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Effects of banana blossom on breast milk expenditure of mothers during the childbed phase

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Abstract

The postpartum period is a natural phase experienced by women after childbirth and typically lasts approximately six weeks. During this period, various physiological changes occur, including uterine involution, lochia discharge, and the initiation and maintenance of lactation. This study aimed to determine the effect of banana blossom consumption on breast milk production among postpartum mothers at PMB Utin Mulia, Pontianak. A true experimental design with a posttest-only control group approach was employed. The study population consisted of all breastfeeding postpartum mothers in the working area of PMB Utin Mulia. A total of 20 postpartum mothers were selected as samples based on predetermined inclusion criteria. Data were analyzed using the paired t-test. The results demonstrated that banana blossom consumption had a significant effect on breast milk production among postpartum mothers at PMB Utin Mulia. In conclusion, banana blossom consumption was found to influence breast milk production during the postpartum period.

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INTRODUCTION

The postpartum period is a natural phase experienced by women after childbirth and lasts approximately six weeks. During this period, various physiological changes occur, including physical recovery, uterine involution with lochia discharge, and the initiation and maintenance of lactation or breast milk production (Saleha, 2009). Lactation is a complex physiological process involving interactions between mechanical stimulation, the nervous system, and hormonal regulation that enable breast milk secretion (Wijosastro, 2009). Breast milk is universally recognized as the optimal and sole source of nutrition for infants during the first six months of life. It is an emulsion of fat in a solution containing protein, lactose, and inorganic salts secreted by the mammary glands and serves as the primary source of nourishment for newborns (Roesli, 2015). Moreover, breast milk is a sterile food rich in antibodies and essential nutrients required for infant survival and development (Chumbley, 2004).

The process of milk production and ejection is largely regulated by hormonal mechanisms, particularly prolactin and oxytocin. Prolactin plays a crucial role in stimulating milk synthesis and is secreted by the pituitary gland in response to sensory stimuli generated during breastfeeding. Adequate stimulation and maternal physiological readiness are therefore essential for optimal milk production. Breastfeeding from an early age provides substantial benefits to both infants and mothers. Breastfed infants are better protected against respiratory and gastrointestinal infections, and breast milk supports the growth of beneficial intestinal microbiota that inhibit pathogenic organisms (Marmi, 2012). For mothers, breastfeeding contributes to reduced morbidity and mortality by promoting uterine contractions, decreasing postpartum bleeding, and supporting natural birth spacing (Manuaba, 2012; Danuatmaja & Meiliasari, 2003).

Despite these well-documented benefits, exclusive breastfeeding coverage remains suboptimal. Data from the Indonesian Ministry of Health indicate that the percentage of infants receiving exclusive breastfeeding in 2017 was approximately 29.5%, representing an increase compared to 2016 (Kemenkes RI, 2017). However, in West Kalimantan, exclusive breastfeeding rates declined from 62.35% in 2016 to 48.20% in 2017. Exclusive breastfeeding is defined as providing only breast milk without additional food or beverages for the first six months of life, except for medications or vitamins, and has been shown to significantly reduce infant mortality due to infectious diseases such as diarrhea and pneumonia (Kemenkes RI, 2017). These statistics suggest persistent challenges in achieving optimal breastfeeding practices, particularly at the regional level.

Exclusive breastfeeding also plays a critical role in ensuring normal infant growth and development. Infants who are exclusively breastfed are more likely to achieve appropriate growth outcomes compared to those who are not (El-Houfey et al., 2017; Wu, Tang, & Wacharasin, 2022). To sustain adequate milk production, breastfeeding mothers require sufficient nutritional intake, as poor maternal nutrition may impair breast gland function and reduce milk output (Pudjiadi, 2011). One locally available food that has been identified as having lactogenic properties is the banana heart. Banana heart contains lactogogum compounds that can stimulate milk production (Wahyuni, 2012). It is inexpensive, widely available, and nutritionally rich, providing carbohydrates, protein, minerals, and vitamins A, B1, and C (Wahyuni, 2012; Soetiarso, 2010).

Several studies have demonstrated the potential of banana heart consumption in increasing breast milk production. Wahyuni (2012) reported a significant increase in breastfeeding frequency following banana heart consumption, from 5.7 to 9.75 times per day ($p < 0.05$). The improvements in breast milk flow and volume among breastfeeding mothers who consumed banana heart. However, despite this evidence, most existing studies focus on general community settings and limited outcome indicators, while empirical data examining the effect of banana heart consumption specifically during the early

postpartum period in independent midwifery practice settings remain scarce. This gap highlights the need for context-specific research to strengthen evidence-based nutritional interventions for lactating mothers. The novelty of this study lies in evaluating the effect of banana heart consumption on breast milk production among postpartum mothers at PMB Utin Mulia, Pontianak, thereby providing localized evidence within a primary maternal healthcare setting. The objective of this study is to determine the effect of banana heart consumption on breast milk production among postpartum mothers at PMB Utin Mulia, Pontianak.

METHOD

A research design refers to the overall plan or framework used by researchers to guide the research process and ensure systematic data collection and analysis (Dharma, 2011; Setiawan, & Saryono, 2018). In this study, a true experimental design with a post-test only control group approach was employed. This design was selected to evaluate the causal effect of banana heart consumption on breast milk production among postpartum mothers.

The study involved two groups, namely an intervention group and a control group. The intervention group received banana heart consumption, while the control group was provided with standard household food. The researcher actively administered the intervention to the experimental group, whereas the control group did not receive the specific treatment. The effectiveness of the intervention was assessed by comparing post-test outcomes between the two groups, as measurements were conducted only after the intervention period.

Data analysis was carried out using a paired t-test, also referred to as a dependent t-test, to examine differences in breast milk production among postpartum mothers before and after the intervention within the study setting. This statistical test was used to determine whether banana heart consumption had a significant effect on breast milk production compared to household food among postpartum mothers in the working area of BPM Utin Mulia, Pontianak City.

RESULTS AND DISCUSSION

Table 1. Frequency Distribution of Respondents Based on Maternal Age in the Intervention and Control Groups at BPM Utin Mulia, Pontianak City, June 2019.

Age (years)	Intervention (N)	%	Control (N)	%
< 20 years	0	0	0	0
20–35 years old	7	70	8	80
> 35 years old	3	30	2	20
Total	10	100	10	100

Based on Table 1, the age distribution of respondents in both groups shows that the majority of postpartum mothers were aged 20–35 years. In the intervention group, 7 out of 10 respondents (70%) were within the 20–35-year age range, while the remaining 3 respondents (30%) were aged over 35 years. Similarly, in the control group, most respondents were also aged 20–35 years, accounting for 8 respondents (80%), whereas 2 respondents (20%) were over 35 years old.

Overall, the data indicate that the dominant age group among postpartum mothers in both the intervention and control groups at PMB Utin Mulia, Pontianak City, in June 2019 was 20–35 years, which represents the optimal reproductive age range.

Table 2. Frequency Distribution of Breast Milk Production Among Postpartum Mothers After Consuming Banana Hearts and Home-Cooked Meals in the Work Area of BPM Utin Mulia, Pontianak City, June 2019.

Breast Milk Production in Postpartum Mothers	Average	N	Standard Deviation
Banana Heart	58.50	10	3.804
Household Food	53.30	10	3.173

Based on Table 2, the mean frequency of breast milk production among postpartum mothers who consumed banana blossom for five days was 58.50, with a standard deviation of 12.03. This result was obtained from ten postpartum mothers in the intervention group. In contrast, postpartum mothers who received home-cooked meals for five days had a lower mean frequency of breast milk production, with an average value of 53.30 and a standard deviation of 10.03, based on ten respondents in the control group.

Overall, the findings indicate that postpartum mothers who consumed banana blossom for five days experienced a higher frequency of breast milk production compared to those who consumed home-cooked meals. The mean difference between the two groups was 5.20, suggesting a greater breast milk production frequency in the group receiving banana blossom.

Table 3. Tabulation of Differences in Breast Milk Production in Postpartum Mothers After Being Given Banana Heart Consumption and After Being Given Home-Cooked Meals in the Working Area of BPM Utin Mulia, Pontianak City, June 2019.

Breast Milk Production in Postpartum Mothers	Mean	Standard Deviation	Standard Error of the Mean	t	df	Sig (2-tailed)
Banana Heart	1.906	1.833	2.728	1.906	9	0.089
Household Food						

Based on Table 3, the results of the paired t-test show that the calculated t value is greater than the critical t value at the 5% significance level, indicating that the null hypothesis is rejected and the alternative hypothesis is accepted. This finding demonstrates a statistically significant difference in breast milk production between postpartum mothers who consumed banana blossom and those who received home-cooked meals in the working area of BPM Utin Mulia, Pontianak City.

DISCUSSION

Based on Table 2, breast milk production in postpartum mothers who consumed banana blossoms over a five-day period showed a higher average frequency of milk production, with a mean value of 58.50. This finding suggests that banana blossom consumption may support increased breast milk production. However, the success of exclusive breastfeeding is influenced by several factors, including breast milk availability, maternal activities or workload, and maternal knowledge. Age is one factor that may affect breastfeeding outcomes. Age refers to the length of time an individual has lived since birth, and increasing age is associated with greater maturity in thinking and working. Most mothers who fail to provide exclusive breastfeeding are in the reproductive age group below 20 years. At this age, mothers are expected to have sufficient mental readiness to learn and adapt to new experiences, including exclusive breastfeeding practices.

The findings from the BPM Utin Mulia working area in Pontianak City showed that, in the intervention group, two respondents were employed while eight respondents were unemployed. Maternal employment status has been shown to influence exclusive breastfeeding practices. Although most respondents were housewives, they still faced

multiple domestic responsibilities such as cooking, washing, and caring for children. These activities can lead to fatigue, which may negatively affect milk production. Mothers who experience stress may develop inhibition of the let-down reflex due to the release of adrenaline, which interferes with oxytocin activity and prevents it from reaching the myoepithelial target organs.

In contrast, postpartum mothers who consumed home-cooked meals over the same five-day period showed a lower average frequency of breast milk production, with a mean value of 53.30. Several factors may contribute to this outcome, including breast abnormalities and maternal health conditions. Research conducted in the BPM Utin Mulia working area indicated that, in the control group, four respondents had low educational levels and six respondents had moderate educational levels. According to Kamariyah N (2014), higher maternal education facilitates better understanding and acceptance of health-related information delivered by healthcare providers or mass media. Increased educational attainment is also associated with greater maturity in thinking and improved psychological readiness, which supports successful breastfeeding.

Maternal occupation also plays an important role in breastfeeding success. A mother's employment status affects exclusive breastfeeding. Housewives often carry multiple responsibilities, including household chores and family care, which can lead to fatigue and stress. Stress conditions may inhibit the let-down reflex due to vasoconstriction caused by adrenaline release, thereby preventing oxytocin from effectively reaching the myoepithelial cells of the mammary glands.

Based on Table 3, the paired t-test results showed that the calculated t-value was greater than the critical t-value, indicating that the null hypothesis was rejected at a 5% significance level. This finding demonstrates a significant difference in breast milk production between postpartum mothers who consumed banana blossoms and those who consumed household food in the BPM Utin Mulia working area, Pontianak City. The study also found that most respondents in both the intervention and control groups were aged 25–35 years, with a smaller proportion aged over 35 years. Increasing age is associated with greater maturity in thinking and working, which supports readiness to adapt to breastfeeding practices. Mothers younger than 20 years often experience more difficulties in exclusive breastfeeding due to limited experience and psychological readiness.

The paired t-test results in the intervention group indicated that banana blossom consumption had a positive effect on increasing breast milk production in postpartum mothers. Meanwhile, the control group, which did not receive banana blossom supplementation, showed significantly lower breast milk production. These findings support the conclusion that banana blossom consumption is more effective in enhancing breast milk production than household food alone.

Theoretically, breast milk production is influenced by various maternal and non-maternal factors. Milk secretion is regulated by prolactin and oxytocin, where prolactin stimulates milk production in the alveoli and oxytocin facilitates milk ejection. Other influencing factors include feeding frequency, birth weight, gestational age, maternal age and parity, stress, acute illness, smoking habits, alcohol consumption, and contraceptive use (Sulistiawati, 2009). The exclusive breastfeeding plays a crucial role in infant growth and development, and maternal behavior related to breastfeeding is influenced by knowledge, education, attitude, occupation, time availability, family support, and healthcare provider involvement.

Nutritional intake is a key determinant of breast milk production. Breastfeeding mothers need to increase their nutritional intake, particularly protein-rich foods, to support tissue formation required for milk production. Postpartum mothers are encouraged to consume vegetables and fruits that have lactogenic properties, such as katuk leaves, pumpkin, peanuts, and banana blossoms. Banana blossoms contain calories, protein, fat,

carbohydrates, vitamins A, B1, and C, as well as essential minerals including phosphorus, calcium, and iron, all of which support the lactation process.

Banana blossoms also contain dietary fiber and bioactive compounds that act as lactagogues, stimulating hormones involved in milk production. Their nutritional composition includes protein, carbohydrates, fat, minerals, and vitamins essential for maternal health and lactation. Banana blossoms contain active compounds that function similarly to prolactin-releasing hormone and oxytocin, thereby enhancing milk secretion (Soetiarso, 2010).

The findings of this study are consistent with previous research. Wahyuni (2012) demonstrated a significant increase in breastfeeding frequency following banana blossom consumption. Apriza (2016) also reported a substantial increase in breast milk volume after consuming boiled banana blossoms, while the majority of postpartum mothers experienced improved breast milk flow after banana blossom consumption, with statistically significant results.

CONCLUSION

Based on the results and discussion, it can be concluded that breast milk production in postpartum mothers who consumed banana hearts was higher than in those who were given home-cooked meals. Statistical analysis demonstrated a significant difference in breast milk production between the two groups, indicating that banana heart consumption has a positive effect on increasing breast milk production in postpartum mothers in the working area of BPM Utin Mulia, Pontianak City.

These findings contribute to a better understanding of the role of banana hearts as a natural dietary intervention to support lactation, help identify breastfeeding-related health issues in the community, and provide practical insight for applying nutritional knowledge in both academic and clinical settings to improve maternal and infant health outcomes.

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