

The Effectiveness of Neck Massage to Increasing the Total of Postpartum Breast Milk on the First until Third Days at PMB Medan City

Herna Rinayanti Manurung
STIKes Mitra Husada, Medan

ARTICLE INFO

Article history:

Received Sep 19, 2022
Revised Sep 26, 2022
Accepted Okt 17, 2022

Keywords:

Neck Massage
Increasing the total Mother
Milk
Postpartum Mother

ABSTRACT

A breastfeeding program with the slogan "Love Babies, Give ASI" has been launched by the government. However, the coverage of ASI has not reached the national target. 80%. One of the causes of the failure of exclusive breastfeeding is due to the problem of adequacy of breast milk. Neck massage is believed to help expel breast milk. The purpose of this study was to examine the effectiveness of neck massage on increasing the amount of postpartum breast milk from the first day to the third day. This type of research is quantitative with the static group comparison research design. The sampling technique used is Systematic Propionate Random Sampling. The sample in this study was 52 and the sample per group was 26 respondents. The population members affected by the sample in PMB A are patients whose number is multiple of 2, and PMB B is multiple of 2. The results of the study of the effect of neck massage on increasing the amount of postpartum breast milk on the first to third day from the analysis of comparative data of the experimental group and the comparison group obtained p-value 0.000, meaning that neck massage is more effective than pectoralis major muscle massage in increasing breast milk production in postpartum mothers on the first to third day. Therefore, health workers, especially physiotherapists, make neck massage in breast care for postpartum mothers with complaints of breast milk not coming out and teach mothers and families how to massage the neck properly and correctly

This is an open access article under the [CC BY-NC](#) license.



Corresponding Author:

Herna Rinayanti Manurung,
Bachelor of Midwifery Program,
STIKes Mitra Husada Medan,
Email: hernarinayanti28@gmail.com

INTRODUCTION

Based on data from the Central Statistics Agency (BPS), the Infant Mortality Rate (IMR) in Indonesia in 2012 was 32 per 1,000 live births, in 2015 it decreased to 22.23 per 1,000 live births and was in accordance with the 2015 MDGs, but in 2016 the IMR in Indonesia increased to 25.5 per 1,000 live births. The target for the Sustainable Development Goals (SDGs) until 2030 is 12 per 1,000 live births (Institution Center of Statistiic, 2020). One of the main causes of infant morbidity and mortality in Indonesia is diarrhea and infection, while diarrhea and infectious diseases can be prevented by breastfeeding infants. Breast milk as a single food will be sufficient to meet the growing needs of

normal infants until the age of six months which ensures good nutritional status of infants and decreases child morbidity and mortality (Walyani & Purwoastuti, 2017).

The Indonesian Health Demographic Survey (IDHS) report in 2017, the achievement of exclusive breastfeeding in Indonesia was 42%. Meanwhile, in 2018 it increased to 55.7%. Reports from the Medan City Health Office in 2019 the coverage of exclusive breastfeeding was 54.3%, while in 2019 there was a fairly high increase to 71.6% (Health Office, 2019). The results of this coverage still have not reached the national target expected by the government of 80%. (Central Bureau of Statistics, National Family Planning Coordinating Board, Ministry of Health, & Macro International, 2019). Based on Permana's research in 2016, one of the causes of the failure of exclusive breastfeeding is due to the problem of adequacy of breast milk (Permana, 2016).

The preliminary study conducted at PMB Ida Febrianita contained 19 postpartum mothers. 15 of 19 mothers complained that breast milk was not smooth, especially the first day to the third day, so far the method used at BPM Ida Febrianita is breast care. This can be overcome with massage. Based on Ipang Suryani's research in 2017, neck massage and pectoralis major muscle massage are beneficial for breastfeeding mothers in the postpartum period. Neck massage and pectoralis major muscle massage have been shown to be good for milk production but there is no information about which massage is more effective in increasing the Total of breast milk. According to the neck massage theory, it is more effective in milk production (Ganong, 2013).

Based on the above background, the researcher is interested in conducting a study entitled "The effectiveness of neck massage on increasing the Total of postpartum Breast milk from the first day to the third day at PMB Medan."

RESEARCH METHOD

This type of research is quantitative research with pre-experimental research methods with the static group comparison design research design. The population in this study were all postpartum mothers who were treated in the postpartum room. The monthly average population of postpartum women in PMB Ida Febrianita, Medan City (PMB A) is 25 postpartum women and the average population of postpartum women in PMB Vina, Medan City (PMB B) is 55 postpartum women. The sample size is 52 and the sample per group is 26 respondents. The sampling technique in this study is Systematic Proportional Random Sampling (Systematic random sampling) (Sugiyono, 2012). Then the members of the population affected by the sample in PMB A are patients whose numbers are multiples of 2, and PMB B's are multiples of 2.

The inclusion criteria are postpartum mothers on day 1, mothers who do not consume breast milk, maternal breast milk that does not come out on the first day of postpartum, and who are willing to become breastfeeding mothers. respondents. Meanwhile, the exclusion criteria were if during the study after massage, before 30 minutes the baby cried and wanted to breastfeed, the baby was given milk directly and the patient was dropped out. Technical analysis of the data carried out normality test using Kolmogorof Smirnov.

RESULTS AND DISCUSSIONS

Univariate Analysis

Table 1. Characteristic Respondent in PMB Medan City

	experiment		Comparing		P
	N	%	N	%	
Characteristics					

Age	Healthy reproductive	21	38,5%	18	33,3%	0,813
	Adult reproductive	6	11,1%	9	16,7%	
Status of Nutrition	Thin	9	16,7%	9	16,7%	1,755
	Normal	16	29,6%	15	27,8%	
	Fat	2	3,8%	3	5,6%	
Parity	Primipara	16	29,6%	7	13%	0,605
	Multipara	11	20,4%	20	37%	

Based on table 1, the characteristics of respondents based on age, the majority of respondents reproduced healthy, namely in the experimental group 21 (38.5%). The majority of each group of normal nutritional status was 16 (29.6%) in the experimental group and the majority of parity in the experimental group was primipara, which was 16 (29.6%).

Bivariate

Table 2. The average of Total ASI on Experiment and Comparison Group in PMB Medan City

Group	N	Total ASI day 1		Total ASI Day 2		Total ASI day 3	
		Mean	SD	Mean	SD	Mean	SD
Massage of Neck	27	0,856	1,317	6,9352	10,795	30,525	28,719
Massage Muscle pectoralis	27	0,481	0,05798	0,6111	0,5198	2,081	1,3223

Based on the table above, the experimental group shows the mean, standard deviation of the experimental group (neck massage). It appears that the mean or average value of total The output of the amount of breast milk on the first day after being given neck massage treatment was 0.8556, the amount of breast milk on the second day was 6.9352 and the amount of breast milk on the third day was 30.5259. The standard deviation of the amount of breast milk on the first day of the experimental group was 1.31715, the amount of breast milk on the second day was 10,79537, the amount of breast milk on the third day was 28,71904.

In the comparison group the mean, standard deviation of the comparison group (pectoralis major muscle massage). It appears that the mean or average value of the amount of milk expulsion on the first day after being given pectoralis major muscle massage treatment is 0.481, the amount of breast milk on the second day is 0.6111 and the amount of breast milk on the third day is 2.0815. The standard deviation in the experimental group was up to the amount of breast milk on the first day of 0.05798, up to the amount of breastfeeding on the second day 0.51986 and up to the total of breastfeeding on the third day 1.32230.

Table 3. Difference of total breast milk on experiment and comparison groups at PMB Medan City

Group	N	Difference ASI Day 1 and 2		Difference ASI day 1 and 3	
		Mean	SD	Mean	SD
Experiment	27	6,0796		29,6704	
Comparison	27	0,5630		2,0333	

Based on table 3, it can be seen that in the experimental group the mean difference (difference) in the amount of breast milk on the first to second day is 6.0796 and the mean value difference in the amount of breast milk on the first and third days is 29.6704.

To find out which treatment is more effective between the experimental group and the comparison group, a test using the Mann Withney test is carried out, with the results of the analysis as follows:

Table 4. the differences between Experiment and Comparison Group

Group		Average of Total ASI	<i>p-value</i>
Experiment	27	39,44	0,00
Comparison	27	15,56	

Based on table 4.5, it can be interpreted that the mean difference in the amount of breast milk on day 1 and 2 in the experimental group is 36.48 and the comparison group is 38.98, while the difference in the amount of breast milk in the experimental group on day 1 and 3 is 38.98 and the comparison group is 16.02. . The results of the analysis in this study are P-Value = 0.00 < sig 0.05, which means that there is a significant difference between neck massage and pectoralis major muscle massage. The conclusion is that neck massage is more effective than pectoralis major massage in increasing breast milk production in postpartum mothers from the first until the third day. Before proceeding with the multivariate analysis, the confounding variables were first tested for bivariate using the Mann Whitney test for age and parity variables. Kruskal Walls test for nutritional status variables. The results of data processing are as follows:

Table 5. Analysis Bivariate Variable of Confounder

Variable of Confounder	Average of Total ASI		<i>p-value</i>
	Mean	Std	
Reproductive Ages			
Health	27,92	0,452	0,710
Adult Reproductive	26,40		
Status of Nutrition			
Thin	28,50		
Normal	26,81	0,612	0,907
Fat	28,20		
Parity			
primipara	27,26	0,499	0,911
multipara	27,68		

* 0,25 level of significant

After the confounding variables were tested using Kruskal Walls, the results showed that the age variable $p\text{-value } 0,71 > \text{sig } 0,25$, nutritional status variable $p\text{-value } 0,955 > \text{sig } 0,25$, parity variable $p\text{-value } 0,911 > \text{sig } 0,25$. It can be concluded that the variables of age, nutritional status and parity are not confounders in increasing the amount of postpartum mother's milk on the first to third day at PMB Medan City in 2021. Age, nutritional status and parity variables do not meet the requirements for multivariate analysis, so that in this study only up to the bivariate test. In the comparison group, the mean difference (difference) in the amount of breast milk on the first to second day was 0.5630 and the mean value for the difference in the amount of breast milk on the first and third days was 2.0333.

Discussion

Based on the results of the study, the effect of neck massage on increasing the amount of postpartum mother's milk on the first to third day from the comparative data analysis of the experimental group and the comparison group was obtained a $p\text{-value}$ of 0.000, meaning that neck massage was more

effective than pectoralis major muscle massage in increasing breast milk production in postpartum mothers from the first to the third day.

Milk secretion is under neuroendocrine control, tactile stimulation of the breast also stimulates oxytocin, which causes shortening of myoepithelial cells (Myles, 2009). Massage is very useful for people who experience excessive fatigue, the effect of massage is very comfortable, sedative and able to stimulate nerves and increase muscle activity. (Trisnowiyano, 2014). Neck massage provides relaxation to postpartum mothers while breastfeeding, in a relaxed state the hypothalamus will release endorphins where the endorphin hormone has a calming effect on the mother so that breastfeeding mothers are able to maintain milk production so that it can be sufficient for the baby. The presence of massage stimulates the nervous tissues, activates the sympathetic nerves and parasympathetic nerves, the massage stimulates the hypothalamus and stimulates the anterior pituitary to secrete the hormone prolactin and oxytocin into the blood. Where the hormone oxytocin plays a role in increasing AS expenditure (Roesli, 2009).

Neck massage can reduce pain for nursing mothers and help reduce emotional stress, with neck massage stimulates the release of calming endorphins so that the oxytocin and prolactin reflexes become smooth. Prolactin stimulates milk production, but other hormones are needed to expel milk to the surface of the nipple. Stimulation of areolar mechanoreceptors activates neural pathways that ascend to the paraventricular and supraoptic nuclei of the hypothalamus, via the lateral cervical nerves of the brainstem. This neural pathway excites magnocellular neurons to pulsately secrete oxytocin into the blood at 10-20 minute intervals (Ward, Clarke, & Linden, 2007). The back neck muscles (soboxipitalis muscle) are innervated by the subostipital nerve, a branch of the cervical nerve and the chest muscle (pectoralis major) is innervated by the lateral medial pectoralis nerve (brachial plexus infraclaficularis (C5-T1). with the action of the semispinal muscles causing simultaneous contractions will accelerate the blood supply that transports oxytocin and prolactin. Blood supply to the neurohypophysis occurs through the two inferior pituitary arteries which are branches of the internal carotid artery, then enters the neurohypophysis and forms a capillary network. Venous flow flows through pituitary vein into the dural sinus. Blood supply to the pituitary is not direct ie through the superior pituitary artery (a branch of the internal carotid artery) then enters the middle part of the hypothalamic bulge and the infundibulum trunk to form the first capillary nets. Through this system the hormones produced in the hypothalamus The hypothalamus is transported directly to the adenohypophysis. without entering the major blood circulation. The neurohypothalamus secretes two neurohormones, namely oxytocin and antidiuretic hormone (ADH), which are carried directly along the axon and stored in the neurohypophysis. The pituitary has no direct neural connection with the hypothalamus. Anterior pituitary hormones are also released based on signals from the hypothalamus, but through vascular connections (Slone, 2003).

The hypothalamus controls prolactin secretion by sending a prolactin-inhibiting factor (PIF) to the pituitary via the portal circulation. Dopamine is secreted by the basal hypothalamus into the portal system and affects the anterior pituitary. Dopamine binds to lactotroph cells and suppresses the secretion of prolactin into the circulation, without this dopamine, prolactin will still be secreted. Dopamine binds to long-form and short-form G-protein-coupled receptors, but only D2 receptors (long form) are present in lactotrophs. (Ganong, 2013). When massage is performed on the nape of the neck, the suboccipital nerve will stimulate the hypothalamus to suppress the release of dopamine so that the anterior pituitary secretes the hormones prolactin and oxytocin.

Anatomically in the chest there is the pectoralis major muscle. The role of this muscle is to bring blood circulation to the smallest muscles in the breast. Through this muscle strengthening, the muscles in the walls of the blood vessels relax (relax) and the diameter of the blood vessels will widen, thus the blood flow that carries nutrients for the process of forming breast milk is smoother (Ganong, 2013). When viewed from the anatomical difference between the nape of the neck and the pectoralis major muscles, when massaged the nape of the neck directly transmits stimulation to the hypothalamus through the lateral cervical nerves of the brain stem, while massage in the pectoralis

major muscle is carried out through the portal blood system vessels. It is better for pregnant women to do neck massage starting from pregnancy and childbirth, as well as the support and role of the family to continue to massage the neck at home so as to meet the needs of breast milk in babies and babies get exclusive breastfeeding.

From the results of data analysis of age, nutritional status and parity, none of the three factors affect the increase in the amount of postpartum mother's milk on the first to third day. This is supported by research by Nurliawati (2010) that maternal characteristics of age, parity, education level and occupation have no relationship with breast milk production in mothers after sectio caesarea (Nurliawati, 2010). The results of Indriyani's research (2006) that there is no relationship between age and parity with breast milk production in post partum mothers by cesarean section (Indriyani, 2006) and in Desmawati's (2008) research that age has no effect on milk production both in the control group and the intervention group (Desmawati, 2013)

In research, Hajerah (2015) explains that small parity is related to milk production which is measured as a baby's intake of breast milk. This is because the fulfillment of nutrition for infants and mothers is different for each person. If a mother with a nutritious lifestyle and eating habits even though her age can be said to be old, it will produce good breast milk as well compared to young women who breastfeed without being balanced with a system of good eating habits (Hajerah, 2015). The results of the research by Irawati (2003) entitled the effect of nutritional status during pregnancy and breastfeeding on the success of breastfeeding, said that the nutritional status of the mother during pregnancy had no effect on the success of breastfeeding (Irawati, 2003).

In this study, age, nutritional status and paitas did not affect the increase in postpartum breast milk production from the first to the third day at PMB Medan City in 2021 and there may be a relationship with other factors but are not included in the characteristics of this study and this is supported in this study. Safitri (2016), the factors that affect the smooth production of breast milk in breastfeeding mothers at PMB Medan City in 2021, explains that breast care, the use of contraceptives containing the hormone estrogen and the presence of passive smoking have a significant influence on the smooth production of breast milk (I. Safitri, 2016). Based on the results of Marmi's research (2012), things that can affect breast milk production other than breast massage include: (1) Foods that contain protein, (2) Peace of mind and mind will reduce milk production, (3) The child's sucking factor or frequency breastfeeding, (4) Consumption of cigarettes and alcohol, (5) Mother's rest pattern (Marmi, 2014). Dewi (2011) the amount of proclatin secreted and the amount of milk produced are related to the sucking stimulus, namely the frequency, intensity and duration of sucking (Dewi & Sunarsih, 2011).

CONCLUSION

Neck massage is effective in increasing the amount of postpartum mother's milk on the first to third day. Statistically, neck massage was more effective than pectoralis major muscle massage in increasing the production of breast milk on the first to third day of postpartum. Therefore, health workers, especially physiotherapists, make neck massage in breast care for postpartum mothers with complaints that breast milk does not come out. Physiotherapy health workers teach patients and their families how to do neck massage.

References

- Central Bureau of Statistics, National Family Planning Coordinating Board, Ministry of Health, & Macro International. (2013). Indonesia Demographic and Health Survey 2012. Sdki, 16. <https://doi.org/10.1111/j.1471-0528.2007.01580.x>
- Walyani, E. S., & Purwoastuti, E. (2015). Postpartum & Breastfeeding Midwifery Care. Yogyakarta: New Press Library.
- Public health Office. (2017). Health Profile of Medan City in 2017 (2014 Data). Health Profile of Medan City (56), 1-198. <https://doi.org/10.1016/j.jiph.2017.04.005>

- Central Bureau of Statistics. (2015). Infant mortality rate. Retrieved May 23, 2017, from www.bps.go.id
- Permana, F. D. (2006). Factors causing the failure of exclusive breastfeeding to mothers who do not work (Qualitative Study in Batusari Village, Mranggen District, Demak Regency). *Undip*, 2025, 5–6.
- Ganong, F. W. n. (2013). *Textbook of Medical Physiology: Review of medical physiology*. Bram U. Pedit. (N. Andita, Ed.). Jakarta: EGC.
- Sugiyono. (2012). *Qualitative Quantitative Research Methods and R & D* (17th ed.) Bandung: Alfabeta.
- Myles. (2009). *Textbook of Midwifery: Myles Textbook for Midwives*. (D. Fraser & P. E. Karyuni, Eds.) (14th ed.). Jakarta: EGC.
- Trisnowiyano, B. (2014). *Basic Massage Skills*. Yogyakarta: Nuha Medika
- Roesli, U. (2004). *Getting to Know Exclusive Breastfeeding*. Jakarta: Trubus
- Ward, P. . J., Clarke, R. W., & Linden, R. W. . (2007). *At a Glance Physiology: Physiology at a Galance*. (A. Safitri & R. Astikawati, Eds.). Jakarta: Erlangga
- Sloane. (2003). *Anatomy and physiology for Beginners*. Jakarta: EGC.
- Nurliawati, E. (2010). Factors Associated with Breast Milk Production in Post-C-section Mothers in the City and District of Tasikmalaya.
- Indriyani. (2016). The effect of early and regular breastfeeding on breast milk production in post partum mothers by cesarean section at dr. Subandi Jember and dr.H. Koesnadi Bondowoso.
- Desmawati. (2013). The effectiveness of the combination of areolla massage with rolling massage on early release of breast milk in post partum mothers at the Pamulang and Cikupa health centers, Banten.
- Hajerah. (2015). Relationship between nutritional status and onset of lactation in postpartum mothers at PKU Muhammadiyah Hospital Yogyakarta.
- Irawati, A. (2003). Effect of nutritional status during pregnancy and lactation on the success of breastfeeding.
- Safitri, I. (2016). Factors Affecting Smooth Breast Milk Production in Breastfeeding Mothers in Bendan Village, Banyudono District, Boyolali Regency, 14.
- Marmi. (2017). *Midwifery care during the puerperium*. Yogyakarta: Pustaka Abdi.
- Dewi, V. nanny L., & Sunarsih, T. (2015). *Midwifery Care for Postpartum Mothers*. Jakarta: Salemba Medika.