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ORIGINAL RESEARCH

IMPROVEMENT OF MOTHER'S BREAST MILK PRODUCTION THROUGH PAPAYA FRUIT DESSERT

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ABSTRACT

Breast milk (ASI) is the primary source of nutrition for infants as it can fulfill all their needs. However, the current rate of exclusive breastfeeding is still low. In Kutai Kartanegara Regency, the coverage of exclusive breastfeeding is only 47.5%. One of the reasons is insufficient breast milk production. Various efforts have been made to enhance breast milk production, such as providing papaya fruit dessert, as it contains lactagogue compounds that have the potential to stimulate hormones like oxytocin and prolactin. Compounds such as alkaloids, polyphenols, steroids, flavonoids, and other substances are believed to be most effective in increasing and facilitating breast milk production. To analyze the influence of papaya fruit dessert consumption on the enhancement of breast milk production among postpartum mothers in the working area of Sungai Merdeka Community Health Center in 2023. This study employs a quasi-experimental design with a "Pretest-Posttest, Control Group Design." The population includes all postpartum mothers who have given birth normally in the working area of Sungai Merdeka Community Health Center, with an average of 30 deliveries per month. The sample size was determined using the minimal sample size formula by Lemeshow, resulting in 26 participants. The measurement tools consist of observation sheets and a real bubee electric breast pump. Data analysis involves an independent t-test. There is an influence of papaya fruit dessert consumption on the enhancement of breast milk production among postpartum mothers in the working area of Sungai Merdeka Community Health Center, with a p-value of 0.000. The breast milk production in the group provided with papaya fruit dessert was significantly higher, with a difference of 39,231 ml compared to the group without papaya fruit dessert. The presence of compounds like alkaloids, polyphenols, steroids, and flavonoids in papaya fruit can enhance breast milk production.

Keywords

Papaya Fruit Dessert, Breast Milk Production, Postpartum Mothers

INTRODUCTION

Breast Milk (ASI) is the first gift in a newborn's life. For newborns, breast milk is the essential and natural source of nourishment. Providing breast milk offers benefits for both the baby and the mother.

Breast milk serves as the primary source of nutrition for infants, supplying essential proteins, fats, sugars, and calcium in appropriate proportions. Breast milk also contains antibodies that shield the baby from diseases during breastfeeding. Babies who receive breast milk are 3.9 times less likely to succumb to the risk of diarrhea and 2.4 times less likely to contract Acute Respiratory Infections (ARIs) (Arifeen, 2018). Other studies indicate that breastfed infants also face reduced risks of ear infections, food allergies, anemia, and obesity in the future (Haryono, 2018).

Various efforts have been made to enhance breast milk production, including traditional methods. These efforts involve early and regular breast care, improving breastfeeding techniques, or adjusting dietary intake. Natural potential from beneficial plant sources, such as papaya fruit, can also be harnessed for this purpose (Istiqomah & Wulandari, 2019). Nataria & Oktiarini (2018) state that papaya fruit contains lactagogue compounds with the potential to stimulate hormones like oxytocin and prolactin, including alkaloids, polyphenols, steroid flavonoids, and other substances. These compounds are most effective at increasing and facilitating breast milk production. The hormonal prolactin reflex, essential for milk production, occurs when a baby suckles on the mother's nipple, stimulating neurohormonal responses in the nipple and areola. This stimulation is transmitted to the pituitary gland through the vagus nerve, then to the anterior lobe. The anterior lobe releases the hormone prolactin, which enters the bloodstream and reaches the milk-producing glands. These glands are then stimulated to produce breast milk.

The increase in breast milk production is influenced by the presence of polyphenols and steroids in papaya fruit, which affect the prolactin reflex and stimulate active alveolar function in milk production. Oxytocin hormone also plays a role in increasing milk production; its elevation is influenced by the polyphenols found in young papaya fruit. This results in a more forceful milk flow after papaya consumption. Oxytocin is responsible for prompting milk letdown. It works by stimulating the contraction of myoepithelial cells surrounding the alveoli, pushing milk into the milk ducts. As a result, alveoli become empty, encouraging the synthesis of the next batch of breast milk (Nataria & Oktiarini, 2018). In a preliminary study involving interviews with 10 breastfeeding mothers of one-month-old babies, 6 mothers combined breast milk with formula due to perceived low milk supply. Among these, some mothers did not use supplements or foods known to boost breast milk production. Four mothers continued breastfeeding while providing supplemental foods.

Building upon the background described above, the researcher aims to investigate the impact of papaya fruit dessert consumption on breast milk production among postpartum mothers in the Sungai Merdeka Community Health Center's working area in 2023.

METHOD

This type of research employs a quasi-experimental design known as the Pretest-Posttest, Control Group Design. The population for this study consists of all postpartum mothers who have had normal deliveries in the Working Area of Sungai Merdeka Community Health Center, with an average of 30 deliveries per month. The sampling technique was determined using the Lemeshow formula, resulting in a sample size of 26 individuals. The instruments for breast milk production assessment include observation sheets and measurements obtained using the Real Bubee electric breast pump. The dependent

variable is breast milk production, while the independent variable is papaya fruit dessert consumption. Data were analyzed using univariate analysis to describe the characteristics of each researched variable. Univariate analysis presents mean, median, standard deviation, and minimum-maximum values. Furthermore, bivariate analysis was conducted to test the effectiveness of papaya fruit dessert on breast milk production using the Wilcoxon test.

RESULTS

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Table 1. Characteristics Based on Respondents' Characteristics in the Working Area of Sungai Merdeka Community Health Center in 2023

Variable	Cathegory	Case		Control	
		Frequency	Percent (%)	Frequency	Percent (%)
Mother's Age	< 20 years	3	23.1	3	23.1
	20-35 years	7	53.8	8	61.5
	35 years	3	23.1	2	15.4
Parity	Primiparous	7	53.8	3	23.1
	Multiparous	1	7.7	7	53.8
	Grandemulti	2	15.4	1	7.7
Education	Junior High School	7	53.8	1	7.7
	Senior High School	2	15.4	8	61.5
	College/ University	4	30.8	2	15.4
Occupation	Housewife	2	15.4	2	15.4
	Civil Servant	10	76.9	1	7.7
	Private Sector	3	23.1	1	7.7
Nipple Shape	Normal	10	76.9	2	15.4
	Abnormal	3	23.1	11	84.6
Feeding Frequency	< 8 times	10	76.9	2	15.4
	≥ 8 times	3	23.1	11	84.6
Infant's Sucking Strength	Weak	2	15.4		
	Strong	11	84.6		
Total		**13**	**100**	**13**	**100**

Source: Primary Data

Based on Table 1, it is shown that in the group given papaya fruit dessert, the majority are aged between 20-35 years, which is 7 individuals (53.8%). The majority have multiparous parity, with 7 individuals (53.8%). Their education level is mostly high school (SMA), with 7 individuals (53.8%), and the majority are homemakers (IRT), totaling 7 individuals (63.6%). Normal nipple shape is observed in 10 individuals (76.9%), while breastfeeding frequency is ≥ 8 times for 10 individuals (76.9%), and strong infant sucking strength is noted in 11 individuals (84.6%). In the control group not given papaya fruit dessert, the majority are aged between 20-35 years, with 8 individuals (61.5%). Most have multiparous parity, with 7 individuals (53.8%). High school (SMA) is the predominant education level, with 8 individuals (61.5%), and the majority are homemakers (IRT), totaling 9 individuals (69.2%). Normal nipple shape is observed in 11 individuals (84.6%), while breastfeeding frequency is mostly ≥ 8 times for 11 individuals (76.9%), and strong infant sucking strength is noted in 11 individuals (84.6%).

Table 2. Results of Breast Milk Production Data in the Group Given Papaya Fruit Dessert

Breast milk production	Mean	Standar Deviasi	Standar Error	Minimum-Maksimum
Before being given papaya fruit dessert	7.38	3.070	0.851	3-15
	101.54	16.631	4.613	70-130

After being given papaya fruit dessert				

Source: Primary Data

Based on Table 2, before being given papaya fruit dessert, the data reveals a mean value of 7.38 ml, a standard deviation of 3.070 ml, a standard error of 0.851 ml, a minimum value of 3 ml, and a maximum value of 15 ml. Meanwhile, after being given papaya fruit dessert, the breast milk production data shows a mean value of 101.54 ml, a standard deviation of 16.631 ml, a standard error of 4.613 ml, a minimum value of 70 ml, and a maximum value of 130 ml.

Table 3. Results of Breast Milk Production Data in the Group Not Given Papaya Fruit Dessert

Breast milk production	Mean	Standar Deviasi	Standar Error	Minimum-Maksimum
Before being given papaya fruit dessert	8.15	3.412	0.946	3-15
After being given papaya fruit dessert	62.31	7.250	2.011	50-75

Source: Primary Data

Based on the collected breast milk production data, before not being given papaya fruit dessert, the data reveals a mean value of 8.15 ml, a standard deviation of 3.412 ml, a standard error of 2.011 ml, a minimum value of 3 ml, and a maximum value of 15 ml. Meanwhile, after not being given papaya fruit dessert, the breast milk production data shows a mean value of 62.31 ml, a standard deviation of 7.250 ml, a standard error of 2.011 ml, a minimum value of 50 ml, and a maximum value of 75 ml.

Table 4. Difference in Breast Milk Production between Those Given Papaya Fruit Dessert and Those Without Papaya Fruit Dessert among Postpartum Mothers in the Working Area of Sungai Merdeka Community Health Center

Breast milk production	Mean	Mean Difference	Standar Error Difference	t_{hitung}	P value
Given papaya fruit dessert	101.54	39.231	5.023	7.796	0.000
Without papaya fruit dessert	62.31				

Source: Primary Data

Based on the analysis results using an independent t-test to observe the difference in breast milk production between those given papaya fruit dessert and those without papaya fruit dessert, a difference of 39.231 ml was observed. The statistical test yielded a p-value of 0.000, which is less than α (alpha) of 0.05, and a calculated t-value of 7.796, which is greater than the t-table value (n-2)(1/2α) = 2.091. This indicates that the null hypothesis (Ho) is rejected, meaning that there is an influence of papaya fruit dessert consumption on the enhancement of breast milk production among postpartum mothers in the working area of Sungai Merdeka Community Health Center in 2023. The research findings indicate that papaya fruit dessert has a more significant effect compared to not consuming papaya fruit dessert.

DISCUSSION

The research findings indicate that the average breast milk production before the intervention was 7.38 ml, with a minimum production of 3 ml and a maximum production of 150 ml. After being given papaya fruit dessert, the breast milk production increased to 101.54 ml, with a minimum production of 70 ml and a

maximum production of 130 ml. The results show that in the group given papaya fruit dessert, the initial breast milk output was minimal, but after consuming the papaya fruit dessert, the breast milk production increased to 130 ml. This study supports the research conducted by Abdullah et al. (2020), where the analysis showed that the average breast milk production before consuming papaya fruit dessert was 91.833 cc, with a minimum score of 60 cc and a maximum of 120 cc. After consuming the papaya fruit dessert, the average breast milk production increased to 112.500 cc, with a minimum value of 80 cc and a maximum of 145 cc.

After consuming papaya fruit dessert, postpartum mothers appeared more enthusiastic about breastfeeding their infants. The increased flow of breast milk was visible, and after nursing, babies fell into deep sleep. Babies didn't wake up frequently during sleep and didn't cry upon waking, indicating that their breast milk needs were being met.

The research results indicate that the average breast milk production was 8.15 ml, with a minimum production of 3 ml and a maximum production of 15 ml. After 7 days, the breast milk production was measured again, and it increased to 62.31 ml, with a minimum production of 50 ml and a maximum production of 75 ml. The results show that in the group not given papaya fruit dessert, the initial breast milk production was minimal, but after 7 days without consuming the papaya fruit dessert, the breast milk production increased to 62.31 ml. These findings demonstrate that in the group not given papaya fruit dessert, initially, the breast milk production was low. After 7 days without consuming the papaya fruit dessert, the breast milk production increased, with an average of 62.31 ml, a minimum of 50 ml, and a maximum of 75 ml during home visits. Therefore, an increase in breast milk production was observed after 7 days of research.

The process of postpartum breast milk production is a natural occurrence due to the lactation phase. Lactation or breastfeeding is the process of forming breast milk involving hormones such as prolactin and oxytocin. During pregnancy, prolactin levels increase, but breast milk does not yet flow due to the inhibitory effect of high estrogen levels. After childbirth, estrogen and progesterone levels decrease, and prolactin becomes dominant, leading to milk secretion (Astutik, 2018).

The research results show a significant difference between those given papaya fruit dessert and those not given papaya fruit dessert, with a p-value of 0.000. This indicates that consuming papaya fruit dessert can significantly increase breast milk production, as seen from the increase in production before and after the intervention, with a difference of 39.231 ml. These findings align with the study conducted by Fitriah et al. (2022), titled "The Effect of Papaya Fruit Dessert Consumption on Breast Milk Production Enhancement in the Srikuncoro Community Health Center Area, Pondok Kelapa Subdistrict, Central Bengkulu, 2022." The study demonstrated a difference in average breast milk production enhancement of 5.458 with a significance level of 0.000.

The research results show a significant difference before and after without papaya fruit dessert consumption on breast milk production in breastfeeding mothers at the Sungai Merdeka Community Health Center, with a p-value of 0.000. This indicates that even without papaya fruit dessert consumption, breast milk production can increase significantly. The difference in breast milk production before and after the intervention was 54.154 ml. This study indicates that breast milk production in postpartum mothers experienced

enhancement, both in those who produced less and those who produced more milk. The change was influenced by the age and parity of the mothers. In the group not given papaya fruit dessert, the increase in breast milk production was attributed to the mothers' consumption of nutrient-rich foods, such as vegetables and protein sources, which influenced breastfeeding outcomes.

The research findings show a significant difference in breast milk production between those who consumed papaya fruit dessert and those who didn't among breastfeeding mothers at Sungai Merdeka Community Health Center, with a p-value of 0.000. This indicates that the average breast milk production in the group given papaya fruit dessert is higher compared to the average breast milk production in the group without papaya fruit dessert, with a difference of 39.231 ml. The study conducted by Elly Wahyuni in 2018, titled "The Influence of Papaya Fruit Dessert Consumption on Breast Milk Production Enhancement in the Srikuncoro Community Health Center Area, Central Bengkulu," yielded similar results. The study showed an increase in average frequency of breast milk production from 5.7 times before consuming papaya fruit dessert to 9.75 times after consuming it.

CONCLUSIONS

Based on the analysis results using the Wilcoxon test, a p-value of 0.000 ≤ α (0.05) was obtained. Thus, it can be concluded that there is a difference in breast milk production before and after giving papaya fruit dessert to postpartum mothers in the working area of Sungai Merdeka Community Health Center.

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