The Effectiveness of The Marmet Technique Breast Massage is Comparable to Standard Breast Massage

Efektivitas Pijat Payudara Teknik Marmet Dibandingkan dengan Pijat Payudara Standar

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ABSTRACT/ ABSTRAK


INTRODUCTION

Mother's milk is a liquid a woman's breast gland produces when breastfeeding. Mother's milk contains various active ingredients, including antibodies, antioxidants, nutrients, and hormones. These active components are essential for the survival and development of children. Breastfeeding is protective for infants and mothers. For infants, mother’s milk has an antinfection function and supports nervous system development. For mothers, breastfeeding

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can suppress breast cancer (Beral et al., 2002; Shen, Zhang, Zhu, & Chen, 2018). Breastfeeding can prevent necrotizing enterocolitis even for preterm infants and help mental, motor, and behavioral development (Sullivan et al., 2010; Vohr et al., 2006). In Europe, the rate of breastfeeding initiation when the infant is born is 90%, and the proportion of mothers still breastfeeding after six months is around 80% (Callen & Pinelli, 2004). In Hong Kong, the breastfeeding rate is 53.9% (Lau, 2010). In China, the breastfeeding initiation rate is very high, at 93.6%, but the breastfeeding rate for six months is only 6.2% (Ouyang, Su, & Redding, 2016).

During the first six months of life, the World Health Organization and UNICEF recommend that all infants be exclusively breastfed (without artificial milk or other fluids) (WHO & UNICEF, 2003). Nevertheless, the success of this program globally still needs improvement, with a rate of around 36%. Furthermore, the duration of breastfeeding is also poor globally (Mgongo, Mosha, Uriyo, Msuya, & Stray-Pedersen, 2013; Tarrant et al., 2010; Victora et al., 2016).

Breastfeeding can be difficult because infants may close their mouths and swallow air and may be nervous. Difficulties may arise due to pain and discomfort from the mother’s side. Breastfeeding success is based on several factors: interpretation of an infant’s cries, time availability, adequacy of milk, and the initial introduction of solid foods (Amir, 2014; Neifert & Bunik, 2013). Although it has become a government program and various world health organizations have supported it, various technical efforts are still needed to support exclusive breastfeeding.

Various studies have investigated various methods of increasing the low rates of breastfeeding, including breastfeeding education (Chan, Ip, & Choi, 2016) and breastfeeding counseling (Lau, 2010). In particular, previous studies have been conducted on the effects of massage on increasing the amount of breast milk produced. It has been reported that foot reflexology increases breast milk production in mothers of preterm infants (Mirzaie, Mohammad-Alizadeh-Charandabi, Goljarian, Mirghafourvand, & Hosseini, 2018) and that manipulation of Tui Na post-partum may also increase milk production (Zheng, Yi, Ping, & Wang, 2012). Acupressure has been shown to increase the amount of breast milk produced after childbirth (Ahmad, Usman, Sinrang, Alasiry, & Bahar, 2020; Sulymbona et al., 2020).

Based on the theory that direct massage on the breast can empty the breast and stimulate the production of breast hormones (Yokoyama, Ueda, Irahara, & Aono, 1994), massage is best focused on the breasts other than other parts of the body. The Marmet technique is a technique to help breast ejection reflexes. This technique is used to increase breast milk production so that it can be used for mothers with low milk volumes (La Leche League International, 2003). Although several studies have investigated this technique for supporting breast milk production, the results are still controversial. One study showed that the Marmet technique improved the smooth production of breast milk more than back massage (Widiastuti, Arifah, & Rachmawati, 2015). Another study reported that the Marmet technique could not increase breast milk production more than standard breast care (Aprilina & Suparti, 2016). Given these discrepancies, this study aimed to assess the benefits of breast massage in improving the quality of breastfeeding in post-partum mothers.

METHOD

The subjects of this study were post-partum mothers who agreed to participate. One hundred breastfeeding mothers were randomly assigned to two groups: the control group (which received the standard breast care massage technique) and the treatment group (who received the Marmet technique breast massage). The selection of the treatment group was carried out by randomizing. The selection step used a lottery number. The study's inclusion criteria were post-partum mothers between the first and fourth days, primigravida, gestational age greater than 37 weeks, no post-partum complications, and no nipple abnormalities. Mothers with nipple abnormalities or who were unwilling to participate in the study were excluded from the study.

The Marmet technique involves two stimulation techniques for removing breast milk: emptying the ductus terminals and assisting the milk ejection reflex with a massage. Massage of the breasts with the palm between the breasts is the standard breast massage technique. The mother performed the Marmet technique with technical assistance, guidance, and supervision from researchers and midwives—the birthing clinic's location for the Marmet technique and standard breast massage treatment. The Research Ethics Committee of Tanjungkarang Ministry of
Health Polytechnic has approved the intervention procedures.

**Marmet Technique Massage**

The Marmet technique was adapted from the guidelines issued by La Leche League International (La Leche League International, 2003). Milk-producing cells produce breast milk (called alveoli). These cells can be stimulated, allowing milk to enter the ductal system. The milk ejection reflex is the name given to this stimulation process. The ductus terminals in the areola will be filled due to this stimulation process.

The ductus terminalis is emptied as the first step in the Marmet technique. To empty the ductus terminalis, start by forming the letter C with the thumb, index finger, and middle finger. The thumb is at the areola's 12 o'clock position, and the index and middle fingers are at the areola's 6 o'clock position. After this position, press the fingers toward the chest without stretching them. The thumb was then rotated forward in a circular motion, changing the pressure from the middle finger to the index finger. The thumb is forward twisting motion is similar to the wave motion of a baby's tongue. The ductus terminals will be emptied as a result of this movement. The movement is performed sequentially, beginning with placing the finger position, pressing towards, and turning.

The Marmet technique's second step is to assist the milk ejection reflex. Massage activates the milk ejection reflex. The massage begins by placing all four fingers, apart from the thumb, on the upper breast. Massage the areola by pressing all your fingers around it on one side, then switching to the other. Following the massage movement, a stroke is performed by pressing the four fingers toward the center of the areola. This movement will cause relaxation and the milk ejection reflex to occur. The final movement is to shake the breast so that gravity causes milk ejection. In one cycle, the first step is performed for 5 minutes, followed by the second for 5 minutes. Every day for three days, a total of two cycles were performed. According to a previous study (Lai, Hale, Simmer, & Hartmann, 2010), the best frequency of performing the Marmet protocol is twice a day with a 12-hour interval, which results in increased milk production.

**Standard Breast Massage**

The standard breast massage protocol was carried out by official guidelines issued by the Republic of Indonesia's Ministry of Health Promotion (Kementerian Kesehatan RI, 2019). The left hand's palm is placed on the bottom of the left breast, while the right hand's palm is placed on top of the left breast. Next, move your palms 15-20 times from the chest to the nipples. Massage slowly starting from the chest until it is conical towards the nipple, making a circular motion around the surface of the breast to around the nipple 15-20 times. Repeat this procedure on the right breast. Use the tips of the thumb and index finger to gently twist the left and right nipples up to 15 times simultaneously.

**The Quality of Breastfeeding**

The quality of breastfeeding was assessed based on the smooth release of breast milk. The breast milk markers included the presence or absence of 1) a tight/tense breast when the baby sucks the nipple, 2) a soft/empty breast after breastfeeding, 3) the mother feeling the milk flowing out when she starts breastfeeding, 4) breast milk seeping after feeding with an interval of < 4 hours, 5) remaining pressure around the nipple after finishing breastfeeding, 6) a fussy infant during and after breastfeeding, and 7) the mother feeling drowsy after breastfeeding. Assessment of fluency in breastfeeding was performed every day.

**RESULT**

**The Characteristics of The Subjects**

The characteristics of the subjects in the control and Marmet groups are shown in Table 1. There were no statistically significant differences in age, gestational age, parity, or type of work. This allowed the two groups to be compared.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Standard breast care (control) (n=50)</th>
<th>Marmet breast massage (n=50)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>26.95±4.94</td>
<td>28.70±6.46</td>
<td>0.345</td>
</tr>
<tr>
<td>Gestational age (weeks)</td>
<td>29.55±0.98</td>
<td>29.65±1.81</td>
<td>0.828</td>
</tr>
<tr>
<td>Gravidity Profession</td>
<td>1.55±0.74</td>
<td>1.85±0.81</td>
<td>0.235</td>
</tr>
<tr>
<td>Homemaker</td>
<td>14 (70.00%)</td>
<td>14 (70.00%)</td>
<td>1.000</td>
</tr>
<tr>
<td>Professional</td>
<td>6 (30.00%)</td>
<td>6 (30.00%)</td>
<td></td>
</tr>
</tbody>
</table>

Note: values are presented as mean ± standard deviation.

**The Quality of Breastfeeding**

Figure 1 shows the quality of breastfeeding scores each day of the study period. The
breastfeeding quality score for the control group was 2.20±1.88 on the first day, 4.02±2.33 on the second day, and 5.38±1.88 on the third day. Meanwhile, in the Marmet massage technique group, the quality of breastfeeding score was 2.24±1.51 on the first day, 4.52±1.77 on the second day, and 5.64±1.27 on the third day.

DISCUSSION

Because breastfeeding quality scores improved day by day, our study makes a significant contribution to the literature. There was no difference in the rate of improvement between the Marmet and control groups, indicating that the Marmet technique works just as well as traditional breast massage. According to the findings of this study, the Marmet technique can help post-partum mothers increase milk production. Furthermore, the Marmet technique is beneficial for babies with anatomical problems such as cleft lip and palate and babies who do not want to breastfeed (Kent, Prime, & Garbin, 2012).

The Marmet technique is based on a protocol for emptying the ductus terminals. This emptying is critical for increased stimulation of breast milk. When the breast is empty, the rate of breast milk production increases (Dewey & Lönnerdal, 1986). A breastfeeding baby may not always correctly empty the breast (Daly, Owens, & Hartmann, 1993). As a result, we recommend the Marmet technique for primigravida mothers who can learn the technique quickly and have no problems, such as pain, while following the protocol. The Marmet technique can be used as an alternative to the standard breast massage technique because if the standard massage does not produce enough milk, the Marmet method can be used.

In this study, breast massage using the Marmet technique increased milk production, assessed by a smooth feeding score. This increase occurred day by day. This finding indicates that the Marmet massage technique can stimulate milk production at a rate comparable to usual breast massage techniques. The mechanism behind the Marmet technique in stimulating breast milk occurs through the increased ejection of breast milk deposits in acini by involving the dynamics of the hormone oxytocin and prolactin. It is similar to the mechanism of sucking the nipple of a baby. When the Marmet technique was done after each breastfeeding and carried out from the beginning on the first to the third day of the post-partum period, it will activate the increase of prolactin and oxytocin levels. Oxytocin is a nine-amino acid neuropeptide synthesized in the hypothalamus and bed nucleus stria terminals as antistress and anxiolysis (Morhenn, Beavin, & Zak, 2012; Yoshida et al., 2009).

Various studies suggest that tactile massage or stimuli can trigger an increase in endogenous oxytocin in various body fluids,
including blood, saliva, and urine (Crockford et al., 2013; Holt-Lunstad, Birmingham, & Light, 2008; La Leche League International, 2003; Light, Grewen, & Amico, 2005; Matthiesen, Ransjö-Arvidsson, Nissen, & Uvnäs-Moberg, 2001). Maternal oxytocin will increase when a breastfed infant touches (hand massage) the breast. This study extends previous findings that breast massage can increase breast milk ejection in the breast acinus due to the dynamics of oxytocin and prolactin (Ishak, Kahloon, & Fakhry, 2011).

Several things could be improved in this study. First, the study was only conducted in four birth clinics, and more birth clinics are needed to determine the feasibility of the protocol used. Second, the protocol is quite complicated, making it difficult for the mother to learn and apply it directly; it requires the presence of a trained midwife to teach the protocol. Third, the timing of the massage, the heterogeneity of breast size, and the hand pressure used during the massage can all be critical success factors for the protocol. Fourth, because this study was only conducted on primigravida, a future comparison between primigravida and multigravida is required.

CONCLUSIONS

This study concludes that the Marmet breast massage technique can increase preterm infant milk production. This technique could be introduced to increase the success of breastfeeding and, ultimately, the rates of exclusive breastfeeding. Hopefully, findings from this research can influence policymaking regarding midwifery management. It is also hoped to improve post-partum service quality and apply the Marmet technique separately or along with standard massage to post-partum mothers. The Marmet technique is promoted to be applied, especially in babies with lip problems and mothers with nipple problems.

REFERENCES


Oktaviani et al., *The Effectiveness of The Marmet Technique Breast Massage is Comparable to ...* 171


