The Effect of Guided-Imagery and Oxytocin Massage on Breast Milk Production in Post Partum Mothers

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ABSTRACT

The global exclusive breastfeeding rate is only 44%, many factors influence failure of exclusive breastfeeding, problem breast milk production contributes to breastfeeding failure. Guided-Imagery is alternative therapy in overcoming stress with minimal cost and minimal side effects, in addition to reducing stress, this therapy can reduce fatigue as well. Oxytocin massage is another alternative to overcome the problem of breast milk production. Oxytocin massage can stimulate oxytocin hormone needed in the process of breast milk production, besides that it can also provide a sense of comfortable to mother and reduce fatigue. This study used Quasy Experimental method with pretest-posttes control group design involving 52 respondents divided into an intervention group (26 respondents) who were given combination of guided-imagery and oxytocin massage 1x in day for 14 days, and a control group (26 respondents) with the purpose of Analyzing the effect of combination of guided imagery and oxytocin massage on breast milk production. Mann-Whitney test showed that significant increase in breast milk production in the intervention group (p = 0.000) after treatment. However, control group did not showed an increase in breast milk production. So, the combination of guided-imagery and oxytocin massage effective in increasing breast milk production in postpartum mothers.

INTRODUCTION

The percentage of mothers who fail to exclusively breastfeed their infants for the first 6 months is 44% (WHO, 2023). The percentage of exclusive breastfeeding coverage in Indonesia in 2022 was 67.96% (WHO, 2023). The coverage rate has exceeded the target percentage of exclusively breastfed infants <6 months in Indonesia in 2022, which is 50% (MOH RI, 2023). The percentage of infants aged 0-5 months who received exclusive breastfeeding in East Java Province in 2022 was 69.72% (Badan Pusat Statistik, 2022). This figure has not met the East Java exclusive

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breastfeeding coverage target of 92% (East Java Health Office, 2022).

The cause of exclusive breastfeeding failure is due to reduced breast milk production (Pierdant et al., 2022), interference in breast milk production due to stress 19%, understanding and ability of mothers by 14.8%, (Agyekum et al., 2022; Zakarija-Grkovic & Stewart, 2020). In working mothers, there are various factors that cause exclusive breastfeeding failure, namely giving formula milk 10.7%, and husband and family support by 5.2% (Hashim et al., 2020; Vieira et al., 2021). In addition, primiparity was 32.2%, emotional distress during pregnancy was 32.0%, and low education was 24.9% (Ogbo et al., 2018; Vandenplas, 2022).

Post partum mothers who experience stress can reduce breastfeeding for the baby later, this is because stress can cause a delay in the lactogenesis process which results in insufficient milk production in the first two weeks postpartum (Nagel et al., 2023).

The impact of inappropriate exclusive breastfeeding (EBF) on infants, namely child development 21.3%, child mortality 45%, malnutrition 6.9%, (Mardani et al., 2022), and can increase the risk of infants experiencing illness (49%) (Penugonda et al., 2022). Therapy to overcome breast milk production can use pharmacological therapy, namely using galactagogues and domperidone (Foong et al., 2020; Treasure, 2018). Treatment using galactogogues has side effects, namely anxiety, indigestion, insomnia, severe depression, and seizures, while in infants it causes intestinal discomfort (Tabares et al., 2014). The use of domperidone has side effects of dry mouth, headache, dizziness, nausea, abdominal cramps, diarrhoea, palpitations, malaise, shortness of breath, and also causes gastrointestinal, breast swelling, weight gain, and fatigue (Mc Bride et al., 2023).

Non-pharmacological therapies such as, acupuncture, guided-imagery, oxytocin massage can be used to overcome obstructed milk production (Grzeskowiak et al., 2019; Pierdant et al., 2022; Shukri et al., 2017). Listening to audio recordings accompanied by guided-imagery before expressing breastmilk every day for 1 week proved

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that the average volume of breastmilk increased significantly (Procelli, 2019).

Guided imagery is one of the therapies in overcoming stress that is easy to do, inexpensive, and has minimal side effects, besides that it can be done individually, in groups or remotely with a mentor (John, 2018; Krau, 2020; Winsor et al., 2017). Guided-imagery has benefits such as reducing depression, relaxing the mind and body, distracting from pain, stress, worry and anxiety, and has no risks during therapy delivery (Kugali & Natekar, 2020).

Doing guided imagery is very powerful to overcome the symptoms of stress because anxiety is a perception-based emotion (Nguyen & Brymer, 2018). Stress can affect the physiological and hormonal systems, guided-imagery has been shown to be relaxing, calming (Gupta & Chakraverty, 2022), reduce fatigue (Parel, 2021), be a key measure to prevent stress and related complications (Shaji, 2023) and have few but significant side effects in relieving stress in breastfeeding mothers (Chen et al., 2015).

Another way to increase milk production is with the help of the hormone oxytocin. Oxytocin massage can increase oxytocin and prolactin levels, this is due to stimulation of the afferent nerves, so that the oxytocin hormone increases which causes prolactin levels to increase, and this action has very little side effects (Anbarasi et al., 2022). Giving a massage to the mother's back will cause a sense of comfort and relaxation so that the production of the hormone oxytocin is maintained (Triansyah, Stang, et al., 2021), and can reduce stress (Walker et al., 2017).

Massage is proven to stimulate oxytocin production, so it can be an option for treatments to increase oxytocin production in women (Riem et al., 2017). This massage for skin nerve stimulation is harmless and can stimulate the release of oxytocin and has anti-stress effects and can reduce cortisol levels (Uvnäs et al., 2019).

In a previous study to increase breast milk production by reducing stress by providing guided-imagery therapy for 1 week which had the result that the mother's milk volume increased (Procelli, 2019). Although the study

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stated that reducing stress using guided-imagery therapy for 1 week gave good results, this study aims to review further if guided-imagery therapy is given for more than 1 week, namely for 14 days and not only focuses on reducing stress factors but also on maternal milk production.

In this study, guided-imagery and oxytocin massage were chosen as interventions because guided-imagery is a complementary action that causes negative side effects to increase breast milk production in mothers after childbirth has been proven through a study conducted by Gomez et al with the research title perinatal psychological interventions to promote breastfeeding. Where this study states that emotional distress in mothers inhibits the let-down reflex thus affecting breastfeeding self-efficacy. This is supported by the research of Uvnas et al entitled maternal plasma levels of oxytocin during breastfeeding. This study states that in fact, more oxytocin hormone is released through breast massage compared to infant suction (Uvnas et al, 2020).

Guided imagery is said to be more effective when combined with other therapies (Revermann, 2019). So in this study, researchers will combine two therapies, namely the provision of guided-imagery therapy and oxytocin massage to postpartum women for 14 days to see the increase in breast milk production of postpartum women.

RESEARCH METHODS

This study applied a quasy experimental design (Nonequivalent control group design). With a population of mothers who have babies 0-2 weeks who are still breastfeeding and the sampling technique is Non-Randomised sampling. Sample calculation using the Cochran formula obtained a sample of 26 respondents for each group, so that the total sample was 52 respondents.

In this study, the independent variable is the combination of guided-imagery and oxytocin massage while the dependent variable is the mother's milk production. This study used instruments in the form of observation sheets of respondents' personal data and smooth milk production, regularity of listening to guided-imagery audio, namely once a day before breastfeeding and before oxytocin massage, observation of oxytocin massage every

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day and breastpump to measure the smoothness of milk production. The bivariate test used Wilcoxon Sign Rank Test and Mann-Whitney test to test the difference of breast milk production between the two groups. This research has paid attention to the ethical aspects of research by obtaining a research permit from the Health Polytechnic of the Ministry of Health Malang with a research permit letter number No.DP.04.03/F.XXI.31/0803/2024.

RESULTS AND DISCUSSION

Table 1 Characteristics of respondents

Karakteristik Responden	Group				P-Value
	n=26 Intervention Group		n=26 Control Group		
	F/M	% SD	F/M	% SD	
Age	25.62	6.080	23.12	5.210	0.161
Employment					
Not working	14	45.2%	18	69.2%	
Employed	12	38.8%	8	30.8%	
Education					
Low	1	3.8%	4	15.4	
Medium	19	73.1%	19	73.1%	
High	6	23.1%	3	11.5%	
Breast milk production					
Not Current	23	88.5%	11	42.3%	0.000
Current	3	11.5%	15	57.7%	

Table 1 states the characteristics of the responses in this study in the intervention group, the average respondent did not work and had breast milk production that was not smooth. In breast milk production, the normality test was carried out with a p-valeu value of 0.000, indicating that breast milk production data showed no normal distribution.

Table 2 Breast milk production in the intervention group with the combination of guided-imagery and oxytocin massage

Breast milk production	Intervention Group (n=26)		*P-Value*
	Pre-Test	*Post-Test*	
Not Current	23	0	
Current	3	26	0.000
Total	26	26	

Table 3 Milk production in the control group

Breast milk production	Control Group (n=26)		P-Value
	Pre-Test	Post-Test	
Not Current	11	18	
Current	15	8	0.494
Total	26	26	

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Table 4 Differences in breast milk production between intervention and control groups

Variable	Intervention Group (n=26)		Control Group (n=26)		P-Value
	Mean	±SD	Mean	±SD	
Breast milk production	37. 56	±17.808	15.44	±371.35	0.000

Identification of Breast Milk Production in Intervention Group and Control Group

Table 2 shows in the intervention group that there is an increase in breast milk production after the combined intervention of guided-imagery and oxytocin massage with a large number of respondents 25 out of 26 respondents experienced an increase in breast milk production to be smooth compared to before. The Wilcoxon test confirmed the significance of this difference, with the p value obtained ($p \leq 0.05$) indicating that there was a significant effect of guided-imagery and oxytocin massage on the intervention group. This suggests that the combination of guided-imagery and oxytocin massage has positive potential in increasing breast milk production in postpartum mothers.

Relaxation and healthy imagination can reduce psychoneuroimmunology, which affects the response to stress. The stress response is caused when there is a situation or event either real or imagined that can be a risk to one's physical or emotional health that exceeds their capacity. The limbic system works because of the emotional response to an event, and this is the reason for the physiological changes in the peripheral and autonomic nervous systems that are responsible for coping with stress. This psychoneuroimmunology can be reduced by effective imagination mechanisms (Supardi et al., 2022). Guided-imagery relaxation therapy has the potential to accelerate the sympathetic nervous system and endocrine system in patients, signals in the form of words from the instructor can help produce beta endorphin and reduce the hormone cortisol, so that patients feel more relaxed and calm (Syah & Delianti, 2024).

Guided-imagery is one of the cognitive behavioural relaxation

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techniques where respondents are guided to imagine a beautiful thing or a beautiful experience that provides a sense of freedom from stress, this technique depends on the respondent's imagination, the strength of the imagination that the respondent has. Guided-imagery can create a sense of confidence and optimism, eliminate fears, and can increase endorphin hormones, this therapy is also an affordable therapy, easy to implement and has no side effects (Indriani et al., 2021). Giving positive affirmations periodically aims to influence a person's mind to help develop perceptions to help someone change their mindset for the better. Positive words given to postpartum mothers can affect the physical postpartum mother which in turn can increase the production of the hormone oxytocin (Ardiana et al., 2023).

Methods that can be used and carried out in an effort to facilitate breast milk production can apply oxytocin massage, in addition to the combination with music or instruments that can calm is a way that has no risk, affordable, and effective. Music therapy has been proven to improve relaxation by influencing the diaphragm function which will reduce the bypothalamus axis, pituitary and adrenal glands. This process can increase the production of oxytocin and prolactin hormones which are important to encourage faster milk production (Wulandari et al., 2020).

Oxytocin massage is a method to increase breast milk production without the use of drugs that can stimulate the letdown reflex, which is stimulated by sensory stimulation of the afferent system that can be done by providing massage in the spinal area. The massage is done at the 7th cervical section to the costal area 5-6, stimulation in this area can trigger the work of parasympathetic nerves to give orders to the hypothalamus to produce the hormone oxytocin (Kusmayadi, 2023). Oxytocin massage has the benefit of providing a sense of comfort to the mother which in turn will stimulate the process of releasing the hormone oxytocin so that it can increase milk production and increase the smoothness of milk release. There are several factors such as maternal fear, anxiety, and stress that can inhibit the let-down reflex (Pertasari, 2022).

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This is in accordance with studies showing that guided-imagery can increase breast milk production in mothers after childbirth. In this study, the average post-test score of breast milk production was greater than the average pre-test result ($p<0.05$), in this study researchers used a measuring bottle instrument where breast milk was collected in a measuring bottle so that it could determine how much breast milk production (Lekshmy & Sundresh, 2017). Guided-imagery given to post partum and breastfeeding mothers has an impact on increased milk production so that it can also encourage the growth of babies, especially in premature babies. In this study, the total number of responses was 72 participants, where respondents were divided into two groups, the intervention group and the control group, where each group had 36 respondents. The intervention was given at least once a day, for 2 weeks. In measuring the results of the intervention, researchers used the Perceived Stress Scale (PSS) questionnaire, using the baby's weight by measuring the baby's weight using a scale, the Infant Feeding Behaviour Questionnaire, using saliva samples of postpartum mothers to determine cortisol levels, using breast milk samples to analyse duplicate macronutrients (Dib et al., 2022). This study is in line with previous research where the provision of guided-imagery in postpartum mothers has an effect in increasing milk production and increasing breastfeeding frequency, and can reduce stress in mothers (Safari et al., 2022).

This is also supported by research where the use of audio guided-imagery designed for breastfeeding mothers in the intervention group, given to mothers who have given birth, at 5-12 days after giving birth at 24 clinics shows that in breastfeeding mothers given guided-imagery shows that there is an increase in baby weight, and a decrease in stress in breastfeeding mothers (Yu et al., 2024). the provision of audio relaxation conducted for 10 days has the possibility of reducing stress and anxiety in postpartum women and increasing milk production (Dabas et al., 2019).

The frequency of oxytocin massage has an influence on maternal prolactin hormone levels and breast milk. Breast milk production can not

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only be stimulated by the baby's suction, but can also be stimulated by receptors in the ductal system, one of the ways that can be done by doing oxytocin massage which will provide stimulation so that milk production increases and becomes smooth. Respondents were taught how to do oxytocin massage during the first to the third visit. In this study, 3 respondents who were patients at PMB were given oxytocin massage for 10 minutes (Maryati et al., 2023). This oxytocin massage has the benefit of increasing milk production, can reduce fatigue, is more practical and economical, besides that oxytocin massage can also provide a sense of comfort and stimulate increased milk production when massaged in the spinal area. Respondents in this study were 4 respondents, oxytocin massage was given for 2 times and observed 3 times every 6 hours. In this study, the measuring instruments used to measure breast milk production were observation sheets and interview sheets (Setianingrum & Wulandari, 2022).

This study supports the finding that regular oxytocin massage in postpartum mothers can stimulate the oxytocin hormone to increase milk production, this study uses a descriptive approach, where oxytocin massage is done 2 times in 1 day for 15 minutes. The stimulus score was measured using the gutman score which has 6 indicators (Pratiwi & Mualifah, 2023). In a study conducted by (Triansyah, Indarty, et al., 2021) stated that oxytocin massage has the benefit of increasing breast milk production in post partum mothers. Circular movements when performing massage on the back area can stimulate the prolactin hormone which has the task of stimulating milk production, massage with this technique is effective for increasing milk production (Saputri & Yanti, 2021).

Several other studies have also mentioned that oxytocin massage has an effect on breast milk production (Andika Sari et al., 2023; Dwedar et al., 2023; Mudrikatin & Wati, 2020; Nasution & Rosa, 2023).

A total of 80 postpartum women were given oxytocin massage for 2 months, to determine breast milk production. Measurement of breast milk production was carried out using oxytocin massage checklits, lactation problems, and body length observation

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sheets. This study used pre-experiment research using post-test only design and true-experiment using post-test only control group design. Oxytocin massage was given at least 3 times in the first week after delivery. The results of this study showed that oxytocin massage can reduce lactation problems experienced by postpartum mothers (p=0.000) and support the growth and development of babies (p=0.000) (Lestari et al., 2022).

The theories described above show that the results of this study are consistent with previous research in the intervention group and it can be concluded that breast milk production after giving a combination intervention of guided-imagery and oxytocin massage has increased in the intervention group.

This study has differences compared to previous studies that are in line, the differences in this study include combining two non-pharmacological interventions that have minimal side effects, namely guided-imagery therapy and oxytocin massage therapy combined to increase the smooth production of breast milk in postpartum women. Not only that, the difference contained in this study is the duration of the combination of guided-imagery and oxytocin massage for 14 consecutive days where in the previous study the guided-imagery was only given for 5 days, 1 week, and 10 days. In the provision of oxytocin massage is only given at the 1st postpartum visit to the 3rd postpartum visit, then there are studies that give oxytocin massage 3 times. Whereas in this study, the combination of guided-imagery and oxytocin massage was given for 14 days.

The similarity between this study and the previous study, namely in this and the previous study, is in taking respondents who are breastfeeding postpartum women who are still in the first week of the postpartum period. In this study, the researcher used previous research as a reference with the same topic, but the researcher combined the therapy given and measured breast milk production. This study and the previous study have the same results where the respondents with breast milk production conditions are smoother than before.

In this study, it was found that the use of a combination of guided-imagery and oxytocin massage can

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increase milk production in postpartum mothers who are breastfeeding based on the data and statistical tests that have been carried out. In this study, the measurement tool used was a breastpump.

Breast milk production experienced by postpartum mothers in the intervention group after the combination of guided-imagery and oxytocin massage increased. Guided-imagery gave mothers a calm and relaxed impression, helping them visualise and feel how much they love their babies and want them to be healthy. This makes the mother more comfortable and calm, so that it can reduce the stress that mothers face during this breastfeeding period. There are two hormones that can affect milk production, prolactin and oxytocin. Oxytocin hormone can be released through stimulation of the baby's suction during breastfeeding and can also be done by massaging the mother's spine. The massage performed on the mother's spinal area provides a sense of comfort, calm, relaxation, this can trigger the oxytocin hormone which has an impact on milk production. The second combination makes the mother more relaxed and comfortable, this indirectly increases breast milk production in postpartum mothers.

Table 3 shows that in the control group there was a change in the frequency distribution of breast milk production. In the control group, there were 11 respondents whose breast milk production was not smooth, while in the control group, the number of respondents whose breast milk production was not smooth became 1 respondent. This shows that the control group can also have a positive impact on breast milk production, although there are variations in the way individuals improve breast milk production.

Table 4.3 shows that in the control group, similar results were also seen with most respondents (13 out of 26) experiencing smoother breast milk production compared to before. The Wilcoxon test confirmed the significance of this difference with the p value obtained (p ,0.05) stating that there is a significant effect of providing standardised care for postnatal visits in improving breast milk production.

Studies conducted (Yonemoto et al., 2021) state that home visits to

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postpartum mothers can increase exclusive breastfeeding and also feel happier and more satisfied, so that mothers are more enthusiastic in providing breast milk to babies. Home visits during the postpartum period by health services also have the impact of providing support to postpartum mothers and increasing breastfeeding in the first 6 weeks. So that the mother's milk production continues to increase because the mother is more diligent in providing breast milk to the baby.

The theory described above and the results of research in the work area of Puskesmas Wilayah Selatan and Puskesmas Ngletih, the researcher concluded that breast milk production in the control group increased when compared to before standard home visit care was given to the control group.

Analysing the difference in breast milk production results between the two groups

Table 4 shows the difference in breast milk production in the two groups, after receiving the combination of guided-imagery and oxytocin massage, tested using the Mann-Whitney method. The Mann-Whitney test results for both groups showed significant results with a value of P = 0.000. This indicates that there is a difference in breast milk production in both groups.

Previous studies by (Ismanti et al., 2021) noted that giving oxytocin massage to postpartum mothers can increase breast milk production in postpartum mothers. Another study also found that increased milk production occurred as a result of oxytocin massage which showed its effect in increasing milk production (Mahulette & Masini, 2022). Giving oxytocin massage can significantly increase the amount of milk production in postpartum mothers by taking into account the amount of milk, how often to breastfeed and how often the baby urinates can increase milk production in postpartum mothers (Purnamasari & Hindiarti, 2023).

The pressure felt by mothers during breastfeeding can inhibit milk production. This condition often occurs in the first month after giving birth (Ulfa & Setyaningsih, 2020). In reducing stress in breastfeeding mothers, guided-imagery techniques can be used. The guided-imagery technique can be used to manage stress by imagining things. The benefits of using

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this technique can reduce stress, the body becomes more relaxed and comfortable and can also improve sleep quality (Cahyani et al., 2022).

The theory that has been described above shows that this study is in line with previous research, where the combination of guided-imagery and oxytocin massage has an influence in increasing the milk production of postpartum mothers in the intervention group when compared to the control group. In addition to increasing breast milk production in this study, the combination of guided-imagery and oxytocin massage can reduce the stress experienced by mothers during breastfeeding and make the mother's body more relaxed.

CONCLUSIONS

Based on the research results, it can be concluded as follows:

1. In the intervention group, all respondents experienced an increase in breast milk production by 37.56 after being given a combination of guided-imagery and oxytocin massage for 14 days.
2. In the control group, almost half of the respondents experienced an increase in breast milk production of 15.44.
3. Giving a combination of guided-imagery and oxytocin massage has an effect in increasing breast milk production in postpartum mothers, with a P-Value of 0.000.

It is expected that mothers can apply the combination of guided-imagery and oxytocin massage routinely during breastfeeding which can be done by the closest family, as another option to increase breast milk production after the mother's nutrition is fulfilled For future researchers, further research can be carried out by focusing on other variables, such as measuring stress levels in postpartum mothers with breast milk production. It is hoped that this research can be used to develop teaching materials and guidelines in applying the combination of guided-imagery and oxytocin massage as a way to overcome breast milk production problems.

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