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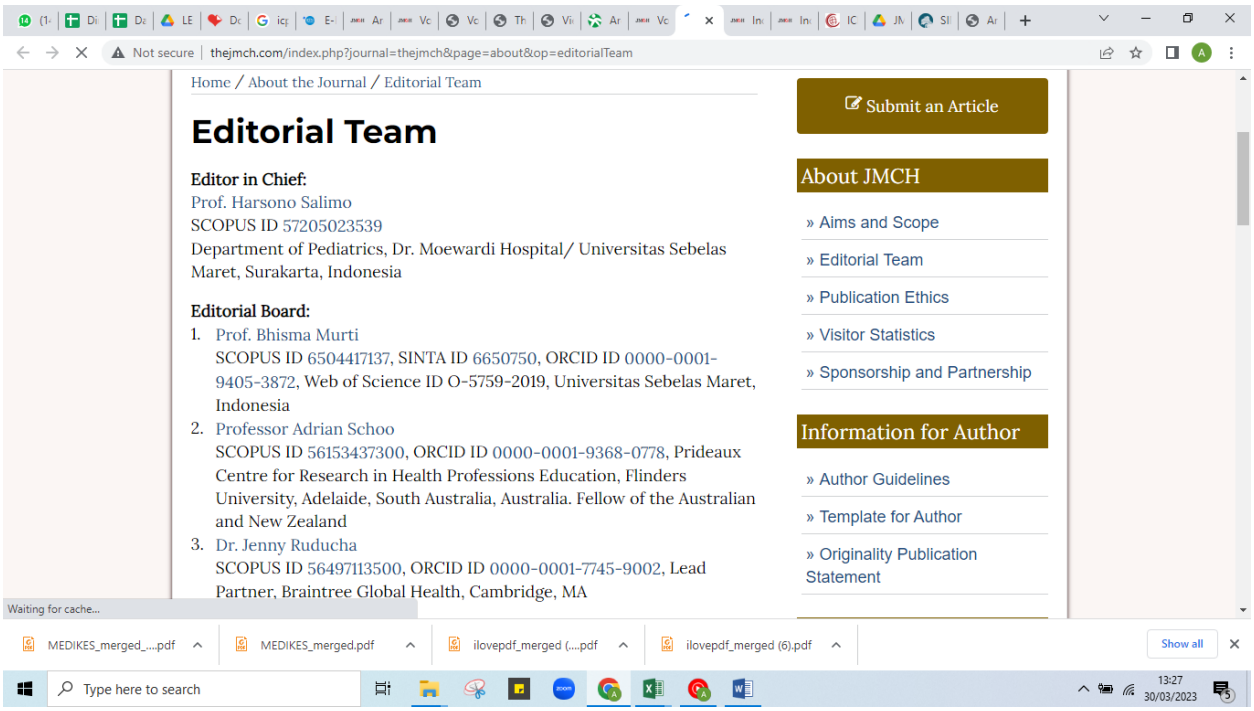

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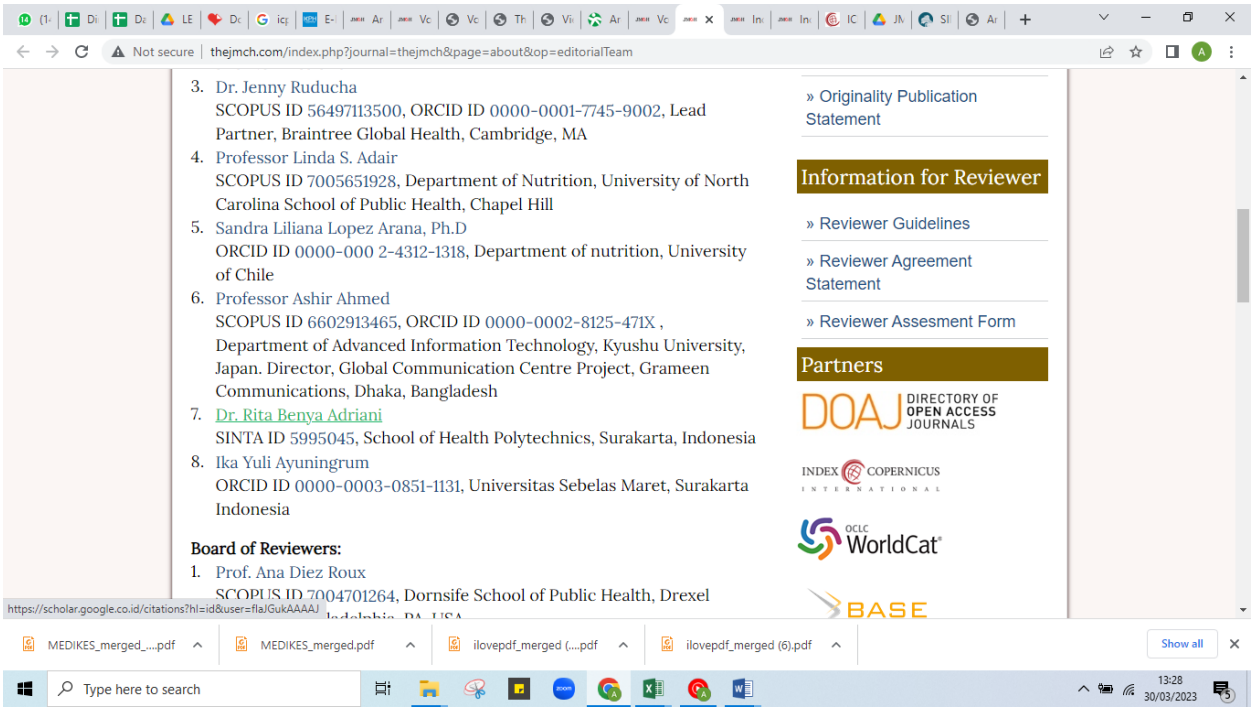

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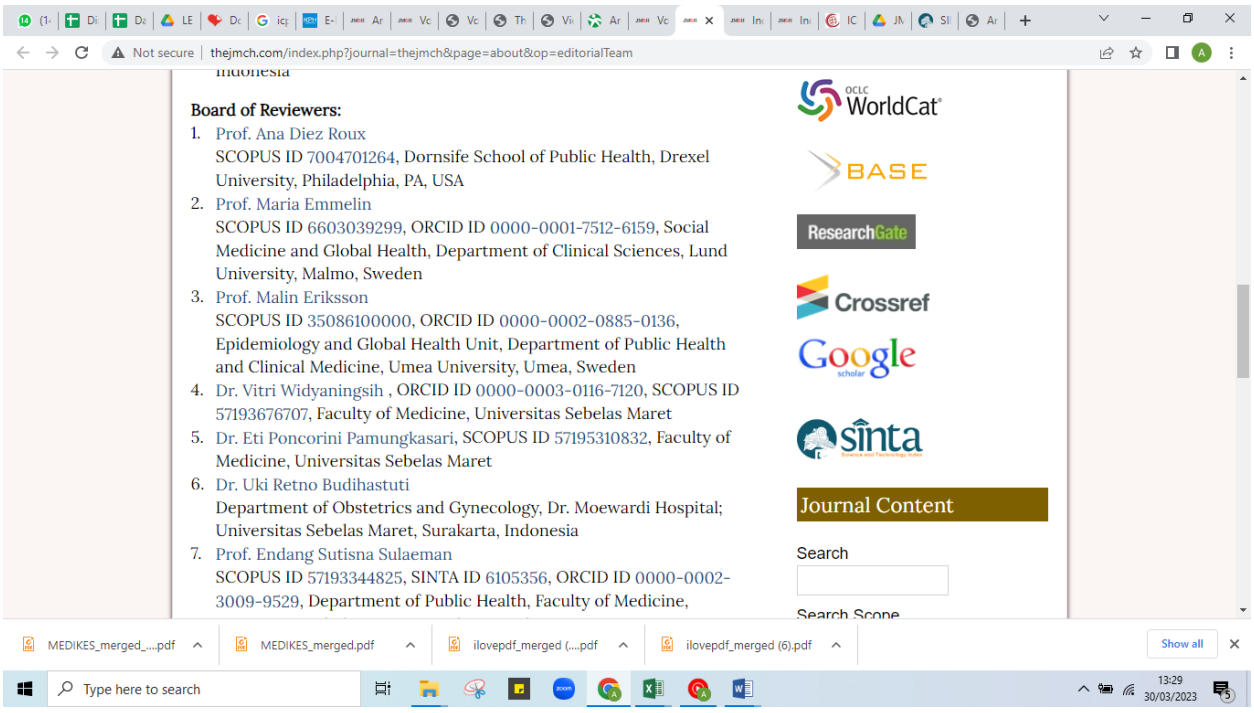

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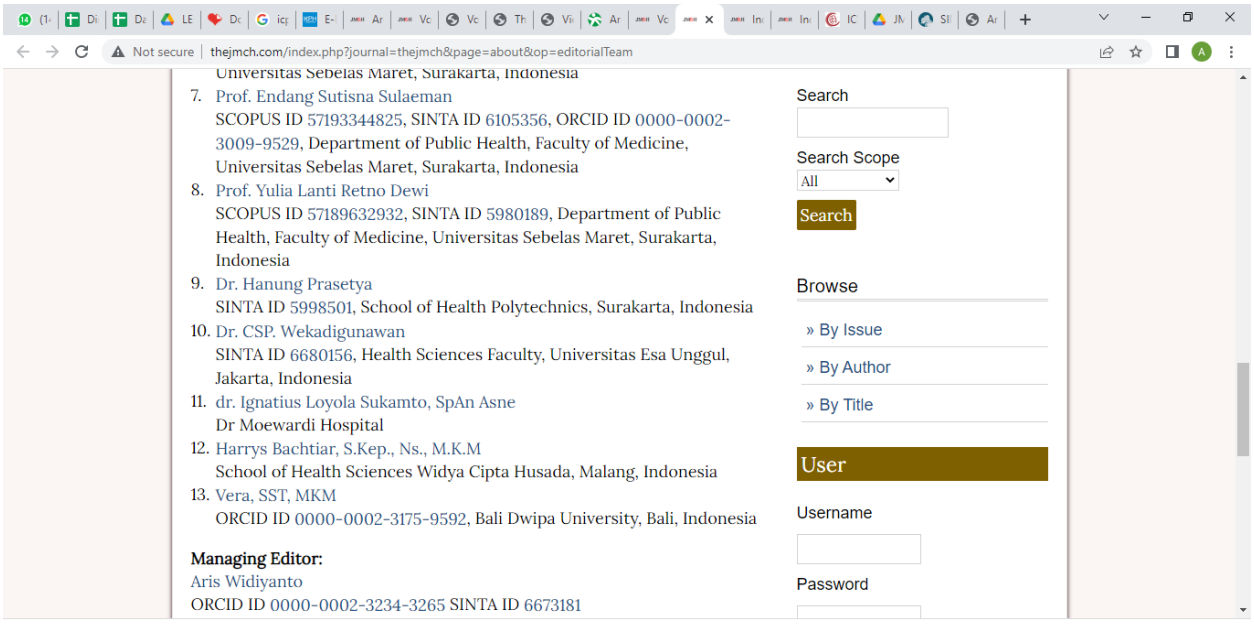

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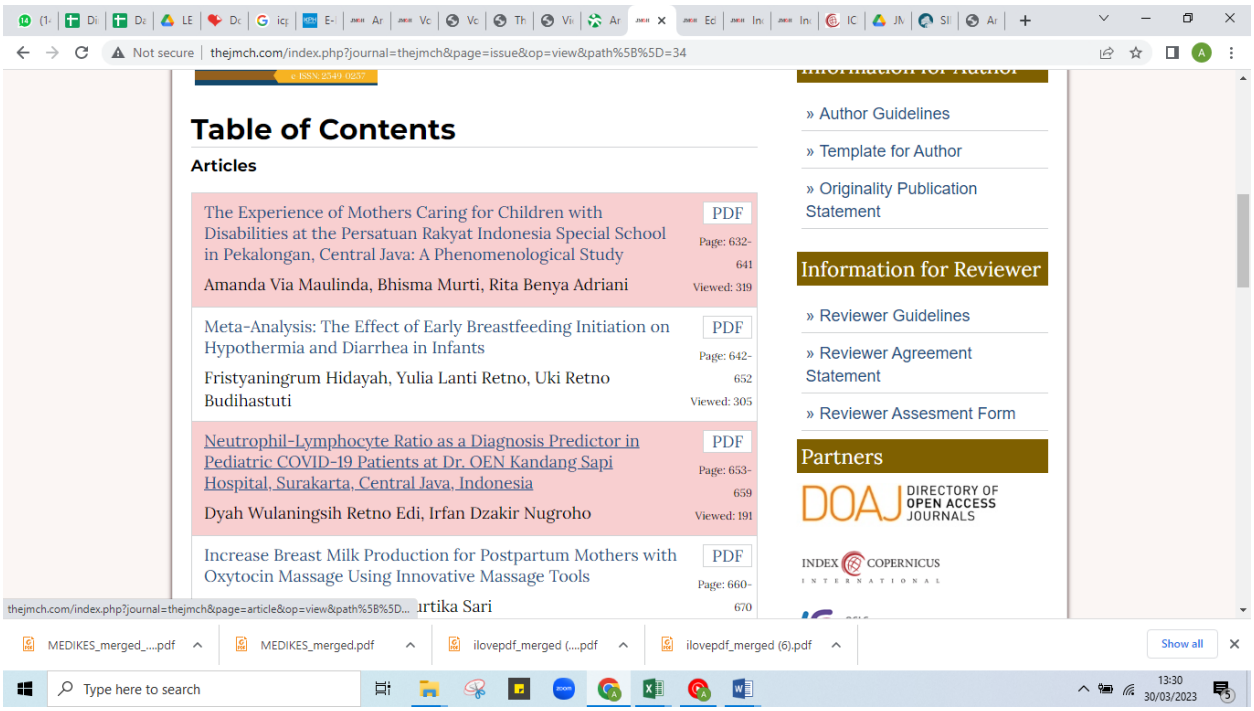

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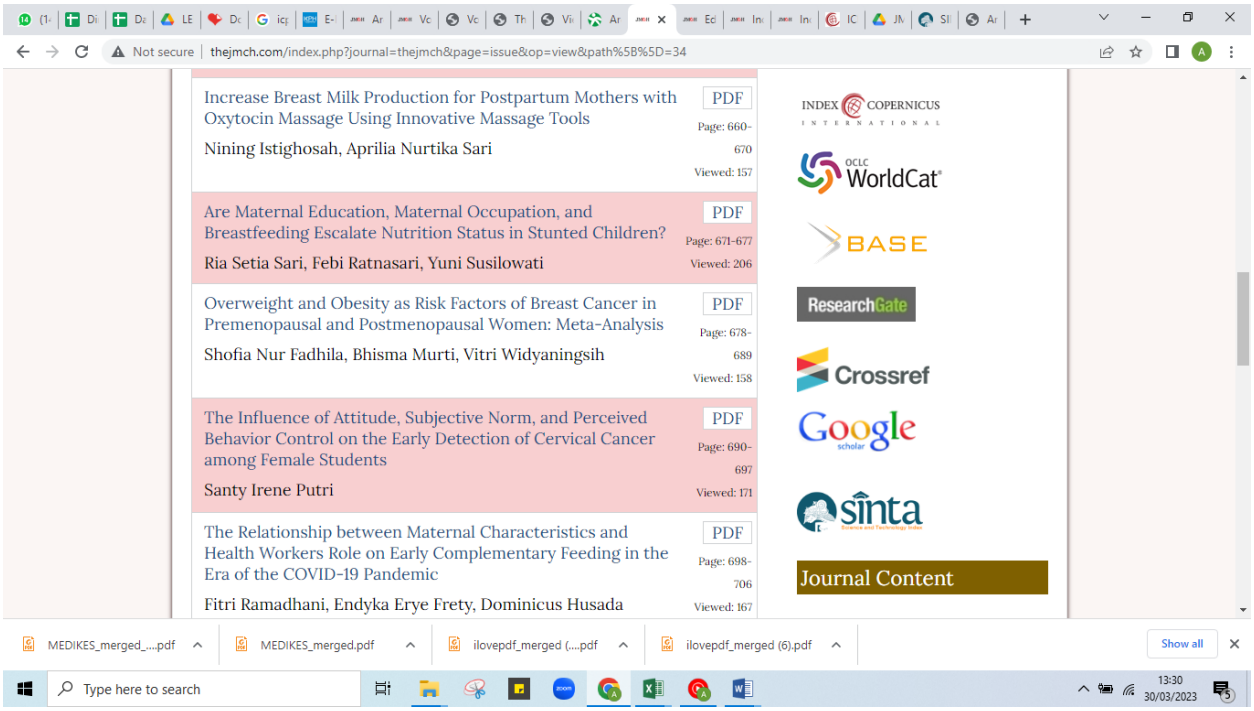

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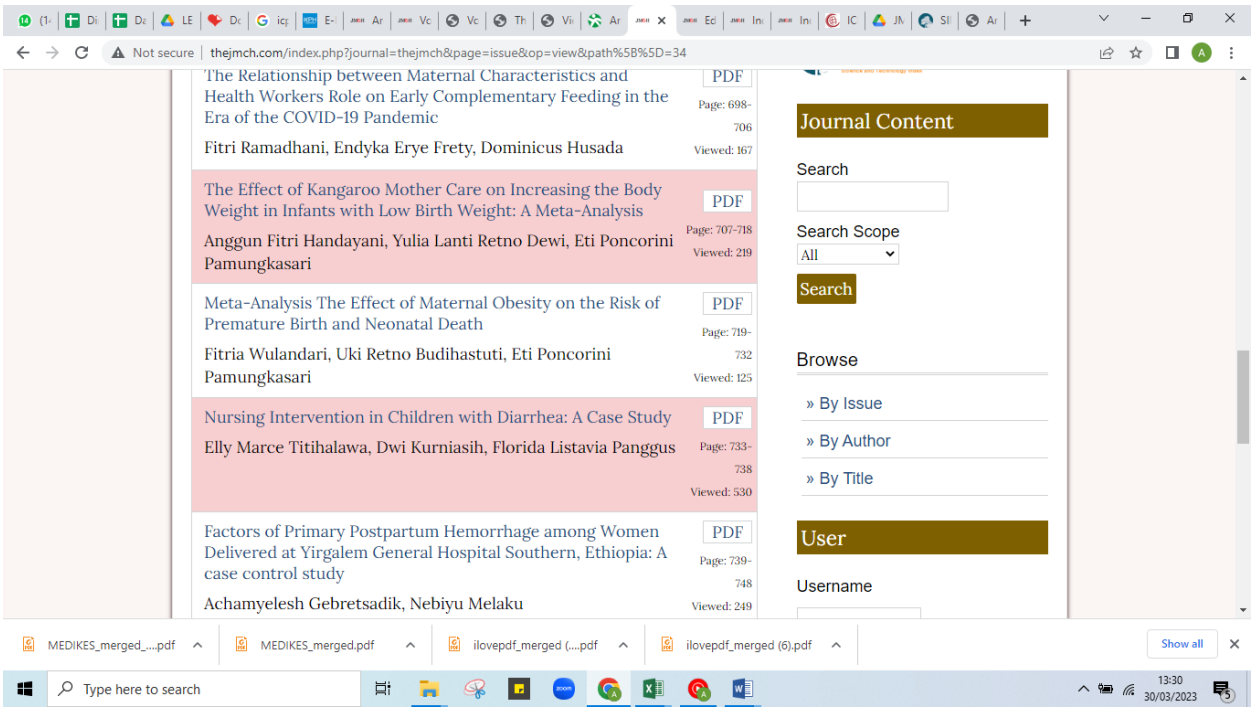
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Masters Program in Public Health, Universitas Sebelas Maret
Research

Increase Breast Milk Production for Postpartum Mothers with Oxytocin Massage Using Innovative Massage Tools

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ABSTRACT

Background: Goal 3 of Global commitment of 2015-2030 Sustainable Development Goals (SDGs) program is to ensure a healthy life and to promote well-being for all people at all ages in the 2nd achievement indicator targeting by 2030. It is hoped to end infant and under-five mortality that can be avoided, with all countries trying to reduce the Neonatal Mortality Rate to at least 12 per 1,000 KH and the Toddler Mortality Rate by 25 per 1,000 KH. Infant mortality cases caused by nutritional factors reached 53%. Several diseases that arise due to malnutrition include pneumonia (13.2%), diarrhea (17.2%) and perinatal problems (36%). Breast milk is the best food for babies and has the right balance of nutrients, is bioavailable, easy to digest, protects babies from disease, and has anti-inflammatory properties. This study aims to analyze the difference in the volume of breast milk before and after the mother received oxytocin massage with the Effleurage technique and a combination of innovative massage tools.
Subjects and Method: This research is a quasi experiment. The study was conducted in the City of Kediri from August to September 2020. The sample used was post partum women on days 4 to 10 using simple random sampling technique. The dependent variable is the volume of breast milk. The independent variable is the type of oxytocin massage treatment with effleurage technique, and the combination of oxytocin massage with efflurage technique and innovative massage tools. Data analysis per treatment and control groups used the one-way annova test with 95% CI.
Results: There was no difference in the mean volume of breast milk in mothers who received lactation massage using the innovative massage method (Mean= 21.65; SD= 15.43; p= 0.994), conventional Efflurage massage (Mean= 22.15; SD= 15.43; p= 0.330), and in control group (Mean= 20.50; SD= 15.43; p=0.386).
Conclusion: There was no difference in the mean volume of breast milk in each group and this result was not statistically significant.

Keywords: oxytocin massage, breast milk production, innovative massage tool.

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BACKGROUND

The Infant Mortality Rate (IMR) in Indonesia continues to decline every year. However, there is still a long way to go to combat AKB. The results of the Indonesian Demographic and Health Survey (IDHS) show that from year to year the IMR has decreased significantly. From 68 deaths per 1,000 live births in 1991, to 24 deaths per 1,000 live births in 2017. Global commitment to the 2015-2030 Sustainable Development Goals (SDGs) program which is a

continuation of the 2000-2015 MDGs (Millennium Development Goals) program. In the third program goal, which is to ensure a healthy life and promote well-being for all people at all ages. The 2nd achievement indicator is targeting by 2030, ending preventable infant and under-five mortality, with all countries trying to reduce the Neonatal Mortality Rate by at least up to 12 per 1,000 KH and the Toddler Mortality Rate 25 per 1,000 KH (Ministry of Health of the Republic of Indonesia, 2015).

The infant mortality rate in Indonesia is mostly related to nutritional factors, reaching 53%. Several diseases that arise due to malnutrition include pneumonia (13.2%), diarrhea (17.2%) and perinatal problems (36%). Statistics also show that more than 70% of under-five deaths are caused by diarrhea, pneumonia, measles, malaria and malnutrition. According to data from the Indonesian Ministry of Health in 2018 as many as 78.5% of neonatal deaths occurred aged 0-6 days with the cause of death mostly preventable and treatable (GERMAS, 2018).

Exclusive breastfeeding (ASI) is able to reduce infant morbidity and mortality in cases of infant mortality that occur in both low- and middle-income countries. Optimal breastfeeding can prevent 1.4 million deaths worldwide in children under five every year and reduce deaths due to acute respiratory infections and diarrhea by 50–95%. Suboptimal breastfeeding causes 45% of neonatal deaths due to infectious infections, 30% of deaths due to diarrhea, and 18% of deaths due to acute respiratory distress in children under five years of age in developing countries (Mekuria and Edris, 2015; WHO, 2009; Debes et al., 2013).

Oxytocin massage is one solution to overcome the inability to produce breast milk. Oxytocin massage is done by massaging the back area along both sides of the spine so it is hoped that with this massage the mother will feel relaxed and fatigue after giving birth will disappear. If the mother feels comfortable, relaxed, and not tired, it can help stimulate the release of the hormone oxytocin and milk will come out quickly. Oxytocin massage is an act of spinal massage starting from the 5-6th nerves to the scapula which will accelerate the work of the parasympathetic nerves to convey commands to the back of the brain so that oxytocin comes out. Oxytocin massage is done to stimulate the oxytocin reflex or let down reflex. In addition to stimulating the let down reflex, the benefits of oxytocin massage are to provide comfort to the mother, reduce swelling, reduce milk blockage, stimulate the release of the hormone oxytocin, maintain breast milk production (Pilaria, 2018; Rahayuningsih et al., 2017; Prime, 2013; Lollivier et al., 2006).

Oxytocin can trigger anti-stress-like effects such as lowering blood pressure and cortisol levels. It raises the pain threshold, exerts an anxiolytic-like effect and stimulates various types of positive social interactions. The hormone oxytocin is a hormone that can be stimulated by physical activity in the form of touching the skin in the form of warm gentle pressure, such as in the mother's back massage or during breastfeeding. The release of the hormone oxytocin in nursing mothers is characterized by the following conditions: (1) The presence of a throbbing sensation in the breasts when the mother feeds her baby; (2) Milk that automatically flows from the other breast when the mother feeds the baby; (3) milk that flows profusely when the breastfeeding process is suddenly interrupted; (4) The baby calmly sucks the nipple and swallows milk slowly; (5) breast milk that automatically drips or flows from the breast when the mother relaxes by remembering her baby or hearing the baby cry; (6) Mother feels pain sensation in uterus due to smooth

blood flow; (7) Mother feels thirsty while breastfeeding her baby (Prime, 2013).

By doing proper oxytocin massage and according to needs, a very favorable condition will be obtained for both mother and baby because the effect of oxytocin release not only increases the feeling of relaxation in the mother but also feels comfortable in the baby because proper nutrition can be fulfilled properly. In the end, the condition of the mother and baby will be much calmer, the mother's pain threshold will increase, the mother's cortisol level will decrease, there will be a good emotional closeness between the mother and baby (Uvnas-Moberg, 2005).

Neonatal mortality is defined as death during the first 28 days of life and is the most critical phase for a child's survival. Despite the strong evidence supporting the short-term and long-term health benefits of the benefits of early breastfeeding in infants. (Phukan et al., 2018) Providing proper nutrition to infants and toddlers is the most effective step in improving the health of infants and toddlers. Based on WHO data in 2006 an estimated 9.5 million children died before their fifth birthday, and two thirds of these deaths occurred in the first year of life. 35% of these causes of death are associated with nutritional disorders in children. This is also the main cause of failure of optimal growth in children in the world. Around 32% of children under the age of 5 years in developing countries experience stunting and 10% experience wasting. It is estimated that non-exclusive breastfeeding is the cause of death in 1.4 million children and accounts for 10% of the incidence of disease in children under 5 years of age worldwide (WHO, 2009).

Breast milk is an ideal nutrient for babies. Milk production on days 1 to 6 after delivery determines milk production on the following days. An Australian study states that milk production is said to be normal if it reaches a minimum of 440 ml / day on day 11 after delivery. Breast milk production that is less than 440ml in the 2nd week after delivery indicates that the mother needs intervention from a lactation expert. Support and interventions to facilitate milk production in the first week of labor are very important steps in supporting the success of exclusive and adequate breastfeeding for infants. Steps that can be taken to increase milk production in the first week after delivery include early initiation of breastfeeding at 24 hours of delivery and frequent emptying of the breast either by breastfeeding or by regularly expressing breast milk. Early lactation intervention has a significant effect on increasing milk production at 1 to 4 months after delivery. A study reported that routine breastfeeding in the first days of breastfeeding can stimulate milk production up to 415 ml (123 g) on day 5 post partum, namely the lactation transition period, even post partum mothers who give birth to term babies who regularly emptied their breasts regularly. breastfeeding and expressing can achieve a mature milk production of 973 ml on day 5 (Kent et al., 2016). This study aims to analyze the difference in breast milk volume before and after mothers receive oxytocin massage with the Effleurage technique and using innovative massage tools.

SUBJECTS AND METHOD

1. Study Design

This research is a quasi experiment. Data analysis per treatment and control groups was carried out using the Annova difference test with 95% CI.

2. Population and sample

The subjects in this study were all post partum women on days 1 to 14 in the city of Kediri, East Java. The research subjects were obtained by using random sampling

technique. The inclusion criteria in this study were all post partum women on days 1 to 14 with the condition of the baby at term and the age range from 20-35 years to get a homogeneous group. While the exclusion criteria in this study were post partum mothers with mental disorders and babies who died.

3. Study Variables

The dependent variable is the amount of milk production. The independent variable is the type of oxytocin massage treatment with effleurage technique, and a combination of oxytocin massage with effleurage technique and innovative massage tools.

4. Operational Definition of Variable

The volume of breast milk was the amount of milk produced after oxtocin massage and measured before the baby suckles or at least 2 hours after the previous feeding. In order to restore milk production to the volume before feeding the baby, both breasts are pumped for ± 30 minutes @ ± 15 minutes or until the milk does not again dripping with an additional time of ± 2 minutes.

The type of oxytocin massage treatment with the effleurage technique, and the combination of the oxytocin massage with the effleurage technique and the innovative massage device was the treatment for postpartum mothers on days 4 to 10 during oxytocin massage using the conventional efflurage method and with a combination of innovative massage tools performed by practitioners 1x with a duration of 5 to 10 minutes each.

5. Study Instrument

Oxytocin massage treatment data was measured using a record form. Massage using conventional efflurage is carried out in the morning or evening with the mother relaxed, not hungry and allowing oxytocin massage for 10 minutes. It was carried out once in the 4th to 14th day post partum and controlled with subjects receiving oxytocin massage using an innovative massager.

The results of pumping breast milk are measured using a measuring tube in ml and then the results are entered into a record form. Breast milk pumping was not carried out on the first day until the 3rd day postpartum because it was related to the lactogenesis period I. Breast milk was pumped when the breasts were full after oxytocin massage, both on subjects who had conventional massage or using innovative massage tools. In each subject, both groups that received oxytocin massage with the conventional efflurage method and using massage tools were also measured their milk production when not given massage treatment so that they could compare the volume of breast milk before and after the oxytocin massage action.

6. Data Analysis

Analysis of data per treatment and control groups using One-way Annova test with CI 95%.

7. Research Ethics

This research proposal has been presented in front of the examiners of the research ethics committee and received approval from the ethical committee of the Karya Husada Pare Health Sciences College - Kediri in July 2020 with the certificate number of ethical feasibility: 238/EC/-LPPM/STIKES/KH/VII /2020

RESULTS

1. Sample Characteristics

Subjects consisted of 30 post partum women on days 1 to 14 with an age range from 20 to 35 years. A total of 30 subjects consisted of 3 groups including 10 subjects with massage treatment with the conventional Efflurage method, 10 subjects with massage treatment using a combination of innovative massage tools and 10 control subjects. Each group of subjects received pre and post treatment.

The majority of the subjects were in the treatment group (conventional Efflurage and innovative massage tools) and the control group, 90% of the subjects were in the range of 20-30 years. While the education of the majority of subjects in all groups is high school graduates with the predominance of work as housewives. Body Mass Index (BMI) of the majority of subjects in the range 18.5 – 22.9, which means that the majority of subjects have good nutritional status. 60% of the treatment group using the conventional Efflurage massage technique were multiparous, while the treatment group using conventional massage tools and the control group were evenly distributed, both primiparous and multiparous (Table 1).

Table 1. Sample Characteristics

Characteristics	Criteria	Groups					
		Conventional effleurage		Innovation massager		Control	
		n	%	n	%	n	%
Age	20- 30 years	9	90%	9	90%	9	90%
	> 30 years	1	10%	1	10%	1	10%
Education	PS	2	20%	0	0%	1	10%
	JHS	4	40%	2	20%	4	40%
	SHS	4	40%	5	50%	3	30%
	College	0	0%	3	30%	2	20%
Occupation	Working	2	20%	4	40%	3	30%
	Not working	8	80%	6	60%	7	70%
BMI	< 18.5	1	10%	2	20%	2	20%
	18.5 – 22.9	6	60%	5	50%	7	70%
	≥ 23	3	30%	3	30%	1	10%
Parity	Primi	4	40%	5	50%	5	50%
	Multi	6	60%	5	50%	5	50%
Perceived Stress Scale (PSS)	Light	5	50%	4	40%	4	40%
	Moderate	5	50%	6	60%	6	60%
	Severe	0	0%	0	0%	0	0%
Frequency of breastfeeding	8-12 times	7	70%	6	60%	8	80%
	> 12 times	3	30%	4	40%	2	20%

2. Univariate Analysis

The average milk production in subjects who were given lactation massage treatment using an innovative massage tool (Mean= 131.35; SD= 62.49) was greater than the average milk production after being massaged using the conventional Efflurage method (Mean= 129.70; SD= 52.12) and without treatment (Mean= 109.20; SD= 21.67) (Table 2).

Table 2. Differences in the average milk production in the Efflurage, Innovative massager and Control groups

Group	N	Mean	SD	Min.	Max.
Innovation massage tool	10	131.35	62.94	70.00	290.00
Conventional	10	129.70	52.12	70.00	278.00
Control	10	109.20	21.67	75.00	152.00

3. Bivariate Analysis

There was no difference in the mean volume of breast milk in mothers who received lactation massage using the innovative massage method (Mean= 21.65; SD= 15.43; p= 0.994), conventional Efflurage massage

(Mean= 22.15; SD= 15.43; p= 0.330), and in control group (Mean= 20.50; SD= 15.43; p=0.386) (Table 3).

Table 3. ANOVA test results Differences in the average milk production before and after receiving oxytocin massage Conventional Efflurage Techniques, innovative massage tools and controls

Group	N	Mean	SD	p
Innovation vs Conventional Massage Tools	10	21.65	15.43	0.994
Innovation vs Control Massage Tool	10	22.15	15.43	0.330
Conventional vs Control	10	20.50	15.43	0.386

DISCUSSION

The results of this study indicate that both subjects who received oxytocin massage treatment with the conventional Efflurage method and the combination of innovative massage tools obtained significant results on milk production. So at the end of the study it can be concluded that oxytocin massage therapy is a therapy that is very beneficial for postpartum mothers so that it has a positive impact on the lactation process because it has been shown to increase milk production.

Massage therapy is known as the most ancient therapy in the world of medicine which is then included in complementary therapy in nursing and midwifery practice. This therapy is very popular to be applied because it is a non-pharmacological therapy that is easy to implement, safe for patients and relatively inexpensive and is not an invasive action to clients. Massage can affect the central nervous system by releasing substance B in the nervous system such as endorphins and encephalins and preventing the release of substance P (neurotransmitter). So that it can reduce stimulation of the sympathetic nervous system and increase stimulation of the parasympathetic nervous system as a result, heart rate and respiratory rate are reduced and regular, so that circulation blood and lymph system becomes smoother. Decreased sympathetic nerve activity after childbirth can cause a relaxed and comfortable feeling in the mother, reduce anxiety, reduce pain due to childbirth, prevent the incidence of post partum blues and increase emotional bonding between mother and baby (Moradi et al., 2016; Jahdi et al., 2016; Sari, et al, 2017).

Oxytocin hormone has an important role in the lactation process, especially in the process of expulsion of breast milk through contraction of myoepithelial cells in breast tissue. The presence of oxytocin receptors on each epithelial cell indicates that the oxytocin hormone has its own role in mammalian breast organs. Oxytocyn is a small peptide compound consisting of only 9 amino acids which is usually associated with the process of childbirth and breastfeeding. Oxytocyn is not only a hormone but is a neurotransmitter and parecrine substance in the brain. During the breastfeeding process, this substance will be released by the brain in both mother and baby due to stimulation and stimulation (Lollivier et al., 2006; Prime, 2013; Zuppa et al., 2010).

Oxytocin massage is an act of spinal massage starting from the 5th-6th ribs to the scapula or shoulder blade which will accelerate the work of the parasympathetic nerves to convey commands to the posterior pituitary to release the hormone oxytocin. Oxytocin massage is done to stimulate the oxytocin reflex or let down reflex and can be done with the help of the family, especially the husband. In general, massage can significantly affect the peripheral nervous system, increasing the excitability and conduction of

nerve impulses, weakening and stopping pain and increasing blood flow to tissues and organs and making muscles flexible so that they feel comfortable and relaxed. Therefore, after the oxytocin massage, it is hoped that the mother will feel relaxed so that the mother does not experience stress conditions that can inhibit the oxytocin reflex (Rahayuningsih et al., 2017).

This study was conducted on 30 spontaneous postpartum mothers, both primiparous and multiparous, with an age range of 20-35 years. Researchers made 3 visits to each subject. The first visit was carried out on the first day after postpartum at the health facility where the subject gave birth. The second visit was carried out on the 5th day postpartum or the range of days 5-14 Post partum where mature milk production has begun to form (Lactogenesis Phase II) to measure Breastfeeding production Pre-action massage and the 3rd visit were carried out on the 6th day to perform oxytocin massage therapy and measure milk production post-action. The visit was carried out while still paying attention to and implementing health protocols during the COVID-19 pandemic.

From the results of the study, it was found that the subject's milk production after oxytocin massage using the conventional efflurage method increased an average of 42 ml. Meanwhile, subjects who received combination massage using innovative massage tools experienced an average increase of 60 ml. Meanwhile, in the control group, the average pre and post milk production value also increased by 3 ml.

Based on the ANOVA test, the mean ± Standard Deviation in the oxytocin massage treatment group using the conventional Efflurage method was 129 ± 52 while in the massage treatment group using an innovative massager was 131 ± 62 and in the control group it was 109 ± 21.6 with a $p > 0.005$. From the results of this study, although the mean and SD values of oxytocin massage using innovative massage tools and conventional Efflurage methods were higher than the control group, there was no significant difference.

In this study, the increase in breast milk production in the massage treatment group using innovative massage tools at pre and post was higher than in the massage treatment group using the conventional Efflurage method. The increase in breast milk production can be seen through the results of pumping breast milk using a standardized manual pump before and after oxytocin massage, from 101 ml to 161 ml at week 2 postpartum.

Breast milk production is the volume of breast milk produced when the breasts are full again after feeding the baby. The oxytocin massage method used is either using the conventional efflurage method, namely completely skin to skin contact between the therapist and client and using a combination of skin to skin and innovative massage tools, in principle, both are media to stimulate the activity of the parasympathetic nervous system so as to increase the feeling of comfort in the mother, reduce fatigue and stimulate milk production. Breast milk is released by the breast due to the contraction of the muscles around the breast stimulated by the hormone oxytocin through the let down reflex mechanism. Massage therapy performed by the therapist must be tailored to the needs of each client. Correct massage movements can stimulate nerve fibers in the skin which then affect a person's body and mind due to the activity of the nervous and hormonal systems. Movement that is regular and controlled and creates a feeling of comfort can improve blood circulation. So that the use of massage methods must adapt to the client's physical condition, whether it is enough with skin to

skin movements from the therapist or the help of massage tools is needed so that the client really feels comfortable and relaxed.

Based on the results of this study, subjects who received oxytocin massage therapy using the conventional Efflurage method and the combination method of innovative massage tools gave different reactions. Subjects who were given massage using massage tools felt that the massage given was deeper and more comfortable than massage using only the therapist's hand. They revealed that therapists who have a smaller body than the subject tend to be less strong in applying pressure to the back properly so that the subject feels less satisfied with the pressure given by the therapist. This innovative massage tool can be used easily by all family members including the subject's husband. Therefore, as a therapist, it is very necessary to pay attention to the needs of clients according to the physical condition of both therapists and subjects. If the client's body tends to be fatty, then of course it takes strong pressure and stronger energy from the therapist so that both therapist and client can achieve the expected results.

In accordance with research conducted by Rahayuningsih (2017) that the production of breast milk in the postpartum mother group who received breast care and oxytocin massage (Mean= 17.37; SD= 9.70) was greater than the control group (Mean = 1.58, SD = 1.69), and significantly statistically ($p < 0.001$). Meanwhile, based on research by Zuppa et al. (2010) that increased levels of the hormone oxytocin have been shown to increase milk production significantly 3-5 times in primiparas and 2 times in multiparas.

The oxytocin massage technique which is carried out by adjusting the mother's physical condition with the method used by the therapist and also emphasizing on the right massage points can increase comfort in postpartum mothers thereby increasing the release of oxytocin and stimulating milk production through the let-down reflex mechanism. In addition, the right effect of oxytocin massage also reduces the psychological stress scale of postpartum mothers in both primiparas and multiparas. Oxytocin massage should be a part of midwifery care for postpartum mothers, especially for mothers who have lactation problems. Oxytocin massage can be done by anyone, both health workers, therapists and family members of postpartum mothers. The use of innovative massage tools helps the implementation of oxytocin massage to be easier for anyone, including the patient's family, so that it is hoped that there will be no more nutritional problems for newborns related to the lack of breast milk production.

Massage on the back causes stimulation of the spinal cord which functions as a nerve liaison between the brain and the peripheral nervous system. All communication up and down the spinal cord is located in ascending tracts that transmit signals from afferent input to the brain. The gray matter located in the center of the spinal cord contains the interneurons that lie between afferent input and efferent output and the cell bodies of efferent neurons. Afferent and efferent fibers, which carry signals to and from the spinal cord, respectively, unite into spinal nerves. These nerves attach to the spinal cord in pairs along the cord. Inhibitory neurons and excitatory cholimergic neurons make synaptic contact with neuro-secretory oxytocin neurons in the paraventricular and supraoptic nuclei. Then the hypothalamus produces the hormone oxytocin and flows to the posterior pituitary. Oxytocin goes to the breast, so the hormone oxytocin is released. Furthermore, the hormone oxytocin will trigger the smooth muscles around the milk-making

cells to secrete milk. These muscles will contract and expel milk. This process is called the let down reflect. In addition, massage in the spinal muscles will relax tension and relieve stress, therefore it will launch the process of releasing the hormone oxytocin (Greenstein and Diana, 2010).

Stimulus for breast milk production given early in the post partum period has been shown to increase milk production in the early weeks of post partum. In addition to stimulating increased milk production, oxytocin massage has been shown to increase feelings of comfort, reduce pain due to childbirth, reduce maternal anxiety, thereby increasing the emotional bond between mother and baby and improving the quality of the lactation period. Based on the results of the study, there was no significant difference between the milk production of subjects who received good lactation massage using innovative massage tools, conventional Efflurage massage and the control group.

From the results of this study, there was no significant difference between the milk production of each treatment group, this could be influenced by many factors. Based on the literature that the factors that affect the production of breast milk include nutrition, peace of mind and mind, use of contraceptives, breast care, breast anatomy, physiological factors, rest patterns, child sucking or breastfeeding frequency, birth weight of the baby, gestational age at delivery and cigarette consumption. Other factors that can affect milk production even though massage has been carried out with good and correct techniques, such as 1) maternal age, younger mothers produce more milk than older mothers. 2) Education, education can affect the ability and efforts of parents in caring for and maintaining children's health. 3) Working, working mothers are an obstacle in breastfeeding. 4) Parity, mothers giving birth to a second child or more have more milk production than the birth of the first child. Even though the researchers have controlled each treatment group so that group homogeneity is obtainned, the small number of samples may also affect the results of statistical tests. So, it is hoped that in future research can control the quality and quantity of samples better so as to get more satisfactory results.

AUTHOR CONTRIBUTION

Nining Istighosah is the main researcher who chooses the topic, conducts a search for data collection in this study. Aprilia Nurtika Sari conducted data analysis and review of research documents.

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CONFLICT OF INTEREST

This research does not have any conflict of interest other than to contribute to science, especially care for postpartum mothers based on Evidence Based.

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