

“The Effectiveness of The Kangaroo Mother Care Application of Low Birth Weight Baby in Maintaining Thermoregulation Stabilization at Cendrawasih Ward of Idaman Banjarbaru Hospital”

ABSTRACT

Introduction: Low birth weight (LBW) that need to be considered is the problem of infant thermoregulation is hypothermia because it can cause infant death. The interventions that can be done for the risk for hypothermia is the Kangaroo Mother Care (KMC). KMC was chosen because able to increase temperature through heat transfer and increase parent and infant bounding. **Objectives:** the research uses to describe the Application of the KMC of low birthweight baby in maintaining thermoregulation stabilization. **Method:** The research used an evaluative design is a case study with data analysis using descriptive analytic. **Results:** The case study was conducted on Mrs. S. A’s Baby No. 1 who was born at 32 weeks' gestation spontaneously and birth weight 1420 gr. The client has a risk of hypothermia so the kangaroo method is treated for 3 days. **Discussion:** Evaluation of the 3 days of implementation are the increase in body temperature before and after the KMC. The KMC is effective in increasing the baby's body temperature, so it is hoped this method can be carried out by health workers and the baby's parents.

Keywords: Low Birth Weight Baby, Risk For Hypothermia, Kangaroo Mother Care

ABSTRAK

Latar belakang: Bayi berat lahir rendah merupakan salah satu masalah yang perlu diperhatikan berupa masalah thermoregulasi bayi yaitu hipotermia karena bisa menyebabkan kematian pada bayi. Perawatan metode kanguru dipilih menjadi intervensi unggulan karena metode ini mampu meningkatkan suhu tubuh melalui perpindahan panas dan peningkatan bounding orang tua dan bayi. **Tujuan:** penelitian ini bertujuan Menggambarkan efektifitas penerapan perawatan metode kanguru pada asuhan keperawatan bayi berat lahir rendah. **Metode:** Penelitian ini menggunakan rancangan evaluative dalam bentuk studi kasus dengan analisa data menggunakan deskriptif analitik. **Hasil:** Studi kasus yang dilakukan pada By.Ny. SA 1 yang lahir pada usia kehamilan 32 minggu secara spontan dan berat lahir 1420 gr. Klien memiliki resiko hipotermia sehingga dilakukan perawatan metode kanguru selama 3 hari. **Diskusi:** Evaluasi dari 3 hari implementasi, peningkatan suhu tubuh sebelum dan sesudah tindakan perawatan metode kanguru pada 3 November 2020. Berdasarkan data tersebut perawatan metode kanguru efektif meningkatkan suhu tubuh bayi, sehingga diharapkan metode ini bisa dilakukan oleh tenaga kesehatan dan orang tua bayi.

Kata kunci: Bayi Berat Lahir Rendah, Resiko Hipotemia, Perawatan Metode Kanguru

INTRODUCTION

The birth of a child is a dream for every married couple because children are the next generation of the nation with both physical and mental quality (Anggeriyane,

2019). Parents have hope that their children will grow up to be healthy, intelligent, creative, independent, faithful and devoted to God (Rahayu, Anggeriyane and Mariani, 2020).

Low birth weight babies are babies with birth weights less than 2500 grams (Yunanto, 2013). 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. The prevalence of low birth weight babies in the world in 2015 was 20.5 million babies, prevalence in Asia is 17.3% or 12.8 million (United Nation Children's Fund (UNICEF), 2019). The proportion of low birth weight babies in Indonesia from 2013-2018 was 6.2% (Kementrian Kesehatan RI, 2018). The number of low birth weight babies in South Kalimantan in 2017 was 3,676 babies, then increased to 3,728 babies in 2018. Data at the Idaman Hospital, Banjarbaru City, the number of low birth weight babies in 2018 was 280 babies, and in 2019 there were 268 babies.

Factors that influence the incidence of low birth weight babies can be from maternal, fetal, and placental factors. Maternal factors due to family history of giving birth to premature babies, socioeconomic status, educational status, age at pregnancy, stress, depression, smoking, pregnancy with low body mass index, infection, periodontal disease, uterine abnormalities, history of cervical surgery, vaginal bleeding, pregnancy double, polyhydramnios, short cervix (Frey and Klebanoff, 2016). Fetal factors include chromosomal abnormalities (autosomal trisomy), chronic fetal infection (cytomegaly inclusions, congenital rubella), familial dysautonomia, radiation, multiple/twin pregnancies; pancreatic aplasia (Proverawati and Ismawati, 2010). The presence of microbium in the placenta is also a

contributing factor in low birth weight babies due to impaired oxygenation and nutrition to the baby (Zheng *et al.*, 2015).

Newborns are usually very susceptible to hypothermia because the baby has a relatively large surface area compared to body weight, thin skin and easily passes heat, has little subcutaneous fat, has a limited capacity to generate heat, the ability to generate heat from poor sympathetic responses. , premature babies are unable to lighten their bodies to reduce skin exposure (Lissauer and Fanaroff, 2013).

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, or more commonly referred to as thermoregulation. The hypothalamus detects small changes in body temperature. The anterior hypothalamus regulates heat loss, while the posterior hypothalamus regulates heat production (Potter, P. A., & Perry, 2010).

Babies who are at risk for thermoregulatory disorders, include preterm and small babies, babies with congenital abnormalities, especially with imperfect skin closure, newborns with central nervous disorders, babies with sepsis, infants with prolonged resuscitation. One of the physiological responses of infants to cold exposure is the oxidation process of brown fat or brown adipose tissue. Brown fat tissue contains a high concentration of triglyceride content, is a capillary rich network and is tightly innervated by sympathetic nerves ending in the veins and in individual adipocytes. Normal temperature in neonates is between 36.5 to 37.5°C (Yunanto, 2013).

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 pump disorders (Farhadi, 2014). There are so many dangers that will arise from hypothermia so as much as possible it is avoided. Treatment of low birth weight babies with the risk of hypothermia can be treated in an incubator, touch therapy, and Kangaroo Mother Care (Roesli, 2010). While still in hospital treatment, the risk of hypothermia is closely monitored by nurses while the baby is in the incubator. But when they are at home, parents and families will do it, so they must be taught how to prevent hypothermia at home.

Kangaroo Mother Care is the treatment of premature babies or low birth weight babies by placing the baby between the mother's two breasts so that there is direct contact of the mother's skin to the baby's skin (Oktiawati and Julianti, 2017). There are two types of Kangaroo Mother Care, namely intermittent and continuous. The intermittent method is usually carried out in special and intensive care unit facilities, not done all the time but for a minimum of 60 minutes, carried out when parents or family visit, can be started on infants who are still in the treatment process. The continuous method can be carried out in the inpatient unit or at home, given around the clock, and the baby must be free from breathing problems (Maryunani, 2013).

The Kangaroo Mother Care is a bare-chested baby (only wearing diapers, hats, gloves, socks), placed face down on the mother's chest in an upright or diagonal position. The baby's body sticks or is in

direct contact with the mother. Position the head, neck, and body properly to avoid obstructing the airway. Head turned sideways under the mother's chin (light extension). The baby's hands and feet are flexed like a "frog" position. Then "fixation" with a scarf. The mother wears loose clothes or blouses so that the baby is in the same clothes as the mother. If necessary, use a blanket (Kemenkes RI, 2012).

Babies who are cared for in an incubator will get warmth through heat transfer through conduction and radiation. The Kangaroo Mother Care has a working mechanism similar to care in an incubator. Heat transfer by conduction occurs when the skin is in direct contact with the mother and baby. While radiation heat transfer is when the baby and mother are in a blanket or special clothes (Thukral, Chawla, Agarwal, Deorari, dan Paul (2008) dalam Sari, Wardani, & Arismawati, 2018).

A case study conducted on Tuesday 2 November 2020 on Mrs. SA's baby number 1 who was born at 32 weeks' gestation spontaneously behind the head with a birth weight of 1420 gr. Physical assessment carried out on the client found factors that can pose a risk for hypothermia are the baby's skin is thin, looks shiny, a lot of lanugo in the face area, both upper arms and around the back, nipples look thin, the scrotum looks shiny and smooth, the skin on the soles of the feet looks thin and tattoo on the leg a little. The results of temperature measurements during the study were 36.5 °C. Based on these data, risk for hypothermia nursing diagnosis appears, the superior intervention given is the Kangaroo Mother Care.

METHODS

The methodology in this case is evaluative design with a case study, the data analysis using descriptive analytic on Mrs. SA's baby number 1 with LBW treated in the Cendrawasih ward of Idaman Banjarbaru Hospital.

CASE REPORT

The nursing intervention given to Mrs. SA's baby number 1 with a diagnosis of risk for hypothermia is Kangaroo Mother Care on 3-5 of November 2020. The purpose of planning a nursing diagnosis of risk for hypothermia is after 60 minutes of action, risk for hypothermia does not occur with the outcome thermoregulation outcome: newborns (0801) remained in normal conditions at stable temperature parameters (normal 36.5 – 37.5°C), regular breathing (normal 40-60 times/ minute), changes in skin color, lethargy. The nursing action carried by Kangaroo Mother Care.

The procedure for treating the method is asking the mother to take off the top clothes and then put on the special clothes provided, remove the baby from the incubator, measure the baby's body temperature after one minute after being at room temperature.

DISCUSSION

Analysis of Risk for Hypothermia with Cases of Low Birth Weight Babies.

Mrs. SA's baby number 1 has the physical appearance of a pure premature with a low birthweight baby with thin skin. The condition of premature baby has a large body surface area. The client is undergoing treatment in a room with central air conditioning so that when the baby is removed from the incubator, it will experience the risk for exposure to cold

air. The researchers argue that these conditions can increase the risk for hypothermia, which if not immediately intervened properly will lead to a decrease in conditions and even death. The baby's thin skin is easy for air to pass, especially in a low-temperature environment with central air conditioning so that heat loss can occur from the client's body. The client's body surface area is large so it is easy for evaporation to occur.

Physical assessment carried out in a multisystem manner on the client obtained data that the baby's skin was thin, looked shiny, a lot of lanugo in the face area, both upper arms and around the back, the nipples looked thin, the scrotum looked shiny and smooth, the skin on the soles of the feet looked thin and tattoos on the feet a little. The author observed that the baby's condition is a clinical manifestation that will indeed appear in infants with pure prematurity, namely when observed the most obvious sign is the baby's thin and shiny skin. Meanwhile, the baby with dysmaturity has dry skin, thick nipples, rough scrotal skin, and lots of tattoos on the soles of the feet. Other opinions that are in accordance with the client's condition and the author's opinion are: Clinical manifestations of LBW are physical: small baby, less movement and still weak, head bigger than body, weight <2500 grams. Skin and genitals: thin and transparent skin, lots of lanugo, fine and thin hair, immature genital (Maryunani, 2013).

Newborns are particularly susceptible to hypothermia because they have a relatively large surface area compared to their weight, so there is an imbalance between heat release (related to body weight) and heat loss (surface area); their skin is thin and heat passes easily; they have little subcutaneous fat to retain

heat; they have a limited capacity to generate heat because they depend largely on non-shivering thermogenesis, using a special form of adipose tissue, brown fat scattered around the neck, between the scapula and around the kidneys and adrenal glands; their ability to generate heat from a non-shivering sympathetic response occurs only at ambient temperatures $< 16^{\circ}\text{C}$ in term infants and does not occur in premature infants until two weeks of age; premature babies are not able to lighten their bodies to reduce skin exposure (Lissauer and Fanaroff, 2013).

One of the baby's responses to cold exposure is the metabolism of brown fat by the oxidation process of brown fat or brown adipose tissue. Brown fat tissue contains a high concentration of triglyceride content, is a capillary rich network and is tightly innervated by sympathetic nerves ending in the veins and in individual adipocytes. Each cell has many mitochondria, but what is unique here is that the proteins consist of unpaired proteins which limit enzymes in the heat production process. Thus, due to the activity of this protein, when fat is oxidized there will be heat production, and not energy rich in phosphate bonds as in other tissues (Yunanto, 2013).

Analysis of the Effectiveness of the Application of the Kangaroo Mother Care on the Risk for Hypothermia

The results of data analysis show that the client has risk factors that can cause hypothermia in newborns so that interventions need to be given to prevent it. The researcher chose the kangaroo mother care to be a superior intervention because this method can later be done independently by parents at home, because it is difficult for parents to provide an

incubator at home. The tools used are also quite easy to obtain, namely cloth to tie the baby and loose clothes for mothers or blankets for mothers. This method in addition to preventing hypothermia in clients is also useful for increasing the client's bonding with parents. The author's opinion is supported by statements about the benefits of the kangaroo method, including the benefits for babies, including: reduced calorie consumption; there is stabilization of breathing and heart rate; temperature stabilization occurs; reduced incidence of infection so as to reduce the risk of this death in infants; baby can suckle better and longer; baby's weight gain is better; baby's sleep time is longer; reduce baby's stress; decreased pain response; boost the immune system; better baby behavior; shorter treatment time.

The benefits of Kangaroo Mother Care for mother include: mothers become closer to their babies; mothers are more confident; mother and family are calmer; increase breast milk production; save on household expenses; mothers and fathers are better prepared to take care of their babies. reduce baby's stress; decreased pain response; boost the immune system; better baby behavior; shorter treatment time. The benefits of Kangaroo Mother Care include: mothers become closer to their babies; mothers are more confident; mother and family are calmer; increase breast milk production; save on household expenses; mothers and fathers are better prepared to take care of their babies. reduce baby's stress; decreased pain response; boost the immune system; better baby behavior; shorter treatment time. The benefits of Kangaroo Mother Care include: mothers become closer to their babies; mothers are more confident; mother and family are calmer; increase breast milk production; save on household expenses; mothers and fathers are better prepared to take care of their babies.

The benefits of Kangaroo Mother Care for fathers include: fathers have a

greater role in caring for their babies; can improve the relationship between father and baby, especially playing an important role in countries with high levels of violence against children. The benefits of the Kangaroo Mother Care for health workers include: energy efficiency because mothers tend to take care of their own babies more. The benefits of the kangaroo method of care for health care facilities include: shorter length of treatment so that babies can return home from health care facilities quickly; increased turnover, i.e. the place left by the baby to go home, can be immediately used by other babies who need it; budget efficiency due to the use of facilities such as electricity, incubators, and other sophisticated equipment. The benefits of the Kangaroo Mother Care for the country include: foreign exchange savings in imported formula milk due to increased use of breast milk; savings in health care costs (Maryunani, 2013).

The implementation of risk for hypothermia was carried out for 3 days, each time the action was approximately 60 minutes, then before and after the action. The Kangaroo Mother Care process which was carried out for 3 days did not experience any obstacles. The client's mother is very cooperative, the client also does not experience a worsening of the condition. Evaluation on Wednesday, November 3, 2020, monitoring of vital signs was carried out before the Kangaroo Mother Care, pulse: 143 times/minute, respiratory rate: 40 times /minute, temperature: 36.4°C, SpO₂: 100% without oxygen. Vital signs after kangaroo mother care for pulse: 139 times /minute, respiratory rate: 48 times /minute, temperature: 36.9°C, SpO₂: 100% without oxygen. Evaluation on Thursday, November 4, 2020, monitoring of vital signs prior to the treatment of the kangaroo method, pulse: 138 times /minute, respiratory rate: 45 times /minute,

temperature: 36.6°C, SpO₂: 99% without oxygen. Vital signs after kangaroo mother care are pulse: 141 times /minute, respiratory rate: 42 times /minute, temperature: 36.8°C, SpO₂: 100% without oxygen.

Evaluation on Friday, November 5, 2020, monitoring of vital signs was carried out before the kangaroo mother care, pulse: 145 times/minute, respiratory rate: 42 times /minute, temperature: 36.8 oC, SpO₂: 100% without oxygen. Vital signs after mother care are pulse: 144 times/minute, respiratory rate: 42 times/minute, temperature: 37.1°C, SpO₂: 100% without oxygen.

For 3 times the kangaroo mother care was treated, the client's body temperature increased after the action was carried out. This proves that the kangaroo mother care is effective in preventing hypothermia in infants when removed from the incubator. The increase in body temperature after the procedure has been proven in research on kangaroo mother care proven to be able to increase body temperature in the study of Bera, Ghosh, Singh, Hazra, & Som (2014). The study was conducted by 265 infants in West Bengal, India by providing intervention for 3 days. The average temperature increase on the first day is 0.34 C, the second day is 0.39 C, and the third day is 0.43°C.

Kangaroo mother care is able to raise the client's body temperature because this method is care for low birth weight babies or premature births by making direct contact between the baby's skin with the mother's skin or skin-to-skin contact where the mother uses her body temperature to warm the baby (IDAI, 2013). During the kangaroo treatment process, the mother was able to control body temperature better than the incubator so that there was an increase in body temperature. A warm body temperature in infants is needed for

the efficiency of energy metabolism as measured by a reduction in calories. Saving calories is expected to improve physiological changes in the body, one of which is body temperature (Zahra, 2018).

Babies who are cared for in an incubator will get warmth through heat transfer through conduction and radiation. The kangaroo mother care has a working mechanism similar to care in an incubator. Heat transfer by conduction occurs when the skin is in direct contact with the mother and baby. While radiation heat transfer is when the baby and mother are in a blanket or special clothes (Thukral, Chawla, Agarwal, Deorari, dan Paul (2008) in Sari, Wardani, & Arismawati, 2018). Various benefits are obtained in carrying out kangaroo mother care for babies, mothers and fathers. Increasing physical contact with children can increase the attachment between children and parents (Muhsinin and Rahmaniar, 2021).

CONCLUSION

Evaluation of the 3 days of implementation, the increase in body temperature before and after the kangaroo method of care on 3 November 2020 was 36.4°C to 36.9°C, on 4 November 2020 it was 36.6 °C to 36.8°C, on 5 November 2020 is 36.8 °C to 37.1°C.

The increase in the client's body temperature after implementation of kangaroo mother care shows that this method is effective in preventing hypothermia in low birth weight infants. When the kangaroo mother care is treated, heat transfer occurs by conduction and radiation. Heat transfer by conduction occurs when the skin is in direct contact with the mother and baby. While radiation heat transfer is when the baby and mother are in a blanket or special clothes.

SUGGESTION

For Hospitals: It is hoped that they will be able to facilitate a special room for parents who can carry out continuous kangaroo mother care.

For Community health services: it is hoped that health workers can make home visits to conduct health education and monitor the condition of low birth weight babies at home.

Nurses are expected to be able to consistently provide health education about kangaroo mother care methods to parents of babies.

For Parents of Infants: it is advisable to use the kangaroo method care as a method of preventing hypothermia at home.

For Educational Institutions: it is hoped that this paper can be used to add a reference source for the field of nursing science study programs and other health workers.

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