds and continuing to check with health workers.

The validity test used for this instrument looks at the value of content validity (content validity index) and the assessment of the expert (experts) about the validity of each item in the questionnaire. The validity value obtained in previous studies to prove the validity of the research conducted with a CVI value of 0.80. The reliability test of this instrument which was used by previous researchers by conducting a pilot study first to other respondents who were not the research sample by taking a different place from the research location, the Cronbach Alpha value of 0.74 was obtained.

The implementation of the intervention is by consuming herbal leaves, namely the bangun-bangun leaves. The leaves are consumed as vegetables that are boiled as much as 100 g with a frequency of 3 times a day for 1 week, given starting from the 1st day after giving birth to the 7th day after giving birth. The control group was not given any intervention. After the intervention was given, the measurement of breast milk production was carried out, namely when the 1st day of milk was released and the measurement of the health condition of the postpartum mother. The purpose of this study was to determine the effect of the consumption of herbal ingredients in the leaves of bangun-bangun to increase breast milk production and the health condition of postpartum mothers.

The univariate data analysis method is described in terms of the mean, standard deviation (SD) in the frequency distribution table of the

respondent's characteristics and bivariate data analysis using inferential analysis (significance test), namely paired t-test and t-test for independent groups because it uses an interval scale and has normal data distribution. The normality test with its parameters is the Kolmogorov-Smirnov test with the assumption that the data distribution is normal if the $p > 0.05$. The ethical considerations in this study began with ethical clearance of the Research Ethics Committee at the University of Sumatera Utara and was declared to have passed the ethical test with letter number NO: 97/KEP/USU/2021.

Results

The characteristics of postpartum mothers are shown in the following table.

Based on Table 1, the characteristics of postpartum women respondents in the intervention and control groups were dominated by respondents in the age range of 21–35 years (53.3%), but there were still many mothers who were at high risk of giving birth under the age of 20 years (30%). Parity is dominated by parity with the number of births of the 2nd child. The most dominant level of education in the intervention group was high school with 13 people (43.3%) and the education level in the control group was also junior high school with 18 people (33.3%). Based on the occupation, the majority of respondents were

Table 1: Distribution of frequency and percentage based on characteristics of respondents (n=60)

Characteristics	Intervention (n = 30)		Control (n = 30)	
	n	%	n	%
Age				
<20 years	9	30	10	33.3
21–35 years old	16	53.3	11	36.7
>35 years old	5	16.7	9	30
Parity (Number of children)				
1	4	13.3	8	26.7
2	14	46.7	16	58.3
>3	12	13.3	6	20
Education				
Primary school	4	13.3	6	20.0
Junior high school	5	16.7	18	33.3
Senior high school	13	43.3	8	26.7
University	8	26.7	6	20.0
Profession				
Civil servant	3	10	7	23.3
Self-employed	8	26.7	8	26.7
Housewife	19	63.3	15	50.0
When the milk comes out				
Day 1	4	13.3	2	6.7
Day 2	13	43.3	7	23.3
Day 3	11	36.7	12	40.0
Day 4	2	6.7	7	23.4
Day 5	0	0	2	6.7
Baby food				
Breastfeeding	22	73.3	14	46.7
Not breastfeeding	8	26.7	16	53.3
Mother's health condition				
Painless	24	80.0	23	76.7
Ever sick	6	20.0	7	23.3
Sick in the last 1 month				
Painless	24	80.0	26	86.7
Ever sick	6	20.0	4	13.3
Baby food				
Only breast milk	22	73.3	14	46.7
Supplementary food	8	26.7	16	53.3

housewives in the intervention group, which amounted to 19 people (63.3%) and the control group with IRT occupations also amounted to 15 people (50.0%).

Judging from the postpartum milk expulsion, in the intervention group most of the respondents when the first breast milk was released on day 2 amounted to 13 people (43.3%) and the control group was also the majority when the first breast milk was released on day 3 as many as 12 people (40.0%). The majority of respondents in the intervention group gave breast milk as many as 22 people (73.3%) and in the control group did not breastfeed as many as 16 people (53.3%). Infant food with only breast milk in the intervention group was 22 people (73.3%), the majority control group was baby food with additional food as many as 16 people (53.3%).

Based on Table 2, the results of the analysis using the Independent t-test of breast milk production in the intervention group with Mean = 2.37; SD = 0.809, while the value in the control group Mean = 3.00; SD=1.017. From the results, it was found that there was an effect of the intervention of giving Bangun-bangun leaves on milk production in the intervention group and control group with a p = 0.010 (t = -2.670, p = 0.010).

Table 2: The effect of intervention on giving *Coleus amboinicus* lour to breast milk production in postpartum mothers between the intervention group and the control group (n=60)

Variable	Intervention group Mean ± SD	Control group Mean ± SD	t	p-value
Breast milk production	2.37 ± 0.809	3.00 ± 1.017	-2.670	0.010

Based on Table 3, the results of the analysis using the Independent t-test of Maternal Health Status in the intervention group with Mean = 1.22; SD = 0.415 while the value in the control group Mean = 1.50; SD = 0.504. From the results, it was found that the intervention of giving the leaves of the tree to the Maternal Health Status in the intervention group and the control group obtained a p = 0.001 (t = 3.359, p = 0.001).

Table 3: The effect of the intervention on giving *Coleus amboinicus* lour on postpartum maternal health conditions between the intervention group and the control group (n=60)

Variable	Intervention group Mean±SD	Control group Mean±SD	t	p-value
Mother's health status	1.22 0.415	1.50 0.504	3.359	0.001

Discussion

Based on the results of the study, there was an effect of the intervention of giving form to the breast milk production with p = 0.010. Breast milk production in the intervention group was more dominant on day 2 than in the control group, namely on day 3. Breastfeeding is a common thing and is always done by every mother who is used for the baby's survival process. However, only a few mothers managed to breastfeed exclusively and

also many mothers stopped breastfeeding earlier than the recommended time [1]. Regarding the breastfeeding process, postpartum mothers often fail due to, among other things, inadequate milk production or even breast milk does not come out at all on the first day of delivery. One of the various attempts to increase breast milk pharmacologically is the administration of galactagogue substances. Drugs with galactagogue substances that are widely circulated and with medical prescriptions are domperidone, metoclopramide, Moloco+B12, Lactamam, Asifit, Smooth breast milk. However, there are some mothers who consume herbal foods/drinks which are a hereditary tradition such as a wake plant with Latin called *C. amboinicus* Lour and is believed to be able to increase the process of breast milk secretion [17].

Bangun-bangun leaves that contain Galactagogum have only been used based on experience and no scientific research has been conducted on the content of the form that can increase the secretion of breast milk in postpartum mothers [18]. Bangun-bangun leaves contain the main ingredients, namely carvakrol, thymol, humulene, undecanal, terpinene, cymene, caryophyllene oxide, terpineol, and salinene whose nutritional content and composition help to stimulate breast milk production. The nutritional content of the leaves is quite high and the composition is polyphenols, Vitamin C, Vitamin B1, Vitamin B12, beta carotene, niacin, carvacrol, calcium, fatty acids, oxalic acid, and fiber [19]. From several studies, it is known that there is a galactagogue content in the leaves of bangun-bangun which is believed to be able to trigger an increase in breast milk production. The researchers found that the bangun-bangun leaves have the benefit of increasing breast milk production, which is supported by the content of the leaves of Bangun-bangun, namely saponins, flavonoids, polyvenols, as well as increasing breastfeeding hormones, namely prolactin and oxytocin [13]. The presence of polyphenols in the leaves can affect the increase in the hormones oxytocin and prolactin which functions to stimulate the alveoli which work actively in the formation of breast milk. An increase in the hormone oxytocin will make breast milk flow more profusely than usual. In addition, the leaves also contain Vitamin B12 which is beneficial for nursing mothers [20]. The presence of polyphenols in the leaves can affect the increase in the hormones oxytocin and prolactin which functions to stimulate the alveoli which work actively in the formation of breast milk. An increase in the hormone oxytocin will make breast milk flow more profusely than usual. In addition, the leaves also contain Vitamin B12 which is beneficial for nursing mothers [20]. The presence of polyphenols in the leaves can affect the increase in the hormones oxytocin and prolactin which functions to stimulate the alveoli which work actively in the formation of breast milk. An increase in the hormone oxytocin will make breast milk flow more profusely than usual. In addition, the leaves also contain Vitamin B12 which is beneficial for nursing mothers [20].

The content contained in the leaves of bangun-bangun can increase the production of mother's milk so that it has a good impact on the growth of the baby. Plants are very easy to grow anywhere but are rarely found in urban areas and are usually abundant in residential areas of the Batak people. For people who live in rural areas, these plants can be used as fences for their gardens or land. If the community has the remaining land and can be used for family medicinal plants (TOGA), the plants are suitable to be planted so that at any time they can be used for alternative medicine. The results of breast milk production are in accordance with the provision of methanol extract in human mammary gland epithelial cells so that it can increase the expression of glucocorticoid receptor genes that function in the lactation process [14].

This research is also reinforced by another study which states that 150 g of fresh leaves in breastfeeding mothers can increase the volume of breast milk by 65% from the 14th to the 28th day. Giving 150 g of fresh leaves (in the form of soup) to breastfeeding mothers can also increase the total volume of breast milk and the child's body weight at the 3rd and 4th weeks [21]. One of the fresh leaf food products as a functional addition for lactating mothers is a product with the addition of leaves that can effectively increase breast milk production. Another study also looked at how the steeping of Bangun-bangun leaf tea on breast milk production in postpartum mothers and the results showed that there was an effect of giving Bangun-bangun leaf tea infusion on breast milk production [22].

Based on the results of the study, the effect of giving the leaves of bangun-bangun also affects the health condition of the postpartum mother with a $p = 0.001$. The potassium content in the leaves of Bangun-bangun functions as a blood purifier, fights infection, reduces pain, and creates a sense of calm so that breast milk secretion becomes good and the mother's health condition is also better because the leaves of Bangun-bangun can fight various infections so that they can improve immunity and status. postpartum maternal health [23].

Bangun-bangun leaves are included in plant foods that have the potential as a source of antioxidants because they contain flavonoids and polyphenols that are useful for preventing or reducing the risk of developing metabolic syndrome disorders (disorders include increased high blood pressure, accumulation of fat in the abdomen, and increased blood sugar, cholesterol levels and triglycerides) due to an unhealthy diet. With these benefits, it can improve the health status of the mother and avoid various diseases [24].

Besides being believed to increase breast milk production, the leaves of Bangun-bangun can also improve the health condition of postpartum mothers because the leaves are used as traditional medicine to treat various diseases, namely cough medicine, stomach, nausea, vomiting, wound healing, canker

sores, and so on. Giving the extract of the leaves with flavonoid compounds also inhibits the release of aldosterone, which affects the work of the kidneys to retain sodium and water. If the action of aldosterone is inhibited, then the expenditure of water from the body becomes more and causes blood pressure to fall. In addition, the results of phytochemical tests stated that the leaves of Bangun-bangun contain alkaloids, flavonoids, and tannins that have a relationship with reproductive hormones and are used in traditional medicine for patients with premenstrual syndrome [25].

Fulfillment of the nutritional needs of infants 0–6 months is absolutely obtained through breast milk given immediately after birth. One of the actions that can be taken to increase breast milk production is to provide education and consume foods that can increase breast milk production. Several types of herbal plants that are often consumed by postpartum mothers after giving birth to increase breast milk in North Sumatra, especially the city of Medan are making vegetables of bangun-bangun leaves. This plant contains phytosterol compounds that function to increase and facilitate the production of breast milk (laktagogum effect). The research about the effectiveness of the bangun-bangun leaves in postpartum mothers. The officer implementing the intervention must ensure that care can be carried out and continued by the postpartum mother. The success of a postpartum mother in participating in an exclusive breastfeeding program since the first breast milk comes out is determined by the significant efforts of a postpartum mother in breastfeeding through various interventions that will help increase the hormone prolactin and release the hormone oxytocin from breast milk production [26]. The intervention by consuming the leaves of the tree stimulates the acceleration of the production and expenditure of breast milk. In addition, this plant also contains antibodies that can increase the body's immunity. This can be explained by the mother consuming the leaves of bangun-bangun in general the maternal health condition in the intervention group was in a good category, namely the results of the assessment of the measurement of vital signs within normal limits (blood pressure ranged from 120/80 mmHg, pulse frequency 60–78×/min, breathing 16–20 ×/min, temperature not more than 37.5°C and Covid-19 is not detected. The existence of interventions can provide information about postpartum maternal care and breastfeeding to babies so that they can improve good habits and behavior in the community [27], [28]. Socio-culture is one of the factors that is closely related to the provision of nutrition to infants because it is related to the way of caring for babies, including the fulfillment of food and nutrition, especially breastfeeding. One of the socio-cultural factors related to providing nutrition to infants is the mother's educational background and knowledge. Therefore, it is necessary for postpartum mothers to know the best way to increase breast milk production [27]. An intervention will have an impact on increasing knowledge, attitudes, and health status

of pregnant and childbirth women. The importance of family and community involvement has an important role in health services for pregnant women and childbirth in order to increase the health status of pregnant women and postpartum mothers [28].

Conclusion

This study concludes that there is a significant effect of the intervention on the consumption of the leaves of Bangun-bangun on breast milk production in postpartum mothers with a $p = 0.010$ and the health condition of postpartum mothers with a $p = 0.001$. The intervention of consuming herbal leaves such as *C. amboinicus* Lour can help increase breast milk production in postpartum mothers so it is very useful to apply. especially during the COVID-19 pandemic, it is important to pay attention to the health status of pregnant women through various efforts such as providing education on postpartum maternal care during the Covid-19 pandemic. This research is expected to be additional information and input in academic development, especially in the field of nursing.

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