

# Effects of Breastfeeding Process with Stimulus Smoothly Breastfeeding DC Motor Vibrilator (DMV) to Postpartum Woman

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**Keywords:** Breastfeeding, Dc Motor Vibrilator (DMV), Postpartum.

**Abstract:** One of the treatments for postpartum is to maximize the acceleration of breastfeeding expenditure. The interventions can be resolving these problems are to use the effects of vibration on the breast of postpartum woman by using DC Motor Vibratory system (DMV). This intervention will assistance stimulate prolactin hormone and oxytocin hormone in the expenditure of breast milk. This study is quasi experiment pretest-posttest with control group. The purpose of this study was to determine the effectiveness of breastfeeding DMV tools in accelerating the expenditure of breast milk for the postpartum women. The sample of study consist of 60 postpartum women in Universitas Sumatera Utara Hospital and maternity clinics in Medan with accidental sampling sampling techniqu. The data were collected by using questionnaires, consisting of 2 parts, namely demographic data and observation of breastfeeding expenditure. Data was analyzed by using t-independent test. The results showed that interventions can accelerate the process of breastfeeding in the postpartum. That was significance  $p < 0.05$ . The study suggested that DMV can be used to postpartum woman especially in the stimulation of breastfeeding expenditure.

## 1 INTRODUCTION

The breastfeeding is one of the adaptation processes experienced by postpartum mothers. Breast Milk is a natural nutrient for infants with the most appropriate nutrient content for optimal growth (Hegar, 2008). Breastfeeding helps protect the health of mothers and infants (Nasution, 2018). This is in line with the priorities of development and development of USU and the focus of research based on TALENTA (tropical science and medicine, agroindustry, local wisdom, energy, natural resources, technology and arts) especially in the health field of research development related to maternal and children and family planning. Achievements in maternal and child health, especially for the babies are important in improving health status. Indicators in the successful development of the health sector one of which is the decline in morbidity, maternal and infant mortality (Risksedas 2010).

Maximal breastfeeding since the baby borned can sufficient the nutritional and nutritional needs, so the baby will be protected from the illness and death. The World Health Organization (WHO) recommends that each newborn be exclusively breastfed for six months, but in some mothers do not

give exclusive breastfeeding on the grounds the reason that breastmilk does not come out or only slightly so that it does not sufficient for the baby's needs (WHO, 2013). Postpartum women often experience breast engorgement after birth almost 90%, on the second day until the fourth day (Novita, 2011). This occurs with regard to unconscious breastfeeding and is a strong reason for the mother to stop breastfeeding. (Nasution, 2015).

Results of the RISKESDA report in 2010 showed exclusive breastfeeding for infants <6 months were reported to be less than 40% (Rizkesdas, 2010). Many methods are used to facilitate the expenditure of postpartum mother's milk such as breshcare, oxytocin massage, acupuncture and acupresseur but this method is still considered ineffective because using the invasive method, the time is long enough, not practical, must have the skills and techniques in the implementation. In subsequent developments non-invasive method into alternatife to replace the method of breshcare, massage of oxytocin, acupuncture, and acupresseur.

Based on this the researchers designed the tool used as a stimulus therapy for the acceleration of postpartum mother's breast milk expenditure is simpler, economical, practical by utilizing Dc Motor

Vibratory which gives vibration effect to activate hormone prolactin and hormone oxytocin. The DC motor vibratory method is a vibration propagation method that vibrates the ions present in the breast which are directed to the activation of the hormone prolactin and the hormone oxytocin resulting in stimulus in the alveoli in passing the milk through the ducts into the lactiferous ducts and into the milk sinus and into the nipple .

## 2 METHOD

This type of quantitative research using experimental design of experimental quasi method with the design of only-post-test with control group design. The study was conducted on two groups of postpartum women by observing the first breastmilk spending time. Data analysis was done with frequency distribution and presentation, independent t test with 5% significance level ( $\alpha = 0,05$ ). The tool used is self-made DMV by researchers, as follows:

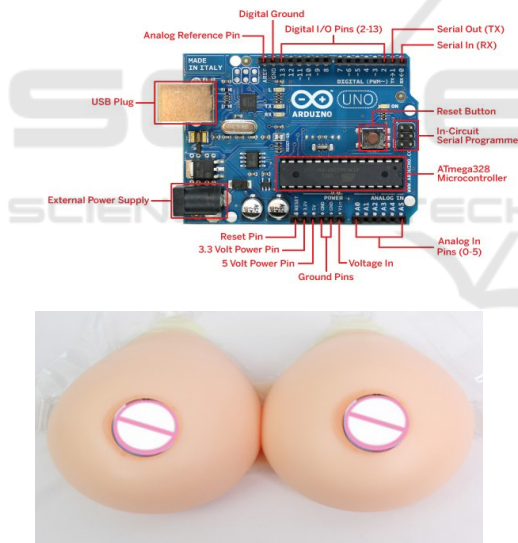


Figure 1: The Element of DC Motor Vibrilatory Stimulus.



Figure 2 : DC Motor Vibrilatory Stimulus

List of components, ingredients and tools of breastmilk vibrator that can be used in the following table.

Table 1: List of Components

No	Component	Function	Quantity
1.	Arduino	as micro vibrator output controller	1
2.	Micro vibrator	as a vibrating producer	8
3.	Battery 3,7 V	as a voltage source	2
4.	Regulator MT3608	as a voltage stabilizer system	1
5.	Transistor C945	As a current amplifier from system to micro vibrator	2
6.	Switch on / off	As a on / off bottom system	1
7.	Lcd oled	As a viewer output of vibrilator value	1
8.	Potensiometer	As a regulator of the vibrilator output value	1
9.	Cable	As a conjunction among system & micro vibrator	enaught
10.	Box	As a place to put the system & materials	1
11.	Flannel	As accessories	1
12.	Webbing	accessories	1
13.	Glue Shot	Coating	10
14.	Patchwork	accessories	1
15.	Wings	accessories	1
16.	Foam	coatings	2

The DMV specifications used can be seen in the following table

Table 2: DMV Specifications

Technical parameter	Technical specification
Vibration pickup	Piezoelectric ceramic accelerometer (shear-type)
Measurement range of acceleration	20 .1~199.9m/s peak
Measurement range of velocity	0.1~199.9mm/s rms
Measurement range of displacement	0.001~1.999mm p-p
Measurement accuracy	Velocity and displacement range is limited by 2a cceleration199.9m/s ±5%±2digits
Measurement frequency range of acceleration	10Hz~1KHz (LO) 1KHz~15KHz (HI) 10Hz~1KHz (LO)
Measurement frequency range of velocity	10Hz~1KHz (LO)
Measurement frequency range of displacement	10Hz~1KHz (LO)
Displays update cycle	1 second
LCD display	3 1/2 digits display
Single output	AC output 2 V peak (display full scale)
Power supply	Load impedance 10KΩor more earphones can be connected
Static current	9V Alkaline battery ≤20μA
Operating current	≤25mA
Battery life	20 hours
Auto power-off	continuous use
LCD backlight	Turns off automatically in 60 seconds
Operating temperature range	7 seconds 0~40°C
Operating humidity range	30~90%RH
Low battery indication	6.9V±0.2V
Dimensions	67x30x183mm
Weight	182g ( including battery

The results of DMV tool analysis can be seen in the following table:

Table 3: The analysis Value Of DMV

Number	Tool Value (%)	Standard Value (mm/s)
1	10	1
2	50	2.5
3	100	5

### 3 RESULT

The characteristics of the Mothers Living a Spontaneous Delivery are as follows:

Tabel 4: Demographic Data of Characteristic Respondent (n=38) in Intervention Group

Mother Characteristic	n	%
Age		
Risk (<20 and 35) Years	13	34
No Risk (20-35) Years	25	66
Obstetric History		
Primi (1)	9	24
2-3	23	61
> 3	6	15
Education		
Low (Elementary–Junior High	7	18
Midle (Senior High School)	22	58
High (university)	9	24
Work		
Housewife	17	45
Government Employee	8	21
Entrepreneur	13	34

Based on the table above, shows that most postpartum mothers are in the age range of 20-35 years 25 people at 66%, most of the mother parity is 2-3 people as many as 61 people, most of the high school mothers' education is 22 people as much as 58%, most mothers 17% of housewife

Table 5: Distribution of First Mother's Breastfeeding Time Out in Intervention and Control group

Day	Intervention		Control	
	N	%	N	%
1	17	45	4	11
2	4	10	16	42
3	0	0	16	42
4			2	5
Total	38	100	38	100

Based on table 5 the distribution of first expenditure on postpartum in intervention intervention group the majority of expenditure on day 1 and 2 as much as 17 people (45%) and first expenditure on postpartum in majority control group of expenditure on day 2 and 3 as many as 16 people (42%)

Table 6: Breastfeeding Differences in Intervention and Control Group

Variable	Mean	Std. Deviasi	p value
Intervention	1,65	0,668	0.000
Control	2,42	0,758	

From table 6. Shows the different days of asi exposure in the control and intervention groups. Mann Whitney test result is  $p = 0.000$  where this result indicates that  $p$  value  $< 0.05$  meaning that there is significant / significant difference.

## 4 DISCUSSION

### 4.1 Influence of DC Motor Vibrilatory (DMV) Smoothy Breastfeeding to Process of Expenditure Breast Milk

The results generally show that DC Motor Vibratory (DMV) smoothly milk. May increase stimulation of breastfeeding expenditure. Average in the first day intervention group while the control group days two and three. Implementation of Dc Motor Vibratory: Components required in Dc Motor Vibratory implementation. Arduino Nano: As the brain of the tool, which is useful in controlling the speed of the motor as well as setting up the time of use of the tool. Transistor: To give more current to the motor so that the motor can bloom faster. Dioda: As a voltage rectifier. My potential set the motor speed by changing the resistance value. Laser to fire the light to the destination point. Led to provide more lighting on therapy. Motor vibratory: As a vibrator tool. Use of this tool provides a solution for mothers who do

not breast feed to infants. Maximal breastfeeding since the baby is born can meet the nutritional and nutritional needs accordingly, so the baby will be protected from the pain and death. (Dep.Kes, 2016). The low maternal behavior in breastfeeding is also influenced by various factors, namely sociocultural community, psychological condition, physical mother, lack of information from health workers (Nasution, 2015). Incessant promotion of formula or canned milk, condition of newborns, and lack of knowledge about breastfeeding and breastfeeding, and there is a complaint of breast milk that has not been out and insufficient for the baby's needs (Nasution, 2016). Breast Milk (ASI) is a natural nutrient for infants with the most appropriate nutrient content for optimal growth (Hegar, 2008). Breast milk is the only nutrient source that also plays a role in the rapid and healthy growth of the baby's brain and nervous system (Medifoth and Janet, 2013). Maturation of the digestive system and the development of its immune system. According to the World Health Organisation (WHO), exclusive breastfeeding is breastfeeding alone with no additional fluids either formula, water, orange juice or other supplementary foods before reaching the age of six months (WHO, 2013).

### 4.2 Breast Care for Post Partum Mother

The process of breast care in postpartum mothers is certainly necessary to facilitate the production of breast milk. Some treatments are often done such as breshcare, massage oxytocin, acupressure and acupuncture. But the process of breast care certainly cannot be separated from technological developments in the field of health so that there will be some latest innovations in the development of breast care. So, every postpartum mother can perform breast care independently. But not all postpartum mothers immediately remove breast milk because breast milk expenditure is a very complex interaction between mechanical stimulation, nerves and various hormones that affect the expenditure of oxytocin. Expulsion of the oxytocin hormone in addition to being affected by the baby's sucking is also influenced by the receptors located in the ductal system, when the duct is dilated or becomes soft, it is reflectorically expelled by oxytocin by the pituitary to squeeze the milk from the alveoli (Arora, 2009). Constraints in breastfeeding have been identified including factors such as lack of information, apathy on the part of health care providers, inappropriate hospital practices such as providing water and supplements for infants without

medical needs, lack of follow-up care at the beginning of the postpartum period.

Breast Milk (ASI) is a natural nutrient for infants with the most appropriate nutrient content for optimal growth (Hegar, 2008). Breast milk is the only nutrient source that also plays a role in the rapid and healthy growth of the baby's brain and nervous system, maturation of the digestive system and the development of its immune system. According to the World Health Organization (WHO), exclusive breastfeeding is breastfeeding alone with no additional fluids either formula, water, orange juice or other supplementary foods before reaching the age of six months (WHO, 2013).

### 4.3 Hormone That Affect Milk Production Breast Milk

#### 4.3.1 Oxytocin

This hormone causes epithelial cell contraction around the alveoli, urging breast milk into the lactiferous ducts. This milk expenditure is a reflex called let down reflex. Nipple stimulation causes the release of oxytocin for 3-4 seconds into the bloodstream every 5-15 minutes (Forster et al 2006).

#### 4.3.2 Prolactin

Prolactin is produced by the anterior pituitary which serves to stimulate the breastmilk glands to produce breast milk (Nasution, 2018). The release of prolactin occurs in response to direct stimuli in the nipple or areolae which control otokrin in lactogenesis III. Prolactin will come out in case of milk emptying of the breast. Decreased production and expenditure of breast milk in the first days after childbirth can be caused by a lack of stimulation of prolactin and oxytocin hormones that play a role in the smooth production and expenditure of breast milk. Breast care should be performed immediately after delivery (1-2 days), and should be done regularly. By giving stimulation to the muscles of the breast will help stimulate the hormone prolactin to help milk production (Bobak, 2005). Lack of milk production is one reason why mothers decide to give formula milk to their babies (Nasution, 2014). UNICEF asserted that infants who use infant formula have the possibility of dying in the first month of their birth, and the possibility of formula-fed infants is 25 times higher in mortality than infants exclusively breastfed (Hamilton, 2002).

## 5 CONCLUSIONS

The breast milk DMV can increase breastfeeding expenditure. Implementation of the intervention was performed in women who underwent breastfeeding and data complications showed that there was a significant increase breastfeeding expenditure after breast milk DMV with a p value <0.05 (p = 0.000).

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