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The Effectiveness of Touch Therapy on Increasing Body Temperature of Low Birth Weight Babies

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ABSTRACT
Background: Low birth weight baby is one with a birth weight of less than 2500 grams. The number of premature babies is tended to increase from year to year at the MA Hanafiah Hospital Batusangkar. Low birth weight babies are at risk for hypothermia and will leads to death. Touch therapy can be considered as one method of preventing hypothermia. Objective: The study aims to determine The Effectiveness of Touch Therapy on Increasing Body Temperature of Low Birth Weight Babies. Methods: This study is a Quasy Experimental Pre-Post Test design With intervention and Control Group. Recruited 30 participants using accidental sampling methods. Data were analyzed using dependent and independent t-test. Results and discussion: The results showed that there was the effectiveness of touch therapy in increasing the body temperature of low birth weight babies (p-value = 0.00 01. Conclusion: Touch therapy is an effective way in increasing the body temperature of low birth weight babies at the MA Hanafiah Batusangkar General Hospital, Indonesia. Suggestion: Touch therapy can be an alternative to preventing hypothermia which can be applied in health services and at home.

Keywords: *low birth weight, temperature, touch therapy, premature babies*

1. INTRODUCTION

Low birth weight (LBW) babies are babies with a birth weight of fewer than 2500 grams. Low birth weight babies are one of the public health problems that get special attention because low birth weight babies will have short- and long-term consequences. The vast majority of low birth weight babies occur in low-middle income countries[1]

The number of premature babies is currently increasing. Based on the data of the World Health Organization (WHO), the incident of premature babies happens in one of ten birth. It is estimated that around 350,000 babies are born prematurely or with low birth weight in Indonesia every year. This prevalence is relatively high in Indonesia with the number of 7–14%, even in some districts, it reaches 16%, and greater than in some developing countries, namely 5-9% and 12-13% compared to the USA [2] [3]

The highest incidence of premature and low birth weight babies in West Sumatra is in Batusangkar City, as a contributor to 10% of the incidence of prematurity. MA Hanafiah Hospital Batusangkar recorded data on premature babies and low birth weight in 2007 as many as 5.1% cases. There was a significant increase in the following year. In 2008 as many as 7.7% of premature cases occurred and increased to 11.4% in 2013. MA Hanafiah General Hospital also recorded that 11.7% of premature cases occurred in 2014, and increased Drastically up to 19.5% in 2015. Data from the Perinatology Room of the MA Hanafiah Batusangkar General Hospital also noted that 113 of the 493 babies (22.9%) were premature cases that occurred from January to July 2019 [3] [4]

Babies have a relatively large surface area compared to body weight, the skin is thin and caused easily lost the body heat, has a little subcutaneous fat, has a limited capacity to generate heat, and worst ability to from the heat as the response to the sympathetic process. It becomes the

main reason for babies to be vulnerable to hypothermia[5] [6]

Body temperature is a balance between heat production and heat loss that is adjusted to the body's needs (Vaughans, 2013). Physiological and behavioral mechanisms regulate the balance between heat lost and generated, called thermoregulation. The hypothalamus detects small changes in body temperature. The anterior hypothalamus regulates heat loss, while the posterior hypothalamus regulates heat production[7] [8] [9]

Babies who experience hypothermia will be susceptible to peripheral vasoconstriction, decreased peripheral perfusion, ischemia, metabolic acidosis, increased basal metabolic rate, respiratory distress, hypokalemia, increased bacterial infections, and heart problems. The occurrence of Hypothermia among newly birth babies is Mandatory due to countless dangerous side effects from hypothermia. In the health care facilities, the risk of hypothermia is closely monitored by nurses/health care professionals but when the babies arrived home, this task will be delivered to parents and families, that is why the caregivers have to teach how to prevent hypothermia at home. One of the options to prevent hypothermia is using touch therapy. This therapy can be used as a prevention or treatment of hypothermia[10] [11] [13]

Touch therapy or low birth weight baby massage is doing massage with movements that should be slow and gentle, but not so smooth that it feels like a tickle. This massage provides tactile stimuli and kinesthetic stimuli six times in each part[13]. Touch therapy applied systematically is called massage, baby massage is expected to reduce stress levels, increase the growth and development of low birth weight babies [14] [15]. Each movement is done 6 times on each part. The sequence of massage for low birth weight babies is the first to give tactile stimuli for 5 minutes, the second to give kinesthetic stimuli for 5 minutes, and the third to give tactile stimuli for 5 minutes. The increase in temperature occurs in infants who receive therapeutic touch because it occurs transfer of heat by conduction through the touch of a hand giving a massage to decrease the loss of heat, facilitating the temperature regulation in the nervous system, and increases blood flow in the body's circulation [16] [17] [18]

Preliminary studies that have been carried out at RSU MA Hanafiah Batusangkar show that the management of premature babies at RSU MA Hanafiah Batusangkar is still conventionally by putting the baby in the incubator, providing care, as usual, giving milk according to the baby's needs, minimizing contact with the babies, and Letting the baby's to grow and develop itself and carrying out the doctor's recommendations. Touch therapy has never been done at RSU MA Hanafiah Batusangkar, while the medical record data states that there is a significant increase in the prevalence of premature babies from year to year in this general hospital.

2. METHODS

This study uses a Quasy Experimental Pre-Post Test design With intervention and Control Group. The data were collected from October 1 to November 30, 2019, at the MA Hanafiah General Hospital in Batusangkar. Thirty participants were recruited using an accidental sampling technique with inclusion criteria, infants with gestational age < 37 weeks, weight < 2500 grams, treated in an incubator with the temperature setting adjusted for the baby's gestational age and weight, heart rate 140-160 x/min, respiratory rate: 40-60 x/min. The infant who has disruption of breath, congenital abnormalities, attached to the IV line and body temperature > 37 ◦C were excluded from the study. Temperature is measured using the Infrared Carezoe thermometer model KD3356. Data were analyzed using dependent and independent t-test [19]

Babies were selected by alternating techniques to determine the type of treatment. The research process is carried out by measuring the temperature of the body before treatment, which is 3 minutes after the baby is removed from the incubator then the baby will be given touch therapy treatment for 15 minutes, followed by temperature measurements after 3 minutes of treatment ends.

3. RESULTS

3.1 Body Temperature before touch therapy

Table 1. Body Temperature before touch therapy

Variable	Mean	SD	Min-Max	95% CI
Body temperature before touch therapy	36,79	0,2333	36,40-37,00	36,66-36,92

3.2 Body temperature after touch therapy

Table 2. Body Temperature after touch therapy

Variable	Mean	SD	Min-Max	95% CI
Body temperature after touch therapy	36,96	0,238	36,60-37,40	36,83-37,09

3.3 changes in body temperature before and after touch therapy

Table 3. distribution of changes in body temperature before and after touch therapy

Variable	Mean	SD	Min-Max	95%CI
Body temperature change	0,7	0,110	0,00-0,40	0,11-0,23

3.4 Body temperature Analysis before and after touch therapy treatment

Table 4. Calcium analysis before and after intervention

Variable	Mean	SD	Std Error	P-value
Body temperature before touch therapy	36,79	0,233	0,060	0,0001
Body temperature after touch therapy	36,96	0,238	0,62	

4. DISCUSSION

Based on table 1, the average body temperature before touch therapy treatment was 36.79 o C, median 36.90 o C (95% CI: 36.66-36.92) with a standard deviation of 0.233 o C. The lowest body temperature was 36, 40 o C, and the highest body temperature was 37 o C. Based on a 95% confident interval, the average body temperature before touch therapy treatment was between 36.66 o C to 36.92 o C.

Based on table 2, the average body temperature after touch therapy treatment was 36.96 o C, median 37 o C (95% CI: 36.83-37.09) with a standard deviation of 0.238 o C. The lowest body temperature was 36.60 o C and the highest body temperature was 37.40 o C. Based on a 95% confident interval, the average body temperature after touch therapy treatment was between 36.83 o C to 37.09 o C.

Based on table 3, the average change in body temperature before and after touch therapy treatment is 0.17 o C, median 0.20 o C (95% CI: 0.11-0.23) with a standard deviation of 0.110 o C with minimum/maximum changes is 0 o C and 0.40 o C. Based on 95% confident interval, the average change in body temperature before and after touch therapy treatment is between 0.11 o C to 0.23 o C.

Based on table 4, it is found that the average body temperature before touch therapy treatment is 36.79 o C with a standard deviation of 0.233 o C. After touch therapy treatment the average body temperature is 36.96 o C with a standard deviation of 0.238 o C. It can be seen the mean difference in body temperature before and after treatment was 0.17 with a standard deviation of 0.110. The results of statistical tests obtained p-value = 0.0001, it can be concluded that touch therapy is effective in increasing the body temperature of low birth weight infants.

The mean body temperature before and after touch therapy treatment was 36.79 o C and 36.96 o C, with a mean difference was 0.17 and p = 0.0001. These findings are correlated with research conducted by Ningsih (2017) with a study sample consisting of 27 premature babies in the perinatology room of the Bangkinang Hospital who were given touch therapy without a control group. The results of temperature measurements before treatment were 36.0633 C to 36.5867 C after treatment. Another study conducted by Bayomi & El-nagger, (2016) provided massage therapy interventions on 64 premature babies. The results of this study showed a p-value of 0.01 0.05.

An increase in temperature occurs in infants receiving touch therapy because conduction heat transfer occurs through the touch of the massager's hand, thereby reducing heat loss, facilitating temperature regulation in the nervous system, and increasing blood flow in the body's circulation. This shows that there is the effectiveness of touch therapy on increasing the body temperature of low birth weight babies[20]

5. CONCLUSIONS

Touch therapy is an effective way on increasing body temperature among low birth weight babies. Applying touch therapy can be a reference for the daily care of premature babies in the health care center or even babies' home. It is necessary to teach parents or caregivers to apply this therapy to make this beneficial method widely used in the community.

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