THE EFFECTIVENESS OF BABY SWIMMING AND BABY MASSAGE IN IMPROVING BABY WEIGHT

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Abstract
Infancy is a golden era, therefore, this period requires special attention for the growth and development of children. Development and growth are continuous and interrelated process since the infancy and childhood periods. Infants grow rapidly in the first 12 months of their ages. There are some indicators of baby growth, one of them is body weight. Some efforts to increase baby weight are through baby massage and baby swimming. This research was aimed to discover the effectiveness of baby massage and baby swimming in improving baby weight. This research used one-group pretest-posttest design of quasi-experimental method. The researcher conducted intervention of massage therapy for 8 times in 4 weeks, and also 8 times in 4 weeks for baby swimming The data of weight measurement results in before and after the treatment were examined with statistical hypothesis test. Accidental sampling was used as the sampling technique. Independent t-test was used as the statistical test. Mean weight of infants before baby massage is conducted was 7.92 kg, mean weight of infants after baby massage is conducted was 8.23 kg, and mean weight of infants after baby swimming is performed was 7.59 kg. According to the analysis result of difference test performed with Independent T-Test, 0.186 of p value has been acquired. There is no significant difference between baby massage and baby swimming in improving baby weight.

Keywords: baby swimming, baby massage, baby weight, infants

1. INTRODUCTION

Infancy is a golden era, therefore, this period requires special attention for the growth and development of children. Development and growth are continuous and interrelated process since the infancy and childhood periods. Infants grow rapidly in the first 12 months of their ages [1]. There are some indicators of baby growth, one of them is body weight [2]. Since they were born, infants have needs that have to be fulfilled by parents such as physical, biological, and emotional needs. One of the means to fulfill baby needs is through massages [3]. Massages on infants will enhance their growth and development because massages able to increase enzymes and hormones of growth on cells and tissues

According to Vivian [3] stimulus touch or massage is an art of health care and treatment that be practiced for centuries. Massages will increase the activity of serotonin neurotransmitter which will increase the decreasing level of adrenaline hormone (stress hormone). The decrease of this hormone will improve body vitality especially IgG and IgM [4]. This condition is consistent with Rosalina [5] who mentioned that baby massage will affect the peripheral and central nervous systems, the pressure on nerve receptors in skin will cause dilated vena, artery, and capillary that will inhibit muscle stricture and tension, blood pressure will slow down and the movement of smooth muscle will increase.

The research conducted by Pepino & Mezzacappa [6] stated that massages on infants will provide many benefits such as accelerating the weight gain, shortening hospital treatment (BBLR), and increasing growth. Livingstin et al. [7] stated that baby massage could increase body weight significantly because it able to stimulate vagal and gastric activity. Diego et al. [8] also expressed that massages with medium pressure can enhance gastric motility and will surely accelerate body weight gain. Field et al. [9] also stated that infants who get massaged with medium pressure have relaxed condition indicated by heart rate and increasing state of sleep, therefore, the energy release is decreased and body weight is increased. Dieter et al.[11] also stated that the massage therapy for five days could stabilize body weight and sleep pattern on premature infants in hospitals.

Baby massage itself has been put into combinations, one of them is baby spa. Baby spa is bathing or swimming while baby massage is given. Baby spa treatment is highly beneficial for the health and development of infants. Swimming can increase a better body balance which includes improving the appetite of infants [11]. Darmayanti [12] in her study stated that swimming for 20 minutes with warm water as the medium will release more physical energy of infants, therefore, the appetite will increase and the infants will experience body weight. This research was aimed to discover which more effective in increasing body weight of infants between baby massage and baby swimming.

2. METHODS

The type of this research was quasi-experiment by applying nonequivalent without control (posttest-pretest only) design. This research was performed in Massage Therapy of Mrs. Ning and Bee Spa in Yogyakarta Special Region on July to August (2017). Accidental sampling was used as the sample collection technique with inclusion criteria: healthy infants, infants aged between 3 to 12 months.

The researcher conducted intervention of massage therapy for 8 times in 4 weeks, and also 8 times in 4 weeks for baby swimming. The baby massage therapy and baby swimming are performed by experts who have followed the training for baby massage and baby swimming. After therapies were conducted for 8 times in 4 weeks, then, the researcher measured the baby weight. Baby massage and baby swimming were done for 15 minutes and 2 times a week.

3. RESULTS AND DISCUSSION

Mean of baby weight before and after treatment can be seen in **Table 1**, meanwhile the effectiveness of baby massage and baby swimming on body weight can be seen in **Table 2**.

Table 1 Mean weight of baby in before and after baby massage and baby swimming

	Baby Massage	Baby Swimming
Mean weight before treatment (kg)	7.92	7.32
Mean weight after treatment (kg)	8.23	7.59
Difference (kg)	0.31	0.27

Table 2 The effectiveness of baby massage and baby swimming on body weight

Category	Mean	Difference	p value
Weight after baby massage (kg)	8.23 kg	0.31 kg	0.186
Weight after baby swimming (kg)	7.59 kg	0.27 g	

3.1 Baby Massage

According to the research results, it has been acquired that increasing body weight occurred after baby massage was given with 0.31 kg or 310 gram mean difference. These data are consistent with the theory of Roesli [4] that mentioned that baby massage could increase body weight of infants because there was an increasing activity of vagus nerve, therefore, it affected the mechanism of food absorption. The massaged baby has increasing tonus of vagus nerve which will result in better food absorption and increasing baby weight. In addition, baby massage will stimulate digestive hormone such as insulin and gastrin. Insulin holds important role in metabolism and causes the increase of carbohydrate metabolism, glycogen storage, fat synthesis, and the take of amino acids of protein synthesis. The increasing level of insulin and gastrin will stimulate digestive function, therefore, the absorption of food essence will be better.

The research of Field et al. [13] also proved that baby massage can increase baby weight because baby massage could enhance vagal activities that will stimulate the secretions of insulin, gastrin, and IGF-1 in which these factors are highly contributing in the addition of body weight.

It can be concluded that baby massage is one of the factors that could increase body weight of infants because it could increase the activity of vagus nerve that will enhance vagus muscle which enhances the activity of nutrient absorption due to increasing secretions of insulin, gastrin, and IGF, therefore, the body weight of infants will increase. The increase of digestive hormones will enhance better absorption of food essences and better absorption process will increase the appetite which will make infants to have more breastfeeding. The increase in baby weight is not only affected by baby massage alone but also due to other factors such as the nutrition of infants, child health, immunization, and social-economic factor in which those factors are not controlled by us.

3.2 Baby Swimming

According to the research results, it has been acquired that body weight has increased in before and after baby swimming was given with 270 grams of mean difference. This result is consistent with Galenia's theory [14] which stated that baby swimming can increase body weight, the quality of sleep will improve on infants who given with baby swimming because the brain wave might change when infants are swimming that proved with the utilization of EEF (electro-encephalogram), thus, infants become more relaxed and infants will fall asleep easily. When infants fell asleep, the growth hormone will increase and will improve the appetite of infants. Roesli [15] also stated that baby swimming could increase the body metabolism of infants, therefore, it will increase the appetite of infants. Infants who have increasing metabolism will automatically increase their appetite.

In view of the above, it can be concluded that baby swimming could increase body weight of infants because it makes infants to be relaxed so they could fall asleep easily and can stimulate the release of growth hormone which able to increase appetite as well as increasing body weight. However, there are some underlying factors of growth including prenatal factors that affect unborn children and postnatal factors that affect children after birth [2].

3.3 The difference test on the impact of baby massage and baby swimming in improving body weight

According to Table 2, it has been acquired that there is no significant difference between baby massage and baby swimming on the increasing body weight of infants with p value 0.186.

Roesli [5] mentioned that baby massage could increase body weight of infants because there was an increase of Vagus Nerve's activity so it affected the mechanism of food absorption. The massaged infants are having the increase of vagus nerve that will cause better food absorption and increasing body weight of infants. Galenia [14] stated that baby swimming can improve body weight, the infants who swim also have increased quality of sleep because during swim, the brain wave changed that can be proved by using EEG (electro-encephalogram), therefore, infants could be more relaxed, infants will fell asleep easily in a relaxing state. When infants are sleeping, there is an increasing level of growth hormone, in addition, sleep can also improve the appetite if infants. Roesli [15] also stated that baby swimming can improve the metabolism of infants' body, thus, it automatically improve infants' appetite.

Gelenia [14] also expressed that baby swimming and baby massage (Baby spa) will provide stimulation and relaxation effects, accelerating blood flows, improving body vitality, improving the concentration of infants, making infants to have a good sleep, and increasing body weight of infants. In view of the above, it can be concluded that baby massage and baby swimming are both able to increase the body weight of infants, none of these two that more effective or better compared to each other.

4. CONCLUSION

Based on this research, it can be concluded that infants given with massage and swimming activity have gained body weight. There is no significant difference of body weight increase on infants that given massage or swimming activity.

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