

THE EFFECTIVENESS OF OXYWICH MASSAGE (OM) ON PROLACTIN HORMONE LEVELS AND BREAST MILK PRODUCTION IN NORMAL POSTPARTUM MOTHERS

Efektivitas OM terhadap Kadar Hormon Prolaktin dan Produksi ASI pada Ibu Nifas Normal

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ABSTRAK

Produksi Air Susu Ibu (ASI) yang optimal sangat penting untuk mendukung pertumbuhan dan kesehatan bayi. Salah satu metode yang dapat meningkatkan produksi ASI adalah dengan stimulasi melalui pijatan. Oxywich Massage, kombinasi pijat oksitosin dan pijat Woolwich, diyakini dapat meningkatkan kadar hormon prolaktin yang berperan dalam produksi ASI. Penelitian ini bertujuan untuk mengevaluasi efektivitas OM terhadap kadar hormon prolaktin dan produksi ASI pada ibu nifas normal. Penelitian ini menggunakan desain true experimental dengan rancangan randomized pretest-posttest with control group design. Sampel terdiri atas ibu nifas normal pada hari ke-2 hingga ke-6 yang dibagi menjadi kelompok intervensi dan kontrol. Kelompok intervensi mendapatkan OM dua kali sehari selama lima hari, sedangkan kelompok kontrol tidak mendapatkan intervensi. Kadar hormon prolaktin diukur menggunakan metode ELISA (Enzyme-Linked Immunosorbent Assay), sementara produksi ASI diukur dengan gelas takar standar setelah pemompaan. Analisis statistik menunjukkan bahwa terdapat peningkatan kadar hormon prolaktin dan produksi ASI yang signifikan pada kelompok intervensi dibandingkan dengan kelompok kontrol ($p < 0,05$). Analisis lebih lanjut mengindikasikan bahwa intervensi OM memberikan efek positif setelah mengontrol variabel confounding seperti frekuensi menyusui, paritas, dan asupan nutrisi. Oxywich Massage terbukti efektif dalam meningkatkan kadar hormon prolaktin dan produksi ASI pada ibu nifas normal. Teknik ini dapat direkomendasikan sebagai metode non-farmakologis dalam mendukung keberhasilan menyusui.

Kata kunci: hormon prolaktin, ibu nifas, oxywich massage, pijat oksitosin, produksi ASI

ABSTRACT

Optimal breast milk production is essential to support the growth and health of infants. One method that can increase breast milk production is through massage stimulation. Oxywich Massage, a combination of oxytocin massage and Woolwich massage, is believed to increase prolactin hormone levels that play a role in breast milk production. This study aimed to evaluate the effectiveness of OM on prolactin hormone levels and breast milk production in normal postpartum mothers. This study used a true experimental design with a randomized pretest-posttest with control group design. The sample consisted of normal postpartum mothers on days 2 to 6 who were divided into intervention and control groups. The intervention group received OM twice a day for five days, while the control group did not receive any intervention. Prolactin hormone levels were measured using the ELISA (Enzyme-Linked Immunosorbent Assay) method, while breast milk production was measured with a standard measuring cup after pumping. Statistical analysis showed that there was a significant increase in prolactin hormone levels and breast milk production in the intervention group compared to the control group ($p < 0.05$). Further analysis indicated that the OM intervention had a positive effect after controlling for confounding variables such as breastfeeding frequency, parity, and nutritional intake. Oxywich Massage was proven to be effective in increasing prolactin

hormone levels and breast milk production in normal postpartum mothers. This technique can be recommended as a non-pharmacological method in supporting successful breastfeeding.

Keywords: *breast milk production, oxywich massage, oxytocin massage, postpartum mother, prolactin hormone*

PENDAHULUAN

Breast milk has the best nutritional and bioactive components needed by babies to support their health, growth, and development.^{1,2} WHO and UNICEF recommend that breastfeeding be continued exclusively without food or other fluids for the first six months of life and continued with complementary feeding of breastfeeding until the age of 2 years. WHO targets exclusive breastfeeding of 70% by 2030. In 2015-2021, 48% of babies under 6 months received exclusive breastfeeding, which is almost close to the target set by the World Health Assembly (WHA) of 50% by 2025.³

The coverage of exclusive breastfeeding in Indonesia in 2022 was recorded at 67.96%, a decrease compared to 2021, which reached 69.7%.⁴ However, based on the 2023 Indonesian Health Survey (SKI), exclusive breastfeeding coverage in infants aged 0–5 months increased to 73.8%. Although nationally it shows an increasing trend, exclusive breastfeeding coverage in Bengkulu Province is still relatively low, which is 69%. In particular, coverage in Bengkulu City only reaches 53%, making it the area with the second lowest exclusive breastfeeding achievement after Kaur Regency (43%). This figure is still below the national target. In accordance with the Decree of the Minister of Health of the Republic of Indonesia Number 450/Menkes/SK/IV/2004, the national target for exclusive breastfeeding coverage is 80%.^{5,6}

Several studies explain the reasons for non-optimal breastfeeding results (non-exclusive breastfeeding and/or cessation of breastfeeding). Various causes of low breastfeeding coverage, including inadequate exclusive breastfeeding caused by maternal

psychological stress (e.g., stress, anxiety, depression), are also associated with breastfeeding difficulties and cessation of breastfeeding, social and cultural factors, health and commercial system factors, and lack of knowledge about breastfeeding. Another cause is that mothers feel that their milk production is not enough, and problems with breastfeeding disorders such as mastitis and breast milk dams, and other problems. According to the results of Rini and Kumala's research in Anggraini et al (2022), it is added that several other factors that affect breast milk production are, peace of mind and mind, sleep, birth weight, breast care, contraception, food, gestational age during childbirth, cigarettes, alcohol and psychological disorders.⁷

The hormone responsible for breast milk secretion is called prolactin. Hormones stimulate lactation in women during pregnancy and maintain the supply of breast milk during breastfeeding. Oxytocin is an important trigger for the secretion of prolactin (PRL) from the anterior pituitary. Prolactin and lactagogue are the main ones needed in producing breast milk. Prolactin As reported in classical studies in humans, that prolactin follows a pattern of secretion in childbirth, prolactin decreases during active and expulsive labor, and increases after the birth of the placenta and subsequently the breastfeeding baby.⁸

Lack and slow release of breast milk production can cause the baby's needs to be unmet. In addition to the hormone prolactin, the lactation process also relies on the hormone oxytocin, which is released from the posterior pituitary gland as a sucking reaction of the nipple. Oxytocin affects the myoepithelial cells that surround the mammary alveoli so that the alveoli contract and secrete milk

that has been excreted by the mammary gland. The oxytocin reflex is determined and influenced by the mother's psychology. If anxiety, stress, and doubt arise, breast milk stimulation can be disrupted. So one of the efforts is to maintain the oxytocin hormone by giving a back massage that can make the mother feel comfortable and relaxed.⁹

OM is a combination of two types of massage, namely oxytocin massage and woolwich massage. Oxytocin massage is performed on the back area along the spine, which is effective after childbirth to increase the production of the hormone oxytocin. Massage of the back area will release neurotransmitters to stimulate the medulla oblongata, which directs the hypothalamus in the posterior pituitary gland to release oxytocin so that it can minimize maternal stress and reduce anxiety,¹⁰ as well as oxytocin production, which results in myoepithelial cell contraction and increases prolactin in breast milk production.⁹

Woolwich massage is a method of massaging the area of the lactive sinuses, which is located approximately 1-1.5 cm above the areola of the breast, with a duration of 15 minutes. Woolwich massage is one of the types of breast massage. The main purpose of this massage is to facilitate the production of milk from the lactive sinuses. One of the advantages of Woolwich massage is its simplicity, as it consists of massage techniques that are easy to follow and can be done by mothers themselves. In fact, the benefits of the Woolwich massage method in addition to increasing milk production, also increase breast milk secretion and prevent breast inflammation or mastitis.¹¹

One effective way to stimulate the release of the hormones prolactin and oxytocin is to give the mother a sense of relaxation through Woolwich massage therapy. This massage stimulates the myoepitel cells around the breast gland which then send signals to the brain, specifically to the hypothalamus and

anterior pituitary gland, to increase the secretion of the hormone prolactin. In this study, five respondents of primipara postpartum mothers experienced a significant increase in the volume of breast milk production, from an initial average of 2.54 cc to 8.12 cc after regular Woolwich massage twice a day. This increase indicates that Woolwich massage is not only effective in smoothing breast milk production, but also in physiologically increasing levels of the hormone prolactin which plays a role in the formation and maintenance of breast milk production.¹²

Other research results show that the administration of lactation massage techniques such as oxytocin massage has positive results on breast milk production,^{13,14} baby weight gain,^{9,15} increased prolactin levels. Previous studies have also shown that Woolwich massage has an effect on breast milk production, the smooth flow of milk, and the prevention of milk duct obstruction.¹⁶

The results of previous research related to the combination of oxytocin and woolwich massage showed that there was a significant increase in breast milk production.¹⁷ However, other studies found that there was no difference in the effect of the combination of woolwich massage on the smooth production of breast milk. There has been no study that has comprehensively examined the impact on prolactin levels in breast milk from the combination of oxytocin and woolwich massage, there is still a lack of research that takes this issue and the inconsistency of the results of previous studies on breast milk production. So the latest part of this study is the use of a combination of oxytocin massage and woolwich massage to see its effect on prolactin hormone levels, not just breast milk production as in previous studies. In addition, the study used a more robust randomized experimental design and considered other factors such as breastfeeding frequency, nutrient intake, and parity. With the aim of this study, it

can further analyze the effect of giving Oxywich Massage (OM) on prolactin hormone levels and milk production in normal postpartum mothers.

METODE

The research has received approval from the Health Research Ethics Committee of the Ministry of Health of the Ministry of Health of Semarang with number 1111/EA/F.XXIII.38/2024, which is valid from August 26, 2024-August 26, 2025. This research was carried out from August to October 2024 in Bengkulu. The research was conducted in several Independent Midwife Practices in Bengkulu City. This study uses a true experimental design with a randomized pretest-posttest with control group design. This design allows for the evaluation of the effects of *the OM* intervention on prolactin hormone levels and milk production in normal postpartum mothers by comparing pre- and post-treatment outcomes in the intervention and control groups.

The subjects of the study were normal postpartum mothers who met the inclusion and exclusion criteria. The inclusion criteria used were normal postpartum mothers on day 2 to day 6, aged 20-35 years, exclusive breastfeeding, babies in normal condition, and mothers who were willing to be respondents. The exclusion criteria used were mothers with breast abnormalities, mothers who experienced postpartum blues, mothers who consumed booster breastfeeding, and mothers who received other non-pharmacological therapies. Respondents were declared to drop out if the mother did not follow the provisions given during the intervention.

The sampling technique in this study uses probability sampling with a simple random sampling method. The randomization process is carried out directly by postpartum mothers. Each mother who met the inclusion criteria was asked to take a piece of paper from a sealed box containing the number code 1 or 2, without knowing the

contents first. Code 1 indicates the intervention group (Oxywich Massage/OM) and code 2 indicates the control group. In this way, each respondent has an equal chance of getting into one of the groups, thus maintaining the principle of randomization in experimental research.

The number of samples was determined using the sample size calculation formula for experimental research with a significance level of 5% and power of 80%. The sample was divided into two groups, namely the intervention group that received OM (oil massage) and the control group that did not receive the intervention. The calculation results show that the minimum number of samples needed is 14 people per group. To anticipate the possibility of dropout, a correction of 10% was made, but the final number of samples per group was still set at 14 people. Thus, the total sample in this study is 28 people. Informed consent is given to each participant before the research is carried out as a form of voluntary consent to participate in the research.

The independent variable in this study is *oxywich massage*, the dependent variable is prolactin hormone levels and breast milk production, with the frequency of breastfeeding and nutrient intake as *the confounding variables*.

Prolactin hormone levels and milk volume were measured in both groups before the intervention as pretest and posttest. The treatment carried out in the intervention group was *OM* twice a day (morning and evening) for 5 consecutive days by trained health workers, each for 30 minutes. The control group was given breast care 2 times a day (morning and evening) for 5 consecutive days by trained health workers, with a duration of 15 minutes. Furthermore, re-measurement of prolactin hormone levels and re-measurement of milk production volume (Posttest Data Taking) were carried out after the intervention was completed.

For the pretest and posttest test instruments, the measurement of prolactin hormone levels was carried out using the ELISA (*Enzyme-Linked Immunosorbent Assay*) method.

After measurement, the data were tested for normality using the Shapiro-Wilk test. If the data is distributed normally, then a difference in PRL levels is analyzed using the Paired Sample T-test to compare data before and after the intervention in one group, as well as the Independent T-test to compare the differences between the intervention

and control groups. To control confounding variables such as breastfeeding frequency, parity, and nutrient intake, linear regression analysis was used. All data analysis was performed using IBM SPSS Statistics software version 25.

RESULT

Univariate analysis is used to analyze the frequency distribution of respondent characteristics and analyze the distribution of dependent variables and confounding variables of the study.

Table 1. Characteristics of Research Respondents

Category	Respondent Group			
	Intervention		Control	
	n=20	%	n=20	%
Paritas				
Primipara	10	50	9	45
Multipara	6	30	7	35
Largemultipara	4	20	4	20
Nutritional Intake				
Good	12	60	7	35
Less	8	40	13	65
Frequency of Breastfeeding				
Good ($\geq 12x/24$ hours)	7	35	7	35
Sufficient (8-12x/24hrs)	8	40	7	35
Less ($< 8x/24$ hours)	5	25	6	30

Table 1 shows that the frequency of parity in the intervention and control groups was dominated by the primipara status of the intervention group as many as 10 people (50%), while in the control group, as many as 9 people (45%). Nutrient intake in respondents was dominated by a large group in the intervention group (60%) rather than the control group (35%). Frequency of breastfeeding. In the intervention group, breastfeeding frequency was mostly moderate (8-12x/24 hours) (40%), and in the control group was mostly moderate (8-12x/24 hours) (35%).

In Table 3, there were levels of the hormone prolactin after each treatment in the intervention group of 293.35 ng/ml and the control group of 228.20 ng/ml.

Breast milk production after each treatment was given in the intervention group with an average of 48.70 ml and a control group of 35.10 ml. The results of the homogeneity test had a p value of >0.005 , meaning that there was no difference in the average parity, frequency of breastfeeding and nutritional intake between the intervention group and the control group before being given treatment.

The homogeneity test was carried out to determine whether the variables tested were homogeneous or not in the dependent variables, consisting of prolactin hormone levels and milk production. The homogeneity results can be seen in the following table:

Table 2. Homogeneity Test

Variabel	p-value*
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Prolactin hormone levels	0,889
Breast milk production	0,422

Table 2 presents the results of the homogeneity test for the characteristics of prolactin hormone levels and milk production before treatment. The p-value obtained is greater than 0.05, which indicates that the data from both groups are homogeneous.

Data normality tests are carried out to ensure appropriate statistical tests for use in data processing and analysis. The

Shapiro-Wilk test is used for normality assessment due to the small sample size of the study (less than 50 samples). A significance value or probability value of >0.05 indicates that the data follows a normal distribution, while a significance value or probability value of <0.05 indicates that the data does not follow a normal distribution

Table 3. Effect of OM on Prolactin Hormone Levels

Variable	Group		p-value*
	Intervention (Mean±SD)	Control (Mean±SD)	
Prolactin hormone levels			
Pre	207,15±79,86	249,15±86,95	0,120
Post	293,35±77,78	228,20±66,81	0,007
p-value*	0,000	0,248	

Table 3 shows that the results of the Paired sample T-test of the intervention group of prolactin hormone levels before and after treatment showed that there was a significant difference in mean levels. Meanwhile, in the control group, there was no significant difference in prolactin levels before and after treatment. The effect size of OM compared to breast care was 1.09; there was a very large influence on the

increase in the level of the prolactin hormone in postpartum mothers. Milk production data are distributed normally, so the differential test to determine the average difference before and after treatment in the intervention group and the control group uses the paired sample T-test, and to test the mean difference after treatment in the intervention group and the control group using the Independent T-test.

Tabel 4. Pengaruh OM Terhadap Produksi ASI

Variable	Group		p-value*
	Intervention (Mean±SD)	Control (Mean±SD)	
Breast milk production			
Pre	18,00±3,71	18,80±4,56	0,547
Post	48,70±20,29	35,10±16,21	0,025
Δpre-post	30,70±20,28	16,30±16,35	
P value*	0,000	0,000	

Table 4 shows that before the intervention, there was no difference in milk production in the two groups (p-value 0.547). After being given the treatment intervention, the intervention group experienced a significant increase in breast milk production by 30.70 ml

with a p-value of 0.000 (<0.05) while the control group experienced an increase of 16.30 ml with a significance p-value of 0.025. The effect size of OM compared to breast care is 2.10 there is a very large influence on the increase in postpartum breast milk production.

Table 5. Confounding Variable Analysis of Dependent Variables

Variabel	Coefficients (sig)	R Square
Δ Prolactin hormone levels		
Nutritional Intake	0,18	0,24

Paritas	0,59	
Frequency of Breastfeeding	0,00	
δ Milk Production		
Nutritional Intake	0,78	0,14
Paritas	0,89	
Frequency of Breastfeeding	0,02	

Table 5 shows the results of the analysis of *the confounding variables* of nutritional intake, parity, and breastfeeding frequency on the variables of prolactin hormone levels and milk production, the determination coefficient values (R Square) were obtained of 0.24 and 0.14 which means that the ability of *the confounding variable* to affect the level of the prolactin hormone is 24% and the ability of the counfoning variable to affect milk production by 14% so that the counfoning variable It was concluded that it was successfully controlled and did not affect the dependent variable because it was less than 25%.

DISCUSSION

In this study, although physiologically prolactin levels in breastfeeding postpartum mothers should remain high, a decrease in the level of the hormone can occur due to reduced breastfeeding stimulation and the presence of psychological factors such as stress, fatigue, and anxiety that inhibit the release of oxytocin. The research conducted implemented Oxywich Massage (OM) as an intervention to optimize hormonal stimulation, so that the resulting increase in oxytocin can also help neutralize the negative effects of these factors and promote increased prolactin secretion. Thus, the group that received the OM intervention showed a significant increase in prolactin levels compared to the control group that received only breast care. These findings are in line with the results of previous research, which showed that a series of factors, both physiological and psychological, have an important role in regulating prolactin levels during the postpartum period, So, interventions designed to increase breastfeeding

stimulation can effectively address the unwanted decrease in prolactin levels.

Treatment in the intervention group was in the form of giving Oxywich massage, which is a combination massage between oxytocin and woolwich massage. Both massages are already known by many people, but combining the two can be an alternative in improving the quality of breastfeeding. The purpose of oxytocin massage is for mothers to feel calm and relaxed so that they can increase affection for their baby and stimulate the release of oxytocin which can facilitate the release of breast milk. While woolwich massage optimizes their breastfeeding experience by ensuring a stable supply of breast milk for the baby by targeting the lactive sinus area located 1-1.5 cm above the areola of the breast.¹⁸

In this study, the average post-intervention prolactin level was 293.35 ng/ml while in the post-control group the average prolactin level was 228.29 ng/ml there was a difference in the two groups of 65.06 ng/ml. Prolactin levels showed that in both groups within normal limits. An imbalance in prolactin levels can harm this ability. If the level is too low, a mother will not be able to produce breast milk, and if the level rises inappropriately, this can lead to galactorrhea in women or men who are not breastfeeding.¹⁸

Nutrition has an important role in regulating levels of the hormone prolactin, which is a key hormone in breast milk production for breastfeeding mothers. Some studies suggest that the intake of certain foods can increase prolactin levels, for example, green beans and fennel, known as galtagogum (breast milk inducers). The content of carbohydrates, proteins, and flavonoids in these foods can stimulate the

secretion of prolactin and increase milk production.¹⁹

The adequate nutritional status of a pregnant woman greatly determines the success of breastfeeding. According to data obtained in the study, caregivers' participation in health education significantly affects the nutritional status of primipara women. The findings of the study also confirm the influence of social relationships on the diet of pregnant women. Therefore, there is a significant difference between the level of breastfeeding and the presence of pregnant women caregivers in health education ($p < 0.05$) and social support that has an effect on improving the health habits of mothers, children, families, and communities. Low levels of prolactin inhibit the process of lactogenesis which is important in the initiation, synthesis, and secretion of breast milk. Breastfeeding mothers are prone to malnutrition so it is important to assess the nutritional health of postpartum mothers.²⁰

Based on the results of the analysis, the average volume of breast milk before intervention in the treatment group was 18.00 ml, and after the intervention increased to 48.70 ml, with a difference of 30.70 ml. This shows an increase in breast milk production after the intervention. In the control group, the average volume of breast milk before treatment was 18.80 ml and increased to 35.10 ml after breast care, with a difference of 16.30 ml. These findings suggest that both groups experienced increased breast milk production, but a greater increase occurred in the group that received additional interventions.

The results of this study are in line with the research conducted by Triansyah et al (2021) explaining that there was an increase in breast milk production in the breast massage group and oxytocin (mean = 17.37, SD = 9.70) was greater than that of the control group (mean = 1.58, SD = 1.69) where the difference was statistically significant ($p < 0.001$). The process of forming breast milk occurs through two

processes, namely production and production. Through stimulation of the mother's nipples through the baby's mouth or massage on the mother's back, the hormone oxytocin will be released.⁹

Meirita et al (2024) in their research explained that woolwich massage has an effective impact on increasing breast milk production from 132 cc to 420 cc in 7 days, meaning that there is an increase of 288 cc. Giving back massage is effective on breast milk production during the postpartum period by increasing breast milk production from 135 cc to 400 cc in 7 days, meaning there is an increase of 265 cc.²¹

Milk production is affected by the hormone prolactin, while milk production is regulated by the hormone oxytocin. To increase breast milk production, postpartum mothers can implement several strategies. Among them are breastfeeding the baby more often (about 7-8 times in a 24-hour period), alternating between the two breasts in each breastfeeding session, using a breast pump in between breastfeeding times, adhering to a balanced diet that includes the right choice of foods and vitamins, ensuring adequate hydration (about 3 liters of water per day), doing a back massage (oxytocin massage) to facilitate milk production, take herbal supplements, and consult with health professionals to support increased breast milk supply.

Oxytocin massage is effective in releasing the hormone oxytocin which is a hormone that can increase breast milk in postpartum mothers. so that it will increase the hormones oxytocin and prolactin, where these two hormones will affect the amount of breast milk production and milk production. The nutritional needs of breastfeeding mothers have an important role in increasing the quality and quantity of breast milk produced. Research conducted by Lopez et al (2023) in their research stated that important nutrients such as folic acid (7.16 ± 5.88 ng/ml), vitamin B12 (160.59 ± 36.92 pg/ml), and transferin (223.86 ± 44.14 mg/dl) as well

as breastfeeding frequency have a significant influence.^{9,20}

There was no difference in the mean pre-test levels of prolactin between the intervention group and the control group, but in the post-test results, there was a significant difference between increased levels of the hormone prolactin and milk production in the intervention and control groups. Thus, OM intervention has been shown to be more effective in increasing prolactin hormone levels and milk production compared to breastfeeding alone.

The limitation in this study is the control of variables that can affect the results, such as education level, maternal knowledge, anxiety level, and support from husband and family. These factors can be confounding variables that have the potential to affect the effectiveness of a given intervention. In addition, the effects of interventions, such as oxytocin and woolwich massages, are temporary so that repeated interventions are needed to obtain long-term benefits.

CONCLUSION

Giving OM for 30 minutes, twice daily for five days, significantly increased prolactin hormone levels by 86.20 ng/mL ($p = 0.007$; effect size = 1.09) and milk production by 30.70 mL ($p = 0.025$; effect size = 2.10) in postpartum mothers. The effects are very strong. These results show that OM is effective in supporting the success of exclusive breastfeeding. Further research is recommended to consider variables of education, knowledge, anxiety levels, husband support, and family roles as factors that can affect breastfeeding success.

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