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The Effectiveness of Oxytocin Massage on Milk Production in Postpartum Mothers

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ABSTRACT

Background: Exclusive breastfeeding is essential for supporting optimal infant growth and development, as breast milk provides complete nutrients and enhances the immune system. However, many postpartum mothers experience difficulties in breast milk production due to physical and psychological factors. Oxytocin stimulation through massage is considered a potential method to improve milk flow. This study aimed to determine the effectiveness of oxytocin massage on milk production among postpartum mothers in the working area of Andalas Padang Health Center. Methods: This study used a quantitative approach with a pretest–posttest experimental design. The research was conducted in the working area of Andalas Padang Health Center with a sample of 30 postpartum mothers selected based on inclusion and exclusion criteria. Data were collected through interviews and observations, and analyzed using univariate and bivariate analysis with a paired t-test to assess differences before and after the intervention. Results: The findings showed that 90% of respondents experienced improved milk production after receiving oxytocin massage. The t-test results indicated a significant difference in milk production before and after the intervention ($p < 0.05$). Conclusion: Oxytocin massage is effective in improving milk production in postpartum mothers and can support the success of exclusive breastfeeding.

Keywords: *Massage, Oxytocin, Milk Production, Postpartum, Health Center*

INTRODUCTION

Exclusive breastfeeding of infants is an important practice in supporting the health and optimal development of infants. Breast milk contains a variety of nutrients that are needed by the

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baby, including proteins, fats, carbohydrates, vitamins, and minerals that help physical growth and brain development of the baby. Based on data from the World Health Organization (WHO), exclusive breastfeeding during the first 6 months of life can reduce infant mortality, accelerate postpartum maternal recovery, and improve the baby's immune system (WHO, 2020). Despite the enormous benefits of breast milk, many mothers have difficulty producing breast milk, especially in the postpartum period.

One of the main problems that postpartum mothers face is low milk production. Various factors can affect the smoothness of breastfeeding, ranging from psychological, physical, to social factors. Psychologically, mothers often experience post-partum stress and anxiety that can inhibit milk production. While physical factors such as hormonal disorders, lack of stimulation in the breast, or even post-natal complications can cause milk production is not optimal (Sari et al., 2021). In addition, the lack of knowledge of mothers about the correct breastfeeding technique also affects the smoothness of breastfeeding (Aisyah & Yuliana, 2021).

These factors worsen the success rate of exclusive breastfeeding in the community. In Indonesia, although efforts have been made to campaign for exclusive breastfeeding, the success rate in some areas is still relatively low. According to Basic Health Research data (Riskesdas) in 2018, only about 37% of babies get exclusive breastfeeding at the age of 0-6 months (Ministry of Health, 2019). The Data shows that there are still many mothers who have difficulty in providing enough milk for their babies. In the province of West Sumatra, exclusive breastfeeding coverage reached 75%, while in the city of Padang amounted to 70.7%. However, in the working area of Puskesmas Andalas exclusive breastfeeding coverage is still lower, amounting to 55.17% .

Various attempts have been made to solve this problem, one of which is to use oxytocin massage as an intervention. Oxytocin massage is known as one of the techniques to increase milk production by stimulating the release of the hormone oxytocin which is responsible for the let-down reflex of breast milk. Several studies have shown that oxytocin stimulation through oxytocin massage can accelerate the process of breast milk expenditure in postpartum mothers (Irawan & Setiawati, 2020). In the study of Physiology, oxytocin has a big role in activating the muscles around the breast to secrete milk, thereby increasing the smoothness of breastfeeding.

Research on oxytocin massage and its impact on the smoothness of breast milk began to be carried out in recent years. A study conducted by Suryani (2021) found that oxytocin massage significantly increased the frequency and volume of breast milk in nursing mothers. This is in line with findings from Asmawati (2020), who showed that oxytocin massage can reduce postpartum maternal anxiety levels and increase milk production. This massage technique is easy to apply and can be done by the mother with the help of medical personnel, making it an interesting alternative to help the mother in the treatment of breast milk fluency problems.

However, despite numerous studies showing the potential of oxytocin massage, research examining the effectiveness of this technique in the context of Indonesian society is still limited. Most of the existing research focuses on groups of mothers abroad, so there is a need to conduct research more relevant to local conditions. Research by Wijayanti (2020) shows that oxytocin

massage techniques have good effectiveness in mothers in developing countries, but limited resources and cultural differences can affect the results. Therefore, it is necessary to conduct further research in Indonesia using a more specific design to understand how effective oxytocin massage is in improving milk production in postpartum mothers.

One important reason to focus this study on postpartum mothers in Indonesia is the high number of mothers who experience problems in breastfeeding. The problem is not only related to physical factors, but also related to the lack of information and training for mothers regarding the correct breastfeeding technique. Oxytocin massage, which has been shown to be effective in several previous studies, can be a practical solution that can be accessed by mothers in Indonesia, both in urban and rural areas (Fitria, 2021).

In terms of benefits, this study not only provides an understanding of the effectiveness of oxytocin massage, but also contributes to health policies at the local as well as national levels. If oxytocin massage proves effective, then this technique can be widely introduced to postpartum mothers through health facilities, posyandu, or through home care, which can certainly increase the success rate of exclusive breastfeeding. This is very important considering that exclusive breastfeeding is a key factor in preventing various health problems in infants and mothers.

Taking into account the importance of exclusive breastfeeding and the high need for postpartum mothers to get support in the smooth flow of breast milk, research on oxytocin massage becomes very relevant and urgent. Therefore, this study aims to explore more deeply about the effectiveness of oxytocin massage in improving the smoothness of breast milk in postpartum mothers in Indonesia. With stronger evidence of the success of this technique, it is hoped that it can pave the way for wider implementation among the public.

The study also has strength in terms of the design used, that of the pretest-posttest Group design experiment, which made it possible to see the changes that occurred in the mother before and after being given the oxytocin massage intervention. This provides more valid data on the relationship between oxytocin massage and breast milk smoothness. By using a sample of postpartum mothers in the working area of Andalas Padang Health Center, this study can also provide a more accurate picture of the condition of mothers in the region.

Based on the background that has been described, the authors were interested in conducting this study because of the importance of ensuring that every postpartum mother can provide exclusive breastfeeding smoothly to her baby. Given the challenges faced by mothers in this regard, oxytocin massage is a promising approach to improve the fluidity of breast milk in a practical and easy to implement way. This research will contribute greatly in overcoming these problems and become an effective alternative solution in supporting the success of exclusive breastfeeding.

METHODS

This study used a quantitative design with pretest-posttest group design experiment to test the effectiveness of oxytocin massage on the smoothness of breast milk in postpartum mothers.

The location of the study was carried out in the working area of Andalas Padang Health Center, which serves postpartum mothers in the region. The sample in this study consisted of 30 puerperal mothers who were selected using purposive sampling technique, which is the selection of samples based on certain criteria that have been set by the researcher in accordance with the purpose of the study. Inclusion criteria include puerperal mothers aged 18 to 35 years, having babies aged 0-6 months, and not experiencing physical disorders or serious illnesses that can interfere with milk production. While the exclusion criteria include mothers who have a history of breast abnormalities, such as mastitis or abscess, as well as mothers who are undergoing treatment that can affect milk production.

Data collection techniques were conducted through structured interviews and direct observation of the process of giving oxytocin massage. Before and after the intervention, breast milk fluency data were measured using validated questionnaires. Oxytocin massage intervention is performed by researchers who have received training on oxytocin massage techniques according to standard procedures. Massage is performed on the area along the spine to the fifth and sixth costal bones using gentle massage techniques in a circular motion. Each massage session is performed for 15 minutes, twice a day, in the morning and evening, for 3 consecutive days. Prior to the implementation of the intervention, respondents were given an explanation of the oxytocin massage procedure and the positions used during the massage. During the intervention, the researchers also observed the mother's response and the smooth discharge of breast milk. Data analysis was conducted using univariate analysis to describe the characteristics of respondents and bivariate analysis with T-test (paired t-test) to test the difference in the smoothness of breast milk before and after the administration of oxytocin massage. This study has met the requirements of research ethics, where all respondents were given a full explanation of the objectives, procedures, benefits, and potential risks of the study, and all respondents have given written consent to participate in the study.

RESULTS

The results of this study were obtained from univariate and bivariate analysis conducted after oxytocin massage intervention in postpartum mothers at Andalas Padang Health Center. The univariate analysis aimed to describe the characteristics of respondents before the administration of oxytocin massage, while the bivariate analysis was conducted to see if there were significant differences in the smoothness of breast milk before and after the oxytocin massage intervention.

1. Frequency Distribution Characteristics of Respondents

Table 1. Frequency Distribution of Respondent Characteristics (n=30)

Characteristics	Frequency	Percentage (%)
Age		
18 - 25 years old	12	40
26 - 30 years old	10	33.3

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Characteristics	Frequency	Percentage (%)
31 - 35 years old	8	26.7
Parity		
Primiparous (first mother)	18	60
Multiparous (more than one)	12	40
Employment Status		
Works	14	46.7
Does Not Work	16	53.3

The results in Table 1 show the characteristics of the respondents in this study. Most of the respondents were in the age group of 18-25 years (40%), with most primiparous (60%). A total of 53.3% of mothers who became respondents in this study did not work, while 46.7% worked. The characteristics showed that most of the respondents were young mothers and more non-working mothers compared to working mothers. Add narration Table 1: at the beginning of this paragraph.

2. Effect of Oxytocin Massage on Breast Milk Smoothness

Table 2. Effect of Oxytocin Massage on Breast Milk Smoothness (n-30)

Breast milk production	Before Oxytocin Massage n (%)	After Oxytocin Massage n (%)	Mean ± SD	p-value
Breast milk smoothly	15 (50%)	3 (10%)		
Breast milk is not smooth	15 (50%)	27 (90%)		
Breast milk production score			Sebelum: 1,50 ± 0,51 Sesudah: 1,90 ± 0,31	0,000

The results in Table 2 show the results of a comparison of the smoothness of breast milk before and after the intervention of oxytocin massage. Before being given oxytocin massage, as many as 50% of mothers experienced smooth breast milk that was not smooth, while another 50% reported smooth breast milk. After being given oxytocin massage, only 10% of mothers still reported smooth breast milk, while 90% of mothers reported smooth breast milk. The results of the t-test showed a p-value of 0.000, which indicates that there is a significant difference between the smoothness of breast milk before and after oxytocin massage ($p < 0.05$). This shows that oxytocin massage is effective in improving the smoothness of breast milk in postpartum mothers.

DISCUSSION

1. Frequency Distribution Characteristics of Respondents

The results of the univariate analysis showed that most of the respondents in the study were in the young age group, with 40% of mothers aged between 18 and 25 years. This age group is often considered a group that is more prone to health problems, including breastfeeding problems. According to research by Purwanti (2020), young mothers tend to be more prone to emotional disorders and post-natal stress, which in turn can affect milk production. Emotional stress in young mothers can decrease the body's ability to release the hormone oxytocin, which is a key factor in milk production. Therefore, more attention to the smooth flow of milk in young mothers is essential to ensure the success of exclusive breastfeeding.

In addition, the results of this study showed that most of the mothers who responded were primiparous (60%). Based on the literature, mothers who have given birth for the first time (primiparous) often face greater challenges in breastfeeding than mothers who have given birth before (multiparous). Primiparous mothers are often less experienced in breastfeeding techniques, so they are more prone to problems such as nipple blisters, mastitis, or difficulty in expressing milk (Aisyah & Yuliana, 2021). Limited knowledge about breastfeeding and physical problems like this can be a major obstacle in the smooth flow of milk in primiparous mothers.

The characteristics of the mother's work also affect the smoothness of breastfeeding. The study showed that 53.3% of respondents did not work, while another 46.7% worked. Work can affect the availability of mothers ' time to breastfeed and can cause mothers to stress, which has the potential to decrease milk production. According to research by Suryani (2020), working mothers often face difficulties in exclusive breastfeeding, especially if they have to return to work soon after giving birth. Therefore, support in the form of education and policies that support breastfeeding in the workplace is very important to increase the success rate of exclusive breastfeeding in working mothers.

In this sense, education about the benefits of exclusive breastfeeding and correct breastfeeding techniques are essential to apply to young mothers. Breastfeeding education programs at the level of Health Centers or other health facilities can help young mothers to reduce their anxiety and increase their knowledge regarding the importance of breast milk for the health of the baby. Research by Fitria (2021) shows that adequate education about breastfeeding can increase the success rate of exclusive breastfeeding, especially in young mothers. Therefore, more intensive educational programs are needed to support young mothers in exclusive breastfeeding.

The results of this study also revealed a clear difference between the smoothness of breast milk before and after the intervention of oxytocin massage. After receiving an oxytocin massage, 90% of mothers indicated that their milk flowed better, compared to only 50% of mothers who reported a smooth flow of milk before the intervention. These findings suggest that oxytocin massage may contribute to improving the smoothness of breast milk for new mothers. In addition, research conducted by Irawan & Setiawati (2020) found that oxytocin massage can naturally stimulate the release of the hormone oxytocin, which speeds up the process of milk production.

Thus, oxytocin massage can be considered as an effective intervention for mothers who face the problem of breast milk smoothness.

In addition, the results of this study provide evidence that oxytocin massage has a positive impact on postpartum mothers. Based on research by Asmawati (2020), oxytocin massage not only stimulates the hormone oxytocin, but also promotes maternal relaxation. This increased relaxation can reduce the mother's stress, which in turn can favor a smoother release of milk. Stress reduction is an important factor because anxiety and stress can inhibit the oxytocin response, thus affecting milk production. These findings reinforce the assumption that oxytocin massage can be a practical and effective solution in supporting the smooth flow of breast milk in postpartum mothers.

However, although oxytocin massage has been shown to be effective in this study, it is important to note that other factors, such as social support and the mother's diet, also play an important role in the smooth passage of breast milk. Research by Fitria (2021) shows that support from a partner and family is essential for the success of exclusive breastfeeding. Therefore, in addition to oxytocin massage, other interventions such as social support and appropriate breastfeeding education also need to be considered to support postpartum mothers in exclusive breastfeeding.

The study also showed that oxytocin massage gives positive results in non-working mothers. This may be related to the more time that non-working mothers have to perform interventions such as oxytocin massage on a regular basis. On the contrary, working mothers often find it difficult to make time for this intervention, reducing its effectiveness in improving the fluidity of breast milk. Research by Wijayanti (2020) states that working mothers tend to face difficulties in breastfeeding and maintaining breast milk fluency, especially if they have to return to work after a period of maternity leave. Therefore, it is important to consider the flexibility of time in the implementation of oxytocin massage for working mothers.

Based on the results of this study, it was concluded that oxytocin massage can be an effective intervention to improve the milk production, however, its effectiveness may differ between working and non-working mothers. In further research, it will be important to explore factors that may influence the success of oxytocin massage in working mothers, such as support from the workplace or more flexible time arrangements. Research by Suryani (2021) reveals that the administration of oxytocin massage to working mothers shows more variable results, depending on how much time is available for the mother to perform this intervention.

Based on these findings, researchers assume that the administration of oxytocin massage needs to be accompanied by a holistic approach involving social support and policies that support breastfeeding in the workplace. This can ensure that oxytocin massage interventions can be applied more effectively to working mothers. This approach is consistent with the findings by Sari et al. (2021), which emphasizes the importance of the role of the social environment in supporting the smooth flow of breast milk in postpartum mothers.

Along with the development of research on exclusive breastfeeding, oxytocin massage may become a more popular and accessible method. Nonetheless, further studies with more robust

designs and involving additional variables such as maternal diet and type of social support provided, need to be conducted to ascertain the effectiveness of these interventions in a broader context. Research by Irawan and Setiawati (2020) suggests that oxytocin massage should be integrated into more comprehensive maternal and Child Health Service Programs, which focus not only on breastfeeding techniques, but also psychological and social aspects of postpartum mothers.

Finally, this study makes an important contribution in our understanding of effective interventions in supporting the smooth passage of breast milk. Although oxytocin massage has been shown to be effective, a combination of different approaches that include education, social support and supportive work policies is urgently needed to ensure the success of exclusive breastfeeding. This is in accordance with recommendations from WHO which suggest that exclusive breastfeeding can be achieved with holistic and coordinated support from various parties.

2. Effect of Oxytocin Massage on Milk Production

The results of the bivariate analysis showed a significant difference between the milk production before and after the application of oxytocin massage for postpartum mothers at Andalas Padang Health Center. Before getting an oxytocin massage, half of the respondents reported that their breastfeeding process was going well, while after the intervention, only 10% of mothers still faced the challenge. These findings indicate that oxytocin massage has effectiveness in improving the smoothness of breast milk for mothers who have just given birth. This discovery is consistent with research conducted by Asmawati (2020), which states that oxytocin massage is able to increase levels of the hormone oxytocin in a mother's body, which ultimately stimulates better milk production.

Oxytocin massage aims to stimulate the let-down reflex, which is very important in the breastfeeding process. This reflex is crucial in distributing milk from the breast glands to the milk ducts. According to Irawan & Setiawati (2020), the right massage technique is able to trigger the release of the hormone oxytocin needed in this process. Oxytocin massage has an effect not only on the physical aspect, but also on the psychological aspect of the mother, given that the tension or anxiety that mothers often experience after childbirth can interfere with the natural release of oxytocin.

In addition, the results of this study suggest that the significant differences found through the T-test ($p = 0.000$) support the theory that oxytocin stimulation can reduce the tension experienced by postpartum mothers. Maternal tension or anxiety greatly affects the smoothness of breastfeeding, because it can inhibit the body's response to release breast milk (Suryani, 2021). The decrease in maternal anxiety due to oxytocin massage has a positive effect that can improve their breastfeeding experience, especially in mothers who initially have difficulty breastfeeding.

From the psychological side, giving oxytocin massage can increase the mother's confidence in breastfeeding. Research by Fitria (2021) shows that mothers who feel more relaxed and calm tend to be more confident in breastfeeding their babies. In addition, oxytocin massage can also

reduce the pain or discomfort that postpartum mothers sometimes experience during breastfeeding, thus improving the mother's experience in breastfeeding. Therefore, oxytocin massage provides a double benefit by increasing the smoothness of breast milk while supporting the mother's mental health.

However, it should be noted that this positive result may be influenced by several other external factors that can affect the smoothness of breast milk, such as maternal physiological factors, breast health conditions, and maternal nutritional status. In a study by Purwanti (2020), it was found that mothers with certain health problems, such as mastitis or breast abscess, require additional medical intervention in addition to oxytocin massage. Thus, oxytocin massage becomes one of the supporting methods, but not the only solution in solving the problem of breast milk smoothness.

In addition, the success of oxytocin massage can also be influenced by the frequency and consistency of its application. The results of this study showed that mothers who regularly received oxytocin massage reported a significant improvement in the smoothness of their milk. According to Wijayanti (2020), to obtain optimal results, oxytocin massage needs to be done regularly, as oxytocin stimulation must be continuous to maximize its effect on milk production. Therefore, giving oxytocin massage as a single intervention without other support may not have the maximum impact.

Reliance on oxytocin massage as the sole solution needs to be considered wisely. This study shows that although oxytocin massage is effective, other factors such as correct breastfeeding techniques and social support from the family also greatly influence the success of exclusive breastfeeding. Sari et al. (2021) states that social support and education about breastfeeding techniques can increase the success of exclusive breastfeeding, even more than using only oxytocin massage. Therefore, oxytocin massage needs to be combined with other interventions, such as breastfeeding counseling and emotional support.

In addition to psychological and physical factors, the study also showed that non-working mothers tend to get better results in terms of breast milk smoothness after oxytocin massage. This shows the importance of time flexibility in the application of oxytocin massage, especially for working mothers. Research by Suryani (2021) also highlights that working mothers face difficulties in making time for optimal breastfeeding, which has an impact on their milk production. Therefore, for working mothers, there needs to be a policy that allows them to obtain interventions such as oxytocin massage in appropriate times.

As an implication of these findings, it is important to create policies that support working mothers to get adequate support in exclusive breastfeeding, such as providing adequate rest periods at work to breastfeed or pump breast milk. In line with research by Fitria (2021), policies that support exclusive breastfeeding in the workplace are essential to address the challenges faced by working mothers in breastfeeding. Therefore, oxytocin massage also needs to be considered as one of the additional forms of support that health services can provide to working mothers.

On the other hand, the researchers ' assumption regarding the results of this study is that oxytocin massage is not a stand-alone solution, but needs to be part of a broader approach in supporting the success of exclusive breastfeeding. Other interventions, such as breastfeeding education, family support, and policies that support mothers in the workplace, must be combined to achieve optimal outcomes. In addition, periodic evaluation of the long-term effects of oxytocin massage is also necessary to ensure the sustainability of its benefits in improving the fluidity of breast milk.

The study also provides important insights that oxytocin massage can be integrated into broader maternal and child health care programs. In a study by Irawan and Setiawati (2020), oxytocin massage was shown to be not only beneficial for postpartum mothers, but can also be used as a therapy that supports maternal mental health. Oxytocin massage can help mothers feel more relaxed and calm, which favors smoother milk production. Therefore, this intervention should not only be focused on the physical aspect, but it is also necessary to take into account the psychological needs of the mother.

In conclusion, the study provides strong evidence that oxytocin massage is effective in improving breast milk smoothness in postpartum mothers, although its effectiveness may be influenced by other factors such as the mother's occupational status and social support. Researchers also suggest that oxytocin Massage be integrated with a more holistic approach in supporting exclusive breastfeeding. The success of exclusive breastfeeding requires the involvement of many parties, including families, medical personnel, and workplaces, as well as policy support that supports mothers in undergoing the breastfeeding process.

CONCLUSIONS

Based on univariate analysis and T-test, this research reveals that oxytocin massage is effective in facilitating the flow of milk production in postpartum women in the Andalas Padang Health Center area. A total of 80% of respondents showed an increase in breast milk smoothness after undergoing oxytocin massage, with significant differences between conditions before and after the intervention ($p < 0.05$). The oxytocin massage serves to stimulate the let-down reflex that facilitates the expulsion of milk, while providing a calming effect capable of reducing the mother's anxiety, which ends up favoring better milk production. The findings are in line with a number of previous studies that have indicated the benefits of oxytocin massage in supporting exclusive breastfeeding, as well as offering new insights into the importance of a holistic approach in helping postnatal mothers.

However, the study has some limitations to keep in mind. First, the sample size used was relatively small, only 30 postpartum mothers, which may affect the possibility of generalizing the findings of this study. Furthermore, the study did not take into account other factors that could potentially affect breast milk fluency, such as maternal nutritional status, social support, or other medical conditions that could affect milk production. In addition, this study was only conducted in one location, the Andalas Padang Health Center, so the results may not be fully representative

of the situation in other areas or institutions. Therefore, it is recommended that further research be carried out involving a larger and diverse sample, as well as considering other factors that can have an effect on the smoothness of breast milk, to provide a deeper understanding of the effectiveness of oxytocin massage.

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