



# The Effectiveness of the Rolling Massage Technique on Breast Milk Adequacy for the Baby in the COVID-19 Pandemic

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## Abstract

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**BACKGROUND:** Rolling massage is one of the actions for postpartum mothers that can increase breast milk production (ASI). There are many benefits of rolling massage for babies. Still, there are no studies that discuss the effectiveness of rolling messages on the adequacy of breast milk in infants during the COVID-19 pandemic.

**AIM:** This study aims to identify the effectiveness of rolling massage on the adequacy of breast milk during the COVID-19 pandemic.

**METHODS:** This research is quantitative research with a quasi-experimental approach. The sample selection used a random method with a total sample of 63 postpartum mothers divided into two groups, namely, 32 samples in the intervention group and 31 in the control group. The rolling massage was performed on mothers in the intervention group on days 1, 3, and 7 postpartum. Data were analyzed using the ANOVA test.

**RESULTS:** The results showed a significant difference between the adequacy of breastfeeding in the control group and the intervention group, which was seen from the difference in the frequency of urination ( $p = 0.036$ ), satisfaction with breastfeeding ( $p = 0.001$ ), and the increase in infant weight ( $p = 0.001$ ) at measurements 7 and 30 postpartum day.

**CONCLUSION:** Rolling massage is very effective for postpartum mothers to achieve adequate milk intake for babies. Therefore, it is highly recommended to do it in the first days after giving birth to increase the mother's milk production to meet the needs of breast milk intake for the baby.

## Introduction

All mothers in the world should receive exclusive breastfeeding for 6 months, because breast milk is a source of nutrients that are loaded with various bioactive factors [1]. With its unique composition, breast milk is needed to prepare optimal growth and development for babies. Breast milk microbiota can directly form the gut microbiota in infants so that the absorption and metabolism of breast milk are easier for infants [2].

One of the main causes of high rates of neonatal morbidity and mortality is an infection in neonates. This happens because babies have very low immunity, so they are susceptible to infection. The provision of breast milk (ASI) can reduce morbidity and mortality rates, because the anti-oxidant and anti-inflammatory substances can protect the intestines from various risks of inflammation [2].

Breast milk is an emulsion of fat in a protein solution. Besides that, it also contains lactose and organic salts secreted by the two glands of the mother's breast. Breast milk is useful as the main food for babies.

Exclusive breastfeeding is breastfeeding only without the addition of other fluids such as formula milk, oranges, honey, tea water, water, and solid foods such as bananas, papaya, milk porridge, biscuits, and team rice [3]. Breast milk contains various nutrient content that is very beneficial for babies, especially the first breast milk, also called colostrum, rich in nutrients, and protection [4]. In addition to meeting all the nutritional, immunological and other nutritional needs of babies, breastfeeding provides an opportunity for mothers to express love and protection to their children. The content of breast milk, which is rich in protein, fat, carbohydrates, essential minerals, and vitamins, really helps children avoid various diseases and infections by increasing body resistance [5], [6].

The magnitude of the benefits of breastfeeding for the baby's quality of life must be supported by efforts and actions to increase and facilitate breast milk production, one of which is by rolling messages. A rolling massage is an act of massaging the mother's back along the spine to make the mother relaxed and comfortable to facilitate the release of breast milk and meet the baby's needs [7]. The adequacy of breast milk received by the baby can be seen from the frequency

of urine elimination, the satisfaction of the baby after breastfeeding, and the increase in the baby's weight.

The difference between the rolling massage technique intervention before and after the COVID-19 pandemic is the application of stricter health protocol procedures during the intervention. This is a challenge for health care provider. Previously, before pandemic health care provider could be closer and more interactive with the mother and the baby without worrying about contracting the COVID-19 virus. In addition, the use of equipment for wearing masks, gown or skort, and keeping a distance re-things that are a concern during the intervention proses.

During the COVID-19 pandemic, many sectors and structures experienced disruption, including families. Many studies discuss the rolling message intervention and milk production for infants. Still, no adding research discusses the effectiveness of rolling messages on the adequacy of breastfeeding in infants during the COVID-19 pandemic. The purpose of this study was to determine the effectiveness of the rolling massage intervention on the adequacy of breast milk for infants during the COVID-19 pandemic.

## Methods

### Study design and participants

This research is a quantitative type with a quasi-experimental method with a cross-sectional design. The sample was selected using a random sampling technique, and the sample size was based on Cohen's table [8]. The result is that the required sample size is 57 people. To avoid dropping out during the study, the sample was added by 10% so that there were 62.7 or 63 respondents who were then divided into two groups, namely, 31 controls and 32 interventions.

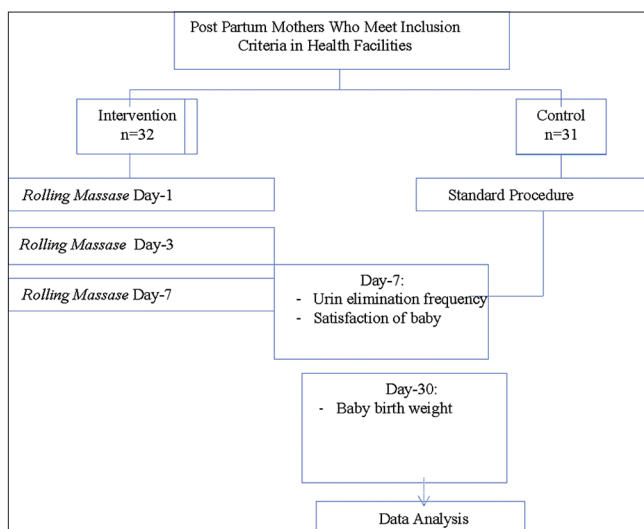


Figure 1: The details of the research process

### Data collection and analysis

The details of the research process are illustrated in the following diagram:

The intervention group of postpartum mothers was given rolling massage, which is an intervention by giving a gentle massage in the spinal area on days 1, 3, and 7 postpartum. This research was conducted in three working areas of the Aceh Besar District Health Center. The instrument in this study was a questionnaire used to measure breast milk production in postpartum mothers consisting of demographic data, breast milk production indicators consisting of three indicators, namely, the number of urinations more than 6 times a day, the baby was satisfied when breastfeeding, which was seen from not fussy or not fussy. Sound sleep after feeding and an increase in the baby's weight was appropriate after 1 month by measurement using a baby scale. The instrument in a questionnaire has been tested for validity and reliability with a Cronbach alpha value of 0.945. In the validity test, it is known that all variables have met the requirements and are valid, where the calculated r-value is greater than r table value (0.361). The instrument has passed the content validity test by an expert in the Maternity Nursing Field, Faculty of Nursing, Syiah Kuala University. The data analysis process used repeated ANOVA for frequency of urination, Chi-square to analyze satisfaction data, and Mann-Whitney for data on infant weight gain. The stages of treatment are illustrated in the following chart:

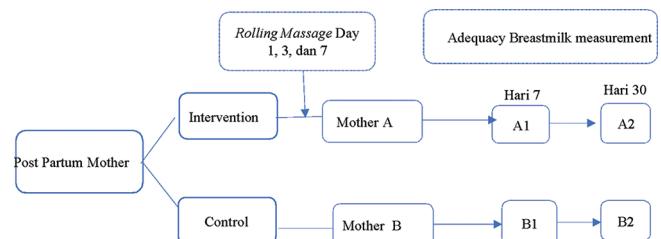


Figure 2: The stages of treatment

Information:

- A: Mother who was given a rolling massage
- B: Mother who was not given a rolling massage
- A1: Adequacy of breast milk as measured on day 7 of the intervention group
- A2: Adequacy of breast milk as measured on day 30 of the intervention group
- B1: Adequacy of breast milk as measured on the 7<sup>th</sup> day of the control group
- B2: Adequacy of breast milk as measured on the 30<sup>th</sup> day of the control group.

The Ethics Committee approved this study of the Nursing Faculty, Syiah Kuala University, Banda Aceh, Aceh Province, with code No.113001260421. All participants are provided written informed consent for the interview and explained the purpose of this study and its benefits. Participants were also assured that the information they provided would be anonymous, and their confidentiality would be guaranteed.

## Results

The results showed a significant difference in breast milk adequacy between the control and the intervention groups were given who rolling massage treatment. These differences are shown in Table 1.

**Table 1: Demographic data of respondents in the intervention group and control group (n = 63)**

Demographics	Intervention		Control	
	Frequency	%	Frequency	%
Age (23–38 years)	32	50.8	31	49.2
Work				
Work	10	14.3	14	23.9
Does not work	22	34.9	17	27
Family income				
<Regional minimum wage	23	36.5	19	28.6
Regional minimum wage	9	9.6	12	19.1
Birthplace				
Clinic	14	20.7	9	14.2
Public health center	2	3.2	3	4.8
Hospital	16	25.4	20	31.7

Based on Table 1, the postpartum mothers aged 23–38 years it's about 32 people (50.8%) for the intervention group and 31 people (49.2%) for the control group. Employment status data showed that most respondents did not work, 22 people (34.9%) for the intervention group, and 17 people (27%) for the control group. Meanwhile, for family income, most respondents have a monthly income equal to or more than the minimum wage, 29 people (36.5%) for the intervention group, and 19 people (28.6%) for the control group. And finally, the place of delivery data showed that most respondents gave birth at the clinic, 14 people (20.7%) for the intervention group, and 20 people (31.7%) for the control group.

Table 2 shows a difference in the frequency of urination between the intervention and control groups on days 7 and 30. This study found that all infants of mothers who received the rolling message intervention had urinary elimination frequency of more than 6 times, in contrast to infants who received a rolling message. They did not receive back massage; some had urination frequency less than six times a day, although there was no significant difference between self-efficacy in the two groups.

**Table 2: Differences in urination frequency in the control and intervention groups on days 7 and 30**

Urination frequency	Control (n = 31)		Rolling massage (n = 32)		Difference (CI 95%)	p
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)		
Day 7	5.90 (0.39)	7.34 (0.86)	1.44 (1.10-1.78)	0.001		
Day 30	6.03 (0.18)	7.34 (0.86)	1.31 (0.99-1.63)	0.001		

Repeated ANOVA test  $p = 0.036$ . \*Post hoc analysis. Significant value = 0.05

In this study, it was found that there were significant differences in the two groups, namely, in mothers who were given rolling messages; most of the babies were not fussy and fell asleep after feeding. In contrast to the control group, most infants reported being fussy, often awakened from sleep and slept only briefly, and often cried and seemed to want to suckle longer and often. Babies who breastfeed for more than

**Table 3: Infant satisfaction after breastfeeding intervention group and control group (n = 63)**

Group	Breastfeeding baby satisfaction				Total	p
	Satisfied		Not satisfied			
Group						
Intervention	31	96.9%	1	3.1%	32	0.001
Control	10	32.3%	21	67.7%	31	
Total	41	65.1%	22	34.9%	63	

Chi-square test with Yates correction.

10 min will get foremilk which contains a lot of protein, and hind milk which contains a lot of fat, which will make the baby full and fulfilled his needs. This makes the baby satisfied, not fussy, and can sleep soundly for brain development (Table 3).

Based on the data in Table 4 above, it shows that there is a significant difference in infant weight gain between the two groups with a mean value of 1312.50 for the intervention group and 927.74 for the control group with  $p = 0.001$  so that the hypothesis is accepted which indicates that there is a difference in weight gain in the intervention group compared to the control group. With the control group, after being given the Rolling Massage Technique intervention.

**Table 4: Differences in the difference in infant weight gain in the intervention group and the control group (n = 63)**

Baby weight gain	Mean (SD)	p	Mean difference (CI 95%)
Intervention	1312.50 (329.956)	0.001	384.7 (221.4–548.0)
Control	927.74 (317.854)		

## Discussion

Feelings of happiness, comfort, love, and affection can increase the work of the hormone oxytocin, which functions to secrete breast milk, so it is important for mothers always to feel these feelings. One of the comforts of the mother can be achieved by rolling massage, which is a gentle massage along the mother's spine. The soft and comfortable massage can stimulate the nervous system to transmit signals to the brain to release the hormone oxytocin to facilitate the release of breast milk from the mother's breast [9]. The massage can be done by the husband and other people closest to the mother. Sufficient milk production can meet the baby's needs. Signs of the adequacy of breast milk in infants can be seen from the frequency of the baby's urination, the satisfaction of the baby after feeding, and the baby's weight gain [10].

This study found that all infants of mothers who received the rolling message intervention had urinary elimination frequency of more than 6 times, in contrast to infants who received a rolling message. They did not receive back massage; some had urination frequency less than six times a day, although there was no significant difference between self-efficacy in the two groups. Babies whose daily fluid needs are

fulfilled can be seen from the amount and frequency of urine elimination which is the final output of the filtration, reabsorption, and augmentation processes in the baby's kidneys. Babies who meet their daily fluid needs will produce adequate urine at least 6 times a day. The lack of urination frequency in infants indicates that the baby lacks fluids obtained from breast milk intake [11]. Lack of fluids can be fatal in infants, causing hyperbilirubinemia, shock, and death. Lack of breast milk intake can also cause jaundice in infants because bilirubin is not excreted in the urine and feces. Therefore, it is important to do prevention through education to mothers and families. Another sign of adequate breast milk intake is that the baby looks satisfied when he finishes breastfeeding, which can be seen from the baby not fussing or falling asleep after feeding.

In this study, it was found that there were significant differences in the two groups, namely, in mothers who were given rolling messages; most of the babies were not fussy and fell asleep after feeding. In contrast to the control group, most infants reported being fussy, often awakened from sleep and slept only briefly, and often cried and seemed to want to suckle longer and often. Babies who breastfeed for more than 10 min will get foremilk which contains a lot of protein, and hind milk which contains a lot of fat, which will make the baby full and fulfilled his needs. This makes the baby satisfied, not fussy, and can sleep soundly for brain development.

This study indicates that there is a difference in weight gain in the intervention group compared to the control group. With the control group, after being given the rolling massage technique intervention. Another sign of the adequacy of breast milk in infants is the presence of weight gain by the baby's age. In this study, there was a significant difference in the weight gain of infants in the control group and the intervention group on the 30<sup>th</sup> day of measurement. Infants who are breastfed with sufficient duration and frequency would get enough hind milk which contains fat, to increase the baby's weight. This is by a study conducted by Patel *et al.*, (2013) by giving additional hind milk for the first 28 days of life to infants with very low body weight, increasing body weight, and reducing treatment costs [12].

## Conclusion

Rolling messages are very effective for postpartum mothers to achieve adequate milk intake for babies. Adequacy of breast milk in infants can be seen from the frequency of urination, the baby is satisfied after feeding, and the increase in the baby's weight. Therefore, rolling massage is highly recommended to be done in the first days after giving birth to increase the

mother's milk production and meet the needs of breast milk intake for the baby. It is hoped that the results of this study can become the basis for health workers and policymakers self-efficacy in health facilities to apply and teach rolling massage to their husbands and other families.

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## Clinical Implications

This study strongly influences beliefs related to rolling massage, which can increase milk production, so mothers can perform this action, even though it has been done from the hospital. The results of this study are important for education and demonstrations carried out by health workers to make mothers independent after discharge. Husbands and loved ones can be taught to take these actions that have an impact on the long-term health and well-being of the baby, which can be measured by increasing the baby's weight.

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