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Impact of Breast-Massage Training on Milk Formation among Third-Trimester Pregnant Women, Sulili Puskesmas-Pinrang 2024

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ABSTRACT

Introduction: Suboptimal milk production is often the reason why mothers stop breastfeeding, one of which is due to the lack of proper stimulation of the breasts. Breast massage, such as lactation massage, has been proven to stimulate the prolactin and oxytocin hormones that play a role in milk production and secretion. This study aims to determine the impact of breast massage training on the process of breast milk formation in third trimester pregnant women.

Methods: This study used a one group pre-test and post-test design with pre-experimental quantitative methods. The sample consisted of 23 third trimester pregnant women who were selected using purposive sampling technique. The research was conducted at the Sulili Health Center, Pinrang Regency, in August-September 2024. Data were collected through questionnaires, skill checklists, and observation of colostrum production before and after training. Data were analyzed using the Wilcoxon non-parametric test.

Results: The results showed a significant increase in mothers' knowledge and skills after breast massage training. Before the training, all respondents had low knowledge and moderate skills. After the training, 100% of respondents reached the high knowledge and skill categories. In addition, colostrum production increased significantly, from 0% before training to 88% after training.

Conclusion: Breast massage training is effective in improving knowledge, skills, and colostrum production in 3rd trimester pregnant women. It is expected that this training can be integrated in routine health education programs for pregnant women to support successful breastfeeding.

Keywords: Breast massage training; milk production; colostrum; 3rd trimester pregnant women



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Introduction

A survey in Indonesia reported that 38% of mothers stopped breastfeeding due to lack of breast milk. Inadequate breast milk makes mothers worried, afraid to breastfeed and has an impact on the baby's laziness to suckle, resulting in a decrease in the production and activity of the hormones oxytocin and prolactin, causing the amount of breast milk to decrease, even causing the milk ducts to block and stagnate, so that mothers gradually stop breastfeeding and switch to formula milk.¹

The World Health Organization (WHO) publishes child growth standards that are then implemented in all regions of the world and the text of the standards emphasizes the importance of breastfeeding from birth to 6 months in infants, meaning that infants are breastfed until they reach 6 months of age without receiving additional liquids and other solid foods. After birth, nutrition plays the most important role in the healthy growth and development of infants. WHO has set a target that by 2025, at least 50% of infants under 6 months of age will be exclusively breastfed. UNICEF data explains that only 32.6% of them are exclusively breastfed for the first 6 months. In developing countries, only 39% of mothers exclusively breastfeed their babies.¹ Based on the routine report of the Directorate General of Public Health in 2022, the achievement of the indicator of infants aged less than 6 months receiving exclusive breastfeeding was 67.96%. This achievement has met the 2022 national target of 50%. However, there are still around 32.04% of infants in Indonesia who are not exclusively breastfed.²

Pinrang Regency Health Office 2021 states that in 2019, it was recorded that babies who received exclusive breastfeeding were 55.89%. Then in 2020 it increased to 86.92% and in May 2021 it was recorded that 79.79% of babies were exclusively breastfed. This indicates that about 20% of children do not get exclusive breastfeeding and there is an increase of about 7% in babies who do not get exclusive breastfeeding from 2020 to 2021.³

According to experts, breast milk is the most perfect food for infant growth and development. Breast milk has a great influence on the health of both mother and baby. One of the efforts to increase breast milk production is breast care. Breast care can be done by massaging the breasts and stimulating the oxytocin reflex. Oxytocin is a hormone that can increase the influx of intracellular calcium ions.⁴

The purpose of this breast care action is so that blood circulation in the breast area becomes smooth and can prevent inhibition of breast milk channels, so that the process of releasing breast milk becomes smooth. The effect of breast milk production and discharge is caused by prolactin and oxytocin hormones. The prolactin hormone affects the amount of breast milk production, and the process of breast milk release is influenced by the hormone oxytocin.⁵

One of the ways to increase breast milk production is by implementing interventions in the form of breast care.⁴ Breast care is maintenance that is done to facilitate breast milk and avoid difficulties during breastfeeding by doing massage.⁴ Breast massage that can be done to facilitate breast milk is lactation massage,

oxytocin massage, Woolwich massage, and oketani massage.⁶

Lactation massage is a massage technique performed on the head or neck, back, spine, and breast area with the aim of stimulating prolactin and oxytocin hormones.⁷ Furthermore, oxytocin massage is an act of spinal massage starting from the ribs to the shoulder blades, which will accelerate the activity of the parasympathetic nerves to send commands to the back of the brain to produce oxytocin.⁸ In addition to oxytocin massage there is also Woolwich massage. Woolwich massage is intended to activate the stimulation of epithelial muscle cells around the breast glands, with the stimulation then traveling to the hypothalamus and can activate the anterior pituitary gland, produce prolactin hormone and produce more breast milk.⁹ Finally, there is oketani massage, which will make the breasts soft and supple and the areola and nipple more elastic. Oketani massage can make the breast glands mature and enlarge, so that the breast glands will produce more breast milk.⁶

Based on the description above related to the lack of breast milk production in mothers and how the effect of breast care, namely massage, can affect breast milk production in third trimester pregnant women, researchers are interested in conducting research on the impact of breast massage training on the process of breast milk formation in third trimester pregnant women, especially at Puskesmas Sulili Pinrang Regency in 2024.

Methods

This research uses a type of quantitative research with experimental methods, namely pre-experiment research. Pre-Experiment is a research method that uses a research group that does not use a control group. In this study, the design used was a one group pre and post test design, which means that two measurements were taken on the same subject by carrying out certain influences or treatments. Before receiving treatment, a pre-test measurement was taken in the research group, then after the research group received treatment, measurements were taken in the research group to determine the effect of the post-test treatment. This study received ethical approval following a submission in August 2024; approval was granted on September 2, 2024, under reference number 446/A.1/KEP-UMI/IX/2024. The research subsequently commenced in September. The research was conducted at the Sulili Health Center, Mamminasae, Paleteang District, Pinrang Regency, South Sulawesi in September 2024. The population taken from this study were trimester 3 pregnant women at the Sulili Health Center, Pinrang Regency with a sample size of 25 people in September. In this study the research variables were identified as independent variables and dependent variables. The independent variable used in this study is the impact of breast massage training. This is a treatment to get or obtain a certain effect. The dependent variable used in this study is the quality of breast milk in third trimester pregnant women seen from the release of colostrum before labor after massage.

Data that has been collected by researchers will be processed using the SPSS (Statistical Package for

the Social Sciences) program. Data analysis was carried out by univariate and bivariate analysis.

Results

This study was conducted in September 2024 and 25 research respondents were obtained. Research on the impact of breast massage training on the process of breast milk formation in 3rd trimester pregnant women at Puskesmas Sulili Pinrang Regency in 2024. The results of this study are presented in 2 data analyses, univariate analysis to determine the distribution of the characteristics of research respondents and bivariate analysis to determine the effect of breast massage training on increasing knowledge and skills and also knowing whether after breast massage is able to release colostrum after massage.

The following are the characteristics of the research subjects involved in this study.

Table 1. Characteristics of the subjects

Category	Frequency	%
Age		
< 20 years	4	16
20 – 35 years	16	64
> 35 years	5	20
Total	25	100%
Education		
Not in School	6	24
Elementary – Junior high school	7	28
Senior High School/ \Vocational School	9	36
College	3	12
Total	25	100%
Jobs		
Housewife	13	52
Self-employed	9	36
Private worker	1	4
Civil servant	2	8
Total	25	100%

Source: Primary Data, 2024

Table 1 shows that this study involved 25 subjects with the majority aged 20-35 years (64%) and the others aged <20 years (16%) and >35 years (20%). In terms of education, most had secondary education (36%),

while 28% had elementary/junior high school education, 24% did not attend school, and only 12% were college graduates. The most common occupation was housewife (52%), followed by self-employed (36%), with a few working as civil servants (8%) and private employees (4%). This data shows that the majority of respondents are of productive age, have a secondary education background, and are mostly engaged in domestic activities or independent businesses.

The results of the study included the level of knowledge, skill level and colostrum production in pregnant women in the third trimester.

Table 2. Knowledge Test Results

Category	Pre-test		Post-test	
	F	%	F	%
Low	25	100%	0	0%
Simply	0	0%	0	0%
High	0	0%	25	100%

Source: Primary Data, 2024

Based on the results of data analysis in the study on the impact of breast massage training on the process of breast milk formation in third trimester pregnant women, there were significant changes in the level of knowledge of pregnant women before and after attending the training. During the pre-test, 100% (25 people) of pregnant women were in the low knowledge category regarding breast milk formation. However, after the training (post-test), there was a significant increase in knowledge, where all participants (100%) reached the high knowledge category. There were no participants in the moderate or low categories in the post-test.

Table 3. Skill Test Results

Category	Pre-test		Post-test	
	F	%	F	%
Low	0	0%	0	0%
Simply	25	100%	0	0%
High	0	0%	25	100%
Total	25	100%	25	100%

Source:Primary Data, 2024

The results of data analysis regarding the skills of trimester 3 pregnant women in skills before and after breast massage training also showed significant changes. At the pre-test stage, all participants (100% or 25 people) had skills in the moderate category. However, after attending the training (post-test), all participants (100%) showed an increase in skills to the high category. No participants were in the low or fair category at the post-

test stage.

Table 4. Statistical Test Results of Colostrum Production

Kategori	Pre-test		Post-test	
	F	%	F	%
No colostrum production	25	100%	3	12%
There is colostrum production	0	0%	22	88%
Total	25	100%	25	100%

Source: Primary Data, 2024

Based on the analysis of colostrum production in 3rd trimester pregnant women before and after breast massage training, there was a significant increase. At the pre-test stage, all participants (100% or 25 people) had not experienced colostrum production. However, after the training (post-test), 88% of the participants (22 people) began to show colostrum production, while the other 12% (3 people) had not experienced any changes.

Discussion

Breast massage training for 3rd trimester pregnant women at Sulili Health Center showed significant improvement in skills, knowledge, and colostrum production. The results of statistical analysis using the Shapiro-Wilk test showed that the pre-test and post-test data on both skills and knowledge were not normally distributed ($p < 0.001$). Therefore, the Wilcoxon non-parametric test was used to test the effectiveness of this training.

In the skills aspect, there was a significant increase after the training. The average pre-test score of participants' skills was 4.48 (SD = 0.509), while in the post-test it increased to 12.64 (SD = 0.568). The Wilcoxon test resulted in $Z = -4.466$ with $p < 0.001$, indicating that the training was successful in improving participants' skills in performing breast massage to support the process of breast milk formation.

The results of this study are in line with the findings presented by Zulfiana et al. regarding the impact of training on the knowledge and skills of breastfeeding mothers. In training I, before education on proper breastfeeding, only 5 out of 16 mothers had good knowledge, while 11 mothers were still in the poor category. In addition, in the lactation massage and oxytocin massage skills training, only 3 mothers showed good skills, while 13 mothers were still unskilled.¹⁰

After training II, which was conducted with a similar approach, there were significant changes. After education on the correct way to breastfeed, all 16 breastfeeding mothers improved their knowledge to the good category. More interestingly, after training on lactation massage and oxytocin massage skills, all participants (16 mothers) demonstrated good skills. This shows that an effective education and training approach can result in dramatic improvements in mothers' knowledge and skills.¹⁰

The results of this study are also in line with the findings of Zuraidah et al., with the subjects used in

the study being midwives. This study showed an increase in knowledge in midwives after education in community service activities. In Zuraidah et al's research, 80% of midwives had sufficient knowledge and 20% were good at the pre-test, but after education, all midwives (100%) showed an increase to the good category.¹¹ Improvement was also seen in participants' knowledge. The pre-test mean score of knowledge was 8.40 (SD = 0.816), and increased to 16.00 (SD = 0.001) in the post-test. The Wilcoxon test resulted in $Z = -4.467$ with $p < 0.001$, indicating that this training significantly improved pregnant women's understanding of breast massage techniques and their benefits in breast milk formation.

The results of a study conducted by Lestarningsih et al. showed a significant increase in the knowledge of breastfeeding mothers regarding breast milk imbalance and oxytocin massage acupressure techniques after health counseling. Before the counseling, the majority of mothers had sufficient (50%) and insufficient (50%) knowledge. However, after the counseling, there was a striking change, where 83.3% of mothers now had very good knowledge.¹²

This finding is in line with the results of a study conducted at the Sulili Health Center, which also found a significant increase in knowledge in third trimester pregnant women after attending breast massage training. Before the training, these women showed a mean pre-test score of 8.40, which then increased to 16.00 after the training. Statistical tests showed that this change was significant ($p < 0.001$), indicating that the training was effective in improving understanding of techniques that support breastmilk formation.

The research conducted by Rihi et al. is also in accordance with stating that the training showed a positive impact of community service activities on the knowledge and ability of pregnant women in breast care. Before the education, only 7 mothers (32%) had good knowledge about breast care, while 11 mothers (50%) had sufficient knowledge and 4 mothers (18%) had poor knowledge. However, after the implementation of health education, there was a significant improvement where all 22 mothers (100%) showed knowledge in the good category. This finding suggests that proper education can improve mothers' understanding of proper breast care techniques and their benefits during breastfeeding.¹³

The most notable improvement was seen in colostrum production. Before the training, none of the participants reported colostrum production (0 out of 25). However, after the training, 22 people (88%) started producing colostrum, while only 3 people (12%) had not yet experienced production. The Wilcoxon test showed a p value < 0.001 , confirming that the breast massage training had a significant impact in stimulating colostrum production.

The results of a study conducted by Mulazimah et al. showed that breast care training for breastfeeding mothers had a significant impact. Of the total 33 mothers involved, 24 people (72.72%) managed to perform breast care independently, while 9 people (27.28%) still did not perform the treatment properly. This study emphasizes that in addition to maternal knowledge and skills in breast care, the smooth flow of breast milk is also very important to achieve exclusive breastfeeding quality.¹⁴

Good breast care is an important action especially during the postpartum period, where mothers need to take care of their breasts to facilitate milk production. According to this study, breast care can be done on days 1 to 3 after childbirth, at least twice a day, with a duration of 30 minutes each before the morning and evening showers. Physiologically, this action stimulates the breast glands to secrete important hormones such as progesterone, estrogen and oxytocin, which contribute to the smooth production of breast milk.¹⁴

These findings are relevant to the results of a study conducted at Sulili Health Center, which showed that breast massage training was effective in improving the skills and knowledge of 3rd trimester pregnant women. Following the training, the women showed significant improvements in knowledge and skills, which resulted in better colostrum production. A total of 22 out of 25 mothers reported starting to produce colostrum after the training, suggesting that education and training can provide the support needed to improve breastfeeding health.

The results of the study are in line with those conducted by Sembiring, which showed a significant change in the fluency of breast milk production in postpartum mothers after the oketani breast milk massage method. Before the intervention, as many as 14 people (87.5%) of the respondents experienced unsmooth breast milk production. This shows that the majority of the studied mothers faced challenges in producing breast milk properly after giving birth.¹⁵

After the massage training, all 16 participating mothers (100%) reported good milk production. This finding confirms that certain massage techniques can effectively improve the smooth production of breastmilk in postpartum mothers. This intervention provides evidence that massage is not only a physical practice, but also a method that has the potential to improve breastfeeding outcomes for mothers.¹⁵

Literature sources also suggest that other methods can be valuable additions to support pregnant and breastfeeding mothers. For example, endorphin massage training can help promote relaxation and reduce stress, which are important factors in increasing milk production. This massage technique not only focuses on the physical aspect, but also pays attention to the emotional well-being of the mother, thus creating an environment that is more conducive to breastfeeding.¹⁶

Breastfeeding counseling training is also highly recommended. Breastfeeding counseling provides the necessary support for mothers to understand proper breastfeeding techniques and how to overcome any problems they may face. With this approach, mothers not only gain theoretical knowledge, but also emotional support that can help them feel more confident during the breastfeeding period.¹⁷

Lactation massage is a massage that is often used in breast care efforts in preparation for breastfeeding in pregnant women. This massage is done on the nape (neck) area, back, spine (shoulder blades), and also on the breasts whose purpose is to stimulate the hormones oxytocin and prolactin. Lactation massage can increase breast milk production in mothers. The massage is done when the breast is normal, swollen, or not smooth, and in cases where the mother wants to relax, it is assisted by massage on certain parts of the body which has a

positive impact on the condition of the mother's mind and body, giving a calming effect, normalizing blood circulation, and increasing milk supply.¹⁸

Breast massage should also be done with the correct massage technique, overstimulation of the nipple area and the wrong massage technique can trigger the release of the hormone oxytocin, which can cause uterine contractions. This is risky in high-risk pregnancies or before the safe time of delivery. Therefore, before performing a breast massage, you should consult a competent health professional regarding the proper breast massage procedure or technique. It is very important to avoid the possibility of premature contractions of the mother in the late trimester.¹⁹

Oxytocin massage is also a method that is widely discussed in the literature as a beneficial intervention. Oxytocin massage aims to stimulate the mammary glands and increase the release of the hormone oxytocin, which plays an important role in the breastfeeding process. By focusing on this technique, the mother may experience an improvement in the smoothness of milk production, which in turn may improve the quality of exclusive breastmilk that the infant receives.²⁰

Conclusion

Based on the results of data presentation and discussion in this study, it can be concluded that breast massage training affects increasing mothers' knowledge and improving their skills in performing breast massage. Before receiving breast massage, the mothers were unable to secrete colostrum. However, after breast massage was performed, the mothers were able to secrete colostrum.

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