

THE USE OF SWADDLING AND SKIN WRAP IN REGULATION OF BODY TEMPERATURE OF PREMATURE BABIES

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ABSTRACT

This study aims to determine the effectiveness of using swaddling and skin wrap in regulating the body temperature of premature babies in the NICU room of RSHD Kota Bengkulu. The research method used is quasi-experimental with the design of this study using two group pretest posttest. The results showed that the average body temperature of premature babies in the NICU room of RSHD Kota Bengkulu before using swaddling was 35.89⁰C. After using swaddling the average body temperature of premature babies increased to 37.04^oC. The average body temperature of premature babies before using skin wrap was 35.93⁰C and after using skin wrap the average body temperature of premature babies increased to 37.18⁰C. The results of the analysis using paired sample t-test obtained a p-value of 0.000 <0.05. In conclusion, the use of swaddling and skin wrap is effective in regulating the body temperature of premature babies in the NICU room of RSHD Kota Bengkulu.

Keywords: Premature Babies, Swaddling, Skin Wrap

INTRODUCTION

A premature baby is a baby born before the 37th week of pregnancy. For several weeks, the neonate undergoes a transition from intrauterine to extrauterine life and adjusts to the new environment. Most mature neonates (mature gestational age) and mothers who have had healthy pregnancies and low-risk deliveries, to reach this transition period is relatively easy. At this time often occurs such as problems that often arise in premature babies are respiratory disorders, prematurity, sepsis, icterus and hypothermia (Basyariah et al., 2023).

Hypothermia is a medical disorder that occurs in the baby's body, resulting in a decrease in temperature because the body is unable to produce heat to replace the body heat lost quickly. Hypothermia causes changes in the body's metabolism that will cause heart failure, if the baby is left in a room temperature of 25^oC, the baby will experience hypothermia through evaporation, convection and radiation of 200 calories/Kg BB/minute. This will result in a decrease in body temperature of 2^oC within 15 minutes (Zebua et al., 2024).

Early clinical signs of hypothermia include cold feet, weak sucking ability, reduced activity, weak crying. If hypothermia continues, cold injury will occur, characterized by reduced activity, slow breathing, irregular breathing, slow heart sounds, and hypoglycemia and metabolic acidosis can occur, which can cause infant death (Dini & Fitriana, 2023).

This sudden exposure to cold causes the baby to breathe rapidly, much as a person gasps when going from a warm bath to a cold bath. When the baby is exposed to cold air for a longer period of time, however, the dependent effect on stimulating breathing is lost, because the body is poorly insulated and the skin surface is so large, the core body temperature can fall rapidly. Although the baby does not shiver at birth, the body's temperature-regulating mechanisms are still functioning, and the body responds to cold by increasing the metabolic rate (Hariyani et al., 2023).

Some alternative care methods that are easier, cheaper and more effective in stabilizing the body temperature of newborns are by swaddling and skin wrapping. Swaddling is a way to wrap a baby with a blanket with the aim of providing a warm and comfortable feeling. In addition to being a hug, swaddling is the most capable replica of providing an atmosphere similar to when he was still in the mother's womb, while skin wrap is wrapping the baby's body using vinyl isolation or plastic bags or covering the baby with polyethylene plastic. (Sangadji et al., 2023).

This has been proven by Akkoca et al., (2023) which states that cloth swaddling is effective in maintaining the body temperature of newborn babies, as well as research that has been conducted by Kyokan et al., (2023) which states that skin wrap is effective in maintaining the body temperature of newborns. Intervention with cloth swaddling and skin wrap can indeed increase the body temperature of newborns. However, skin wrap is more effective in increasing the body temperature of newborns. However, cloth swaddling can also be done to increase the body temperature of newborns, but not as fast as skin wrap.

Some previous studies that are relevant to this research are: First, Meiriza et al., (2023) focusing on the skin wrap variable in BBRL babies. Second, Habibillah & Fauzi, (2023) is focused on the skin wrap variable in BBRL babies. Third, Basyariah et al., (2023) focuses on giving baby blankets to BBRL. These three articles have differences while this study focuses on skin wrap and swaddling in premature babies.

Based on these updates, the aim of this research is to determine the effectiveness of the use of swaddling and skin wrap in regulating the body temperature of premature babies in the NICU room of RSHD Kota Bengkulu. The benefits of the results of this research study can be used as input for medical personnel in providing nursing care and new understanding so that they can improve the program and quality of health services of related institutions.

RESEARCH METHODS

The research method used is *quasi experimental* with this research design using two group pretest posttest. This study was conducted at the NICU RSHD located in Bengkulu City during August 2024. The demographics examined consisted of all neonates presenting at the NICU RSHD Bengkulu City. During the previous three months of 2024, a total of 101 infants were documented. The sampling methodology used was purposive sampling, resulting in a total of 25 premature infants receiving skin wrapping and 25 others undergoing skin wrapping. The findings of the study were articulated through a frequency distribution table, depicting the magnitude and percentage. Statistical analysis was performed using a paired sample t-test, with the evaluative criteria set at a p-value \leq alpha (0.05).

RESEARCH RESULT

Table. 1
Premature Baby Body Temperature
Before and After Swaddling

<i>Swaddling</i>	N	Percentage (%)	Min – Max
Pretest			
Hypothermia	15	60	35 – 36.9oC
Normal	10	40	
Amount	25	100	
Post test			
Normal	25	100	36.5 – 37.8oC
Amount	25	100	

Based on the data presented in table 1, it was observed that the body temperature of premature infants before the application of the bed was mostly categorized under hypothermia for 15 infants (60%), whereas after the application of the bed, the overall body temperature of premature infants shifted to the normal category (100%).

Table. 2
Premature Baby Body Temperature
Before and After Using Skin Wrap

<i>Skin wrap</i>	N	Percentage (%)	Min – Max
Pretest			
Hypothermia	16	64	35 – 36.7oC
Normal	9	36	
Amount	25	100	
Post test			
Normal	25	100	36.5 – 37.9oC
Amount	25	100	

According to the findings depicted in table 2, it was identified that the body temperature of preterm infants before the utilization of skin wrap was mainly classified in the hypothermia category for 16 infants (64%), and after the application of skin wrap, the overall body temperature of preterm infants was recorded in the normal category (100%).

Table. 3
Effectiveness of Swaddling
in Regulating Body Temperature of Premature Babies

<i>Swaddling</i>	N	Mean	Std. Deviation	Std. Error	p-value
Pretest	25	36.00	0.659	0.132	0.000
Post test	25	36.96	0.359	0.072	

As shown in table 3, the average body temperature of premature infants before the application of the bed was 36.0°C, which increased to 36.96°C after the application of the bed. Statistical analysis conducted through a paired sample t-test resulted in a p-value of 0.000, which was less than the significance threshold of 0.05, resulting in the rejection of the null hypothesis (Ho1) and the acceptance of the alternative hypothesis (Ha1); thus, it can be concluded that the bed is effective in modulating the body temperature of premature infants in the NICU RSHD Kota Bengkulu.

Table. 4
Effectiveness of Using Skin Wraps
in Regulating Body Temperature of Premature Babies

<i>Skin wrap</i>	N	Mean	Std. Deviation	Std. Error	p-value
Pretest	25	36.05	0.543	0.109	0.000
Post test	25	37.01	0.451	0.090	

Based on the results illustrated in table 4, the average body temperature of premature infants before the application of skin wrap was 36.05°C, which then increased to 37.01°C after the application of the skin wrap. Statistical analysis conducted using paired sample t-test resulted in a p-value of 0.000, which is less than 0.05, leading to the rejection of the null hypothesis (Ho2) and acceptance of the alternative hypothesis (Ha2); it can be concluded that the use of skin wrap is effective in regulating the body temperature of premature infants in the NICU RSHD Kota Bengkulu.

DISCUSSION

Use of Swaddling in Premature Baby Body Temperature Regulation

The average body temperature of premature babies before using swaddling was 35.89oC and after using swaddling it became 37.04oC. The results of the analysis using paired sample t-test obtained a p-value of 0.000 <0.05, so Ho1 was rejected and Ha1 was accepted, so it was concluded that the use of swaddling was effective in regulating the body temperature of premature babies in the NICU room of RSHD Kota Bengkulu. The results of this study are in line with the results of the study Prasetyowati et al., (2023) The median value after using cloth was the same, namely 35.50, although statistically there was a significant difference ($Z = -3.035$; p value 0.002 (<0.05)). Thus, cloth swaddling can increase body temperature in newborns.

The results of this study are in line with the results of previous research Meiriza et al., (2023) which states that the average body temperature of babies before using swaddling is 35.95, after using swaddling the baby's body temperature increases to 36.39. The results of other studies conducted by Fadhillah et al., (2022) 15 respondents of the study conducted to determine the average change in body temperature in babies before swaddling at the PMB Kemiling Region in 2022 with an average value of 36.393, while the average value after swaddling the baby was 37.260.

Based on the theory, Damayanti et al., (2022) revealed that until now the benefits of swaddling have not been scientifically proven, in fact swaddling will limit the baby's movements, his hands and feet do not get much opportunity to move freely so that it can inhibit his motor development. However, this is different from the opinion Ghozaturohmah et al., (2022) swaddling is a way to wrap a baby in a blanket with the aim of providing a sense of warmth and comfort. In addition to being a hug, swaddling is the replica that is most capable of providing an atmosphere similar to when he was still in the mother's womb.

Swaddling It has been used for thousands of years, and can help newborns sleep and reduce the chance of heat loss. However, with the advancement of knowledge, swaddling has become controversial because of the possible increased risk of hip dysplasia (Rose & Jeyabarathi, 2024). Daryanti et al., (2024) Adding swaddling should be done in a way that does not interfere with airflow, and the baby should be able to move the legs and spine so as not to increase the risk of hip dysplasia.

The way swaddling cloth can maintain the baby's body temperature is through the conduction mechanism, which is the loss of body heat through direct contact between the baby's body and a cold surface. The swaddling cloth used to wrap the baby can hold the heat flow and prevent heat loss from the baby's body. This can help prevent the loss of the baby's body heat, which can affect the baby's body temperature (Dixley & Ball, 2022).

Use of Skin Wraps in Regulating Premature Babies' Body Temperature

The average body temperature of premature babies before using skin wrap was 35.93°C and after using skin wrap it became 37.18°C. The results of the analysis using paired sample t-test obtained a p-value of 0.000 < 0.05, so H_0 was rejected and H_a was accepted, so it was concluded that the use of skin wrap was effective in regulating the body temperature of premature babies in the NICU room of RSHD Kota Bengkulu.

This research is in line with research Habibillah & Fauzi, (2023) which states that after skin wrapping intervention with plastic within one hour, the results of hypothermia level data in CM infant patients before intervention were 35°C (moderate hypothermia) and after intervention were 36.7°C (normal temperature). NP infants before intervention had a body temperature of 35.4°C (cold stress) and after intervention had a body temperature of 36.5°C (normal temperature). While in patients before intervention had a body temperature of 35.0°C (moderate hypothermia) and after intervention had a body temperature of 36.0°C (mild hypothermia).

The results of other studies conducted by Meiriza et al., (2023) also shows that seen from 15 babies who were given skin wrap. It is known that after the intervention with skin wrap, the average body temperature of the baby before the intervention was 37.04°C, it can be seen that the average body temperature before and after swaddling cloth was 0.44 different. Giving skin wrap to babies has been proven to reduce heat loss due to evaporation and the possibility of radiation not being able to pass through the plastic barrier.

These premature babies are susceptible to temperature instability. Factors that cause temperature instability are very large heat loss due to body surface area to body weight, insignificant subcutaneous fat partitioning, limited brown fat reserves (an inward source for producing heat, found in typical full-term babies), reflex control of skin capillaries is absent or weak (shivering response), inadequate muscle mass activity (so that premature babies cannot produce their own heat), capillaries are easily damaged, and temperature regulation in the brain is immature (Alsafadi et al., 2024).

The typical range of neonatal body temperature differs between full-term and premature babies. The normal range of body temperature for full-term babies is around 36.5°C - 37°C, while for premature babies it is around 36.3°C - 36.9°C. If the baby is left at room temperature (25°C), the baby will lose heat through evaporation, convection and radiation as much as 200 calories/kg BW/minute, while the heat production that can be produced is only one tenth of the amount of heat loss above, in the same time. This will cause a decrease in body temperature of 2°C in 15 minutes. This condition is very dangerous for neonates, especially for premature and LBW babies, babies can experience asphyxia because they are unable to compensate for the decrease in temperature with their own heat production (Freccero et al., 2024).

According to Dini et al., (2022) babies who have undergone skin wrapping intervention with plastic for ± 60 minutes have a warmer temperature, then after that the baby is put into an incubator to keep the baby's temperature warm. The baby's body wrapped in plastic causes evaporation by the diffusion of water molecules by sweat fluid which turns into gas so that evaporation occurs and causes a warm feeling, so that the warm

temperature will be trapped by the plastic and no environmental temperature enters the body.

Skin wrapping with plastic is an innovation used to control hypothermia in infants. Plastic is used because it is effective and simple to maintain body temperature with the principle of radiation and heat convection because it maintains heat sources from the external. In addition to being effective and simple, plastic is also easy to find and cheap and in several studies has been proven to be effective in increasing the temperature in infants (Yadav & Minu, 2022).

In line with the research results Ekawati & Hardianti (2022) shows that plastic is effective in regulating the baby's body temperature. In addition to being effective, plastic is also a device that is easy to find, cheap and simple to use without allergies or skin irritation. Plastic prevents evaporative heat loss by forming a microenvironment with high humidity around the baby. Plastic also prevents convective and radiation heat loss from the baby's body.

CONCLUSION

Based on the results of the statistical test analysis showed that the use of swaddling and skin wrap is effective in regulating the body temperature of premature babies in the NICU room of RSHD Kota Bengkulu.

SUGGESTION

It is hoped that there will be uniformity among nurses in handling hypothermia by using swaddling and skin wraps as well as appropriate interventions to prevent hypothermia in premature babies.

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