



THE EFFECT OF PAPAYA FRUIT (CARICA PAPAYA) TOWARD BREAST MILK PRODUCTION ON POSTPARTUM MOTHERS

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ABSTRACT

A recurring issue encountered by postpartum mothers in breastfeeding is the occurrence of insufficient milk production (32%). Papaya fruit contains substances like Lactogogum, Vitamin A, and Vitamin C, which are known to enhance milk production. This study aimed to investigate the impact of papaya fruit (*Carica papaya*) on milk production in postpartum mothers within the operational realm of the Talu Public Health Center in 2023. Employing a quantitative research approach, the study utilized a quasi-experimental design featuring a one-group pretest-posttest setup. The study encompassed the entire population of postpartum mothers in Talu Community Health Center's jurisdiction, totaling 225 individuals. A sample of 30 participants was selected using a purposive sampling technique. Data analysis involved both univariate and bivariate methods, employing the Wilcoxon test. Statistical findings demonstrated that the average breast milk production score prior to the intervention (papaya fruit) was 4.27. Following the intervention (papaya fruit consumption), the average breast milk production score increased to 4.80. The bivariate test yielded a p-value of 0.000, indicating a significant impact of the intervention on breast milk production. In conclusion, it is established that giving papaya fruit has a positive effect on breast milk production among postpartum mothers within Talu Community Health Center's jurisdiction in 2023. The study suggests that regular consumption of fruits rich in Lactogogum, Vitamin A, and Vitamin C, such as papaya, can potentially enhance milk production for postpartum mothers.

Keywords: Papaya Fruit, Breast Milk Production, Postpartum Mothers

ABSTRAK

Masalah yang sering terjadi pada ibu nifas dalam menyusui salah satunya adalah produksi ASI kurang (32%). Laktogogum, Vitamin A, Vitamin C adalah zat-zat yang dapat meningkatkan produksi ASI yang terdapat pada buah pepaya. Tujuan penelitian ini melihat pengaruh buah pepaya (*carica papaya*) terhadap produksi ASI pada ibu nifas diwilayah kerja puskesmas Talu tahun 2023. Jenis penelitian kuantitatif dengan desain *quasy experiment* dengan rancangan *one group pretest posttest*. Populasi dalam penelitian ini adalah seluruh ibu nifas diwilayah Puskesmas Talu berjumlah 225 dan sampelnya berjumlah 30 orang dengan teknik *purposive sampling*. Analisis data univariat dan bivariat menggunakan uji *Wilcoxon*. Hasil uji statistik didapatkan bahwa hasil rata-rata skor produksi ASI sebelum diberikan intervensi (buah pepaya) yaitu 4,27. Kemudian terjadi peningkatan rata-rata skor produksi ASI setelah diberikan intervensi (buah pepaya) yaitu 4,80. Hasil uji bivariat diperoleh *p-value* 0,000 artinya ada pengaruh intervensi terhadap produksi ASI sebelum dan sesudah diberikan intervensi buah pepaya terhadap peningkatan produksi ASI. Disimpulkan ada pengaruh pemberian buah pepaya terhadap produksi ASI pada ibu nifas diwilayah kerja puskesmas Talu tahun 2023. Diharapkan kepada ibu nifas untuk mengkonsumsi buah-buahan yang mengandung laktogogum, Vitamin A, Vitamin C secara rutin untuk meningkatkan produksi ASI.

Keyword : Buah Pepaya; Produksi ASI; Ibu Nifas

INTRODUCTION

Human breast milk (HBM), commonly known as breast milk or ASI (Air Susu Ibu), stands as the foremost vital nourishment for infants, serving as the most natural and optimal source of nutrition during the initial six months of a baby's life. HBM provides essential energy and nutrients required for the infant's development. It is considered the ideal nutritional source, containing a well-balanced array of nutrients tailored to meet the specific needs of infants and conferring a set of protective agents to combat diseases (Astutik, 2015:31).

Global strategies for infant and child feeding, as outlined by the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF), emphasize the significance of appropriate feeding practices in preventing infant mortality. Exclusive breastfeeding for the first six months of life, followed by the introduction of safe and nutritious complementary feeding (MPASI) at six months, alongside continued breastfeeding up to the age of two years or beyond, is recommended. Optimal breastfeeding practices during the first 0-23 months of a child's life are crucial, potentially saving the lives of over 820,000 children under the age of 5 annually (WHO, 2020).

Indicators reflecting the health status of a population in a given country include Maternal Mortality Rate (MMR) and Infant Mortality Rate (IMR). The leading cause of infant mortality is infectious diseases, with acute pneumonia accounting for 53% of cases and 55% of infant deaths due to diarrhea resulting from inadequate feeding in the first six months of life. Non-exclusive breastfeeding increases the risk of respiratory tract infections (RTIs) by 3 to 4 times and the risk of death from diarrhea by 3.94 times compared to exclusive breastfeeding (WHO, 2020).

Approximately 10 million infants experience mortality globally, with breastfeeding having the potential to prevent around 60% of these deaths. Breastfeeding, proven to enhance the health status of infants, could save 1.3 million lives. To reduce child morbidity and mortality rates, the United Nations Children's Fund (UNICEF) and WHO recommend exclusive breastfeeding for a minimum of six months, followed by the introduction of solid foods. Breastfeeding should ideally continue until the age of two years (E. Novita, M. Murdiningsih, 2022).

Insufficient breast milk production remains the most common hindrance to the practice of exclusive breastfeeding. Breastfeeding failure often results from mothers' inadequate knowledge of breastfeeding techniques necessary for smooth milk provision (Nurrahmaton, Dewi Sartika, 2021).

Common issues encountered by postpartum mothers in breastfeeding include insufficient or slow milk flow. The primary causes of breastfeeding difficulties include failure to initiate early breastfeeding (32%), inadequate milk production (28%), nipple problems (25%), breast engorgement (25%), the influence of formula milk advertising (6%), maternal employment (5%), and external influences, especially from family members (4%). Thus, support for breastfeeding is crucial from family, society, and healthcare providers to foster the health and well-being of the next generation (Kemenkes RI, 2020).

The data from the World Health Organization (WHO) for the year 2020 reveals that, on a global scale, an average of 44% of infants aged 0-6 months who received exclusive breastfeeding during the period from 2015 to 2020 falls slightly below the WHO's global target of 50% (WHO, 2020). In Indonesia, the national coverage of infants receiving exclusive breastfeeding stands at 66.1%, reflecting a decrease from the 2019 figure of 67.74% (Kemenkes RI, 2020).

The National Health Profile of Indonesia in 2019 reported a national coverage of exclusive breastfeeding at 67.74%, surpassing the targeted 50% on 2019 (Kemenkes, 2019). Based on the Health Profile of Indonesia for the year 2019, the West Sumatra Province achieved a coverage of exclusive breastfeeding at 69.23%, which increased to 70.36% in 2020 and further to 74.16% in 2021 (Dinkes Provinsi Sumatera Barat, 2021).

Examining the health profile data for West Pasaman Regency in the year 2020, the coverage of exclusive breastfeeding was 48.5%, and in 2021, it decreased to 47%. This reduction in exclusive

breastfeeding coverage was reported by the West Pasaman Regency Health Office (Dinas Kesehatan Pasaman Barat, 2021). Meanwhile, in Talu Public Health Center in 2021, the coverage of exclusive breastfeeding was reported for 186 infants.

The success of exclusive breastfeeding (EBF) is influenced by the smooth initiation of breastfeeding, where early breastfeeding stimulation activates the nipple nerves. Infants who can breastfeed for 20-30 minutes within the first moments of life trigger the stimulation of nerve endings around the breast to the anterior pituitary gland at the base of the brain, leading to the release of the hormone prolactin. Prolactin plays a crucial role in lactation, promoting the production of breast milk and enhancing its flow. Nutritional intake influences prolactin levels, with higher nutritional intake resulting in increased breast milk production (Kadek Edy Atana, Rilyani, 2021).

Nutritional intake that can boost breast milk production includes a balanced diet of fruits and green leafy vegetables such as sweet potato leaves, moringa leaves, papaya leaves, and katuk leaves. Indonesia possesses numerous plants with potential medicinal properties, some traditionally used to boost breast milk production include papaya fruit, *Sauropus androgynus*, *Pimpinella anisum*, basil leaves, thorny amaranth, black cumin, moringa, turmeric, and others (Kadek Edy Atana, Rilyani, 2021).

The presence of lactagogum in papaya fruit is a substance known to enhance and facilitate breast milk production. Additionally, saponin and alkaloids in papaya fruit can influence prolactin hormone levels, contributing to the smooth process of milk ejection. Adequate breast milk production is evidenced by the frequency of infant weight gain on the 10th day, urination occurring 6-8 times a day, the frequency of infant breastfeeding, and the duration of infant sleep after breastfeeding (Istiqomah, 2015).

Papaya (*Carica papaya*) is one of the fruits containing lactagogum and boasts high nutritional content with numerous health benefits (Buulolo, 2021). Papaya's lactagogum content has the potential to stimulate oxytocin and prolactin hormones, including alkaloids, polyphenols, steroids, flavonoids, and other substances that are most effective in facilitating milk ejection. The hormonal reflex for prolactin secretion occurs when the baby sucks on the mother's breast, initiating a neurohormonal stimulation of the nipple and areola. This stimulation travels through the vagus nerve to the pituitary gland, then to the anterior lobe, releasing prolactin that circulates in the bloodstream and reaches the milk-producing glands, stimulating them to produce breast milk (Murtiana, 2019). The result of the research by Istiqomah (2015) indicates an increase in breastfeeding frequency from an average of 5.7 times to 9.75 times after papaya consumption. Nationally, the exclusive breastfeeding rate for infants in 2020 was 66.06%. Furthermore, another research done by Muhartono, dkk (2018) explored the effects of papaya consumption on the smooth production of breast milk in postpartum mothers. The administration of 600 grams of papaya three times a day for seven consecutive days significantly facilitated breast milk production in postpartum mothers within the first 40 days after childbirth.

According to the findings of the research conducted by Arlenti Lety, 2021 stated that the continuous administration of young papaya fruit for 7 days, starting from the 2nd or 3rd day after childbirth, at a dosage of 600 grams per day (200 grams per serving, three times a day), followed by boiling and consumption for the subsequent 7 days, resulted in a remarkable 9.75-fold increase in breast milk production, with a standard deviation of 0.78640. This increase was measured based on the observed infant weight gain of 500 grams per month, indicating a significant influence of papaya fruit infusion on breast milk production.

Based on the initial survey conducted by researchers on 15 postpartum respondents in the working area of Talu Health Center, it was found that 10 mothers stated that their breast milk production was insufficient and not smooth. This condition led to unsatisfied babies, as evidenced by infants appearing dissatisfied after breastfeeding, being fussy, crying, and not gaining weight. Consequently, mothers took the initiative to supplement with formula milk and complementary foods alongside breastfeeding. Some mothers mentioned having consumed foods to increase breast milk production, such as katuk leaves and banana hearts, but not consistently due to the difficulty of obtaining these

vegetables (katuk leaves) in their area, the high price of katuk leaves, and the need for additional processing. Some mothers also expressed a dislike or even aversion to vegetables. In this preliminary survey, researchers inquired with mothers about the benefits of papaya fruit in increasing breast milk production, but mothers stated that they were unaware that consuming papaya could enhance breast milk production.

One of the non-pharmacological interventions that can be provided to postpartum mothers to increase breast milk production is papaya fruit. Papaya is easily accessible, affordable, and liked by most postpartum and breastfeeding mothers. Papaya can be consumed directly without the need for further processing. Additionally, based on the literature obtained, papaya fruit has a significant impact on production due to the presence of lactagogum, which is one of the substances beneficial for breast milk production in postpartum mothers. Therefore, researchers aim to investigate whether papaya fruit has an effect on breast milk production in breastfeeding mothers in the working area of Talu Public Health Center.

METHOD

This research employs a Quasi-Experimental Design. Inclusion criteria include postpartum mothers with a history of normal childbirth who participate in the researcher-provided papaya fruit consumption program. Exclusion criteria encompass postpartum mothers currently using medications or vitamins/supplements to enhance breast milk production, breastfeeding mothers with congenital anatomical abnormalities in infants such as cleft lip and palate, and others undergoing complementary therapies. Ripe papaya fruit is administered twice a day for 7 days, with each serving weighing 100 grams. Sample selection is conducted using purposive sampling, a technique based on specific considerations. The observation sheet is employed as the research instrument. Bivariate testing involves first assessing data normality with the condition $p > 0.05$ using the Wilcoxon test. Data processing utilizes the Wilcoxon test with a p -value < 0.05 and a confidence level of 90%. Meanwhile, within paired groups, data pre- and post-comparison employs the paired Wilcoxon statistical test.

RESULTS AND DISCUSSION

Table 2
Average Breast Milk Production Before Intervention in Postpartum Mothers in the Working Area of Talu Public Health Center, 2023

Breast Milk Production	n	Mean	Standard Deviation	Minimum	Maximum
Pretest	30	4,27	0,785	3	5

Based on Table 1, it can be observed that the average breast milk production before the intervention (administration of papaya fruit) is 4.47 points out of a total of 30 respondents. The lowest score for breast milk production in postpartum mothers is 3 points, while the highest score is 5 points, with a standard deviation of 0.785 points.

Table 2
Average Breast Milk Production After Intervention in Postpartum Mothers

Breast Milk Production	n	Mean	Standard Deviation	Minimum	Maximum
Prosttest	30	4,80	0,407	4	5

Based on Table 2, it can be observed that the average breast milk production after the intervention (administration of papaya fruit) is 4.80 points out of a total of 30 respondents. The lowest score for breast milk production in postpartum mothers is 4 points, while the highest score is 5 points, with a standard deviation of 0.407 points.

Table 3
The Influence of Papaya Fruit (*Carica papaya*) on Breast Milk Production in Postpartum Mothers

Breast Milk Production	n	Mean	Δ Mean	Standard Deviation	Md	p-value
Pretest	30	4,27	0,43	0,785	-4,000	0,000
Posttest		4,80		0,407		

Based on Table 3, the average score for breast milk production before the intervention (papaya fruit) was found to be 4.27 with a standard deviation of 0.785. Subsequently, there was an increase in the average score for breast milk production after the intervention (papaya fruit), which was 4.80 with a standard deviation of 0.407. The statistical test results yielded a p-value of 0.000, indicating that there is an influence of the intervention on breast milk production before and after the administration of papaya fruit, contributing to an increase in breast milk production.

CONCLUSIONS AND SUGGESTIONS

Istiqomah (2015) stated that breastfeeding mothers often encounter challenges such as insufficient breast milk production, a lack of understanding of proper lactation management, the desire to resume breastfeeding after formula feeding (relactation), infants already exposed to prelacteal feeding (the administration of sugar water/dextrose, formula milk in the first days after birth), maternal abnormalities such as sore or injured nipples, swollen breasts, and working mothers. Meanwhile, infants frequently face obstacles such as illness or abnormalities.

Breast milk production can be improved by providing early and consistent breast care, enhancing nursing skills, or eating nutrients that enhance breast milk production. According to Haryono, R dan Setianingsih (2014) setianingsih (2014) boosting the consumption of nutritious meals is one of the strategies to produce more breast milk and improve its quality. One of the variables influencing the content and production of breast milk is maternal dietary consumption. Indonesia is a nation abundant in plants recognized for their therapeutic benefits. Some of them, such as papaya fruit, are powerful lactagogues. Lactagogues are substances that can increase or decrease the production of breast milk.

In accordance with the conducted research (Septiani, 2017) it is indicated that exclusive breastfeeding is more prevalent in the age group of 20-35 years (53.6%) compared to those under 20 or over 35 years old. However, there is no correlation between age and exclusive breastfeeding. This also suggests that the majority of respondents fall within the healthy reproductive age range. Healthy reproductive age for women is considered to be between 20 and 35 years old. Additionally, within this age range, a woman has reached a level of mental maturity, allowing for a well-managed

reproductive process. The researcher assumes that, aside from experience, older mothers also possess more mature thought patterns, resilience, and a positive mindset in making decisions to continue breastfeeding. This contributes to stimulating the prolactin hormone to function effectively, as it is known that prolactin hormone stimulates alveolar cells to produce breast milk.

According to Istiqomah (2015) the findings of this study show that breast milk production before ingesting papaya fruit had an average nursing frequency of 5.7 times, with a standard deviation of 0.80131. The average nursing frequency rose to 9.75 times after ingesting papaya fruit, with a standard deviation of 0.7864.

Breastfeeding is a basic and ideal necessity for newborns. The mother, close family members, and the newborn all play roles in this process. Occasionally, complications beyond one party's control develop, such as those relating to the mother's breast ailments. Nipple shape, swollen breasts, painful nipples, dry/cracked nipples, clogged milk ducts, mastitis, overly fast milk flow, and inadequate milk supply are all potential disruptions. The infant's sudden rejection of nursing might be related to circumstances such as the baby being born too tiny, early delivery, or the baby having a fungal infection on the skin, among others. Conditions for the mother are determined by hormonal and psychological variables, the quality and amount of the mother's nutrition, and her resting patterns.

The mother's breasts being taut before breastfeeding, breast milk leaking from the mother's nipple when pressed by hand, the baby's breastfeeding frequency of 6 to 8 times a day, the baby's urination frequency of 6 to 8 times a day, and the baby sleeping/calm after each breastfeeding session are the criteria for breast milk production used for observation before providing the intervention (papaya). The researcher obtained 16 respondents with a score of 5, indicating insufficient breast milk production, and 14 respondents with a score of 5, indicating sufficient breast milk production, from the 30 postpartum mothers whose breast milk production was measured using the observation sheet prior to the intervention.

The criterion for breast milk production utilized for observation prior to giving the intervention (papaya) included asking postpartum moms 5 (five) questions. Question number one was the most commonly responded "no" of these five questions, with seven respondents answering "no." Question number one rated the mother's breasts' tautness prior to nursing. Respondents who said "no" were largely under the age of 20 (1 respondent), between the ages of 20 and 37 (4 respondents), and over the age of 37 (2 respondents). In terms of education and employment, the majority of moms who replied "no" had a high school diploma and worked as housewives. In terms of parity and nursing history, the majority of individuals who replied "no" had more than one kid and had never nursed.

The researcher's intervention is papaya fruit, which has benefits such as increasing appetite, serving as a source of vitamin A and vitamin C, promoting smooth bowel movements, and increasing breast milk production. The papaya fruit also contains lactagogues, which can be used to increase the rate of secretion and production of breast milk. It also contains saponins and alkaloids, which can influence the prolactin hormone, aiding in the smooth process of breast milk secretion.

The findings of this study are consistent with those of Putri Gamara (2022), the average breast milk secretion before consuming papaya fruit in the researcher's study was 20.44 cc, with a standard deviation of 6.772. The average breast milk secretion after eating papaya fruit was 34.52 cc. The average difference in breast milk secretion before and after consumption of papaya fruit was 14.75 cc, with a standard deviation of 4.328 cc. It is concluded that the findings indicate an increase in breast milk production as a result of papaya fruit consumption.

The intervention, which involved the administration of papaya fruit, resulted in an improvement in the breast milk category, as observed in the breast milk production after the intervention among postpartum mothers. Out of the 16 mothers categorized as having insufficient breast milk before the intervention, the number decreased to 6 mothers categorized as having insufficient breast milk after the intervention. Among the 7 respondents who, before the intervention, answered "no" to the question about the tightness of the breasts before breastfeeding, there was a change after the intervention, with only 1 mother still answering "no." The question about the baby sleeping or crying

after breastfeeding remained unchanged, with 4 respondents consistently answering "no." Respondents showed a positive response, and breast milk production increased after the intervention of papaya fruit given to postpartum mothers. The increase in breast milk production is influenced by the presence of polyphenols and steroids that affect the prolactin reflex, stimulating the active alveoli in the formation of breast milk. The increase in breast milk production is also stimulated by the oxytocin hormone, influenced by the polyphenols present in young papaya fruit, making the breast milk flow more vigorously than before consuming papaya fruit. Oxytocin is a hormone that plays a role in promoting milk letdown. The role of oxytocin in the mammary glands is to stimulate the contraction of myoepithelial cells surrounding the alveoli, pushing the milk out into the milk ducts, thus emptying the alveoli and encouraging the synthesis of subsequent breast milk (Nataria, 2018).

This study is in line with the research conducted by Siska Indrayani Zuliyana (2021), where the results show that the average breast milk production before consuming papaya fruit is 20.9 times with a standard deviation of 11.915, and after consuming papaya fruit, the average production increases to 66 times with a standard deviation of 31.244. The correlation between the two variables is 0.742, and the difference in the average increase in breast milk production between those who do not consume and those who consume papaya fruit is 4.141 with a significance of 0.000. This means that there is a difference in the average breast milk production before and after consuming papaya fruit. It can be concluded that giving papaya fruit can influence the increase in breast milk production in postpartum mothers.

Regularly giving papaya fruit to breastfeeding postpartum mothers shows very optimal results and significantly influences breast milk production in these mothers. Papaya fruit, provided as an intervention to postpartum mothers, contains high levels of vitamin A and vitamin C, as well as lactagogum, which can increase and facilitate breast milk production. The advantage of regularly consuming papaya fruit is that it can also reduce the impact of insufficient breast milk on infants, such as disrupted growth leading to stunting, as well as health and psychological issues in mothers. One of the non-pharmacological interventions that can be given to postpartum mothers to increase breast milk production is papaya fruit because it is easily accessible, affordable, most postpartum mothers like papaya fruit, and it can be consumed directly without further processing. The results obtained by the researcher indicate the influence of papaya fruit on breast milk production in postpartum mothers in the Public Health Center Talu in 2023.

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