

The Influence of Massage Therapy on Children Body Temperature which Fever

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Abstract

Massage is the oldest touch therapy known to man. With massage is expected to improve the evaporation process by widening blood vessels and opening pores in the child's body so that fever is expected to quickly go down. This study aims to identify whether there is an effect of massage therapy on the body temperature of children who have a fever. This research used pre and posttest control group design. Research location in Hospital Dr. Soekardjo Tasikmalaya. The sample size were 41 people. The result was a significant difference in the average body temperature before and after the compress (p-value=0.000) and massage therapy (p-value=0.000) in both the first and second measurements. Comparison of temperature reduction before and after the compress and massage therapy results were significant at first measurement (p-value=0.002) but not significant in the second measurement (p-value=0.0388). It is expected that nurses on duty in the children's room can increase the participation of families in handling health in children, especially children with fever. And for researchers, further research should be done regarding massage therapy with the use of topical alternative medicine to further enrich family knowledge in the management of sick children.

Keywords: *child fever; warm compresses; body temperature; massage therapy*

Introduction

Fever is a clinical sign of a disease in children. These health problems are often faced by health workers. Traditionally fever is defined as an increase in body temperature above normal. Many parents consider fever dangerous for children's health because it can cause seizures and brain damage⁽¹⁾. Body temperature in the condition of fever can be used as one important measure that can give clues about the deterioration or improvement of the patient's condition⁽²⁾.

Fever refers to an increase in body temperature as a result of infection or inflammation in response to microbial invasion, certain white blood cells secrete a chemical known as endogenous pyrogen which has many effects to fight infection⁽³⁾. Fever is a condition where an increase in temperature up to 38⁰ C or more. There also are taking limits of more than 37.8⁰ C. Meanwhile, when a temperature greater than 40⁰ C is called a high

fever/hyperpyrexia⁽²⁾. Broadly speaking there are two categories of fever namely infectious fever and non-infectious fever. Fever infection is the fever that occurs as the body's response to an increase in *set-point* such as flu, sore throat, mumps, measles, scarlet fever, fever, *typhoid* and so on. Non-infectious fever is an increase in body temperature due to excessive heat formation but not accompanied by an increase in *s-points* such as in patients with mumps/aspirin poisoning⁽⁴⁾. WHO stated the number of fever cases around the world reached 18-34 million. Children are the most susceptible to fever, although symptoms experienced by children are lighter than adults. In almost all endemic areas, the incidence of fever mostly occurs in children aged 5-19 years⁽⁵⁾.

Many ways are done to treat fever. The most commonly used method is, of course, taking fever-lowering drugs such as paracetamol or ibuprofen. Also, of course, treat the cause of fever, if due to infection by bacteria then given antibiotics to kill bacteria. But medicine alone is not enough, so compresses are needed to help reduce fever⁽⁶⁾. The factors that can be used in decreasing debris body temperature include traditional medicines, antipyretic drugs, and hot and cold compresses⁽⁷⁾. Wet warm compresses, dry warm compresses (bladder), wet cold compresses (water

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ordinary), dry cold compresses (ice crates), electric pillows and blankets, irradiation lamps, hot arcs⁽⁸⁾. Warm compresses are a method for lowering body temperature⁽⁹⁾. By the receptor temperature in the body, then a decrease in body temperature by cooling can be done on the hypothalamus, spinal cord, abdominal organs and around large veins⁽¹⁾. In addition to warm compresses, another traditional therapy for handling fever is by massage or massage. Massage is the oldest touch therapy known to man. Touch and massage in infants known as a *baby massage* after birth can assure ongoing body contact that can maintain a feeling of security in the baby⁽⁴⁾.

Massage has been practiced almost all over the world since a long time ago including in Indonesia. The art of massage is taught from generation to generation, although it is not known how massage and touch can have such a positive effect on the human body. The positive influence of touch on the process of growth and development of children has long been known to humans. But scientific research on this matter is still not much done. Although it still needs further research, the findings that have been produced have become the basis for routine baby massage to maintain a baby's health. Especially because this baby massage is cheap, easy, and is commonly done in Indonesia so it is not a new thing for our culture⁽¹⁰⁾. The results of Mardianti and Komalasari's research⁽¹⁰⁾ on the effect of massage therapy on the frequency of breastfeeding were carried out in 60 infants aged 1-3 months using a quasi-experimental design. there was no effect of massage therapy on the duration of breastfeeding (p-value=0.563).

Research on the effects of massage with coconut oil versus mineral oil and placebo (powder) on growth speed and behavior in premature babies⁽²⁾. Premature babies are randomized to receive a good massage with palm oil, minerals or powder. Massage oil is given by a trained person four times a day until discharge and subsequently by the mother until the baby is 31 days old. The result is that coconut oil massage produces a significantly greater

speed of weight gain compared to increases in mineral oil and powder in the premature baby group.

In the literature review written by Field⁽³⁾ about massage methods with kinesthetic and tactile touches, there is evidence that massage therapy influences weight gain, especially for premature babies, this has been applied in various countries including⁽¹⁾ in the Philippines, a group of experts Neonatologists reported a 47% increase in weight gain after the Field massage procedure.

Method

This research used pre-test and post-test with control design, where this design compares the difference between before and after being given compresses and antipyretics in the control group and the difference between before and after being given antipyretics and massage therapy in the experimental group. The experimental group performed massage therapy twice a day for 5 minutes after the antipyretic administration⁽¹¹⁾. Body temperature measurements were carried out before and after the experiment using a calibrated digital thermometer. The difference between before and after the experiment is assumed to be the effect of the experiment Group 1 was referred to as the control group that only received antipyretic and compress administration, while group 2 was called the experimental group that received antipyretic and massage therapy⁽¹²⁾. The sample was toddler-aged children who had a fever and were treated at Dr. Soekardjo Tasikmalaya in August to October 2019. The research instrument used was the SOP for the implementation of massage therapy and observation guidelines for the measurement of body temperature. Data were analyzed using paired t-test and independent t-test.

Findings

Table 1 shows the average body temperature before the intervention.

Table 1. Body temperature before the intervention

Group	Mean	SD	Min-Max	95%-CI
First measurement				
Control	38.5	0.8498	37.3-40.2	38.102-38.898
Experimental	38.586	0.6077	37.4-39.5	38.309-38.862
Second measurement				
Control	38.175	0.5288	37.5-39.6	37.840-38.322
Experimental	38.081	0.6750	37.2-39.5	37.859-38.491

After the intervention, body temperature in each group experienced changes, as shown in the following table 2.

Table 2. Body temperature after the intervention

Group	Mean	SD	Min-Max	95%-CI
First measurement				
Control	38.150	0.6194	37.5-39.6	37.860-38.440
Experimental	37.457	0.7096	36.0-38.5	37.134-37.780
Second measurement				
Control	37.2	0.8985	36.0-38.5	36.779-37.621
Experimental	36.995	0.5491	36.2-38.0	36.745-37.245

The results of the normality test is described in Table 3.

Table 3. The result of normality test

Body temperature	Shapiro-Wilk	Skewness
Before intervention	0.116	1.37
After intervention	0.09	1.10

The normality test based on Shapiro-Wilk on body temperature before intervention was 0.016, so the data was normally distributed, as well as the results of the division between skewness and standard error, the result was 1.37, which means that the data was normally distributed (Table 3).

Table 4. The Differences of Body Temperature in the Control Group

Measurement	Mean	SD	SE	Mean.diff	p-value
First					
• Before	38.500	0.8498	0.1900	38.500	0.000
• After	38.150	0.6194	0.1385	38.150	
Second					
• Before	38.175	0.6750	0.1509	38.175	0.000
• After	37.200	0.8985	0.2009	37.200	

Table 5. The Differences of Body Temperature in the Control Group

Measurement	Mean	SD	SE	Mean.diff	p-value
First					
• Before	38.585	0.6077	0.1326	38.585	0.000
• After	37.457	0.7096	0.1549	37.457	
Second					
• Before	38.081	0.5288	0.1154	38.081	0.000
• After	36.995	0.5491	0.1198	36.995	

Table 6. The Differences of Body Temperature Before and After Intervention in Control and Experimental Groups

Body temperature	Action	Mean	SD	Mean.diff	SD.diff	P-value
First	Before	38.50 38.586	0.8498 0.6077	-0.0857	0.2317	0.0714
	After	38.150 37.457	0.6194 0.7096	0.6929	0.2078	0.002
Second	Before	38.175 38.081	0.6750 0.5288	0.0940	0.1900	0.0624
	After	37.200 36.995	0.8985 0.5491	0.2048	0.2339	0.0388

Discussion

Compress and its effect on body temperature

The rationale for compressing is the conduction method, which is the heat transfer of another object by direct contact. When warm skin touches the warm, there will be heat transfer through evaporation, so that the transfer of heat energy becomes gas⁽¹⁴⁾. The body temperature of the first measurement in the control group before compressing was 38.500°C, while after a compress was 38,150°C. From T-test obtained p-value=0.000 (there is a significant difference in body temperature before intervention in the control group). At the second measurement, body temperature before compressing 38.175°C, while after the pack was 37.200°C. The mean difference in the first measurement was 0.350, meaning that the respondent experienced a change in temperature of 0.350 points as a result of the action taken. Likewise in the second measurement, the mean difference was 0.975, which means that there was

a change in temperature of 0.975 points after the fever was compressed. The T-test obtained p-value=0.000 (there is significant differences in body temperature before intervention in the control group). This is in line with research conducted by^{(8),(9)} who have all proven the effectiveness of giving compresses to children with fever through the tepid sponge or compress method plus alternative medicine.

Massage therapy and its effect on body temperature

Touch therapy or massage has been used since ancient times, at least since 1800 BC massage was the main form of treatment before the advent of the pharmaceutical era in around 1940. Touches in particular that contain elements of emphasis are known to have a variety of positive effects such as reducing oxygen demand and giving a feeling of being comfortable and being loved. A Cochrane meta-analysis found evidence suggestive that infant massage can increase the interaction and affinity

of the baby with the mother, improve sleep quality, reduce the baby's crying, and have a beneficial effect on stress hormones. But unfortunately, there is not enough evidence to support the positive impact of massage on changes in body temperature in children with fever. The mother is the parent closest to the child, where the mother's message to her child is gentle stroking of the fabric of affection. The mother's skin is the earliest skin recognized by a child. Touch and massage given by the mother is a form of communication that can build closeness between mother and child by combining eye contact, smile, facial expression. If the stimulation is often given, the mutual love relationship between mother and child will be stronger⁽¹⁵⁾. The purpose of massaging the body is to expedite the flow of blood so that we can feel the sensation of the body that gets better afterward.

In the research that has been done, the body temperature in children with fever has experienced the following changes in the first measurement of the average body temperature before doing massage therapy was 38.585 °C, while body temperature after massage therapy was 37.457 °C. The T-test obtained p-value=0.000 (there is significant differences in body temperature before and after massage on the first measurement. In the second measurement, the body temperature was 38.081 °C, while after massage was 36.995 °C. The mean difference in the first measurement is smaller than in the second measurement. This is possible because in the second measurement the respondent's initial temperature is the result of the previous intervention and the respondent has done massage intervention twice. The T-test obtained p-value of 0.000 (there is a significant difference in body temperature before and after massage therapy in the second measurement).

The results obtained in the first measurement of the control group before compressing was 38.50 and the intervention group was 38.586. The mean difference was -0.0857 (the mean of the experimental group was higher by 0.0857 points compared to the control group), so that the significance obtained by 0.714 meant that there was no significant difference in the respondent's initial temperature in the two groups prior to the intervention. Significant results were obtained in statistical testing after the intervention both in the control group and the experimental group (p-value =0.002). The mean difference was 0.6929 (massage therapy can make changes to a body temperature of 0.6929 points compared to the group of respondents who get compresses).

As in the first measurement, in the second measurement, the mean difference between the control and intervention groups before the intervention was 0.0940 (there was no differences in the initial temperatures of the two groups (p-value=0.624). This is possible because in both the control group and the experimental group the initial temperature is obtained a few hours after each respondent gets the intervention on the first measurement.

The difference in mean after administration of the action was 0.2048 while the significance of p-value=0.388 (there was no difference in the administration of massage therapy compared with the provision of compresses in reducing the temperature of children during fever). This result is not in line with the theory put forward by⁽⁵⁾ which states that massage in children is not permitted when children have a fever because it can cause hypermetabolism and excessive vasodilation in blood vessels. Massage in children can also cause a decrease in temperature so that it can be used as a non-pharmacological alternative in handling child fever.

Conclusion

The conclusion are:

1. There is significant differences in body temperature in the first and second measurements before and after the intervention was carried out in both the compressed group and the massage therapy group.
2. There is significant difference in the mean body temperature after the intervention in the compressed group compared with the massage therapy group at the first measurement.
3. There was no significant difference in mean body temperature after the intervention in the compressed group compared with the massage therapy group on the second measurement.

The suggestions are:

1. The hospital as a means of providing health services should be able to implement a policy that massage therapy can be an alternative antipyretic companion in handling fever in children.
2. Nurses on duty in the children's room are expected to increase the role of families in handling health in children, especially children with fever.

3. For researchers, further research should be done regarding massage therapy with the use of topical alternative medicine to further enrich family knowledge in the management of sick children.

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Ethical Celarance-Yes

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