

# The influence of infant massage on urination patterns in babies aged 3-6 months receiving exclusive breastfeeding: A study at Bunda Patimah Primary Clinic

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## ABSTRACT

Infant massage has been carried out in Indonesia since antiquity has been passed down from generation to generation without knowing how massage or touch has a positive impact on the human body. The touch part is the skin, which is the widest part of the human body, babies can feel this function from the womb. Micturition disorders occur due to impaired coordination function of the lower urinary tract including the bladder, bladder neck, valves and urethra. Urinary disorders including bed wetting with or without being followed by bowel obstructions, are disorders that are often found in children with all the consequences. Some complications due to urinary disorders are urinary tract infections, constipation and impaired healing of vesicoureteral reflux. In the process of urinating some babies will experience disturbances caused by delays in bladder maturation and development, sleep pattern disturbances, psychopathology, environmental stress, disturbances. To establish effectiveness of infants aged 3-6 months who receive massage and those who do not receive massage on the micturition patterns of infants exclusively breastfed at the Bunda Patimah Primary Clinic. This research uses a type of quantitative research, namely an analytic survey. The research design used was cross-sectional. In this study, it was revealed whether there was an effect if massage was given or not to infants aged 3-6 months on micturition patterns. The chi-square test gives a value of  $p = 0.002 < 0.05$ . This shows that the frequency of infant massage has an effect on urinary behavior in infants aged 3-6 months who are exclusively breastfed.

**Keywords:** Baby Massage; Micturition Pattern; Exclusive Breastfeeding.

## 1. INTRODUCTION

Baby massage, a practice that has been conducted in Indonesia since ancient times, is passed down through generations without knowing how the touch or massage impacts the human body. The part that touches the skin is the largest part of the human body. Babies already experience these benefits in the womb. This arises from the nerve endings on the skin surface and responds to touch. (Windri et al., 2022). There are guidelines for massaging premature babies aged 0-3 months. Massage is also known as touch therapy. Because massage is a good and pleasant communication between mother and baby. This touch provides a very light massage so that the baby feels comfortable and safe (Ningdiah et al., 2022).

Disorders or problems in the urinary tract are caused by a disturbance in the coordination of the urinary tract in the lower part of the bladder, the neck of the bladder, the valve, and the

the urethra. Urination problems are categorized as bedwetting and are not accompanied by defecation problems. These problems are often found in children with various consequences. It can be seen that there are many headaches that interfere with urination, especially urinary tract infections, constipation, and disruptions in the recovery of vesicoureteral reflux. (Soemyarso & Presetyo, 2021).

Voiding dysfunction, or incontinence, is essentially a condition that uses the lower urinary tract and has causes (neurological disease, trauma/injury, or hereditary abnormalities). In urinary disorders, there is a lack of coordination between the detrusor muscle of the bladder and the external urethral sphincter. Its manifestation is a disorder of coordination of the bladder detrusor muscle and external urethral sphincter function. Manifestations of urinary incontinence, bladder emptying problems, urinary incontinence, and higher intravesical. Urinary incontinence in children is the inability to control urination in children aged 5 and over. Some babies have urinary disorders in the urination process

due to maturation and bladder developmental delay, sleep disorders, psychopathology, environmental stress, urodynamic disease, organic disease, urinary tract, and abnormal recent daily antidiuretic hormone (ADH) secretion (Sivaprasad et al., 2022). In this case, the child experiences discomfort and makes the child easily irritable (Mohammad & Madanijah, 2015).

Data from the Central Statistics Agency of North Sumatra Province for 2019-2021 about the proportion of children under 6 months who only get breast milk per province (in percentage) is 50.20% in 2019, 53.39% in 2020, and 83% in 2021. According to the Basic Health Research Riskesdas (2013), only 30.2% of children aged 6 months have been given exclusive breastfeeding. According to the Riskesdas Report (2010), the unique name decreases between the ages of 0 and 5 months. At 0 months, 39.8% are exclusively breastfed, followed by 32.5% (1 month), 30.7% (2 months), 26.3% (3 months), 25.2% (4 months) and 15.3% (5 months).

Based on this data, the rate of exclusive breastfeeding in Indonesia is still very low (80%) (Prasetyo et al., 2023). Caring for babies and toddlers is one of the midwives' skills. Prospective midwives focus on promotional and preventive activities. This advocacy can increase the awareness of parents and the community about exclusive breastfeeding. According to what is stated in the Ministry of Health of the Republic of Indonesia no. 1464/Menkes/Per/X/2010 13 verse 1, midwives have the right to monitor the growth and development of babies, toddlers, preschoolers, and school-age children. With the advancement of science and technology, modern medical experts have scientifically proven that there are many benefits to touching and massaging babies, especially if performed by the babies' own parents, thus reducing urinary disorders.

## 2. METHODOLOGY

### Research Type and Design

This study is quantitative research in the form of an analytical survey. The research design used is cross-sectional, aiming to reveal the influence of massaging, or not massaging, infants aged 3-6 months on micturition patterns.

### Research Venue and Timeline

The research took place at Pratama Bunda Patimah Clinic, located on Pasar 06 Andan Sari Street, Terjun Subdistrict, Medan Marelan District, North Sumatra, in 2023. The choice of venue is due to the fact that this clinic offers baby massage programs not found in all clinics. The research was conducted from September 2022 until April 2023.

### Population and Research Sample

The population refers to all the information focused on in the research, for a particular scale and time (Asiri et al., 2023). In this study, the population is all mothers with infants aged 3-6 months at the Pratama Bunda Patimah Clinic, totaling 32 individuals. The sample refers to a portion of the population that is representative due to being studied in the sample. Non-probability sampling was used, which entails the use of the Accidental Sampling technique. Anyone who happens to meet with the researcher and is considered as a suitable source of

information can be selected as a sample subject (Fahlevi et al., 2022). All mothers with infants aged 3-6 months in the Pratama Bunda Patimah Clinic were considered, resulting in 32 respondents. Inclusion criteria were as follows (Alharbi et al., 2022): a. Infants aged 3-6 months who visit the Pratama Bunda Patimah Clinic. b. Infants exclusively breastfed. c. The infant's mother is willing to participate in the study. Exclusion criteria included: a. Infants not present during the research period. b. Infants whose mothers live far from the clinic. c. Infants who are sick. To determine the sample size, Slovin's formula was applied, as the sample size was less than 1000.

### Research Variables

The independent variable in this study is the influence of baby massage at the age of 3-6 months. The dependent variable is the micturition pattern.

### Operational Definitions

1. Independent: Baby massage - a skin-touch therapy or gentle head-to-toe massage.
2. Dependent: Micturition pattern - the process of releasing urine from the bladder.

### Data Processing and Analysis Techniques

Data Processing Techniques involved the following steps:

1. Data inspection to complete and organize the data obtained from the questionnaires and observation sheets filled out by the respondents.
2. Coding to provide codes to variable groups to facilitate data recording.
3. Scoring to determine the highest or lowest score for each question.
4. Tabulating to compile and present the data.

Data Analysis consisted of Univariate Analysis to view the frequency distribution of the baby's age and the mother's level of knowledge about exclusive breastfeeding. Bivariate Analysis was used to examine the difference in influence of baby massage on micturition patterns in babies aged 3-6 months who have been exclusively breastfed. The Chi-Square test was used to examine the relationship between the independent variable and the dependent variable.

## 3. RESULT AND DISCUSSION

### Univariate Analysis

After conducting research and collecting data from 32 respondents at the Pratama Bunda Patimah Clinic, the following results were obtained:

### Respondent Characteristics

Table 1. Respondent Characteristics Based on Gender, Age, and Weight of Babies Receiving Baby Massage at Pratama Bunda Patimah Clinic in January 2023.

No	Respondent Characteristics	Frequency (f)	Percentage (%)
1	Gender		
	Man	15	46, 9
	Woman	17	53, 1
	<b>Total</b>	32	100

No	Respondent Characteristics	Frequency (f)	Percentage (%)
2	Age		
	3	4	12,54
	4	6	18,85
	5	7	21,9
	6	15	46,9
	<b>Total</b>	32	100
3	Weight (Kg)		
	4 – 5	11	34,4
	6 – 7	5	15,6
	8 – 9	13	40,6
	10 – 11	3	9,4
	<b>Total</b>	32	100

Based on the data from Table 1, it is known that the majority of respondents in this study are female, totaling 17 individuals with a percentage of 53.1%, and males account for 15 individuals with a percentage of 46.9%. As per the data in Table 1, the 6-month age group dominates, with 15 individuals making up 46.9% of the total. This is followed by 7 individuals aged 5 months, making up 21.9% of the total; 6 individuals aged 4 months (18.8%); and finally, 4 individuals aged 3 months (12.5%). Looking at the weight, the majority of the respondents in this study were babies within the weight range of 8-9 Kg, accounting for 13 individuals or 40.6% of the total, followed by 11 individuals within the weight range of 4-5 Kg (34.4%), 5 individuals within the weight range of 6-7 Kg (15.6%), and finally, 3 individuals within the weight range of 10-11 Kg (9.4%).

#### Bivariate Analysis

The frequency of baby massage in relation to urinary patterns in babies who receive exclusive breastfeeding at Pratama Bunda Patimah Clinic in 2023 was tested using the Chi-square test at a significance level of 5% as follows:

Table 2. Distribution Frequency of Baby Massage

No	Baby Massage	Frequency (f)	Percentage (%)
1	Good	28	87,5
2	Netral	3	9,4
3	Bad	1	3,1
	<b>Total</b>	32	100

Table 2 above shows that the research on baby massage at Pratama Bunda Patimah Clinic has been conducted on 32 respondents. Out of these, 28 respondents (87.5%) received good massage, 3 respondents (9.4%) received an netral massage, and 1 respondent (3.1%) received a bad massage.

Table 3. Distribution of Urination Patterns in Babies Receiving Exclusive Breastfeeding

No	The Urination Pattern of Babies	Frequency (f)	Percentage (%)
1	Normal	29	90,6
2	Abnormal	3	9,4
	<b>Total</b>	32	100

Table 3 shows that the research on the urination pattern of babies at Pratama Bunda Patimah Clinic has been conducted on 32 respondents. Of these, 29 respondents (90.6%) had a good urination pattern as observed from the color and frequency of the baby's urination, and 3 respondents (9.4%) had a less satisfactory urination pattern.

Table 4. Cross-Tabulation Between the Relationship of Baby Massage Frequency with the Urination Pattern of Babies Receiving Exclusive Breastfeeding

Variables		Baby Massage							
No	Urination Pattern	Good		Adequate		Less		Total	
		F	%	F	%	F	%	F	%
1	Normal	27	84,4	2	6,3	0	0	29	90,6
2	Abnormal	1	3,1	1	3,1	1	3,1	3	9,4
	<b>Total</b>	<b>28</b>	<b>87,5</b>	<b>3</b>	<b>9,4</b>	<b>1</b>	<b>3,1</b>	<b>32</b>	<b>100</b>

Table 4 explains that babies who received good massages and have a normal urination pattern amounted to 29 respondents with a percentage of 90.6%, and respondents who have an abnormal urination pattern were 3 respondents with a percentage of 9.4%. The Chi-square test results obtained a p-value = 0.002 < 0.05 which indicates that the frequency of baby massage has an effect on the urination pattern of babies who receive exclusive breastfeeding aged 3-6 months. In other words, the more often the baby is given massage therapy, the better and healthier the baby's urination pattern.

## DISCUSSION

### Overview of Baby Massage for 3-6 Month Olds at the Pratama Bunda Patimah Clinic

Based on research conducted at the Pratama Bunda Patimah Clinic, all babies receive massage therapy. The analysis results show that 32 babies have received massages well. The researcher made observations for approximately 15 days. In 7 days, babies received massage therapy twice, conducted by Midwife MOI at the Pratama Bunda Patimah Clinic. The book by Septiana Juwita (2019) states that massage can be used as health care in the form of touch therapy on techniques given to babies so that treatment and therapy can be achieved. In the Complementary Therapy in Midwifery book by Febriani, Widyaningsih & Laela (2022), the frequency of baby massage is how often a baby is massaged. It depends on the baby's needs and health and the parents' willingness to perform baby massage therapy. Baby massage should be done regularly, doing it 3-4 times a month is considered routine. The more regularly you perform baby massage therapy, the more positive its influence on health, fitness, growth, and development process. According to the Baby Massage and Baby Spa book by Mayasharo (2022), 4.8 million babies are born in Indonesia each year. With a population of 270 million people, Indonesia ranks fourth behind China, India, and the United States due to its high fertility rate. Baby massage in Indonesia is still performed by traditional healers. Only 35% of mothers massage their babies in health facilities such as BPM, Clinic Pesan, Pesan Baby, and Baby Spa. Maftuchah et al. (2020) performed baby massage on 1-6-month-old babies, and baby spa can be done on babies aged 8-9 months and above, which is beneficial to increase weight and immunity under the supervision of health personnel who received

training and have a health background. The implementation of baby massage and spa has a fixed flow and procedure to ensure baby's safety and security. Thus, mothers and babies feel safe and comfortable and benefit from baby massage and spa. It optimizes digestive function so that absorption of food nutrients becomes better, as well as increasing baby weight. Yoshida and Funato (2021) state that hormonal and neuroendocrine factors such as oxytocin also play a role in modifying sensory perception. The study by Choirunissa and Cahaywati (2022) suggests that massaging babies can help release oxytocin and endorphins, which can relieve discomfort. Lack of sleep in babies can negatively impact their cognitive development, which is an indicator of health development, especially thinking ability. At the age of 3-6 months, babies might sleep longer than their wakeful periods. Lengthening baby sleep during massage increases the activity of the neurotransmitter serotonin produced during the massage, increases the receptor cells' ability to bind glucocorticoids, and increases the level of adrenaline hormone (cortisol hormone). The cortisol level increases, leading to a decrease which makes the child sleep well, relaxed, and calm. Babies receiving moderate pressure massage generally have better sleep than toddlers receiving light pressure massage. This is an overview of the urination pattern of babies receiving exclusive breastfeeding at the Pratama Bunda Patimah Clinic in 2023.

#### **The Effect of Baby Massage on the Urination Pattern of 3–6-Month-Old Babies Receiving Exclusive Breastfeeding at the Pratama Bunda Patimah Clinic**

Based on the research conducted at the Pratama Bunda Patimah Clinic, it was found that 28 out of 32 respondents had a normal urination pattern, said to be normal because they had clear yellow urine, frequency 4-8 times a day, and the urine did not have a pungent odor, and there were 4 respondents who had an abnormal urination pattern, seen from the baby's urination pattern frequency of 2-3 times a day, and the color was not normal. This happens because the baby drinks less breast milk or it can be said that the baby is dehydrated, so the urine produced is little, and the color of the urine is concentrated with a pungent odor. The authors of the child nursing book affirm that the kidneys, ureters, bladder, and urethra play an important role in the urinary system in both adults and children. The kidney serves as a blood filter and removes body waste products or urine from the nephron to the urine reservoir, the bladder. Then, urine is excreted from the body through the urethra, which is called the urination process. This is explained by Bay and Robson (2020). Urology is the same but functionally different from adults, especially if kidney function is impaired and urine control is not yet mature. Purwanti and Sulastri (2019) show that babies still have poor kidney function, including glomerular filtration, absorption, glucose reabsorption, and urea synthesis and secretion. Bladder control and urine excretion control are also still maturing. In newborns, spinal cord reflexes cause urine to come out naturally. In babies, urination reflexes occur about 20 times a day. Urine evacuation requires contractions of the bladder, abdominal, and pelvic muscles. Impairment of the ability to tighten muscles also reduces the desire to urinate (Fitri, 2017). After the age of 6 months, the frequency of urination decreases, but the amount of urine increases. Although control and urination capacity increase with age, bed-wetting habits can still be seen in children aged 2.5 to 3.5 years, according to Soemyarso (2015).

This condition can be caused by psychological stress or organic causes such as urinary tract infection, hypoventilation, obstruction, diabetes, etc., and can cause urination like anxiety and crying, Richardson (2018).

#### **The Effect of Baby Massage on the Urination Pattern of 3–6-Month-Old Babies Receiving Exclusive Breastfeeding at the Pratama Bunda Patimah Clinic**

Based on the research results at the Pratama Bunda Patimah Clinic, it was found that baby massage affects the urination pattern of exclusively breastfed babies with a p-value of  $0.002 < 0.05$ . Researchers suggest that the baby's urination pattern is influenced by exclusive breastfeeding. Moreover, massage therapy can reduce the risk of secretion disorders in frequently massaged babies. A normal urination pattern depends on the volume and color of the urine. In this study, all babies receiving massage therapy were exclusively breastfed. However, there were still babies with poor urination patterns, known as micturition patterns, or Vay and Robson urination patterns (2020), despite urinating through the urethra. Urology is the same as in adults, but functionally different, especially when kidney function is impaired, and urine control is not mature. Both maturation processes perfectly coincide with the child's age, growth, and development. Purwanti and Sulastri (2019) showed that babies still experience deficiencies in kidney function, such as glomerular filtration, absorption and reabsorption of glucose, as well as the synthesis and secretion of urea. Bladder control and urine volume control are still maturing. In newborns, urine is naturally expelled by spinal reflexes. In babies, urination reflexes occur about 20 times a day. Increased urine volume causes the bladder to swell, which triggers reflex movements and detrusor muscle contractions and relaxation of the extravesical sphincter.

#### **The Effect of Baby Massage on the Urination Pattern of 3–6-Month-Old Babies Receiving Exclusive Breastfeeding at the Pratama Bunda Patimah Clinic**

Based on the research results, it was found that baby massage affects the urination pattern of exclusively breastfed babies at the Pratama Bunda Patimah Clinic, with a p-value of  $0.002 < 0.05$ . According to the researchers, based on the research conducted, the baby's urination pattern depends on exclusive breastfeeding. Additionally, massage therapy can reduce the risk of secretion problems in babies who frequently receive massage therapy. A normal urination pattern is related to the volume of urine excreted per day and the color of the urine. In this study, all babies receiving massages were exclusively breastfed. However, some babies still experienced poor urination patterns even though they received exclusive breastfeeding and massage therapy, possibly due to the baby's lack of interest when breastfeeding and also the baby not receiving good stimulation during breastfeeding. Touch can provide stimulation to the baby, which can be given by gently stroking the baby during breastfeeding. Massage therapy can also stimulate the baby's organs so that when the baby experiences a disturbance in the secretion system, it can be assisted by the received stimulus stimulation. The more often a baby receives massages, the better the results. In addition, the period from 0 to 6 months of age is a period of growth and development when the baby needs adequate nutrition, and breast milk plays a crucial role.

### **The Effect of Baby Massage on the Urination Pattern of 3–6-Month-Old Babies Receiving Exclusive Breastfeeding at the Pratama Bunda Patimah Clinic**

Based on the research results, it was found that baby massage affects the urination pattern of exclusively breastfed babies at the Pratama Bunda Patimah Clinic, with a p-value of  $0.002 < 0.05$ . According to the researchers, based on the research conducted, the baby's urination pattern depends on exclusive breastfeeding. Additionally, massage therapy can reduce the risk of secretion problems in babies who frequently receive massage therapy. A normal urination pattern is related to the volume of urine excreted per day and the color of the urine. In this study, all babies receiving massages were exclusively breastfed. However, there were still babies with a less optimal urination pattern even though they received exclusive breastfeeding and massage therapy, possibly due to the baby's lack of interest during breastfeeding and not receiving adequate stimulation during breastfeeding. Touch can provide stimulation to a baby, such as gently stroking the baby during breastfeeding. Massage therapy can also stimulate the baby's organs, so when the baby experiences a secretion system disturbance, it can be aided by the stimulus received. The more often a baby receives massages, the better the results. Additionally, breast milk plays a crucial role for babies aged 0-6 months, a period of growth and development, during which they need sufficient nutrition.

## **4. CONCLUSION**

Based on the research conducted, it can be concluded that the frequency of baby massage has an influence on the urination patterns of babies aged 3-6 months who are exclusively breastfed. In other words, the more often a baby is given massage therapy, the better their urination pattern will be. Based on the results of this study, the researchers can offer a few suggestions, mothers are encouraged to provide their babies with exclusive breastfeeding more regularly. For future research, it is recommended to develop studies using more accurate data collection techniques.

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