http://heanoti.com/index.php/hn

RESEARCH ARTICLE

URL of this article: http://heanoti.com/index.php/hn/article/view/hn20228

Benefits of Massage for Infants Aged 3 to 5 Months

N. Surtinah[1], Agung Suharto[2(CA)]

[1]Health Polytechnic of Surabaya, Indonesia; nanisurtinah@yahoo.co.id

[2(CA)]Health Polytechnic of Surabaya, Indonesia; agungsuharto14@gmail.com (Corresponding Author)

ABSTRACT

This study discussed about the evaluation of massage influence on 3 to 5-months-old baby in Tawanganom, Magetan 2017. This research was analytical research by Quasy Experimental design in form of nonequivalent control group design with population of 20 babies who were massaged and not massaged. This study used sample of total population. Independent variable was massage for baby, while, dependent variable was baby's weight by using ratio scale. The instrument of data collection used weight scale for baby in grams. Moreover, the statistical test that was used was independent sample T-Test. The results showed that the average of baby's weight which the baby was massaged had a greater increase rather than non-massaged baby. The result of independent t-test was obtained p-value = 0.000 (<0.05). Thus, there was a significant influence of infant massage against baby's weight gain of 3-5 months-old babies. Moreover, it could be concluded that there was a significant influence of infant massage against baby's weight gain which the babies were 3-5 months old. Therefore, it was recommended for either families or mothers to massage their own baby, thus, their baby's growth could be optimal.

Keywords: Infant massage, Baby's weight

INTRODUCTION

Background

One of the goals of the MDGs was to reduce under five years-old mortality rate by two-thirds from 1990 to 2015. The most important indicator of Mortality Rate was the Infant Mortality Rate (IMR). The IMR was one of markers to assess welfare as a result of health development implementation. The Ministry of Health had targeted to reduce infant mortality in Indonesia from an average of 36 to 23 per 1000 live births in 2015. By providing qualified and affordable health services, it could help to reduce Infant Mortality Rate. One of traditional ways that was done mostly by Indonesian people for maintaining their baby's health was through touch therapy. This therapy was quite effective, efficient, economical, and safe. Especially if the parents did it by themseves because caring the baby itself was a priceless happiness.

Touch was the first language between mother and baby. As a primary communication tool, touch had an important role in establishing parent-child relationship. Touch in the form of gentle massage revealed the mother's affection and it could fulfill the baby's needs for physical contact. In addition, any emotional changes caused muscle reactions. By reducing muscle tension, the infant massage calmed the emotions and relieved some trauma and worries that related with birth, new environments, and weaning. The skin supplied persistent information to the central nervous system about the environment around the body through touching by skin, it could give an extraordinary impact on child's physical development, emotional development, and child's growth [(1).]

Massage was a tactile stimulation that provided biochemical and physiological effects on various organs in the body. Massage that was performed correctly and regularly in babies was assumed to have various advantages in the process of infant's growth. Infant massage by parents could improve the emotional relation between the parent and the baby and it was also assumed to increase the baby's weight [(2).]

Various studies had been conducted in order to prove the benefits of infant massage. Conducted research by Dieter et al. (2003) examined the effect of massage that was performed 3 times, 15 minutes per day for 5 days in less months babies. It resulted an average of weight gain, which was per day 53% greater in massaged infant group rather than in the control group (non-massaged infant) [(3)].

Based on a conducted preliminary survey in Tawanganom, Magetan 2017, among 10 mothers with 3-5 months- old babies, it was found 4 babies (40%) who had never been massaged. One of them was R (5 months-

old from RW 03 Tawanganom), on February 2017, R was 8600 grams and on March 2017, R gained 200 grams to be 8800 grams, while, the 6 infants (60%) who had been massaged to a physiotherapist, one of them was N (5 months from RW 03 Tawanganom) that on February 2017, N was 7900 gram and on March 2017, N gained 300 grams to be 8200 gram. Those 10 babies (0%) had never been massaged by their parents.

In order to support the implementation of infant massage, it was expected that midwife needed to teach the mother regarding infant massage to be practiced at home. Besides, the midwifery students needed to be taught regarding infant massage. Hence, they could provide counseling and deep understanding regarding the benefits and impacts of infant massage. However, those efforts were done in order to make optimal growth and development for the baby [(4).]

One of infant massage benefits was able to increase baby's weight. Therefore, this research aimed at evaluating the influence of 3 to 5 months-old babies who were massaged and were not massaged in Tawanganom, Magetan 2017.

Purpose

This research was for knowing the influence of infant massage for babies who were 3-5 months old in Tawanganom, Magetan 2017.

METHODS

This research was analytical research with Quasy Experimental Design in the form of Non equivalent control group design [(5)]. The research was held in Tawanganom, Magetan. The population were all babies who were 3 to 5 months old in Tawanganom. The population size was 20 babies who were divided into 2 groups which were massaged baby group and non-massaged baby group. This study used the population total by using non probability technique (Non Random)[(6)]. The independent variable was infant massage. Meanwhile, the dependent variable was weight of 3-5 months-old babies. The instrument that was used in this study was the baby weight scale in grams. The data were collected by weighing babies who were massaged and were not massaged after 8x massages. The statistics that was used was Independent Samplet T-Test[(7)].

RESULTS

Baby Weight Before and After Massage

After a study on baby's weight who was massaged for 4 weeks, it was known that the average of baby's weight before massaging was 5840 g and after massaging was 6460 g. It could be seen in Figure1.

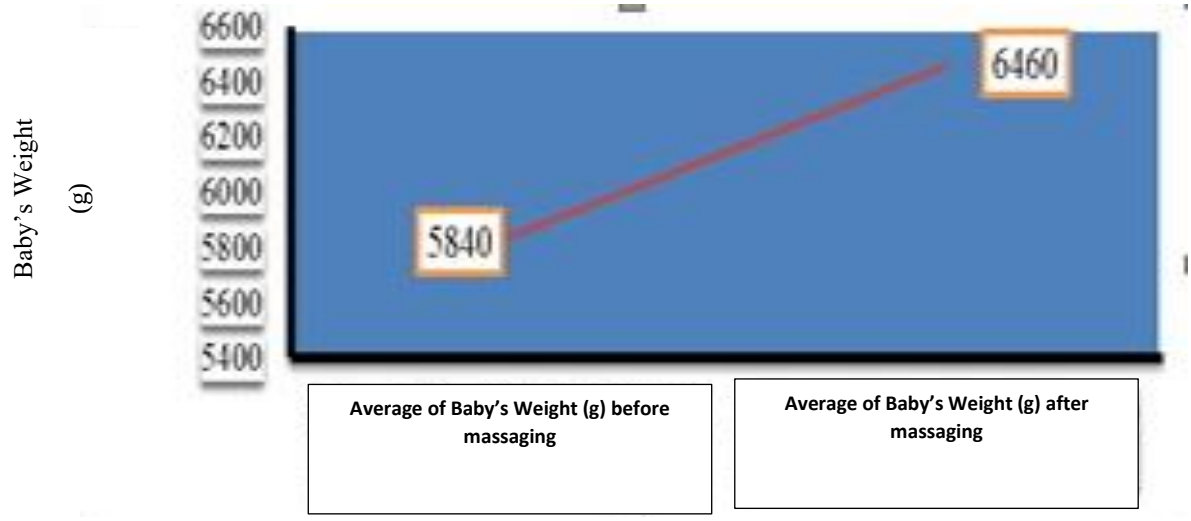

Figure 1. The Average of Baby's weight before and after massaging in Tawanganom

Baby's Weight in Beginning and End of 4th Week of Non-massaged Group

Baby's weight in the beginning and end of 4th week in Tawanganom, Magetan showed an average of 5810 g and 6080 g respectively. It could be seen in Figure 2.

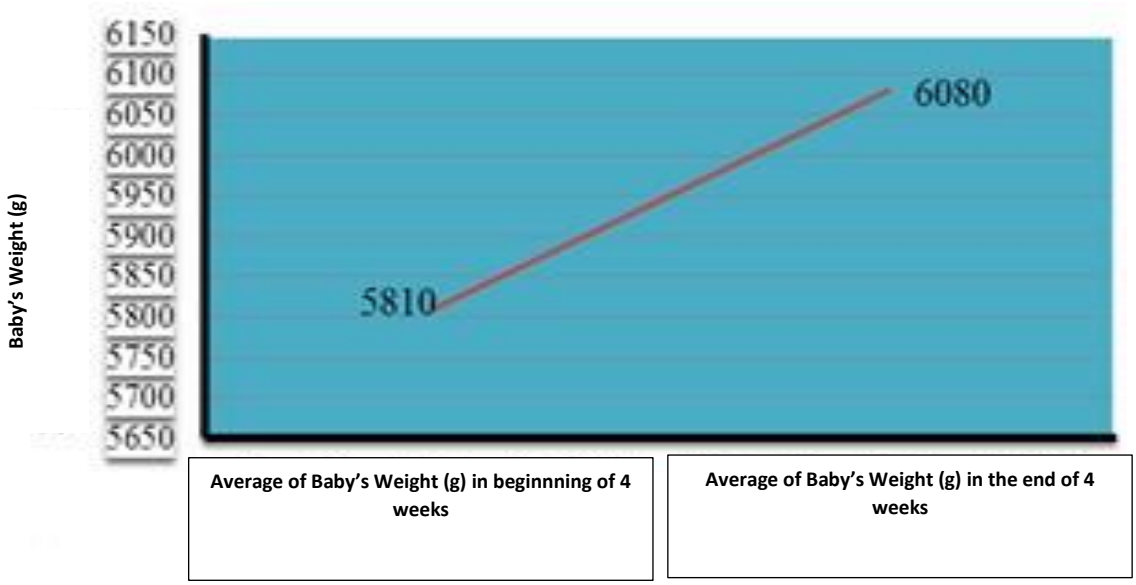

Figure 2. Average of Baby's Weight in Beginning and End of 4th Week of Non-massaged Group in Tawanganom

The Difference of Baby's Weight Before and After Massaging

Weight differences of babies who were 3-5 months old before and after a massage could be known by testing the difference between before and after massaging, starting with the Test of Normality Kolmogorov-Smirnov in order to determine whether the data was normally distributed or not. The result showed significant value greater than 0.05 which meant that the data of baby's weight was normally distributed, thus, it could be done Paired Samples T-Test.

Results of Paired Samples T-Test at 95% of confidence interval was obtained t value -10.811 with a significant value of 0.000 ($p < 0.05$), thus, H0 was rejected, which meant that there was a significant difference of 3-5 months-old baby's weight between before and after massaging. The result of Paired Samples T-Test could be seen in Table 1.

Table 1. Paired Samples Correlations Result of 3-5 months-old Baby's Weight between Before and After Infant Massaging

	n	Correlation	Sig.
Baby's Weight (g) Before & After Massaging	10	0.963	0.000

The Difference of Baby's Weight in Beginning and End of 4th Week on Non-massaged Infant Group

The result of Paired Samples T-Test at 95% of confidence interval was obtained t -12.650 with significant value of 0.000 ($p < 0.05$), thus, H0 was rejected, which meant that there was a significant difference of 3-5 months-old baby's weight in beginning and end of 4th week of non- massaged infant group.

The Difference of Baby's Weight between on Massaged Infant Group and Non-massaged Infant Group

The difference of 3-5 months-old Baby's weight which the baby was massaged and was not massaged could be determined by testing the differences between before and after the homogeneity test and starting with determination whether several variants of the population were equal or not. Moreover, this test was performed as a prerequisite in Independent Sample T-Test analysis.

From the result above, it could be seen that the significant value was 0.397. Because the significance was >0.05, it could be concluded that baby's weight of either massaged infant group or non-massaged infant group had same variant. Levene Statistic rate showed the smaller the value, the greater the homogeneity. df1 = number of data - 1 or 3-1 = 2, whereas, df2 = total data - number of data or 20-3 = 17.

Before being conducted Independent T-Test test, it was conducted variant equality test (homogenity) with the result of F test in significant value of *equal variance assumed* of 0.018 <0.05, then, H0 was rejected and H1

was accepted. Thus, it could be assumed that both variance were different. In this case, the t test utilized equal variance not assumed.

From the analysis of Independent T-Test, t value of equal variance not assumed was 5.330. Then, at t table, the data that was obtained was 2.101, because t count was > t table (5.330 > 2.101) and significance was 0.000 <0.05, Ho was rejected and H1 was accepted, which meant that there was a significant influence of infant massage against baby's weight gain.

DISCUSSION

Baby's Weight Before and After Massaging

The 3-5 months-old baby's weight before and after massaging of 10 infants who were massaged from May to June 2013 was obtained the difference of baby's weight gain as much as 620 g.

This was in accordance with Walker's conducted research that reported the benefits of infant massage as follows: maintaining balance and posture, improving muscle coordination and flexibility as well as overcoming stiff muscles and joints, removing stiff or tense muscles and adjusting joints, improving bone flexibility and strengthening support muscles, helping the digestion and relaxing the body by facilitating abdominal relaxation and maximizing breathing volume. Increased oxygen supply and good circulation would help the baby develop, stabilize the unity and position of the main joints and the alignment of the muscles that controlled the joints, cleansed the skin and made it exposed to the light and oxygen(1).

Through stimulation in infant massage, it could increase the baby's weight because it could help to improve the work of pituitary gland and stimulate Growth Hormone (GH), thereby improving skeletal and muscle growth. In addition, infant massage could stimulate the vagus nerve in intestinal tract and stomach, thus, it improved the mobility of gastrointestinal tract. This condition caused better food absorption and the baby was easily hungry, thus, it increased baby's weight(8).

Furthermore, the infant massage had many advantages, such as babies who were massaged for 4 weeks in a row could increase their weight. In addition, infant massage could also reduce the habit of crying, increasing baby's weight, making the baby easily to sleep, reducing the level of stress hormone. Mothers who massaged their babies were able to produce more breast milk rather than were not massaged (in control group). Therefore, infant massage could increase the volume of breast milk, then, the period of exclusive breastfeeding time could be increased, thus, it could improve the quality of human resources.

Baby's Weight in Beginning and End of 4th Week in Non-Massaged Infant Group

The average of 3-5 months-old baby's weight of 10 babies who were not massaged from May to June 2013 showed different increase of baby's weight as much as 270 g.

Basically, baby's weight in non massaged infant group gained. According to Hidayat (2008: 15-16), baby's weight development was divided into two, those were in the age of 0-6 months and 6-12 months. In the age of 0-6 months, the baby's weight would gain every week about 140-200 grams and it would be twice higher of birth weight at the end 6th months. While, in the age of 6-12 months, it would gain 25-40 grams every week and at the end of 12th months, it would be increased three times of birth weight. During playtime, there was an increase of baby's weight about four times of birth weight. At the age of approximately 2.5 years, the average of baby's weight gain was 2-3 kg each year. It was similar weight with preschool and school period(9).

Non-massaged baby's weight also increased in line with their age but when the baby was massaged regularly, they could experience greater weight rather than non-massage babies. Therefore, baby's weight was one of markers to determine the level of child health. Furthermore, baby's weight would describe body composition as a whole.

The Difference of Baby's Weight Before and After Massaging

The baby's weight after massaging increased more. The result of Paired Samples T-Test was conducted in order to know whether there was average difference between two groups or not. It was known that the average of baby's weight after massaging for 4 weeks was obtained a significant value of 0.000 < 0.05, then, the research hypothesis was accepted. This meant that there was a significant difference in baby's weight before and after massaging.

This situation indicated that the baby's weight gains was occured because of massaging. However, touch would stimulate the skin as a receptor to stimulate the hypothalamus. The hypothalamus would stimulate the arcuate nucleus, which were the center of food intake regulation to secrete Gastrin hormones in the stomach through the Vagus nerve. Gastrin hormone had a function to remove acid hydrolysis and accelerate the movement of stomach wall. Hence, the process of emptying stomach was quickly. When the stomach was empty, the stomach

secreted Ghrelin, the Endogenous Ligand for Growth Hormone Secretagogue Receptors (GHS-R) which acted as the first neuro-enteric peptide for peripheral hunger signal. Ghrelin would activate neuropeptides Y (NPY) and Agouti-Related Protein (AgRP) transmitted through the vagus nerve to the nucleus of the solitarial tract in hypothalamus. This feedback caused the baby felt hungry quickly, the baby's appetite increased, thus, the baby needed more breast milk and the weight gained. This was in accordance with the theory which was regular stimulation could accelerate the children's growth. This research was also in accordance with conducted research by T. Field and Scafidi (1936 & 1990), 1-3 months-old babies who were massaged 15 minutes twice a week for 6 weeks would experience baby's weight gains[10].

Baby's weight gain was also depended by other factors such as genetic factors, gender of ethnic groups and various normal innate and pathological factors. Prenatal environmental factors were environmental factors that affected the fetus during pregnancy. Postnatal environmental factors such as maternal nutrition in breastfeeding period greatly affected the breast milk production. Stress from the mother could affect the quality and quantity of breast milk production and the stress from the baby could affect the baby's appetite.

The fact showed that baby's weight for 4 weeks had increased higher rather than baby's weight before massaging because of outside stimulation of the body. The stimulation would increase serotonin neurotransmitter activity, which increased the capacity of receptor cells that bounded glucocorticoid (adrenaline, a stress hormone). This process would cause the decrease of adrenaline hormone content (stress hormone). Decrease in the stress hormone content would increase endurance that resulted the gain of baby's weight.

From the test, it was known baby's weight gain in either massaged infant group or non-massaged infant group. In this case, baby's weight gains in massaged infant group were higher rather than non-massaged one (620: 270), while, the statistical analysis with the Independent T-Test gained a significant value of 0.000 less than 0.05, then, H0 was rejected and H1 was accepted. Therefore, it could be concluded that there was a significant difference of 3-5 months-old baby's weight who were massaged and not massaged.

Baby's weight which gained in massaged infant group was in accordance with the theory that vagus Nerve Activity affected the mechanism of food absorption. A conducted research by Field and Schanberg (1986) showed that massaged baby experienced an increase of vagus nerve tone (10^{th} cerebral nerve) which would cause the increase of gastrin and insulin content. Hence, the food absorption would be better rather than non-massaged one [11].

Vagus Nerve Activity increased breastmilk and the food absorption became better because of the increase activity of the vagus nerve that caused the baby was hungry very easily and the baby would be more frequent to suckle. As a result, breast milk would be more produced. As it was known that breast milk would be produced more if it was requested more. In addition, mothers who massaged their babies would feel calmer and this had positive impact on the increase of breast milk volume [12].

The results showed that regular infant massage had a different effect on baby's weight gain. Babies who had been massaged for 4 weeks had a greater increase rather than non-massaged babies, because the stress hormone in babies decreased and the babies could suck more breast milk. Therefore, breast milk reproduction and baby weight would increase.

CONCLUSION

Based on the results of the research, it could be concluded that:

1. The average of baby's weight before being massaged was 5840 g and after being massaged was 6460 g.
2. The average of baby's weight in non-massaged infant group in the beginning of 4 weeks was 5810 g and in the end of 4 weeks was 6080 g.
3. There was a significant difference of baby's weight before and after massaging.
4. There was a significant difference of baby's weight in non-massaged infant group in the beginning and the end of 4 weeks.
5. There was a significant difference of baby's weight between massaged infant and non-massaged one.

Based on the results of the research, the researchers wanted to provide advice to various related parties as follows:

1. For the community
   It was expected for the people to continue regular infant massage until the baby was 2 years old, because infant massage was proven to give good effect for the baby's growth and it also could keep baby's immunity.
2. For educational institutions
   It was expected that educators could give demonstration of infant massage movements to the students. Thus, the students could apply it in workplace.
3. For midwives
   It was expected that midwives taught pregnant women about infant massage at ANC, thus, the mother could apply it after the baby was born.
4. For the next researcher

It was expected to do further research regarding more qualified infant massages. For example was using better exsperiment design, using a wider population and a more representative sample, by better infant massage methods and other factors that had not been studied before because of the limitations of researchers, considering that the infant massage was very useful in order to increase baby's weight.

REFERENCES

1. Walker P. Complete Guide on Baby Massage (Panduan Lengkap Pijat Bayi). Jakarta: Puspa Swara; 2011.
2. Rosalina. Baby Massage Physiology (Fisiologi Pijat Bayi). Jakarta: Trisakti Multi Media Johnson & Johnson Indonesia; 2007.
3. Subakti, Yazid, Anggraini DR. Miracle Massage Baby and Toddler (Keajaiban Pijat Bayi dan Balita). Jakarta: PT Wahyu Media; 2009.
4. Maharani S. Massage and Gymnastic Healthy for Baby (Pijat dan Senam Sehat untuk Bayi). Jogjakarta: Kata Hati. 2009.
5. Hidayat AAA. Research Methods in Midwifery and Data Analysis Techniques (Metode Penelitian Kebidanan dan Teknik Analisa Data). Jakarta: Salemba Medika; 2010.
6. Nursalam. Concept and Application of Research Methodology of Nursing Science; Guidelines for the Preparation of Scientific Report, Thesis, and Instrument of Nursing Research (Konsep dan Penerapan Metodologi Penelitian Ilmu Keperawatan Pedoman Skripsi, Tesis, dan Instrumen Penelitian Keperawatan). Jakarta: Salemba Medika; 2008.
7. Piyatno D. Learn SPSS independently (Mandiri Belajar SPSS).Yogyakarta: Mediakom; 2008.
8. Dewi NN. Influence of Infant Massage Stimulation on Weight Gain Improvement in Infants Being Enough Months (Pengaruh Stimulasi Pijat Bayi Terhadap Peningkatan Berat Badan pada Bayi Lahir Cukup Bulan). [Internet]. Universitas Gadjah Mada. 2017 [cited 2017 Mar 11]. Available from: http://etd.ugm.ac.id
9. Widyastuti D, Widyani R. Child Development Guide 0 to 1 Year (Panduan Perkembangan Anak 0 Sampai 1 Tahun). Jakarta: Puspa Swara; 2008.
10. Santi E. Smart Book on Baby Massage for Growth and Growth Optimalization, Healthy & Smart (Buku Pintar Pijat Bayi untuk Tumbuh Kembang Optimal Sehat & Cerdas). Yogyakarta: Pinang Merah Publisher; 2012.
11. Roesli U. Baby Massage Guidelines (Pedoman Pijat Bayi). Jakarta: Trubulus Agriwidya; 2011.
12. Suparyanto. Baby Weight Concepts (Konsep Berat Badan Bayi). [Internet]. dr-Suparyanto Blog. 2017 [cited 2017 Mar 30]. Available from: http://dr-suparyanto.blogspot.com