Effectiveness Of H-Hope Plus Kinesthetic With Virgin Coconut Oil (VCO) On Body Weight In Premature Infants

Lia Dian Ayuningrum¹, Mardiyono, MNS, PhD², Dr. Imam Djumaludin, M.Kes³

¹²³Poltekkes Kemenkes Semarang

¹lia.liadianayuningrum@gmail.com,

Abstract. Background: Prematurity complications in the first year contribute to one million children die and each year around 15 million babies are born prematurely. Prematurity is still a major health problem worldwide. Premature babies with LBW are at risk of developing growth disorders, especially body weight. One intervention that can be given is visual-tactile-kinesthetic stimulation. This stimulation is a stimulus series that provides sensory and motor experiences so those premature babies can show their appropriate growth progress.

Objective: To determine the effectiveness of H-HOPE plus kinesthetic with VCO on the growth of premature infants.

Methods: This type of experimental design study with a pretest-posttest with control group design with independent variables was intervention in the form of H-HOPE plus Kinesthetic with VCO and Kangaroo Mother Care (KMC). The samples in this study were preterm post-treatment infants at Hospital. Sampling uses probability sampling technique with random sampling. The number of samples in this study is 30 respondents with 15 people in the intervention and control groups.

Results: The results of giving H-Hope plus kinesthetic and VCO interventions for 14 days in increasing body weight obtained sig value of 0.001 with mean ± SD (612.27 ± 80.82).

Conclusion: H-Hope plus kinesthetic with VCO is more effective in increasing body weight.

Keywords: H-Hope, VCO, Kinesthetic, Premature baby

1. Introduction

In Indonesia, it is mentioned that it is estimated that babies are born around 350,000 premature babies or low birth weight. The pattern of causes of death showed that the proportion of causes of neonatal death in the highest 0-7 day age group was premature and low birth weight, then asphyxia was born. Percentage of Low Birth Weight Babies in Central Java each year tends to increase by 3.73% (2011), 3.90% (2014), 5.1% (2015). Premature babies more easily lose skin stimulation that occurs in the intrauterine phase through skin contact with amniotic fluid and the mother's uterine wall. This condition is one of the determining factors in the growth and development of the baby's nerves. In addition to the initial sensory deficiencies, prematurity causes other related factors, such as the absence of bonding between the mother and newborn baby due to the need to last in the unit Neonatal intensive care (NICU), which has an adverse effect on the psychological and biological development of children and parental well-being.

The condition of premature babies that are still vulnerable due to the maturity of organs that are not perfect, so care must be done more intensively. Maximizing care can improve the welfare of babies. Babies born with a bodyweight of fewer than 2500 grams are twenty times more likely to experience death in the first month of life compared to babies born with normal weight. This risk increases higher in infants with birth weight less than 1500 grams. The rate of growth of premature babies in the first year is generally lower than that of term infants born on the same day. Deficits in these growth rates tend to correspond to the level of prematurity. Nutritional problems are one of several serious problems in premature babies. Babies born prematurely have an immature digestive system that can cause problems, especially in foods that need special handling. This disorder occurs because infants with low
birth weight (LBW), only have small subcutaneous fat deposits, limited reserves of brown fat, and suction reflexes and swallow the weak baby.

There are some babies weighing <2500 grams that can be discharged because of the stable condition. The high cost of care is one of the family's factors to speed up the time to care for premature babies at the hospital and choose to take it home. The definitive criteria for the return of premature babies, one of whom is the baby is in a stable condition and has gained weight at least 15gr kg/day for 3 consecutive days. The problem is that baby care at home will not be the same as the procedure performed in the hospital. Meeting the physical needs of premature babies at home is to maintain normal body temperature, intake of breast milk so that the baby reaches normal weight and prevention of infection. According to research Nicolau, et al (2009) states, that mothers who care for premature babies at home tend to feel unsure and anxious when they start interacting with their babies [1].

The growth system of premature babies will experience a decrease in the first week, namely weight loss around 10-15% of birth weight and is expected to experience an increase in body weight in the second week of 15g/kg/day until it reaches a normal weight of 2500 gram, increase 0.8-1 cm/week for body length and increase 0.5-0.8 cm/week for head circumference [2]. The development of science and technology raises new innovations, especially in an effort to improve the welfare of premature babies with various interventions for growth and development. The recommendation that has been applied is the Kangaroo Mother Care/KMC method with skin to skin to maintain the baby's temperature through the skin of his mother. Extraterine growth of premature babies can also be stimulated by tactile, kinesthetic, vestibular, oral, auditory stimulation and other stimulation combinations. Stimulation given over time can also help the baby adapt to the extraterine environment [3].

The study of the mechanism of the effects of infant massage on physiological and biochemical changes to promote growth, including increased vagus activity which in turn affects the release of digestive hormones such as gastrin, insulin, and insulin growth factor (IGF-1) and increases the efficiency of the body's metabolic processes. Another effect of massage therapy is to reduce stress levels in infants as evidenced by decreased cortisol levels in infants, thereby increasing the quantity of baby sleep and increasing maternal and child bonding. Research conducted by White et al, which examined the effect of H-HOPE interventions on preterm infants proving faster body weight development compared to groups that were not given the intervention [4].

Research conducted by Field, et al proved that premature babies who are massaged will experience greater weight gain (47%) [3]. Research by Fallah, et al, [5] stated that low birth weight babies who were massaged using sunflower seed oil for 14 days, experienced an increase in body weight of around 249 grams. Sankaranarayanan et al, [6] stated that newborns who were given massage with coconut oil (coconut oil), increased their body weight more than using mineral oil. Another study by Saeidi et al.

Stated that babies who were massaged with MCFA-containing oils had greater weight gain [7]. Methods Kangaroo Mother Care was also developed by Cho et al (2016), in his research which was carried out for 3 weeks this method not only stabilized the temperature but also increased body weight by around 504gr [7].

Based on the description above, that the more complications experienced by premature babies, so that more and more innovation is needed to be done so that the welfare of premature babies can be maximized, researchers are interested in conducting research entitled “Effectiveness of H-HOPE plus kinesthetic with VCO on weight in premature infants.”

2. Research Methods

This study uses a quantitative approach to the Experimental Design method. The samples in this study were preterm post-treatment infants at Sunan Kudus Islamic Hospital and Dawe Community Health Center. The sampling technique uses probability sampling technique with random sampling. Data collection techniques were carried out by participant observation and questionnaire distribution. The collected data was then analyzed using Univariate and bivariate analysis techniques. The hypothesis is that there are differences in weight in premature babies after being given H-HOPE plus Kinesthetic with VCO.

3. Results and Discussions
3.1 Results

Based on table 1, it can be explained that in both groups the gestation characteristics are 33-34 weeks with p-value is 0.646 that means both groups are homogeneous. An ideal level in breastfeeding in infants is 8-12 times in 24 hours with a long time for breastfeeding for 2 hours. The baby should be breastfed every time or whenever the baby wants, with the position must remain altered. Statistical tests showed that all respondent's characteristics are not different or homogeneous.

| Table 1. Distribution of Frequency Characteristic Respondent |
|-------------------------------------------------------------|
| Characteristics | Intervention | Control | P    |
|-----------------|--------------|----------|------|
| Gestation (mean±SD)| 33.60±1.50 | 34.33±0.62 | 0.646|
| Birth weight (mean±SD)| 2087.33±328.97 | 2140±122.76 | 0.212|
| Sex | Boys | 7 | 6 | 0.435|
| Girls | 8 | 9 | |
| Breast Frecuency | 8-12 times | 14 | 13 | 0.237|
| <8 times | 1 | 2 | |
| Mother Education | Junior High School | 10 | 12 | 0.196|
| Senior High School | 5 | 3 | |

Based on table 2, it can be explained that in both groups experienced a weight increase that was in accordance with the standard weight gain at low birth weight that is 30-35 grams/day. In the H-Hope plus kinesthetic group with VCO and KMC, the average post-test score was higher than the pre-test value with a body weight> 2500 grams, which represented a normal baby's weight with a difference of 612.27 grams which means intervention given effective increase weight to 45.7% for 14 days. However, in the control group even though there was an increase, the mean value of the post-test did not reach the normal bodyweight of <2500gram.

| Table 2. Descriptive analysis of body weight on premature infants |
|---------------------------------------------------------------|
| Variabel | Intervensi | Kelompok | Min-Max | Mean±SD |
| Body weight Pre | 2080±292.57 | 2019±334.75 | 1905-2150 | 2105±3105 |
| Post | 2694±275.04 | 2290±13±61.87 | 2205-2385 |

Based on table 3, can be explained that the results of statistical tests using the Wilcoxon test, mean weight in the intervention group with z = -3.411 and p = 0.001 and in the control group with z = -3.409 and p = 0.001. Statistically this shows there is a difference with the value before and after the intervention that is with a p-value <0.05.

| Table 3. Differences in body weight before and after in Premature infants |
|---------------------------------------------------------------------|
| Variabel | pre-test and post-test | Mean Rank | Sum of Ranks | Z | P value |
| Body weight | Intervention | 8.00 | 120.00 | -3.411 | 0.001 |
| Control | 8.00 | 120.00 | -3.409 | 0.001 |

Based on table 4. It can be explained that the Mann-Whitney test showed that H-Hope plus kinesthetic and VCO were more effective in increasing body weight in preterm infants compared to the control group given the KMC method with z and p values of -4.670 and 0.001 (p <0.05).
3.2 Discussions

In this study, an evaluation or growth measurement covering body weight for 14 days was carried out. The results of the study based on intervention for 14 days showed an average weight gain of 612.27 grams. The increase in the mean value on the variable is supported by effect size analyze amounted to 2.0 (high value). This result showed that H-HOPE plus kinesthetic with VCO better than a massage with MCT that has an effect size value 0.1 or with the tactile-kinesthetic stimulation that effect size value is 0.5. Statistical test results using the Wilcoxon test showed that in the intervention group there was a significant difference that illustrated the increase in body weight with \( p = 0.001 \) (\( p > 0.05 \)). This research is in line with that carried out by Rosemary et al. [4], The results of which infants were given H-HOPE interventions (audio, tactile, visual and vestibular) gained weight faster with a mean difference of 46.3 grams compared to the control group, and increased circumference the head was significant in all groups [4]. In this study based on the culture of the respondents, researchers adopted audio, tactile, visual and kinesthetic implementation procedures with premature massage [8]. The research conducted by Sankaranarayanan et al., Which resulted in babies being massaged using VCO had a greater body weight with a difference of 162.39 grams compared to groups using mineral oil. Saeidi et al., In his study also concluded that massage babies using oil containing MCFA increases body weight by 105 grams compared to those massaged without oil [7].

In this study, the expected results of weight gain for 14 days were 420-490 grams, while the average difference in body weight gain obtained was 612.27 grams. The results of these improvements can be achieved due to the intervention is given in the form of a combination of H-HOPE plus kinesthetic with VCO and the KMC method in the intervention period for 14 days. Bodyweight is the result of an increase or decrease in all tissues that exist in the body, such as bones, muscles, fat, body fluids and others that can be used as an indicator to determine the baby's growth and development through weight gain. Nutritional intake or exclusive breastfeeding for infants aged 0-6 months is a direct factor that most influences the baby's body weight. In this study, researchers controlled by including respondents who were only breastfed.

H-HOPE plus kinesthetic and VCO interventions that are integrated with parental participation, in this case, the mother of the baby, are proven to support exclusive breastfeeding and interactions that form stronger bonding. The manipulation technique in this case, namely touch (tactile and vestibular) helps to release growth hormone in the body. The sensations given during tactile and kinesthetic action increase the activity of the vagus nerve which causes gastric emptying more quickly so that the baby will suckle more often. Tactile-kinesthetic stimulation with audio-visual in infants using VCO affects weight gain. In theory can be explained as tactile-kinesthetic stimulation by audio-visual / massage causes stimulation of the vagus nerve which affects the digestive system, which stimulates the stomach to release gastrin; increase gastric and intestinal motility. Gastric motility will facilitate the receptive relaxation of the stomach which causes the stomach to increase its volume without increasing intestinal pressure and motility makes it easier to mix food, so that absorption of nutrients becomes better. The smooth digestion process causes the stomach to become empty quickly. This situation will stimulate hunger and thirst so that babies become more frequent breastfeeding; tactile-kinesthetic stimulation with audio-visual / massage encourages growth hormone for somatomedin release which is the most secreted growth factor by the liver. One of the main somatomedin found in the blood is IGF-1 which is a growth hormone that affects the growth of various body tissues [9].

4. Conclusion

The H-Hope plus Kinesthetic method with VCO given to preterm infants after hospital treatment gives the effect of increasing body weight. H-HOPE plus kinesthetic intervention with VCO which is
integrated with parental participation which in this case the mother-baby is proven to support exclusive breastfeeding and interactions that form stronger bonding. The manipulation technique in this case, namely touch (tactile and vestibular) helps to release growth hormone in the body. The sensations given during tactile and kinesthetic action increase the activity of the vagus nerve which causes gastric emptying more quickly so that the baby will suckle more often. Tactile-kinesthetic stimulation with audio-visual in infants using VCO affects weight gain.

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