

## The Effect of Back Rolling Massage Method with Virgin Coconut Oil Extract Towards Breastmilk Production on Post Partum Mother in Pangkalpinang City, Indonesia

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### Abstract

A quasi-experimental study with static-group comparison was done between (insert the interval of study) to identify the effect of back rolling massage with green coconut oil extract towards breastmilk production on postpartum mothers. The intervention group was the mothers that were given back rolling massage with virgin coconut oil (VCO). The control group was postpartum mothers that were given back rolling massage without green coconut oil extract. The 24 samples that were used for this study consisted of 2 sample groups; 12 samples in the intervention group and 12 samples in the control group. The average breastmilk production of the group with VCO extract in day 4 is 46.9 mL while the group without VCO extract is 42.9 mL until it shows no significant difference towards breastmilk production on day 4 with  $p$ -value = 0.794. On day 7 shows that the VCO extract group has breastmilk production 87.3 mL compared to the group without VCO only 49.2 mL until there is a significant difference with  $p$ -value = 0.046. The antioxidant analysis shows that VCO extract contained alkaloids and saponin. Back rolling massage with green coconut oil extract is effective in increasing breastmilk production at day 7.

**Keywords:** Back rolling massage, Virgin coconut oil (VCO), Postpartum mothers

### Introduction

Breast milk is the best food for growing and developing for babies. In addition to the complete nutritional content of breast milk, the baby will get a comprehensive sensory stimulation (tactile, smell, hearing, warmth and affection) from his mother [1]. Coverage of exclusive breastfeeding around the world is only around 36 % between 2007 - 2016 period. Meanwhile, coverage of exclusive breastfeeding in Indonesia was 54.3 % in 2016. The duration of exclusive breastfeeding for infants had not been reached 6 months and only lasts for 2 months [2]. Many things cause the failure of exclusive breastfeeding, one of which is the lack of confidence in mothers who feel that the milk they have cannot meet the nutritional needs of their babies [3].

In conditions that are full of worry and lack of confidence because they feel that their milk cannot meet their baby's needs, the mother needs help and support to be able to maintain milk production. Because lack of confidence and anxiety will cause inhibition of the hormone oxytocin lack of confidence and anxiety will cause inhibition of the hormone oxytocin. This oxytocin hormone has an impact on the release of the hormone prolactin as a hormone stimulating milk production in mothers during breastfeeding. Various alternatives can be done to increase milk production in mothers giving birth. Findings from previous studies have shown that in addition to consuming foods that are high in protein, one of the efforts that can be done to increase milk production is by doing massage to stimulate the hormone prolactin and oxytocin can also increase milk production [4].

Various alternatives can be done to increase milk production in mothers who have just given birth. Some research results reveal that in addition to consuming foods that are high in protein, one of the efforts that can be done to increase milk production is by doing massage to stimulate the hormone prolactin and oxytocin in the mother. Badrus [5] research results which provide woolwich massage and back rolling massage prove to be able to produce increased milk production in mothers. There are 80 % of

mothers who experience increased milk production after being given back rolling massage and 60 % of mothers who have increased milk production after being given a Woolwich massage. From Desmawati's research [6], it was found that postpartum mothers who were treated with a combination intervention of areola massage and back rolling massage had 5.146 times the opportunity to express breastmilk less than 12 h postpartum.

In addition to using the back rolling massage method to increase breastmilk expenditure, the combination of the back rolling massage method with Virgin Coconut Oil (VCO) is thought to further increase milk production and expenditure. VCO is known to have natural antioxidant potential and can increase the ability of the body's defense system against oxidative stress. Coconut oil is the main source of lauric fatty acids [7] and a component of fatty acids in breast milk. The wealth of fatty acid components in VCO makes this oil capable of being a basic ingredient for the production of fatty acids similar to breast milk [8].

This study aims to identify the phytochemical compounds and antioxidant activity from extracts of green coconut oil (*Cocos nucifera*) used in back rolling massage in post partum mothers. In addition, the study also aimed to analyze the effect of the back rolling massage method by using green coconut oil extract on breast milk production in post-partum mothers in Pangkalpinang City.

## Materials and methods

This research is a quasi experimental study with a static-group comparison research design. The variable to be examined is the effect of back rolling massage with green coconut oil extract on breast milk production in postpartum mothers. The intervention group was mothers who were given back rolling massage with green coconut oil extract on the 1st day of post partum to day 3, then milk production would be measured on days 4 and 7. The control group was post partum mothers who were given back rolling massage without extract green coconut oil, where observations of breast milk expenditure will be made on days 4 and 7. The sample size in this study is 24 samples consisting of 2 sample groups, namely 12 samples in the intervention group and 12 samples in the control group.

The intervention of back rolling massage with extracts of green coconut oil (*Cocos nucifera*) in the intervention group was carried out twice a day for 3 days, while the control group was only given the intervention of back rolling massage with olive oil for 3 days. Mothers will be given back rolling massage by skilled workers who have been certified as Certified Baby and Mom Therapist (CBMT). Measurement of the volume of milk production on the 4th and 7th day is done through the removal of breast milk using an electric breast pump in the group of mothers who are given intervention and control groups. Collated data was analyzed using statistical tests t-test for normally distributed data and Mann Whitney test for data that are not normally distributed.

## Results and discussion

### Phytochemical identification of VCO extract from green coconut fruit

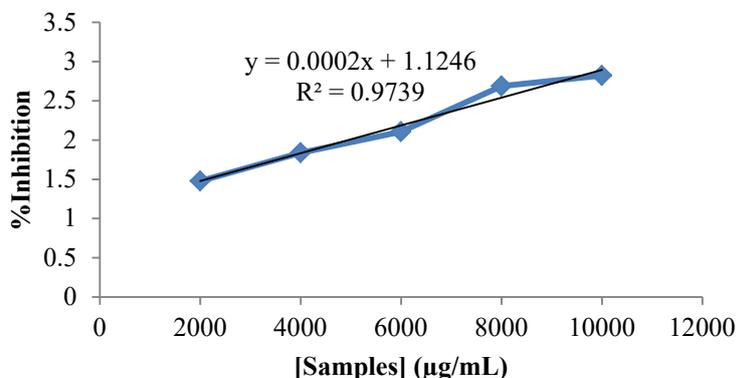
**Table 1** shows that the VCO produced by green coconut used contains alkaloids and saponins. Meanwhile, other bioactive compounds such as flavonoids, phenols or tannins, and steroids or terpenoids were not found positive test results. The tests used in this test were 3 times, indicated by 3 test tubes in each test.

**Table 1** Phytochemicals identification VCO extract from green coconut fruit.

Type of phytochemicals compound	Result
Alkaloids	+
Phenol/Tanin	-
Flavonoid	-
Saponin	+
Steroid/Terpenoid	-

**Antioxidant activity test of VCO extract from green coconut fruit**

Antioxidant activity tends to increase with the addition of VCO concentrations. It's just that the inhibitory activity that occurs is not significantly able to inhibit the work of DPPH. The VCO used in this study was the VCO extracted by the heating method (Figure 1).



**Figure 1** The test of antioxidant activity of VCO extract from green coconut fruit.

**Breast milk production in post partum mother in Pangkal Pinang City.**

Table 2 shows that there was no effect of back rolling massage with green coconut extract (*Cocos nucifera*) on the production of breast milk on the 4th day in post partum mothers, as indicated by  $p > 0.05$  ( $p = 0.794$ ). Meanwhile on the 7th day, there was a significant difference in the production of breast milk with a value of  $p < 0.05$  ( $p = 0.046$ ) where mothers who received VCO extract during the treatment had greater milk production, which was 87.3 mL.

**Table 2** Breastmilk production on post partum mother in Pangkalpinang City.

Variable	Breastmilk production (mL/day)			p-value
	N	Mean	SD	
<b>Day 4</b>				
With VCO Extract	12	46.9	26.8	0.794
Without VCO Extract	12	42.9	39.3	
<b>Day 7</b>				
With VCO Extract	12	87.3	51.5	0.046*
Without VCO Extract	12	49.2	35.3	

**Description:** \*p-value used t-independent test.

The characteristics of respondents, namely the average age is 26 years with the youngest age 22 years old mother and the oldest is 40 years. Then, the highest level of mother's education was high school graduates with 58.3 % (14 people) and the lowest was elementary school (4.2 %) (1 person). As for the number of children at most < 2 children, namely 75 % (18 people) and at least > 2 children, namely 25 % (6 people). Most of the sex of babies in this study were women, namely 66.7 % (16 people) and the least number of them was male as many as 33.3 % (8 people). Meanwhile, the highest number of mothers who did Early Initiation of Breastfeeding was 87.5 % (21 people) compared to mothers who did not do Early Initiation, namely 12.5 % (3 people).

Breast milk production increased significantly in respondents who were massaged using VCO compared to non-VCO. Differences in postpartum maternal milk production in the experimental and control groups can occur due to factors from the mother that can affect milk production. Decreased milk production in postpartum mothers in the control group can be caused by factors in the mother herself such as fatigue, mental calm and mind. To produce good milk, the mental condition and mind of the mother must also be calm [9]. Psychological conditions of mothers who are depressed, sad, and tense can inhibit the work of oxytocin so that it can affect the mother's milk production [10].

On the 7th day, based on the results of the t-independence test analysis, obtained  $p$ -value = 0.046 ( $p$ -value < 0.05) so that it can be concluded that there is an influence that the back rolling massage method with green coconut oil extracts on breast milk production in mothers post partum in the city of Pangkalpinang. In line with other studies, this study also showed that there was a significant influence on the administration of back rolling massage and woolwich massage on the excretion of breast milk with a  $p$ -value of 0.005 (< 0.05) [11]. Other results show that there is a relationship between back massage and breast milk production in post partum mothers ( $p$ -value = 0.026,  $p$ -value < 0.05) [12].

Back rolling massage is 1 solution to overcome the smooth production of breast milk. Back rolling massage is massage along the spine (*vertebrae*) to the 5th-6th costae bone and is an attempt to stimulate the hormone prolactin and oxytocin after giving birth. *Back rolling massage* is done to stimulate the let down reflex [13]. Back rolling massage is an action that can affect the prolactin hormone which functions as a stimulus for breast milk production in mothers during breastfeeding. This action can also relax the mother and facilitate the flow of nerves and breast milk in both breasts [14]. From a study conducted by Desmawati [6], it was found that postpartum mothers who were given a combination intervention of areola massage with back rolling massage had a 5.146 times chance of expending their milk with less than 12 h postpartum. Potential alkaloids as anti-inflammatory agents can be used as a basis for VCO applications in back rolling massage therapy. Coconut oil has been consumed almost in all over Indonesia and is a safe food raw material to be consumed. The green coconut fruit itself is known of owning various phytochemical compound either in its skin, shell, and the fruit flesh tends to have the potency of beneficial phytochemical content for human [15].

Beside alkaloid, another phytochemical component that can be found in VCO extraction result is saponin. The group of this phytochemical compound has important function as anti bacterial component and anti-fungi or mushroom [16]. Saponin has bitter taste which is the key of its protective function towards microorganism that harms human [17]. The presence of this component in VCO can give benefits if applied as topical oil for therapy of back rolling massage

## Conclusions

The average of breastmilk production at day 4 until day 7 experiences increase. VCO usage in back rolling massage produces more average breastmilk production at the 4 in the amount of 46.7 mL. VCO usage in back rolling massage produces more average breastmilk production at day 7 in the amount of 87.3 mL. Back rolling massage method with green coconut oil extract (*Cocos nucifera*) is effective in increasing breastmilk production at day 7.

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