

EFFECT OF THE COMBINATION OF WOOLWICH AND EFFLURAGE MASSAGE ON BREAST MILK PRODUCTION AMONG NORMAL POSTPARTUM WOMEN

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Abstract

The coverage of exclusive breastfeeding in Indonesia is still low, one of which is due to lack of breast milk production. Breast milk production is affected by prolactin reflex and let down reflex. Some of the methods to increase breast milk production are woolwich massage and efflurage massage. This study aims to determine the effect of the combination of woolwich massage and efflurage massage on breast milk production among normal postpartum women. This was a quasi experimental study with non randomized control group pretest-posttest design. Thirty samples were selected using purposive sampling technique, where 15 samples were assigned to the experiment group and control group, respectively. Breast milk production was measured based on the breast milk volume and the infant weight. These measurements were then repeated after 3 days of treatment. Data were then analyzed using dependent t-test and independent t-test. The results showed that there was a significant difference in breast milk volume after treatment in the experiment group (520.10 ml) and control group (171.97 ml) with a p-value of 0.000 (< 0.05). It was also found that there was a significant difference in infant weight after treatment in the experiment group (353.87 grams) and control group (101.33 grams) with a p-value of 0.000 (< 0.05). It can be concluded from this study that there was a statistically significant effect of the combination of woolwich massage and efflurage massage on breast milk production among normal postpartum women. It is expected that the combination of woolwich massage and efflurage massage can be used as a consideration and reference in providing midwifery care to postpartum women.

Keywords : Woolwich Massage; Efflurage Massage; Breast Milk Production; Postpartum Women

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INTRODUCTION

Breast milk is the best nutrition for babies because it contains various nutrients in the appropriate levels needed by babies. Exclusive breastfeeding is considered to reduce infant mortality. Results of a study conducted in Japan showed that school-aged children who were exclusively breastfed for 6-7 months had an opportunity to avoid the risk of obesity by 0.85 times greater than children who were given formula milk [1]

In order to support the exclusive breastfeeding program, the Indonesian government made a policy on exclusive breastfeeding. However, in reality exclusive breastfeeding coverage in Indonesia has not reached the target of 80%. The percentage of coverage of infants receiving exclusive breastfeeding in Indonesia in 2017 was 61.33%. Exclusive breastfeeding coverage of in Central Java Province in 2015 was 61.6%, it decreased in 2016 to 54.22%, and experienced a slight increase in 2017 to 54.4% [2]. One of the cities in Central Java with the lowest exclusive breastfeeding coverage is Grobogan District. The exclusive breastfeeding coverage in Grobogan District in 2016 was 10.18%, and it increased in 2017 by 11.1% [2]. Grobogan District has 30 Community Health Centers, but there was only one CHC with exclusive breastfeeding coverage that exceeded the target of 44%, namely Pusoh Toroh II. Exclusive breastfeeding coverage in Gubug I CHC in 2017 was 8.99%, and in Gubug II CHC in 2017 it amounted to 8.78% [3]. One of the causes of the low coverage of exclusive breastfeeding is the inhibited breast milk production after delivery and the lack of breast milk production. [4]

The local government has tried to increase the exclusive breastfeeding coverage through counseling, but there has been no provision of non-pharmacological intervention to increase breast milk production. Therefore we need an effort to increase breast milk production, one of which is by massage which can stimulate the prolactin and oxytocin hormones. Breast milk production is influenced by two hormones, namely

the hormone prolactin which influences the secretion of breast milk and the hormone oxytocin which influences the reflex of milk secretion [5]. One type of massage that is considered to increase the secretion of the prolactin and oxytocin hormones is a combination of woolwich massage and efflurage massage.

Woolwich massage is a massage in the area of the lactiferous sinus that is 1-1.5 cm above the areola to excrete breast milk in the lactiferous sinus. This massage will stimulate nerve cells in the breast towards the hypothalamus and be transmitted to the anterior pituitary to produce prolactin, thereby increasing breast milk production.[6] One method for stimulating the production of the oxytocin hormone is by performing efflurage massage on the back. Efflurage massage is considered to facilitate blood circulation and the hormonal system, relax muscles and make the psychological condition of the mother comfortable so as to facilitate the delivery of stimuli to the posterior pituitary to produce oxytocin [7]. In addition, giving massage on the back was proven to provide a relaxing effect that allowed the increase in breast milk production [8]

Providing a combination of woolwich massage and efflurage massage is expected to increase the secretion of the prolactin and oxytocin hormones so that it can increase breast milk production and support the smooth flow of breast milk which is characterized by an increase in breast milk volume and infant weight.

Study Methods

This was a quasi experimental study with non randomized control group pretest-posttest design. Thirty samples were selected using purposive sampling technique, where 15 samples were assigned to the experiment group and control group, respectively. Subjects in the study were all primiparous women in 3-10 days normal postpartum in the work area of Gubug I CHC and Gubug II CHC Grobogan District in January - March 2019. Measuring instruments in this study were observation sheets of breast milk production and baby digital

scale. Data analysis in this study used univariate analysis and bivariate analysis using dependent t-test and independent t-test.

RESULTS AND DISCUSSION

Table 1 Characteristics of Respondents

Variable	Group		p-value
	Treatment	Control	
	N (%)	N (%)	
Age			0.110 ^a
20-35	15 (100%)	15 (100%)	
> 35	0	0	
Total	15 (100%)	15 (100%)	
Education Level			0.526 ^a
Junior High School	6 (40%)	7 (46.7%)	
Senior High School	9 (60%)	8 (53.3%)	
Total	15 (100%)	15 (100%)	
BMI			0.665 ^a
18.5 – 25	14 (93.3%)	13 (86.7%)	
> 25	1 (6.7 %)	2 (13.3%)	
Total	15 (100%)	15 (100%)	

^a Homogeneity Test

Table 1 showed that regarding the age characteristic, all respondents in the treatment group were in the age range of 20-35 years (100%). Based on the homogeneity test it was concluded that both groups had the same or homogeneous age characteristic. Age of respondents in the range of 20-35 years means that they were in a healthy reproductive age as stated by Notoatmodjo (2012).⁹ Age is one of the factors that influence breast milk production. A study in New York stated that 58% of women over the age of 30 had a problem of delayed breast milk secretion, while 42% of women aged less than 30 years had no problems in breast milk secretion [10].

Based on table 1 regarding education level characteristic, 6 respondents (40%) in the treatment group were at the level of junior high school and 9 respondents (60%) were at the level of senior high school. Based on the education level homogeneity test, it was concluded that both groups had the same or homogeneous level of education.

The education level of the respondent influenced the breast milk production, the higher the level of one's education, the higher the demand for health quality. Women with higher levels of education generally also had greater attention in understanding the benefits of breast milk for their children [11]. A study in Nepal found that women with primary education (OR 1.24) and secondary education or above (OR 1.63) had a higher chance of having early breastfeeding initiation compared to women without education [12]. Early breastfeeding initiation influenced milk production [13]. A study conducted by Jung-Hyun Choi and Mi Yu found that that age, education level and occupiesome factors that had a significant effect on the success of breastfeeding [14].

Based on Body Mass Index (BMI), 14 respondents (93.3%) in the treatment group were included in the range of 18.5-25 and

1 respondent (6.7%) was included in BMI category of >25. In the control group, 13 respondents (86.7%) were included in the BMI range of 18.5-25, and 2 respondents (13.3%) were included in the BMI category of >25. Homogeneity test on respondent's BMI in both groups obtained p-value of 0.665 meaning that both groups had the same or homogeneous BMI. BMI is one way to determine a person's nutritional status. Poor nutritional intake causes the lack of nutritional needs required to produce breast milk by the women's body [15] Women with normal nutritional status can produce milk smoothly and have sufficient nutritional content [16]. This is supported by Janeckova [17], who states that women with overweight nutritional status will cause the concentration of fat and protein in breast milk to be low due to an increase in adipose tissue accompanied by increased levels of leptin in the blood. Increased levels of leptin in the blood will cause levels of prolactin to be low, so that breast milk production will be disrupted.

The result of a study conducted in London stated that there was a relationship between body mass index and leptin concentration at 7 days postpartum and 3 months postpartum and insulin foremilk at 3 months postpartum [18]. Based on the results of a systematic review conducted by N. J. Andreas et al., it was shown that eleven of the fifteen studies found a relationship between maternal body mass index and leptin concentration in breast milk. Two of the nine studies on adiponectin found a relationship between maternal body mass index and adiponectin concentration in breast milk; however, there was one study which stated that significance disappeared after postpartum time adjustment. So it can be concluded that there was a significant relationship between body mass index and breast milk production both based on leptin concentration and adiponectin in breast milk [19].

Table 2 . Description of Breast Milk Production before Intervention

Variable	Group	Mean ±SD	p-value
Breast Milk Production based on Breast Milk	Treatment	305.45 ±51.52	0.084 ^a
	Control	270.92	

Volume		±87.04	
Breast Milk Production based on Infant Weight	Treatment	3021.93 ±230.25	0.438 ^a
	Control	3106.53 ±258.85	

^a Homogeneity Test

Table 2. showed that the mean breast milk production based on breast milk volume before the intervention in the treatment group was 305.45 ml, while in the control group it was 270.92 ml. Based on the homogeneity test in both groups, obtained a p-value of 0.084 (p-value >0.05) so that there was no difference in breast milk production based on the breast milk volume before intervention in the two groups.

The mean breast milk production based on infant weight before intervention in the treatment group was 3021.93 grams, the homogeneity test in both groups obtained a p-value of 0.438 (p-value >0.05) so that there was no difference in breast milk production based on infant weight before intervention in both groups.

Table 3. Breast Milk Production Before and After Intervention in the Treatment and Control Groups

Variable	Inter-vention	Group		p-value ^c
		Treatment	Control	
		Mean ±SD	Mean ±SD	
Breast Milk Production based on Breast Milk Volume	Pretest	305.45±51.52	270.92±87.04	0.000 ^c
	Posttest	825.55 ±63.10	442.88±85.39	
	Difference	520.10±56.59	171.97 ±65.94	
	p-value ^b	0.000 ^b	0.000 ^b	
Breast Milk Production based on Infant Weight	Pretest	3021.93±230.25	3106.53±258.85	0.000 ^c
	Posttest	3375.80±228.46	3207.87±257.82	
	Difference	353.87 ±27.98	101.33 ±15.57	
	p-value ^b	0.000 ^b	0.000 ^b	

^b Dependent T-test

^c Independent T-test

Breast milk production is generally measured by the breast milk volume [20]. Based on table 2 it was shown that the mean breast milk volume before the intervention in the treatment group was 305.45 ml and it increased to 825.55 ml after the intervention. Based on the dependent t-test, it was obtained a p-value of 0.000. thus, it can be concluded that there was a difference in the breast milk production based on breast milk volume of before and after the intervention in the treatment group.

The mean breast milk volume before intervention in the control group was 270.92 ml and it increased to 442.88 ml after intervention. Dependent t-test obtained a p-value of 0.000. Thus, it can be concluded that there was a difference in the breast milk production based on breast milk volume before and after the intervention in the control group.

Although both groups experienced an increase in the breast milk volume, there was a difference in the mean breast milk volume difference in the treatment group and in the control group of 348.14 ml with a mean difference in the breast milk volume in the treatment group of 520.10 ml and in the control group of 171.97 ml. Based on the independent t-test, it was obtained a p-value of 0.000 <0.05 which meant that there was an effect of the combination of woolwich massage and efflurage massage on breast milk production calculated using the formula for estimating the breast milk volume in the work area of Gubug I CHC and Gubug II CHC Grobogan District in 2019. These results are in line with the study conducted by Pamuji et al., (21), which found that there were differences in prolactin hormone levels and breast milk volume in primiparous postpartum mothers after being given a combination of woolwich massage and endorphine massage compared to the control group. The same finfing was conveyed by Kusumastuti et al., (22) that the administration of a combination of woolwich massage and oxytocin massage was

proven to increase breast milk production 17% higher than the control group.

Besides observation on the breast milk volume, breast milk production can also be measured by the infant body weight. Sari et al., [23], stated that there was a relationship between technique, duration, frequency of breastfeeding, and energy intake to increase infant weight. Based on Road to Health Card graph in the book Maternal and Child Health (MCH), minimum weight gain among infants aged 0 to 1 month is 800 grams, so that body weight for infants aged 0 to 1 month in 1 day is expected to increase ± 26.7 grams or it can be rounded to 27 grams per day.

From the results of this study, the mean infant weight before the intervention in the treatment group was 3021.93 grams, and it increased to 3375.80 grams after the intervention. Based on the dependent t-test, it was obtained a p-value of 0.000. Thus, it can be concluded that there was a difference in the production of breast milk based on the infant weight before and after the intervention in the treatment group.

The mean infant weight before intervention in the control group was 3106.53 grams, and it increased to 3207.87 grams after the intervention. Based on the dependent t-test, it was obtained a p-value of 0.000. Thus, it can be concluded that there was a difference in the production of breast milk based on the infant weight before and after the intervention in the control group.

Based on table 3, it can be seen that there was a difference in the mean infant body weight difference in both groups of 252.53 grams with a mean body weight difference in the treatment group of 353.87 grams and in the control group of 101.33 grams. Based on the Independent T-test, it was obtained a p-value of 0.000 <0.05 which meant that there was an effect of combination of woolwich massage and efflurage massage on breast milk production as seen from the baby weight in the work area of Gubug I CHC and Gubug II CHC Grobogan District in 2019. This in line with the study

conducted by Barokah dan Utami [24] which found that there was a significant difference ($p=0.011$) in breast milk production using woolwich massage between the intervention group (3265.63 ± 320.79) and the control group (3021.88 ± 159.88), which can be seen from the higher mean infant weight in the treatment group compared to the control group. The same thing was also conveyed by Nurvitasari et al., that there was an effect of woolwich massage on the adequacy of breast milk among newborns which was marked by a significant difference in changes in infant weight in the intervention and control groups (p value= $0.000 < 0.05$) [25].

Woolwich massage is a massage on the area of the lactiferous sinus which will stimulate nerve cells in the breast to the hypothalamus to be transmitted to the anterior pituitary to secrete prolactin to stimulate breast milk production. [6]

Efforts to increase milk production can be done on the breast itself. The effectiveness of massage in the breast area on breast milk production was evidenced by the more milk sucked by infants in the breast massage group [26]. The provision of massage on the breast was proven to increase breast milk production. However, it did not only relate to the prolactin and oxytocin hormones alone, because if it only related to the hormones, should both breasts produce the same amount of breast milk, but in this study one side of the breast that was given a massage produced more milk than the other side that was not given a massage, so there might be other factor that influenced it [27]. In addition to increasing milk production, massage in the breast area is also effective for relieving mild breast swelling, relieving breast pain, increasing breast milk pH, increasing the speed of neonatal breastfeeding from postnatal mothers, and increasing the experience of expressing breast milk among nursing mothers. [28][29].

In addition to massaging the breast area with a woolwich massage, increased breast milk production can also be done in the back area by performing efflurage massage. A study in Korea conducted by Lee et al., (30) explained the relationship between massage performed in the vertebral region of lumbar 4 to sacrum 1 to the autonomic nervous system so that it would reduce HRV, serum cortisol and norepinephrine levels and increase oxytocin levels. Other supporting study was the study conducted by Morhenn et al., (31), which showed that there was a relationship between spinal muscle massage and increased oxytocin levels and decreased adrenocorticotropin hormone (ACTH), nitric oxide (NO) and beta endorphin (BE) levels. [30]

Efflurage massage is a gentle, slow and uninterrupted motion to wipe a woman's back using the tips of fingers with light pressure in a circular shape which forms a butterfly pattern. This movement is carried out in accordance with the circulatory system leading to the heart and lymph nodes [32]. Previous study showed that efflurage massage was considered to reduce the level of pain among women and shorten the duration of labor compared to women who did not obtain efflurage massage. The efflurage technique provides effects of relaxation and calm so as to improve the psychological condition of the women. The psychological condition of a woman can affect breast milk production. Good psychological condition will facilitate the delivery of stimuli to the posterior pituitary to produce oxytocin which will affect the let down reflex [7]. In addition, massage therapy with efflurage technique was evidenced to reduce the incidence of baby blues from 46.7% to 20%. [34].

Woolwich massage and efflurage massage are a combination of two methods, namely breast massage to stimulate the breast muscles and massage that stimulates the muscles on the back of the mother. This combination massage aims to provide stimulation to the breast milk glands in order to produce milk and trigger the oxytocin hormone secretion or let down reflex and provide comfort and create a sense of relaxation in the mother which may result in increased breast milk production [20]

CONCLUSIONS

The age characteristic showed that all respondents were included in healthy reproductive age (20-35 years), the majority of respondents had education at the level of senior high school or equivalent, most respondents had BMI that was included in normal status (18.5 - 25). Age, level of education and BMI can affect the production of breast milk. There were significant differences in breast milk volume and infant weight between the treatment and control groups. Thus, there was a significant effect of the combination of woolwich massage and efflurage massage effect on breast milk production among postpartum women in the work area of Gubug I CHC and the Gubug II CHC Grobogan District in 2019.

From the results of the above study, it is expected that the combination of woolwich massage and efflurage massage can be used as a reference intervention to increase breast milk production to support the success of exclusive breastfeeding program. And further researchers are expected to be able to develop studies by adding other variables and controlling more confronting variables, especially regarding food and psychological aspects of the women to produce more accurate study results.

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