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INFLUENCE SWEDISH MASSAGE ON THE QUALITY OF THALASSEMIA BETA MAYOR CHILDREN

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Abstract: *Massage is one of the nursing interventions carried out by a nurse in providing nursing care in providing a sense of comfort to the patient. The purpose of this study was to determine the effect of Swiss massage on the sleep quality of children with thalassemia major. This research is a quasi-experiment with the nonequivalent type of control group, before-after design. The quality of children's sleep uses the Sleep Disturbance Scale for Children (SDSC). The results showed that there were differences in sleep quality in the intervention group before and after massage therapy (0.005 at $\alpha = 5$). The results of the study recommend that massage therapy can be performed in children with thalassemia and as an alternative method of providing nursing interventions with impaired rest and sleep needs in children with thalassemia major.*

Keywords: *Sleep quality, thalassemia major, massage therapy*

INTRODUCTION

Thalassemia disease is found worldwide with the highest prevalence of thalassemia genes in several tropical countries (Soni et al., 2016). Based on its spread, thalassemia is mostly experienced by children in the Mediterranean and Middle East regions. The largest prevalence of thalassemia in the world is in the country of Maldives with a percentage of the population carrying the thalassemia gene (thalassemia carrier) by 18% (Cao & Galanello, 2010). The incidence of thalassemia is also the highest in Southeast Asia (Galanello & Origa, 2010). One of them is in Indonesia, where the prevalence of the population carrying the thalassemia gene in Indonesia ranges from 6-10% of the total population. There are 9,121 thalassemia major patients in Indonesia (Muncie & Campbell, 2009).

Side effects of iron chelation therapy and continuous transfusion cause accumulation in various organs, especially the skin, heart, liver, and endocrine glands, resulting in cardiomyopathy, bleeding due to liver damage, diabetes mellitus, growth disorders, such as short stature, infertility, hypogonadism, black skin and altered face shape known as facies Cooley, accompanied by osteoporosis, may even develop pathological fractures. You can also get an enlarged spleen and liver, causing the stomach of children with thalassemia to look large. The buildup of iron in organs such as the liver and heart is very dangerous because it can cause death. Patients with thalassemia usually have a small, thin, and short stature, this can be caused by a persistent lack of oxygen to the tissues. Also, an enlarged spleen causes a decrease in appetite. All of these conditions cause impaired absorption and use of nutritional substances which in turn cause growth disorders as well as decreased immunity and cause the quality of rest and sleep for children to be disturbed (Szentkirályi & Novák, 2013).

Based on research conducted by (Cohen et al., 2004) regarding a descriptive epidemiological study of thalassemia, it is shown that around 87.5% of thalassemia sufferers undergo blood transfusions once a month. Recent studies have evaluated the benefits of maintaining Hb levels above 10 g/dl, a goal that requires therapy transfusion every 3 weeks. The advantage of doing this therapy include improvements in physical and psychological health because the child can participate in normal activities. The condition of anemia and provision of transfusion in long term in young thalassemia affects not only physical functioning but also affects the conditions of psychological, emotional, integrity, and behavior (Thein, 2013). Research conducted at the Sanglah Hospital in Bali to prove that 37,5% of the children who experience chronic disease experience behavior problems, also, a manifestation of clinically experienced by the child will affect the behavior (Davoudi-Kiakalayeh et al., 2017). It will also have an impact on the sleep needs of children because usually,

the child with thalassemia is evident and easily tired so that the child rest more and sleep. Research conducted by (Chu et al., 2015) for an Overview of Sleep Disorders in Children Thalassemia in the Installation of Central Thalassemia and Hemophilia HOSPITAL dr. Zainal Abidin Banda Aceh identifies the child's condition thalassemia experience interruption of sleep of 9.7 %.

Nurses as health professionals are responsible for providing quality nursing services to handle problems and complaints that occur in children with thalassemia. Currently, there are various types of interventions to address the need for rest in children with sick conditions. One of the nursing intervention approaches given can be in the form of complementary therapy. Various complementary therapies that can be carried out in nursing interventions include traditional healing such as ayuveda and acupuncture, physical therapy such as chiropractic, massage and yoga, homeopathy or herbal remedies, energy use such as polaristic or reiki therapy, relaxation techniques, including meditation and visualization.

Massage is one of the nursing interventions carried out by a nurse in providing nursing care in providing a sense of comfort to the patient. Children with comfortable conditions in improving the quality of children's sleep and improving the quality of life of children. This is corroborated by research conducted by (Silberstein, 2008) Conservative therapy using Swedish massage which is done on children with leukemia can reduce pain in the muscles, increase relaxation, reduce heart rate, blood pressure, depression, and improve sleep quality in deep salvo (Davoudi-Kiakalayeh et al., 2017).

Complementary therapy as a treatment, level of prevention, and health promotion efforts include health systems, modalities, practice in the presence of theory and beliefs by adjusting habits. and the existing culture (Cao & Galanello, 2010). Research on the effectiveness of massage therapy carried out in children with thalassemia is still limited so that although massage therapy provides a promising option for various pediatric populations with thalassemia, it is rarely included in inpatient care plans and there are still few data on the focus of the hematological patient population.

LITERATURE REVIEW

Thalassemia

Thalassemia is a hereditary disease caused by failure to form one of the four amino acid chains that make up hemoglobin, so that hemoglobin is not fully formed. The body cannot form normal red blood cells, so that red blood cells are easily damaged or have a short life of fewer than 120 days, and anemia results (Soni et al., 2016).

Hemoglobin is a substance in red blood cells that functions to transport acids from the lungs throughout the body, as well as to give red color to erythrocytes. Human hemoglobin consists of hem and globin compounds. Hem consists of iron (Fe) and globin is a protein consisting of polypeptide chains. Hemoglobin in normal humans consists of 2 alpha (α) chains and 2 beta (β) chains which include HbA ($\alpha_2\beta_2 = 97\%$), partly HbA2 ($\alpha_2\delta_2 = 2.5\%$) the rest HbF ($\alpha_2\gamma_2 = 0.5\%$).

The Globin chain is a protein, so its synthesis is controlled by a gene. Two groups of genes that regulate the α -globin gene cluster are located on chromosome 16 and the β -globin gene cluster is located on chromosome 11. Thalassemia is inherited through a gene known as the beta-globin gene. This beta-globin gene regulates the formation of one of the components that make up hemoglobin. The only beta-globin gene that has the disorder is called a beta-thalassemia carrier. A thalassemia carrier looks normal or healthy because it still has 1 part of the gene in normal conditions and can function properly and rarely requires treatment. Globin gene abnormalities that occur on both chromosomes are called thalassemia major patients who come from both parents who each carry thalassemia traits. In the fertilization process, the child only gets one beta-globin gene from the mother and one from the father. One of the parents suffering from trait / congenital thalassemia, the chances are 50% healthy and 50% trait thalassemia. Both parents with trait thalassemia are 25% healthy, 25% thalassemia major, and 50% trait thalassemia children (Muncie & Campbell, 2009).

Blood products

According to (Palavecino et al., 2004), blood products are stored in plastic bags containing anticoagulants, such as citrate, phosphate, and dextrose. Blood is stored at 4 - 6 oC. Storage time depends on the type of preservative. Various types of blood products for transfusion are among others.

- A. Washed Erythrocyte (WE). One bag of WE is obtained by washing the packed red cells 2-3 times with saline, the remaining plasma is wasted. Useful for patients who cannot be given human plasma. The weakness of the washed red cell is the danger of secondary infection that occurs during the process and its

short shelf life (4-6 hours). WE are used in the treatment of acquired hemolytic anemia and exchange transfusion. For patients allergic to plasma protein as much as 1 g / dL or Ht as much as 3-4%.

- B. Packed red cell (PRC) contains erythrocytes, platelets, leukocytes, and a small amount of plasma. The hematocrit value is 60 - 70%. One PRC bag (150 - 300 ml) consists of 100-200 ml erythrocytes. This blood product is used in conditions that require the addition of only red blood cells.

Child

(Bibok et al., 2009) The limitations regarding childhood were found to vary considerably. In the current view that is commonly adopted in developed countries, the term early childhood (early childhood) is a child between the ages of 0-8 years. However, if it is seen from the level of education that applies in Indonesia, then those included in the early childhood group are low-grade elementary school-age children (grades 1-3), kindergarten, playgroup, and children. previous period (infancy).

Childhood is divided into the prenatal period and postnatal. The prenatal period included the phases of the embryo (0-1 week intrauterine) and the phase of the fetus (10 minutes of birth). While the graduate program consists of the baby phase (01 Year), the Stage of the Drama (1-3 years), phase preschool (3-6 years), and phase of school (6-12 years). Children of preschool age (3-6 years old) are children in a sensitive period or time-sensitive, The period in which certain functions need to be stimulated, so it is not too late growth and development (Bhadoria et al., 2015).

Sleep

5 Sleep is a state that is repeated, a change in the state of consciousness that occurs during a certain period. Sleep is characterized by minimal activity, varying levels of consciousness, changes in body physiological processes, and decreased response to external stimuli (Szentkirályi & Novák, 2013).

11 Sleep physiology can be divided into two types: rapid eye movement (REM) and non-REM (NREM) sleep (Szentkirályi & Novák, 2013). These two types are defined by differences in electroencephalogram (EEG) patterns, eye movements, and muscle tone. NREM sleep consists of three or four stages, depending on the selection criteria. Stage 1 is observed in the transition between waking and sleeping. Stage 2 is characterized by frequent sleep spindles on slow-spike EEG and K-complex rhythm activity. Stages 3 and 4 are known as slow-wave sleep (SWS) and are characterized by continuous high-voltage EEG activity predominantly over the slowest frequency range. The current recommendations for sleep assessment use two stages combined into one (Chu et al., 2015).

15 Swedish Massage

A Swedish massage is a classic form of western massage technique with a method of manipulating soft tissues including five movements, namely effleurage, petrissage, friction, tapotement, and vibration (Field, 2016). Swedish massage is a gentle and superficial massage technique from light to strong pressure focusing on maintaining health and relaxation (Ernst, 2003). Meanwhile, (Ernst, 2003) defines Swedish massage as a massage technique that focuses on relaxation and improves blood circulation by involving muscles.

The role of the nurse

The American Nurses Association acknowledges that massage therapy is part of the specialty of nursing and The National Association of Nurse Massage Therapies (Simpson, 2009) supports the use of touch therapy in patients who aim for healing based on existing research. According to (Aranda & Law, 2007) effleurage movements taught and carried out by nurses can increase comfort, relaxation, sleep quality, and reduce anxiety in sick patients.

According to (Moyer et al., 2004) massage has been carried out by nurses in nursing practice and is part of nursing practice in providing holistic nursing care where the use of touch is used in healing. On this basis, several studies confirm and confirm that massage originates from nursing in the framework of achieving nursing (Naylor & Kurtzman, 2010).

19 Massage interventions have been listed in the Nursing Interventions Classification (NIC). According to (Butcher et al., 2018) massage is described as a nursing intervention to stimulate the skin and under the tissue with a varying degree of movement and pressure from the hand to reduce pain, produce relaxation and improve circulation.

RESEARCH METHODOLOGY

The design used in this study was a quasi-experimental type of nonequivalent control group, before-after design (Hastjarjo, 2019). This study used a purposive sampling technique with inclusion criteria in this study were children with thalassemia betha, had no history of trauma, fractures in the neck, chest, back, and extremities had no trauma to the back, chest, and extremities, were able to supine mobility. dam prone, resides in the city of Cirebon and does not plan to leave the city during the research, and is willing to be a respondent.

Population in this research is all the children with thalassemia beta which is treated in the Hematology, Oncology, and Tumor (HOT) in hospitals Gunung Jati Cirebon City with a total sample of 17 respondents. The research was conducted in February.d September 2018.

Research instruments to measure the quality of the child's sleep using a scale of sleep disorders for children (SDSC), which is designed by (Valko et al., 2008). Massage research involving older people with thalassemia train how to massage elderly patients with thalassemia, Each parent is trained in massage with demonstration techniques, each participant performs massage movements repeatedly until they understand and are not mistaken in doing massage movements, training participants take turns with each other until the parents can massage properly. Massage movement using 2 movements, namely effleurage and petrissage. Movement and friction and tapotement are not done with a balance, making it easier for parents to do massage and reduce the incidence of injury in children with thalassemia. Massage movements are carried out on the legs and back of the child by repeating for 8 times, for 6 consecutive days, with the implementation of the massage at night before the child goes to bed. To see massage activities, parents are required to do video participation during massage on children for 6 consecutive days and sent to the researcher. Researchers took measurements of early sleep quality. The sleep quality examination of the intervention group was carried out before the first massage treatment and after the last massage. Whereas the control group of the respondents' parents was only advised to do the stroking motion for 6 consecutive days if the child had trouble sleeping, the sleep quality score assessment was carried out at the beginning of the meeting and the 6th meeting, the control group was taught massage after the second day of meeting to measure sleep scores.

RESULTS AND DISCUSSION

Respondent characteristics

The description of the characteristics of respondents based on age, sex, frequency of transfusion, type of blood transfusion, blood pressure, respiration, pulse, and temperature can be seen in Table 1 below:

**Table 1. Distribution of respondents
(n1 = 17, n2 = 17)**

Variable	Group				Total	%
	Intervention	%	Control	%		
Age (years)						
5-12	10	58.8%	10	58.8%	20	58.8%
> 12-18	7	41.2%	7	41.2%	14	41.2%
Gender						
Male	5	29.4%	11	64.7%	16	47.1%
Women	12	70.6%	6	35.3%	18	52.9%
Transfusion Frequency						
1 time	5	29.4%	7	41.2%	12	35.3%
2 times	12	70.6%	10	58.8%	22	64.7%
Blood type						
PRC	11	64.7%	9	52.9%	20	58.8%
WE	6	35.3%	8	47.1%	14	41.2%
Blood pressure						
Hypotension	4	23.5%	3	17.6%	7	20.6%

Normal	13	76.5%	14	82.4%	27	79.4%
Respiration						
Normal	17	100.0%	17	100.0%	34	100.0%
Pulse						
Normal	17	100.0%	17	100.0%	34	100.0%
Temperature						
Normal	17	100.0%	17	100.0%	34	100.0%

The largest proportion of respondents' age was 20 children (58.8%), with the same distribution of 10 people (50%) in the intervention group and control group, 18 people (52.9%) female sex with the distribution of 12 people (70.6%) in the intervention group and 6 people (35.3%) in the control group. In the history of transfusion frequency, 22 respondents (64.7%) had transfusions twice a month with a distribution of 12 people (70.6%) in the intervention group and 10 people (58.8%) in the control group. While the largest proportion of respondents were given transfusions with PRC blood type as many as 20 people (58.8%) with a distribution of 11 people (64.7%) in the intervention group and 9 people (52.9%) in the control group. Measurement of vital signs in children with thalassemia before and after treatment showed that most blood pressures were in normal conditions as many as 27 people (79.4%) with a distribution of 13 people (76.5%) in the intervention group and 14 people (82.4%) in the control group. . Whereas respiration, pulse and temperature showed 34 (100%) respondents, either control or normal respondents

Sleep score before and after the massage

The sleep score of the respondents was measured using the SDSC instrument (Sleep Disturbances Scale for Children) by measuring sleep scores before and after the massage intervention was carried out, the sleep score was divided into 3, namely sleep disturbance (total score > 70), borderline (total score 50 -70), and no sleep disturbance (total score <50) which can be seen in Table 2 below:

Table 2 sleep scores before and after massage
(n1 = 17, n2 = 17)

Variable	Group				Total	%
	Intervention	%	Control	%		
Sleep Score Before Massage						
<70	4	23.5%	4	23.5%	8	23.5%
50-70	9	52.9%	13	76.5%	22	64.7%
<50	4	23.5%	0	.0%	4	11.8%
Sleep Score Seth Massage						
<70	0	.0%	3	17.6%	3	8.8%
50-70	3	17.6%	11	64.7%	11	41.2%
<50	14	82.4%	3	17.6%	4	50.0%

Sleep scores before a massage in the intervention group experienced borderline sleep disorders as many as 9 people (52.9%) while in the control group 13 people experienced borderline sleep disorders (76.5%). Sleep score after massage in the intervention group 14 people (82.4%) did not experience sleep disturbances, while in the control group 11 people (64.7%) experienced borderline sleep disorders. The highest total score before the massage was 22 people (64.7%) with borderline disorders, while the total score after massage 17 people (50%) who did not experience sleep problems.

The average difference in sleep quality scores before the massage

The comparison of the mean differences in sleep scores before the intervention in the intervention group and the control group can be seen in Table 3 below:

Table 3.
Comparison of mean sleep quality scores before the intervention

Variable	Group	Average	Standard Deviation	<i>p-Value</i>
Sleep score before intervention	Intervention	59.9	9.91	0.075
	Control	65.4	5.05	

The mean sleep score in the intervention group before the massage was 59.9 with a standard deviation of 9.91. The results showed that there was no significant difference in the first measurement sleep score (before the massage intervention) in the control group and the intervention group ($p\text{-value} = 0.075$).

The mean difference in sleep quality scores after the massage

The comparison of the average sleep score after massage intervention in the intervention group and the control group can be seen in Table 4 as follows:

Table 4. Comparison of mean sleep quality scores after intervention

Variable	Group	Average	Standard Deviation	<i>p-Value</i>
Sleep score after intervention	Intervention	33.8	3.83	0.0383
	Control	59.3	8.16	

The average sleep score in the intervention group after giving the massage was 33.8 with a standard deviation of 3.83, while in the control group that was not given massage the average score was 59.3 with a standard deviation of 8.16. Further analysis showed a significant difference in the average sleep score after the intervention between the group that was given a massage and the group that was not given massage ($p\text{-value} = 0.0383$). Therefore it can be concluded that at the 95% confidence level it is believed that there is a significant difference between sleep scores in the control group and the intervention group after giving a massage ($p\text{-value} = 0.0383$).

The average difference in the difference in sleep quality scores

The comparison of the average difference in sleep scores between the scores after the intervention minus the pre-intervention scores in the two groups based on the independent t-test is shown in Table 5 below;

Table 5.
Comparison of the mean sleep quality scores of thalassemia children

Variable	Group	Average	Standard Deviation	<i>p-Value</i>
The difference in sleep scores	Intervention	0.76	0.43	0.05
	Control	1.00	0.61	

The average difference in sleep scores before and after the intervention in the two groups. In the intervention group, there was a difference of 0.76 with a standard deviation of 0.43. In the control group, the average difference in sleep scores resulted in a value of 1.00 with a standard deviation of 0.61. The results of the further analysis showed that there was a significant difference in the difference in sleep scores between the intervention group and the control group. Based on the results of these tests, it can be concluded that at a 95%

confidence level massage intervention is effective in reducing or reducing sleep problems in thalassemic children with an average reduction of 0.76.

DISCUSSION

The results of the research that has been conducted found that children with thalassemia before performing a blood transfusion Borderline 17 (42,5%), impaired sleep 8 people (20%), whereas when after doing a blood transfusion Borderline of 15 people (37,5%), sleep disorders 0 people (0%). Can be aware that there are children with thalassemia who are experiencing sleep disorders before performing a blood transfusion. The results of the research that has been conducted by (Arnulf et al., 2014) for an Overview of Sleep Disorders in Children Thalassemia in the Installation of Central Thalassemia and Hemophilia HOSPITAL dr. Zainal Abidin Banda Aceh, which states that a child with thalassemia who are experiencing sleep disorder of 9.7 %, borderline 35,5%, are not sleep disorders of 54.8%. Children with thalassemia before performing a blood transfusion appears to look tired and jaded. According to (Thein, 2005) the one that causes a person to sleep disorders is weariness, tired also affects the sleep patterns of a person. The more tired someone is the shorter period of REM sleep (paradoxical) first. The child's condition thalassemia tired due to lack of hemoglobin levels in the blood likely can be the cause of the sleep disturbances that occur before a blood transfusion. The state of the Children with thalassemia who have undergone a blood transfusion using the PRC is likely hemoglobin levels in the blood can be met so that oxygen can be channeled to all parts of the body which is characterized by the pulse, temperature, respiration within normal limits, these circumstances support the child for better sleep. As has been suggested (Thein, 2005) benefits of therapy Blood Transfusion, include improvements in the physical and psychological health of the child because the child can participate in normal activities. Sleep is one of the normal activities carried out by children in general and children with thalassemia.

The results of the further analysis showed that there was a significant difference in sleep quality scores (p-value 0.05) between the intervention group and the control group. Based on the results of these tests, it can be concluded that the 95% confidence degree of massage Swedish intervention is effective in reducing or reducing sleep disturbances in thalassemic children with an average reduction of 0.76. Thus it can be said that the provision of massage therapy affects reducing sleep scores. In this study, respondents who previously experienced sleep disturbances, after being given massage therapy, no longer experienced sleep disturbances. Based on the recognition of the respondent's parents, after the massage for 6 consecutive days, the child did not experience sleep disturbances. The results of research conducted by (Vellieux & d'Ortho, 2020) in Iran showed that 58 thalassemia major respondents experienced Restless Legs Syndrome (RLS). Restless Legs Syndrome (RLS) is the underlying etiology of sleep disorder thalassemiemia major patients. During this period it becomes very important to require supportive care such as Swedish massage therapy, to reduce complaints and side effects from the treatment of thalassemia or secondary diseases that accompany (Thein, 2005).

The influence of massage therapy on the sleep quality of thalassemia children is by (Field, 2016) that one of the direct benefits of massage is total relaxation and calmness, which can provide comfort while sleeping, this is because massage works directly on the skin, where the skin is an organ. the largest body of a human being and filled with nerve endings. Massage can also trigger the release of endorphins, brain chemicals (neurotransmitters) that produce feelings of comfort. Meanwhile, (Ernst, 2003) states that the direct mechanical effect of rhythmic pressure and the movements used in massage dramatically increases blood flow.

Other factors that influence the effectiveness of Swedish massage therapy in the intervention group include the beliefs of the child and parents when they first receive Swedish massage therapy as a treatment that can reduce some physical complaints. The biggest support factor shown from parents is the basis for children to have the hope of living a longer life. Also, this therapy requires a process of closeness (fostering trust) between nurses and children who tend to feel afraid of being treated, this success becomes a stage that makes it easier for health workers to improve health promotion.

CONCLUSION

Thalassemia is a group of inherited hematological disorders due to defects in the synthesis of one or more globin chains, usually, thalassemia sufferers require supportive therapy to maintain their condition. One of the supportive therapies for interpretation and chelation therapy for thalassemia sufferers is Massage, which is a nursing intervention for thalassemic children. Massage in children with thalassemia is carried out to break down sleep disorders in children so that children get more rest and sleep. Sleep is a process of changing consciousness that occurs repeatedly over a certain period. Sleep disturbance is a group of conditions characterized by

disturbances in the amount, quality, or time of sleep in an individual. One of the methods used to screen sleep disorders is the SDSC (Sleep Disturbances Scale for Children). The purpose of this study was to determine the effect of Swedish massage on children with thalassemia.

This study suggests that in nursing practice, nurses can use Swedish massage as a complementary therapy and is an independent nursing action to meet the sleep needs of children with thalassemia to improve the quality of life of children with thalassemia. Application in nursing practice services in hospitals requires standard operating procedures that make nurses and patients comfortable, nurses who are given training on massage, especially in thalassemic children.

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