

## THE EFFECT OF OXYTOCIN MASSAGE ON THE POSTPARTUM MOTHER ON BREASTMILK PRODUCTION IN SURAKARTA INDONESIA

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### ABSTRACT

The World Health Organization (WHO) recommends exclusive breastfeeding for the first six months of life and continued breastfeeding up to two years of age or beyond. Not having enough breast milk is the most common reason mothers stop breastfeeding. Before the mother expresses her breast milk, she should stimulate her oxytocin reflex to help the breast milk flow. In 2009, WHO introduced oxytocin massage aims to stimulate the oxytocin reflex that breast milk flowing from her breasts so that the breast milk production increases and the adequacy of breast milk. The aim of this study was to explain the difference between the group that received treatment of oxytocin massage and who did not receive the treatment in breast milk production of postpartum mothers. The study was conducted in four community health centers with hospitalization and one general hospital in Surakarta Indonesia. The study used quasi-experimental design. The sample were taken by purposive sampling method, with a sample of 60 postpartum mothers. Data were collected by using questionnaire and analyzed by using independent t-test with significant level of  $\alpha \leq 0.05$ . Results showed that the average amount of breastmilk production that received treatment of oxytocin massage is 9.6233mL, where as that did not receive treatment is 4.4720mL, with p value = 0.0005. It can be concluded that oxytocin massage is effective to increase breast milk production of postpartum mothers. It is recommended to apply oxytocin massage on postpartum mothers to increase breast milk production.

**Keywords: oxytocin massage, postpartum mothers, breastmilk production**

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## INTRODUCTION

Adequate nutrition during infancy and early childhood is essential to ensure the growth, health, and development of children to their full potential [1]. Breast milk contains all the nutrients that an infant needs in the first 6 months of life, including fat, carbohydrates, proteins, vitamins, minerals and water [2]. WHO recommends exclusive breastfeeding for the first six months of life and continuing breastfeeding up to two years of age and beyond [3]. The Indonesian government also changed the recommendation of exclusive breastfeeding duration of 4 months to 6 months and set a target of achieving 80% exclusive breastfeeding [4]. Exclusive breastfeeding is defined as the consumption of breast milk only (including expressed milk and medicines) and excludes infant artificial milk, non-human milk, water or water-based drinks, tea or fruit juice [5]. Exclusive breastfeeding is the single most cost-effective intervention to reduce infant mortality in developing countries. It is estimated that sub-optimal breastfeeding, especially non-exclusive breastfeeding in the first six months of life, results in 1.4 million deaths and 10% of diseases in under-fives. Non-exclusive breastfeeding also has long term impact, including poor school performance, reduced productivity, and impaired intellectual and social development [6-8]. The practice of exclusive breastfeeding worldwide during the first four months of life is not more than 35% of infants [8]. While in many developing countries, Brazil: 58% [9], Bangalore-Karnataka: 40% [10], Iran-Zahedan: 69% [11], Iran: 28% [12], Turkey: 50.6% [13], Lebanon: 10.1% [14], Nigeria: 20% [15], Ethiopia: 49% [16], Kuwait: 30% [17], and Indonesia: 38.0% [18].

Not having enough breast milk is the most common reason for mothers to stop breastfeeding. Maternal lactation capacity also determines the need and timing of complementary feeding [1]. Three reasons most often chosen by mothers who stopped breastfeeding in the first month and between the first and second months after their child's birth, namely “Baby had trouble sucking and latching on” (53.7% and 27.1%, respectively), “Breast milk alone didn't satisfy my baby” (49.7% and 55.6%), and “I didn't have enough milk” (51.7% and 52.2%) [19]. Insufficient production in the first 6 weeks postpartum is the most common reason for discontinuing lactation, 2.8 times more frequent in mothers of preterm than those of term infants [20-22]. By 4-7 days post-birth, exclusively breastfed infants consume approximately 500-600 mL of breast milk daily [23-26]. High doses of breast milk are especially important during the first 28 days post-birth when feedings are introduced and advanced [27,28]. Volumes <500 mL per-day by postpartum week 6 predict early weaning [29].

In mothers of healthy term infants, effective sucking and breast milk removal by the infant play a major role in regulating milk volume [30-34]. When a baby is born, breast milk production increased, while the breast milk-making cells continue to multiply according to demand during the next several weeks. By the time the baby feeds triggers the release of oxytocin, the hormone makes the myoepithelial cells around the alveoli contract. This makes the milk, which has collected in the alveoli, flow along and fill the ducts. This process of releasing milk is called breast milk ejection, which is often less accurately referred to as the “let-down” response (reflex oxytocin). Without this reflex, breast milk cannot be removed, and when not removed, the breast receives the message to cut back on milk production [1, 35]. Treatment with massage is linked to oxytocin release. If repeated blood samples are collected in the beginning of a massage session, pulses of oxytocin can be observed both in the individual receiving massage and in the masseur. Massage is one of the best ways to get oxytocin released into the body [36]. In 2009, WHO introduced oxytocin massage, this is done with a massage up and down the back on either side of the spine between the shoulder blades, or spine until bone costae to 5-6 widened to the scapula [1]. This massage will stimulate

the parasympathetic nerves that will be delivered to the brain to release the oxytocin hormone. We hypothesized that oxytocin massage to stimulate reflex oxytocin in postpartum mother's effect to breast milk production. The aim of this study was to explain the difference between the group that received treatment of oxytocin massage and who did not receive the treatment in breast milk production of postpartum mothers.

## METHODS

The study design was a quasi-experiment with non-equivalent control group design. The study was conducted in four community health centers with hospitalization and one general hospital in Surakarta City, Indonesia. The research was conducted over eight months from May to September 2015. The population is all postpartum mothers. Inclusion criteria were women with a history of normal delivery, postpartum first day that have not issued their breast milk, suction reflex of baby is good, the mother and the baby is treated in one room (rooming-in), babies born at term (>37 weeks), infants with severe normal birth weight ( $\geq 2500$ g), the mother did not use contraceptives, the condition of mothers and healthy babies and mothers willing to become respondents, able to understand and complete the questionnaire. While the exclusion criteria are mother's experience abnormal anatomy of the breast (nipple set, nipple flat), the mother has a habit of consuming alcohol and cigarettes, infants given formula at the time of the study as well as the mother taking drugs to facilitate breast milk, the disruption of communication both verbal and writing and physical disorders that can not be measured. Sampling using purposive sampling technique (Sugiyono, 2011), with a sample of 60 postpartum mothers. The samples were divided into two groups: 30 postpartum mothers as an experimental group given oxytocin massage treatment while 30 others as a control group.

Steps the oxytocin massage are as follows: (1) Mother sat relaxed leaning forward, hands folded on the table with your head resting on it; (2) Breast hanging loose without clothes; (3) The masseuse massage both sides of the spine using both a fist with the thumb facing forward; (4) Press vigorously to form a circular motion into small pieces with his thumbs; (5) At the same time, do massage downward on both sides of the spine; (6) Do it for 2- 3 minutes (7) Massage oksitosin carried out twice a day for 3 days done by a team of researchers have done equation perception by counselor breastfeeding.



**Fig. 1** Oxytocin massage (Source: WHO, 2009 Infant and young child feeding: Model Chapter for textbooks for medical students and allied health professionals. Switzerland)

Data collected through observation sheet of oxytocin massage and observations of adequacy of breast milk, as well as the characteristics of the questionnaire respondents. Data were collected using a questionnaire. Data analysis included univariate and bivariate analysis. Univariate analysis performed to generate a frequency distribution characteristics of respondents. The bivariate analysis was conducted to elucidate the difference between the group

that received oxytocin massage treatment and who did not receive treatment of breast milk production in postpartum mothers. A method of counting breastfeeding with an increase in weight baby which is weighed after suckling.

Independent t-test was used to test the difference in treatment of oxytocin massage with breast milk production, with significant level of  $\alpha \leq 0.05$ .

### **Ethical Considerations**

Ethical approval was obtained from the Health Research Ethic Committee of Dr. Moewardi Local General Hospital – Medical Faculty of Sebelas Maret University No: 452/VII/HREC/2015. The participants of research gave informed consent to participate having read the statement explaining the study.

## **RESULTS**

### **Characteristics of respondents and their effects on breast milk production**

Characteristics of respondents, including age, education, employment status, and parity. Age mostly aged 20-35 years is 27 respondents (90%) in the experimental group and 30 respondents (100%) in the control group. Education largely secondary education is 26 respondents (86.7%) in the experimental group and 25 respondents (83.3%) in the control group. Employment status - the status of a lot more work than not to work with 19 respondents (63.3%) in the experimental group, and 20 respondents (66.7%) in the control group. Mothers parity in the experimental group, primiparas more is 16 respondents (53.3%), whereas in the control group, multiparas more than 21 respondents (70%). Average amount of breast milk production in the group receiving massage oxytocin treatment is 9.6233 mL, whereas in the untreated group was 4.4720 mL. ANOVA test results between age, education, employment status, and parity with the amount of breast milk production, each representing a p-value of 0.184, 0.446, 0.758 and 0.725. Means there is no significant relationship between age, education, employment status, and parity with the amount of milk production. Table 1 shows the characteristics of the respondent, statistical test and the amount of breast milk production.

**Table 1** Characteristics of respondents, the amount of breast milk production and statistical tests

Characteristics of respondents	Experimental group		Control group		p-value
	f	%	F	%	
Age : < 20 years	2	6,7	0	0	0,184
20 – 35 years	27	90	30	100	
>35 years	1	3,3	0	0	
Education: Secondary	26	86,7	25	83,3	0,446
High	4	13,3	5	16,7	
Work	19	63,3	20	66,7	0,758
Not work	11	3,7	10	33,3	
Primiparas	16	53,3	9	30	0,725
Multiparas	14	46,7	21	70	
Average the amount of ASI:					
Before the intervention	0 – 5 mL		0 – 5 mL		
After the intervention	9,62 mL		4,47 mL		

### **Treatment of oxytocin massage on breast milk production in mothers postpartum**

Based on the results obtained by independent t-test p value 0.0005; Mean there is a significant difference between the treatment of oxytocin massage by the number of milk production in postpartum mothers. Statistical test results are presented in Table 2 below:

**Table 2** Results tests of oxytocin massage treatment with the amount of milk

Oxytocin massage treatment	n	Mean	SD	SE	p value
Not done	30	4,4720	1,78405	0,32572	0,0005
Be done	30	9,6233	1,78059	0,32509	

\* Significant level of  $\alpha \leq 0.05$

## DISCUSSION

There are many factors that can influence a postpartum mother's decision to initiate breastfeeding after delivery, such as breastfeeding difficulties, mechanical challenges, social support, beliefs about breast-feeding, and socioeconomic status [37]. Recent evidence suggests that the transition from the initiation to the maintenance of lactation, play a programming role with respect to long-term breastmilk production [38-41]. Breastfeeding can increase the secretion of oxytocin and causing braided the bond between mother and baby [42]. Cessation of breastfeeding is a risk factor for increased anxiety and depression [43].

Maternity care practices related to breastfeeding take place during hospitalization. Postpartum care practices that support breastfeeding include developing a written breastfeeding policy for the facility, providing all staff with education and training on breastfeeding, maintaining skin-to-skin contact between mother and baby after birth, encouraging early breastfeeding initiation, and ensure adequate breast milk production [44]. Before the mother expresses her breast milk, she should stimulate her oxytocin reflex, to help the breast milk flow. She may do this herself by lightly massaging her breasts, or stimulating her nipples, and at the same time thinking about the baby, watching him or her if nearby, or looking at a photograph of him or her. She can also ask a helper to massage up and down her back on either side of her spine between her shoulder blades - called oxytocin massage [1].

The release of oxytocin is unique, oxytocin release occurs during childbirth and breastfeeding, when oxytocin stimulates uterine contractions and breastmilk ejection respectively. In these situations oxytocin is released following activation of sensory nerves originating from the urogenital tract (pelvic/hypogastric nerves) and from the nipple (the mammary nerves). In addition oxytocin can also be released from the skin via activation of cutaneous sensory nerves in response to touch, light pressure, warm temperature and by low intensity electrical stimulation of sensory nerves in rats, and can be triggered by massage [35,36]. Massage was associated with an increase in oxytocin hormone. Oxytocin has a positive health effect, namely (1) the ability to activate the adaptive immune system, (2) its role as a stress buffer, and (3) the ability of its potential to mediate depression [45-49].

Oxytocin released into the brain in response to the massage. Oxytocin massage is a way to stimulate the oxytocin reflex so that the breastmilk flowing from her breasts to increase milk production and the adequacy of breastfeeding babies. If repeated blood samples are collected in the beginning of a massage session, pulses of oxytocin can be observed both in the individual receiving massage and in the masseur. The massage treatment is accompanied by several positive effects. During a massage session levels of anxiety are decreased, the

perception of well-being is increased and that of pain decreased. Moreover, both blood pressure and cortisol levels are lowered [36].

This study examined the effect of oxytocin massage in the postpartum mother on breastmilk production. One possible reason that this study demonstrates that during labor, oxytocin release is associated with high stress levels and cortisol levels are elevated and blood pressure is high in order to make the hard work of labor and uterine contractions. During breastfeeding, cortisol and blood pressure decrease in response to every episode of breastfeeding [50,51]. Breastfeeding also can regulate the secretion of basal diurnal cortisol in mothers postpartum and autonomic responses to stress [52]. Additionally, oxytocin counters the effects of cortisol, a stress hormone, which, if over long periods of time is produced in high levels in the body, can lead to high blood pressure, lowered immune function and even clinical depression [36]. In addition oxytocin is linked to increased levels of social interaction, well-being and regulates stress and anxiety. Oxytocin can be released in response to stressful as well as positive and pleasant mental stimuli and in response to noxious (painful) and non-noxious (pleasant) somatosensory stimulation [36,53].

According to research by Stuebe et al. showed that postpartum mothers experiencing high anxiety and depression had higher levels of oxytocin are low (response oxytocin low) and has a negative attitude during breastfeeding as being unhappy, depressed, and stressed during breastfeeding than in women who score lower anxiety and depression. Higher anxiety and depression scores was further associated with lower oxytocin (group  $p < 0.05$ ) during feeding. During feeding at both visits, higher anxiety and depression scores were also associated with more negative effects, mothers reported feeling less happy and more depressed, overwhelmed, and stressed during feeding than women with lower scores. Symptoms of depression and anxiety were associated with differences in oxytocin response and affect during breastfeeding [54]. Several recent articles show an association between maternal depression and breastfeeding duration [55-57]. Children of mothers with postpartum depression symptoms more at risk of disruption of exclusive breastfeeding in the first months and second. This shows the importance of mental health for the success of exclusive breastfeeding mothers. The study in Finland found that postpartum depression significantly affect exclusive breastfeeding with  $p = < 0.001$  [58]. Breastfeeding can increase the secretion of oxytocin and causing braided the bond between mother and baby [59]. Limitations of this study, among others, does not consider the nutritional and psychological factors of postpartum mothers. Although researchers have attempted to control for confounding variables to establish criteria for inclusion in the sample.

### **CONCLUSION AND RECOMMENDATIONS**

We conclude that oxytocin massage effective for increasing breast milk release will increase breastmilk production from postpartum mothers. Postpartum care practices suggested in efforts to make early breastfeeding initiation, and ensure the production of adequate breast milk by doing oxytocin massage to stimulate breast milk release so that the breast milk production increases.

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