Proceeding of The International Conference of Inovation, Science, Technology, Education, Children, and Health

E-ISSN: 2776-9062

Research Article

Effectiveness of Banana Blossom on Breast Milk Production in Breastfeeding Mothers

Siti Salma Karim[1], Rani Safitri[2*], and Rosyidah Alfitri[3]

[1-3] Program Sarjana Kebidanan Fakultas Ilmu Kesehatan, Institut Sains dan Teknologi Kesehatan RS dr. Soepraoen, Malang, Indonesia, email : rani@itsk-soepraoen.ac.id

* Corresponding Author : **Rani Safitri**

Abstract: Exclusive breastfeeding for the first six months is one of the most valuable investments in a child's health, growth, and intelligence, yet ensuring sufficient breast milk production can be a challenge for some mothers. The banana heart, or banana flower, is an inexpensive and easily accessible part of the banana plant traditionally used to enhance lactation. Rich in fiber, vitamins, and minerals, it is believed to support maternal health and stimulate milk production. This study aimed to determine the effect of banana heart consumption on the average increase in breast milk production among breastfeeding mothers in the Bahari Health Center Working Area. A quasi-experimental design with a pretest–posttest control group was employed, involving breastfeeding mothers divided into treatment and control groups. The treatment group consumed banana heart preparations, while the control group maintained their regular diet. Breast milk production was measured before and after the intervention. Results indicated that, before treatment, the average breast milk production in the treatment group ranged from 401–500 cc, with a mean of 496.67 cc. After consuming banana heart, production significantly increased to 801–900 cc, with a mean of 816.67 cc. In contrast, the control group's production remained between 401–500 cc, with a mean of 453.33 cc, showing no significant change. Statistical analysis confirmed the positive effect of banana heart consumption on increasing breast milk production. In conclusion, banana heart can be considered an effective, low-cost, and locally available dietary intervention to improve lactation outcomes, supporting the practice of exclusive breastfeeding for six months. Public health initiatives could promote the use of banana heart as a natural approach for mothers experiencing lactation challenges.

Keywords: Banana; Breastfeeding; Lactation; Nutrition; Production

1. Introduction

Exclusive breastfeeding (EBF) for 6 (six) months is the best investment for the health and intelligence of children (Friscilla et al., 2023). The benefits of exclusive breastfeeding align with one of the Sustainable Development Goals (SDGs), which aims by 2030 to reduce maternal mortality to below 70 per 100,000 live births, as well as to eliminate preventable infant and toddler mortality. All countries are striving to reduce the Neonatal Mortality Rate to at least 12 per 1,000 live births and the Under-Five Mortality Rate to 25 per 1,000 live births. Approximately 15% of total under-five child deaths in developing countries are caused by non-exclusive breastfeeding. Various nutritional problems, whether undernutrition or overnutrition, also arise due to the introduction of complementary foods before the baby reaches 6 (six) months of age (Ministry of Health of the Republic of Indonesia, 2018).

The rate of exclusive breastfeeding worldwide remains low. According to UNICEF data (2018), exclusive breastfeeding increased globally from 36% in 2000 to 41% in 2018, but this rate is still below the SDG target of 50%. Overall, breastfeeding rates worldwide are quite low. The Global Breastfeeding Scorecard, which evaluated breastfeeding data from 194 countries, found that the percentage of infants under six months given exclusive breastfeeding is only 40%. Moreover, only 23 countries have exclusive breastfeeding rates above 60% (UNICEF, 2018).

Based on data from the Ministry of Health of the Republic of Indonesia (2022), only 50% of infants in Indonesia receive exclusive breastfeeding, and only 5% of children continue to receive breastmilk after the exclusive breastfeeding period. This means that Indonesian

Received: 17, May 2025
Revised: 31, May 2025
Accepted: 16, June 2025
Published: 30, June 2025
Curr. Ver.: 30, June 2025

children do not receive the nutritional benefits they need during early life. More than 40% of infants are introduced too early to complementary foods, and the foods given often do not meet the nutritional needs of the infant (WHO, 2020).

WHO supports global targets to improve the nutrition of mothers, infants, and young children, with a 2025 target of 50% exclusive breastfeeding coverage globally. The Global Breastfeeding Collective, under the leadership of WHO and UNICEF, has set a minimum target of 70% exclusive breastfeeding by 2030. Indonesia has also set a target to improve nutrition to prevent stunting from 2020 to 2024, one of which is through promoting exclusive breastfeeding to reach a target of 60% (Ministry of Health of the Republic of Indonesia, 2020).

According to the 2018 National Basic Health Survey (Riskesdas) report, the proportion of exclusive breastfeeding (EBF) in Indonesia within the last 24 hours for infants aged 0–5 months was 74.5%, with a decline in percentage as the infants' age increased from 0 to 5 months (Ministry of Health of the Republic of Indonesia, 2018). Meanwhile, according to the 2019 Indonesia Health Profile, the national coverage of infants receiving exclusive breastfeeding in 2019 was 67.74%. South Kalimantan Province ranked 6th out of 20 provinces with the lowest percentage of exclusive breastfeeding for infants aged 0–5 months (Ministry of Health of the Republic of Indonesia, 2020). Based on data from the South Kalimantan Provincial Health Office, the coverage of exclusive breastfeeding for infants aged 0–6 months in 2021 in Tabalong district was 73.4%, where out of 2,136 toddlers, 1,567 received exclusive breastfeeding. However, data from Murung Pudak Health Center showed that only 38.4% of infants received exclusive breastfeeding.

When infants reach 6 months old, breast milk can also fulfill their nutritional needs. However, only a small number of mothers are able to provide exclusive breastfeeding for the first 6 months of their child's life. This is caused by several factors, including lack of knowledge and information about the benefits of exclusive breastfeeding, limited education for mothers, and many mothers still believe that frequent breastfeeding causes the breasts to sag because they think that newborns who breastfeed directly cause sagging breasts (Destri et al., 2021; Friscilla, Noorhalsalnah, et al., 2022; Loyal & Nuryanto, 2017).

Exclusive breastfeeding has many benefits for babies. One negative impact of not providing exclusive breastfeeding is an increase in infant morbidity and mortality, nutritional problems, developmental disorders, occurrence of infections, increased family expenses, and the risk of formula milk misuse and related problems (Fitrianil et al., 2023).

The low supply of breast milk after delivery is influenced by several factors. According to Nilal Marwilyah (2020), these factors include lack of knowledge, limited family support, maternal behavior in breastfeeding, insufficient family support, and unmet maternal food intake. For mothers to successfully provide exclusive breastfeeding, those currently breastfeeding must receive support to prevent a decline in milk production. If maternal food intake is insufficient, the mammary glands will not function optimally and eventually affect breast milk production. Breastfeeding mothers need to pay attention to several things to increase the quality and quantity of breast milk they produce (Friscilla, Wijaksono, et al., 2022; Marwilyah & Khalerawati, 2020).

Breast milk production is influenced by the presence of polyphenols and steroids in the pineal gland, which affect the prolactin reflex to stimulate alveoli active in breast milk formation. Additionally, polyphenols influence the increase of oxytocin hormone. Oxytocin is a hormone that plays a role in stimulating milk secretion (milk let-down). The pineal gland is part of the pineal nervous system which is used to increase breast milk production. The pineal gland is chosen because it is affordable and easy to obtain (Pratiwil et al., 2021).

The role of oxytocin in the mammary gland is to promote contraction of myoepithelial cells surrounding the alveoli of the mammary gland, causing the alveoli to be pushed out toward the milk ducts so the alveoli become empty and stimulate synthesis of the next milk secretion. It also serves as a source of fiber and highly beneficial protein. The pineal gland contains antioxidants. Glycine, leucine, alanine, and aspartic acid are the four most common amino acids found in milk protein. Vitamins E and zinc, as well as other phytochemicals like saponins and flavonoids, are also present. The pineal gland contains various lactagogues, including alkaloids, polyphenols, steroid hormones, flavonoids, and other compounds that may help increase oxytocin and prolactin synthesis (Muhandril & Subarnal, 2019).

Based on data from the Puskesmas, the number of breastfeeding mothers was 219, and 44 mothers reached the third trimester. Based on preliminary study results, from 7 mothers who had just given birth, 2 mothers (28.57%) had no milk production at all, 3 mothers (42.85%) had milk production but the flow was irregular, and 1 mother (14.28%) had smooth milk production. The initial results also showed that 5 mothers who had just given birth did not express breast milk during visits to the health center, and none were advised by midwives to consume pineal gland supplements to increase milk production.

Based on background theory and preliminary studies at the research site, the researchers are interested in studying the consumption of pineal gland supplements and its effect on increasing breast milk production in breastfeeding mothers in the working area of the health center.

2. Research methods

This study employed a quasi-experimental design with a pretest-posttest control group design involving two treatment groups. One group received the intervention, while the control group did not receive any treatment. Both groups were initially observed for breast milk production before the intervention. The intervention group was then given 200 grams of pineal gland supplement twice a day. After the intervention period, breast milk production was measured again in both groups.
Population and Sample The population of this study consisted of all breastfeeding mothers within the working area of the Balharil Health Center, totaling 44 individuals. The sample size consisted of 30 breastfeeding mothers, divided into two groups: 15 mothers in the intervention group and 15 mothers in the control group (who did not receive the supplement).

Inclusion Criteria Breastfeeding mothers residing in the working area of Balharil Health Center Willing to participate as respondents in the study
Exclusion Criteria Mothers currently taking other medications that increase breast milk production Mothers with a known allergy history to pineal gland supplements
This research instrument uses the ALSI production observation sheet, which includes observations of ALSI production before the administration of corn starch in the treatment group, observations of ALSI production after the administration of corn starch in the treatment group, and ALSI production observation sheets that did not receive corn starch in the control group. The data were analyzed using univariate analysis.

3. Result and Discussion

Table 1. The distribution of breast milk production before consuming banana blossom in the intervention group at Murung

Breast Milk (cc)	Distribution of breast milk production frequency before consuming banana blossom		Mean
	F	%	
300-400	4	26,7	*Mean = 496,6667 Std. Error of Mean = 23,12835*
401-500	6	40,0	*Medain = 500,0000 Std.*
501-600	4	26,7	*Deviation = 89,5757*
601-700	1	6,7	*Minimum = 350,00*
701-800	0	0	*Maximum = 650,00*
801-900	0	0	
901-1000	0	0	
Jumlah	15	100	

Pudak Health Center shows that breast milk production before the intervention was mostly in the range of 401-500 cc, with 6 respondents (40%) having an average value (Mean) of 496.6667 cc.

Tabel 2. The distribution of respondents based on breast milk production after consuming banana blossom in the intervention group

Breast Milk (cc)	The distribution of breast milk production frequency before consuming banana blossom		Mean
	f	%	
300-400	1	6,7	*Mean = 816,6667 Std. Error of Mean = 45,68700 Median = 900,0000 Std. Deviation = 176,94497 Minimum = 400,00 Maximum = 1000,00*
401-500	1	6,7	
501-600	1	6,7	
601-700	0	0,00	
701-800	2	13.2	
801-900	6	40,0	
901-1000	4	26,7	
Total	15	100	

Based on Table 2, the results of the ALSI production distribution after corn starch consumption in the treatment group showed that most ALSI production after treatment was in the range of 801–900 cc, found in 6 respondents (40%), with a mean value of 816.6667

Tabel 3. The distribution of the average respondents based on breast milk (ASI) production without consuming banana blossom in the control group

Breast Milk (cc)	Distribution of the frequency of breast milk production before consuming banana blossom		Mean
	F	%	
300-400	4	26,7	*Mean = 453,3333 Std. Error of Mean = 32,17018 Median = 450,0000 Std. Deviation = 124,59458 Minimum = 300,00 Maximum = 750,00*
401-500	5	33,2	
501-600	3	20,1	
601-700	1	6,7	
701-800	2	6,7	
801-900	0	0,00	
901-1000	0	0,00	
Total	15	100	

Based on Table 3, the distribution of respondents according to ALSI production in the control group, namely without consuming corn starch, showed that most were in the 401–500 cc range, with 5 respondents (33.2%) and a mean value of 453.3333. The distribution of ALSI production before consuming corn starch in the treatment group showed that ALSI production before treatment was mostly in the 401–500 cc range, with 6 respondents (40%) and a mean value of 496.6667.

The results of this study indicate that the average ALSI production within 24 hours is only 400–500 cc. This shows that the ALSI production of breastfeeding mothers falls into the low category. This condition may lead to insufficient ALSI to meet the nutritional needs of infants, which in turn can impact cognitive and physical development. Effects of insufficient ALSI include delayed brain development leading to reduced intelligence, stunted physical growth making the baby weak and easily sick, and increased risk of allergies, asthma, obesity, digestive disorders, chewing problems, malocclusion, and iron deficiency anemia.

Breast milk production occurs as a consequence of the hormone prolactin, which is secreted by the anterior pituitary gland and stimulates milk production in the breasts. Breastfeeding triggers the release of breast milk through the lactiferous sinuses when the baby suckles. The act of suckling stimulates nerve endings in the areola of the breast, which then send signals to the anterior pituitary gland, prompting the release of prolactin. This hormone

then enters the bloodstream and stimulates milk production in the mammary glands. The milk production reflex, also known as the prolactin reflex, is a physiological response to lactation.

Factors that influence breast milk production in postpartum mothers, according to Alstitik (2015), include gestational age at birth, maternal age, psychological factors or anxiety, breast care, parity, education, and employment. Meanwhile, according to Manalu (2021), factors affecting breast milk production include the baby's sex, maternal nutrition, maternal rest, baby's suckling effectiveness, use of contraceptives, and breast care.

The distribution of breast milk production after banana blossom consumption in the treatment group at Murung Pudak Public Health Center showed that the highest volume of breast milk production was in the range of 801–900 cc, found in 6 respondents (40%), with a mean production of 816.67 cc.

The results of this study indicate that the average 24-hour breast milk production of 400–500 cc is considered low. This level is insufficient to meet the infant's nutritional needs for optimal growth and development. Insufficient breast milk can lead to impaired cognitive and physical development, such as delayed brain development resulting in lower intelligence, stunted physical growth (stunting), weakened immunity, increased susceptibility to illness, risk of allergies, asthma, obesity, digestive disorders, dental issues and malocclusion, and iron-deficiency anemia.

The increase in breast milk production after consuming banana blossom can be seen quantitatively in the rise of mean production from 496.67 cc (before treatment, with most respondents producing 401–500 cc) to 816.67 cc (after treatment, with most respondents producing 801–900 cc). This demonstrates that banana blossom consumption can significantly increase breast milk production in breastfeeding mothers.

Banana blossom, a part of the banana plant, is utilized to enhance breast milk production. It was chosen for this study because it is inexpensive and readily available in the Tanjung area and can even be cultivated at home. Moreover, banana blossom contains lactogogum, a nutritional substance known to stimulate milk production. While there are various types of banana blossoms, this study used the *kepok* banana blossom due to its savory taste and low tannin content, making it less bitter. Additionally, *kepok* banana blossom is rich in nutrients, including vitamin A, vitamin B1, vitamin C, fat, protein, carbohydrates, calcium, calories, and water.

According to Pratiwi et al. (2021), the increase in breast milk production is influenced by the presence of polyphenols and steroids found in banana blossoms, which affect the prolactin reflex by stimulating the alveoli to actively produce breast milk. In addition, polyphenols contribute to increasing the hormone oxytocin, which plays a role in the milk ejection reflex (let-down reflex). Banana blossom is a part of the banana plant that is utilized to increase breast milk production (Pratiwi et al., 2021).

According to Indrayani (2020), the increase in breast milk production is driven by the hormone oxytocin. The rise in oxytocin levels is influenced by the polyphenols present in banana blossoms, which results in a denser milk flow compared to before the mother consumes banana blossom. Oxytocin functions to stimulate milk secretion (let-down reflex). Its role in the mammary glands is to trigger the contraction of myoepithelial cells surrounding the alveoli, so that when these cells contract, milk is pushed from the alveoli into the milk ducts, thereby emptying the alveoli and triggering the synthesis of new milk (Indrayani & Suralaga, 2020).

The results of the study in the intervention group showed an increase in breast milk production among breastfeeding mothers after consuming boiled banana blossom regularly for 7 consecutive days.

The distribution of respondents based on breast milk production in the control group (who did not consume banana blossom) at the Murung Pudak Health Center showed that most respondents (5 respondents or 33.2%) had milk production in the range of 401–500 cc, with a mean production of 453.33 cc.

These findings indicate that in the control group, there was no significant increase in breast milk production. In this group, measurements of breast milk production were only taken to serve as a comparison against the effect of banana blossom consumption in the intervention group.

The low breast milk production among breastfeeding mothers in the control group was likely influenced by maternal age—almost half of the mothers in this study were 35 years or older. Mothers giving birth for the first time and those who had given birth more than twice often experience difficulties in producing sufficient breast milk.

Other factors contributing to low breast milk production include education level. In this study, more than half of the respondents had only completed elementary or junior high school. Education plays a role in shaping behavior and lifestyle; the higher the level of education, the easier it is for a person to accept and apply health information.

Employment was also suspected to contribute to lower breast milk production. According to Alstitik (2015), working mothers often face obstacles in exclusive breastfeeding due to limited time, demanding work schedules, and work environments that do not support breastfeeding. This in turn affects their productivity at work.

The findings of this study suggest that the higher a mother's education level, the more positive her breastfeeding behavior tends to be. A well-educated mother is more likely to have a strong understanding of the importance of breastfeeding, which in turn increases her motivation to breastfeed.

4. Conclusions

The average breast milk production before the banana blossom intervention was in the range of 401–500 cc, with an average mean value of 496.67 cc. After the banana blossom intervention, the average breast milk production increased to the range of 801–900 cc, with a mean value of 816.67 cc. In the control group, the average breast milk production was in the range of 401–500 cc, with a mean value of 453.33 cc.

References

Alstitik, R. (2015). Buku Asuhan Kebidanan Masa Nifas dan Menyusui. Jakarta: Trans Info Medika.

Destri, U., Sarkilah, S., & Friscilla, I. (2021). Efektivitas pemberian aromaterapi lavender terhadap produksi ASI pada ibu nifas normal: Literature review. Proceeding of Sari Mulia University Midwifery National Seminars, 1(3), 1–6. https://doi.org/10.33859/psmum.v3i1.813

Fitrianie, A., Friscilla, I., & Jasmita. (2023). Asuhan Kebidanan Persalinan dan Bayi Baru Lahir. Klaten: Penerbit Underline.

Friscilla, I., Noorhasanah, S., Hidayah, N., Sari, S. P., Nabila, S., Fitrianie, A., Fonna, L., & Darshiva, N. A. (2022). Education preparation for exclusive breast milk at Sungai Andai integrated services post. OCS UNISM, 1, 119–127. https://ocs.unism.ac.id/index.php/semnaspkm/article/view/755

Friscilla, I., Wijaksono, M. A., & Rizali, M. (2022). Analisis kepuasan pasien dalam pemberian discharge planning menggunakan prinsip patient centered care di Rumah Sakit Sari Mulia Banjarmasin. Dinamika Kesehatan: Jurnal Kebidanan dan Keperawatan, 13(2), 11–15. https://garuda.kemdikbud.go.id/documents/detail/3193597

Friscilla, I., Wijaksono, M., Rizali, M., Permatasari, D., Aprilia, E., Wahyuni, I., Marsela, M., Asri, N., Yuliani, R., Ulfah, R., & Aryudita, A. (2023). Pengoptimalisasi penggunaan buku KIA pada era digital di wilayah kerja Puskesmas Kandui. Prosiding Seminar Nasional Masyarakat Tangguh, 299–307. https://ocs.unism.ac.id/index.php/semnaspkm/article/view/1058

Indrayani, T., & Suralaga, C. (2020). The effect of consumption of the heart of banana on the production of breast milk in breastfeeding mother. Health Medical, 2(1), 19–23. https://doi.org/10.55756/hm.v2i1.47

Kemenkes RI. (2018). Hasil Riset Kesehatan Dasar. Badan Penelitian dan Pengembangan Kesehatan, Kementerian Kesehatan Republik Indonesia.

Kemenkes RI. (2020a). Profil Kesehatan Indonesia Tahun 2019. Kementerian Kesehatan Republik Indonesia.

Kemenkes RI. (2020b). Rencana Aksi Kegiatan Kementerian Kesehatan Indonesia. Direktorat Gizi Masyarakat.

Loyal, R. R. P., & Nuryanto, N. (2017). Pola asuh pemberian makan pada bayi stunting usia 6–12 bulan di Kabupaten Sumba Tengah, Nusa Tenggara Timur. Journal of Nutrition College, 6(1), 84–95. https://doi.org/10.14710/jnc.v6i1.16897

Manalu, A. B., Purba, T. J., Siallagan, N. A., & Yanti, M. D. (2021). Pengaruh konsumsi jantung pisang terhadap peningkatan produksi ASI pada ibu menyusui di Desa Candi Rejo Kecamatan Biru-Biru Kabupaten Deli Serdang. Jurnal Kesehatan Komunitas, 6(3), 418–424. https://doi.org/10.25311/keskom.vol6.iss3.592

Marwiyah, N., & Kherawati, T. (2020). Faktor–faktor yang berhubungan dengan pemberian ASI eksklusif pada ibu bekerja di Kelurahan Cipare Kota Serang. Faletehan Health Journal, 7(1), 18–29. https://doi.org/10.33746/fhj.v7i1.78

Muhandri, T., & Subarna. (2019). Kumpulan Istilah Pangan. IPB Press.

Pratiwi, A. M., Fatikasari, S., & Pratiwi, E. N. (2021). Pengaruh konsumsi jantung pisang batu terhadap produksi air susu ibu pada ibu post partum di Desa Banyutowo. Jurnal BIMTAS: Jurnal Kebidanan Umtas, 5(2), 108–115. https://doi.org/10.35568/bimtas.v5i2.1865

UNICEF. (2018). Breastfeeding: A Mother's Gift for Every Child. UNICEF.

World Health Organization (WHO). (2020). Pekan Menyusui Dunia. World Health Organization.