FACTOR ANALYSIS OF LOW BIRTH WEIGHT (LBW) BABIES WITH HYPOTHERMY ON INCUBATOR TREATMENT SUCCESS RATES WHILE IN THE PERINATOLOGY ROOM

Akhmad Rizani, Bisepta Prayogi, Evy Marlinda, Parellangi, Hammad, Khairir Rizani, Syamsul Firdaus, Muhammad Rasyid

ABSTRACT

Objective: The purpose of this research is Analyzing the factors of low birth weight babies (LBW) with hypothermia on the success rate of treatment while in the perinatology room incubator

Theoretical framework: Low birth weight babies (LBW) are still a problem because they contribute to perinatal mortality, namely 76% die in the first hour of birth and more than two-thirds die in the first week of life. While the cause of perinatal death in LBW with hypothermia has a risk of 4 times the occurrence of death. Efforts to maintain LBW body temperature while in the incubator are very important because the ability to control body temperature is not optimal due to the unavailability of sufficient fat tissue as a heat reserve. This study aims to examine the factor analysis of low birth weight babies (LBW) with hypothermia on the success rate of treatment during the incubator in the perinatology room of Ratu Zalecha Martapura Hospital.

Method: In this study using bivariate analysis with chi square while multivariate analysis using logistic regression analysis. The measuring instrument used is the observation sheet. The results showed that of the 89 LBW babies, the most were moderately hypothermic, namely 54 people (60.67%), while the highest treatment success rate was successful, namely 51 people (57.30%).

Results: The results of the Chi-Square test analysis showed that there was a significant relationship between hypothermic LBW infants and the success rate of hypothermic treatment during incubator, with a p value (0.000).

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Results and conclusion: The results of multivariate analysis showed that only fetal age had a significant effect (p value = 0.029) and (OR = 2.941) on LBW infants with hypothermia. The factor of preterm fetal age has a tendency of 2.941 times greater for severely hypothermic LBW babies compared to term fetal age. Efforts that can be made are improving quality services in the form of facilities/facilities that are complete and in accordance with the needs of care for babies, especially LBW babies, such as: adding NICU rooms, incubators, adequacy of the number and functioning of equipment and increasing the knowledge and skills of officers.

Implications of the research: Educational institutions can establish partnerships and collaborate with hospitals to use practice areas, especially perinatology rooms, as learning resources to increase student knowledge and competence.

Keywords: low birth weight (LBW) babies, hypothermia, incubator, perinatology, quality service

ANÁLISE FATORIAL DE BEBÊS COM BAIXO PESO AO NASCER (LBW) COM HIPOTERMIA SOBRE TAXAS DE SUCESSO NO TRATAMENTO DE INCUBADORAS DURANTE A PERINATOLOGIA

RESUMO

Objetivo: O objetivo desta pesquisa é Analisar os fatores de bebês de baixo peso ao nascer (LBW) com hipotermia na taxa de sucesso do tratamento enquanto na incubadora da sala de perinatologia

Estrutura teórica: Bebês com baixo peso ao nascer ainda são um problema porque contribuem para a mortalidade perinatal, ou seja, 76% morrem na primeira hora de nascimento e mais de dois terços morrem na primeira semana de vida. Enquanto a causa da morte perinatal no LBW com hipotermia tem um risco de 4 vezes a ocorrência de morte. Esforços para manter a temperatura corporal do LBW enquanto na incubadora são muito importantes porque a capacidade de controlar a temperatura corporal não é ideal devido à indisponibilidade de tecido adiposo suficiente como reserva de calor. O presente estudo tem como objetivo examinar a análise fatorial de bebês com baixo peso ao nascer (LBW) com hipotermia sobre a taxa de sucesso do tratamento durante a incubadora na sala de perinatologia do Hospital Ratu Zalecha Martapura.

Método: Neste estudo, utilizando análise bivariada com qui quadrado, enquanto análise multivariada utilizando análise de regressão logística. O instrumento de medição utilizado é a folha de observação. Os resultados mostraram que dos 89 bebês com LBW, a maioria era moderadamente hipotética, 54 pessoas (60,67%), enquanto a maior taxa de sucesso do tratamento foi bem-sucedida, 51 pessoas (57,30%).

Resultados: Os resultados da análise do teste Qui-Quadrado mostraram que houve relação significativa entre lactentes com LBW hipotérmicos e a taxa de sucesso do tratamento hipotérmico durante a incubadora, com valor p (0,000).

Resultados e conclusão: Os resultados da análise multivariada mostraram que apenas a idade fetal teve efeito significativo (valor p = 0,029) e (OR = 2,941) em lactentes com hipotermia. O fator da idade fetal pré-termo tem uma tendência 2,941 vezes maior para bebês com baixo peso corporal severamente hipotérmicos em comparação com a idade fetal de termo. Os esforços que podem ser feitos são melhorar os serviços de qualidade na forma de instalações/instalações completas e de acordo com as necessidades de cuidados para bebês,
1 INTRODUCTION

The neonatal period, the first 28 days of life, are the most precarious for a child's survival. At an average global rate of 18 deaths per 1,000 live births in 2021, down 51% from 37 deaths per 1,000 live births in 1990, children have the highest risk of dying in their first month of life. In contrast, the likelihood of passing away after the first month and before turning one was predicted to be 11 deaths per 1,000, and the likelihood of passing away after turning one and before turning five was predicted to be 10 deaths per 1,000 in 2021. Globally, 6,400 neonatal fatalities per day or 2.3 million infant deaths in the first month of life occurred in 2021 (UNICEF, 2021).

The World Health Organization (WHO) estimates that almost all (98%) of the five million neonatal deaths occur in developing countries. More than two-thirds of these deaths occur in the early neonatal period and are generally due to a birth weight of fewer than 2,500 grams, WHO (2006). Whereas in Indonesia the Neonatal Mortality Rate (AKN) showed a very slow downward trend over a period of 10 years, where the AKN in 1997 was 26 per 1000 live births decreased in 2007 to 19 per 1000 live births, BPS (2007) in Darmayanti (2011).

Neonatal death was found to be determined by pregnancy-induced hypertension, public hospital delivery, preterm, referral, and hypothermia. Neonatals born to mothers who have a history of hypertension should receive the proper attention. Additionally, it is preferable to provide newborns who were delivered prematurely, were referred, or were hypothermic the attention they deserve. Finally, greater research should be done to look into the other factors that contribute to newborn mortality (Wake, G. E., et al., 2022)

74% of newborns had hypothermia detected at 5 minutes after birth, 77% after admission to the NU, and 38% at 24 hours. Compared to normothermic patients, neonates who had hypothermia 5 minutes after birth were more likely to have it when they were admitted to the Neonatal Unit. Both hypothermia at 5 minutes and hypothermia at 24
hours were not related with death in the neonates who had it on admission to the Neonatal Unit (Phoya, F., Langton, J., Dube, Q., & Iroh Tam, P., 2020).

Some LBW problems that can cause perinatal death are breathing problems, hypothermia, sucking difficulties, hypoglycemia, infection, jaundice (hyper bilirubin) and bleeding. The recommended treatment for LBW babies is resuscitation if the baby is born asphyxiated, thermoregulation, the kangaroo method, early initiation of breastfeeding and breastfeeding, if jaundice occurs on day 1 or after week 2, the baby needs to be referred and given vitamin K to newborns. according to Beck D., et al (2004). Reports in the developing country show that more than 90% of neonates were hypothermic (temperature less than 36.5 °C) and 10.7% of the newborns were at less than 35.0 °C (Nebiyu, S., Berhanu, M., & Liyew, B. (2021).

The results of Darmayanti’s study (2011) showed that the cause of perinatal death in LBW babies was hypothermia with a value of ρ = 0.003 and OR = 4.84, which means that hypothermia in LBW increased the risk of perinatal death 4.84 times.

At present, with the rapid development of technology, seen from the emergence of tool applications that help facilitate baby care at the hospital, the baby incubator is vital to use for LBW babies with a tendency to experience hypothermia. Keeping the right temperature is very necessary for babies because the outside temperature changes are unstable and always changing. Generally, every nurse/midwife must continue to monitor changes in incubator temperature, whether the temperature received is right with the temperature needed.

Based on data on the baby birth register at Ratu Zalecha Martapura Hospital in the last 3 (three) years it shows that the incidence of low birth weight babies with hypothermia who receive treatment through incubators tends to increase, namely in 2018 there were 112 people, in 2019 there were 120 people and in 2020 as many as 131 people. (Data register of baby births at Ratu Zalecha Hospital).

Efforts to maintain LBW body temperature while in the incubator are very important because the ability to control body temperature is not optimal due to the unavailability of sufficient fat tissue as a heat reserve. LBW factors can be caused by 1) maternal factors; undernutrition during pregnancy, age, close pregnancy spacing, parity, 2) pregnancy factors; pregnant with hydramion, antepartum bleeding, pregnancy complications (pre-eclampsia, eclampsia, ruptured membranes, hypertension) and 3) fetal factors; congenital defects/congenital abnormalities, uterine infections, multiple
pregnancies. Apart from that, another important factor is that the baby's breathing ability and sucking ability are not yet optimal to get breast milk from the mother. Therefore, LBW who are treated while in the incubator, are sometimes given O2 so that their oxygen needs are met, and given breast milk to determine the progress of the sucking response in the baby's mouth.

This baby is also still too young, so the main problem that must be prevented is the occurrence of infection. The incubator must always be in a sterile condition and all health workers who touch it need to make preparations, such as washing hands properly and wearing special gowns provided by the hospital. It is these various factors that determine the success rate of low birth weight babies with hypothermia showing optimal progress and development. If the condition is stable and the baby's response is optimal, then this baby can be cared for by the mother using close baby care or the 'kangaroo' method of care so that the baby's body warmth can always be maintained like in the womb. For this reason, research is needed to analyze the factors of low birth weight babies (LBW) with hypothermia to the success rate of treatment while in the incubator so that the quality of care for LBW babies can be known.

Based on the background above, the formulation of the problem is whether there is an influence of low birth weight (LBW) babies with hypothermia on the success rate of treatment while in the Perinatology Room incubator at Ratu Zalecha Martapura Hospital. The purpose of this research is Analyzing the factors of low birth weight babies (LBW) with hypothermia on the success rate of treatment while in the perinatology room incubator.

2 THEORETICAL FRAMEWORK

The theoretical framework developed in this research uses theoretical foundations sourced from Manuaba (2001), Rukiyah AY, Yulianti Lia (2010) as follows:
3 METHODOLOGY

This research is a retrospective study with an analytical observational design, namely observing events that have occurred with the aim of looking for factors related to the cause. This study examines the factors of low birth weight (LBW) babies with hypothermia on the success rate of treatment during the incubator in the perinatology room using a cross sectional approach where the research is carried out by observing or measuring variables on the subjects studied only once at a time.

The study population was 89 low birth weight (LBW) babies in the Perinatology room of Ratu Zalecha Martapura Hospital in January-December 2021. The research sample was part of the LBW babies who were treated in the incubator using a purposive sampling technique, namely determining the sample by selecting the sample from among the desired population based on inclusion and exclusion criteria. Based on the inclusion criteria, the number of samples was 89 people. The inclusion criteria were: LBW babies with live births, birth weight 1500-2500 grams. While the exclusion criteria were: LBW babies with stillbirth, birth weight <1500 grams and >2500 grams.

Data collection was carried out using observation techniques, namely to obtain data on LBW babies in the form of responses to hypothermic LBW babies before being put in the incubator and data on the success rate of hypothermia treatment in the form of the length of time needed for hypothermic LBW babies while being treated in the incubator. The method used to collect data is by providing entries and placing check marks according to the results of observations. Meanwhile, to obtain data on maternal
age, parity, baby's weight at birth, history of full-term birth, pregnancy complications, multiple/single pregnancies and the condition of the baby without physical disabilities, it is known from the baby's birth register book in the perinatology room of Ratu Zalecha Hospital Martapura.

Bivariate analysis was to test the hypothesis of the relationship between the independent variable (LBW babies) and the dependent variable (success rate of hypothermia treatment) using the Chi-Square Test with a 95% confidence level. If the p-value obtained is smaller than the alpha, the null hypothesis is rejected, which means that there is a significant relationship between the independent and dependent variables, and vice versa.

Multivariate analysis was to test the hypothesis of the effect of the independent variable factor on LBW babies and the dependent variable on babies with hypothermia. using a logistic regression test with a degree of significance p < 0.05.

4 RESULTS AND DISCUSSION

Distribution of Hypothermic LBW Babies

The results of research on the distribution of LBW babies with hypothermia can be seen in table 1.

<table>
<thead>
<tr>
<th>Hypothermic LBW Babies</th>
<th>Respondent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
</tr>
<tr>
<td>Moderate Hypothermia</td>
<td>54</td>
</tr>
<tr>
<td>Severe hypothermia</td>
<td>35</td>
</tr>
<tr>
<td>Total</td>
<td>89</td>
</tr>
</tbody>
</table>

Source: Prepared By the Author (2023)

Based on table 1, shows that of the 89 respondents with hypothermia, it was found that the most were moderate hypothermia, namely 54 people (60,67%). According to the results of the study, the majority of LBW babies were moderately hypothermic because LBW babies were characterized by reduced activity, lethargy, weak crying, uneven skin color (cutis malviorata), weak sucking ability and cold feet.

Low Birth Weight (LBW) babies are babies born with a birth weight of less than 2,500 grams regardless of gestational age. Meanwhile, hypothermia is a decrease in body temperature below 36°C. The normal temperature of a newborn baby ranges from 36,5° C – 37.5° C (Axilla temperature), Maryanti, Sujiati, Tri Budiarti, (2011).
LBW babies are born with a birth weight of less than 2.500 grams regardless of gestational age. Meanwhile, hypothermia is a decrease in body temperature below 36°C. Normal temperature for newborns ranges from 36,5° C – 37,5° C (axilla temperature).

In the condition of LBW babies with hypothermia, it is often found in pure premature babies, namely babies with a gestation period of less than 37 weeks and weight according to body weight for gestational age and babies with disabilities are babies born with a weight less than the normal weight for the term pregnancy, this is due to experiencing growth disorders in the womb and being a small baby for the duration of the pregnancy. This is According to (Manuaba, 2008), the risk for hypothermic babies is low birth weight babies and premature pregnancies. The research data also supports that of the 89 LBW babies there were 42 (47,19%) with term and 47 people (52,81%) with preterm.

In LBW babies with premature loss of body heat quickly and become hypothermic, because the body's heat regulation center does not function properly and its metabolism is low. At the time of birth, the baby experiences a change from a warm intra-uterine environment to a relatively cooler extra-uterine environment. This causes a decrease in body temperature of 2-3ºC, especially heat loss due to evaporation or evaporation of amniotic fluid on the baby's skin which is not immediately dried. These conditions will spur the body to cool down which will cause a metabolic response and heat production. According to Manuaba (2008), the causes of hypothermia in LBW babies can be divided into 3, namely: decreased heat production, increased heat loss and failure of thermoregulation.

Heat regulation in newborns is related to metabolism and oxygen use. In a given environment at maximum temperature limits, oxygen use and metabolism are minimal, therefore body temperature must be maintained for heat balance.

In newborns, there is less subcutaneous fat and the epidermis is thinner than in adults. Blood vessels in infants are very easily affected by changes in environmental temperature and all of this is under the influence of the hypothalamus as a temperature control center. Flexibility in the baby's body decreases in the surface area so that it will accelerate heat loss. This is influenced by the length of the baby's body, the ratio of body surface to body weight of the baby's age, all of which can affect normal temperature limits. Full-term babies without clothes can survive an ambient temperature of around 32-
34° C. Meanwhile, the limit for adults is 26-28°C. Therefore full-term newborns also require a warmer ambient temperature and this environmental temperature must be maintained properly during the incubator.

Distribution of Success Rates in Handling Hypothermic LBW Babies While in the Incubator.

The results of the research on the distribution of success rates for treating LBW with hypothermia can be seen in table 2.

Table 2. Distribution of Success Rates in Handling LBW Babies With Hypothermia in the Perinatology Room

<table>
<thead>
<tr>
<th>Success Rates in Handling Hypothermic LBW Babies</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Succeed</td>
<td>51</td>
</tr>
<tr>
<td>Not successful</td>
<td>38</td>
</tr>
<tr>
<td>Total</td>
<td>89</td>
</tr>
</tbody>
</table>

Source: Prepared By the Author (2023)

Based on Table 2, it shows that the success rate of handling 89 LBW babies with the most hypothermia was successful, namely 51 people (57.30%). progress in the form of increased activity, the baby's crying becomes stronger, the ability/response to suck strong when getting breast milk and the acral feels warm within < 6 days.

The success rate of handling LBW babies is largely determined by the condition of the baby and its hypothermia. Even every newborn has a tendency to hypothermia. As according to Rukiyah AY (2010), that the risk of hypothermia in newborns is due to improper care after the baby is born, the baby is separated from the mother immediately after birth, the baby's birth weight is less and premature pregnancy, the place to give birth is cold and the baby is in a bad condition. asphyxia, hypoxia, prolonged resuscitation, sepsis, respiratory syndrome, hypoglycemia, intracranial hemorrhage.

Based on the results of the study, it was found that most of the success rates in handling LBW babies with moderate hypothermia were due to underweight and premature pregnancies, so that during incubator care there was still an increase in the development of LBW babies. Meanwhile, it was found that there was no success in handling LBW babies during incubators due to the condition of babies with premature or term severe hypothermia with complications and twin births. This is in accordance with the opinion of Rustam (1998), in Rukiyah AY, Yulianti Lia 2010), that LBW babies are found to be dysmature/low weight and pure premature. In addition, according to Jumarni, (1994), in Manuaba (2008) that complications that can occur in LBW babies are due to
respiratory/lung disorders, liver disorders, hypothermia, intraventricular hemorrhage and retinopathy. For this reason, treatment efforts and evaluation of the development progress of LBW babies during incubators greatly determine the success rate of treatment.

The Relationship between Hypothermic LBW Infants and the Success Rate of Handling Hypothermia During the Incubator

The results of research on the relationship between LBW hypothermia and the success rate of treating hypothermia while in the incubator can be seen in table 3.

Table 3. Relationship between Hypothermic LBW Babies and Success Rates Treatment of Hypothermia During Incubator in the Perinatology Room

<table>
<thead>
<tr>
<th>LBW Babies</th>
<th>Success Rates</th>
<th>Total</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Succeed</td>
<td>Not successful</td>
<td></td>
</tr>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Moderate Hypothermia</td>
<td>49</td>
<td>90.7</td>
<td>5</td>
</tr>
<tr>
<td>Severe hypothermia</td>
<td>2</td>
<td>5.7</td>
<td>33</td>
</tr>
<tr>
<td>Total</td>
<td>51</td>
<td>57.3</td>
<td>38</td>
</tr>
</tbody>
</table>

\[ p = 0.0001 \quad \chi^2 = 59.322 \quad \text{continuity correction} \quad \text{OR} = 161.7 \]

Based on the results of data analysis using the Chi-Square test, the result is \( p \) (probability) = 0.0001, this value is smaller than the significance level \( \alpha \) (0.05), which means that \( H_0 \) is rejected. These results indicate that there is a significant relationship between hypothermic LBW infants and the success rate of hypothermic treatment during incubator.

Based on Table 3, it shows that the level of treatment of moderate hypothermic LBW babies was more successful, namely 49 people (90.74%) than unsuccessful, namely 5 people (9.26%). Whereas in LBW infants with severe hypothermia there was a tendency for the treatment rate to be unsuccessful, namely 33 people (94.29%).

The results showed that moderate hypothermic LBW babies were the most successful with successful treatment. This was due to the condition of LBW babies which allowed optimal development to occur by maintaining their body temperature during the incubator. This is according to IDAI (UKK Perinatology), MNH-JHPIEGO, Indonesian Ministry of Health (2003) that the function of a baby incubator is to maintain the temperature of a room so that the temperature remains constant/stable.

In the research data, it was found that there were moderate hypothermic LBW babies with unsuccessful treatment rates, namely 5 people with incubator care > 6 days because the condition of the baby was found at birth with 1 person in breech position, 1
person with hyperbilirubin and the presence of complications in the mother during childbirth namely premature rupture of membranes 2 people and the condition of the mother with asthma 1 person. Whereas in LBW babies with severe hypothermia there were 33 people with unsuccessful treatment during the incubator because some of the babies had sepsis, pneumonia, hepatitis, respiratory distress, multiple congenital and hyaline membrane disease. From the results of this study, it is not necessarily that LBW babies with moderate hypothermia have a more successful level of treatment than LBW babies with severe hypothermia. This really depends on the condition of the LBW baby at that time and the complications that accompany it. According to Jumarni, (1994), in Manuaba (2008) that one of the complications that can occur in LBW babies is due to respiratory problems. In addition, because the fetus factor also determines the success rate of handling LBW babies as in the results of the study found babies with heart defects, respiratory distress, sepsis, infection in the uterus (hepatitis), twins and congenital abnormalities. This is according to Manuaba (2008), that the factors that affect LBW babies are congenital abnormalities (congenital defects), infections in the uterus and multiple pregnancies. If this happens to LBW babies with hypothermia, it will aggravate the situation and the success rate of treatment will decrease. Because of that, efforts are needed to identify the condition of LBW babies from various possibilities that cause emergencies so that their condition does not deteriorate and even death.

Babies born with low birth weight often experience several problems with their body systems, due to their unstable body condition. Perinatal mortality in Low Birth Weight (LBW) Babies is 8 times greater than babies born with normal weight. The prognosis will be worse if the body weight is lower, where death is more often caused by neonatal complications, one of which is hypothermia (Proverawati, 2010).

Based on the results of data analysis using the Chi-Square test, the result is $p$ (probability) = 0.000, this value is smaller than the significance level $\alpha$ (0.05), which means that $H_0$ is rejected. These results indicate that there is a significant relationship between hypothermic LBW infants and the success rate of hypothermic treatment during incubator. This means that the tendency of LBW infants to be hypothermic is significantly related to the success rate of their treatment. This is in accordance with a related study conducted by Darmayanti (2011), that hypothermia has a relationship with the occurrence of perinatal death in LBW babies, namely hypothermia that occurs in LBW babies has a
4.84 times the risk of perinatal death compared to babies with birth weight > 2500 grams, in this study showed that hypothermia is a cause of perinatal death in LBW.

Factor Analysis of Maternal Age, Parity, Pregnancy Complications, Number of Fetuses and Fetal Age on Hypothermic LBW Babies

The results of research on the relationship between maternal age and low birth weight hypothermia can be seen in table 4.

Table 4: Relationship between maternal age and hypothermic LBW babies

<table>
<thead>
<tr>
<th>Maternal Age</th>
<th>hypothermic LBW babies</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Moderate n %</td>
<td>Moderate n %</td>
<td>Moderate n %</td>
<td>Total n %</td>
<td></td>
</tr>
<tr>
<td>Not at risk</td>
<td>45 63.4</td>
<td>26 36.6</td>
<td>71 100.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risky</td>
<td>9 50.0</td>
<td>9 50.0</td>
<td>35 100.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>54 60.7</td>
<td>35 39.3</td>
<td>89 100.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\[p = 0.443 \quad \chi^2 = 0.590 \text{ (continuity correction)} \quad OR = 1.731\]

Source: Prepared By the Author (2023)

Based on Table 4, it shows that there are more moderate hypothermic LBW babies at non-risk maternal age, namely 45 people (63.4%) than at risk maternal age, namely 9 people (50%). Whereas in LBW babies with severe hypothermia there is also a tendency at maternal age not to be at risk, namely 9 people (50%).

Based on the results of data analysis using the Chi-Square test, the result is \(p\) (probability) = 0.443, this value is greater than the significance level \(\alpha\) (0.05), which means that \(H_0\) is accepted. These results indicate that there is no significant relationship between maternal age and hypothermic LBW babies.

The results of research on the relationship between parity factors and LBW Hypothermia can be seen in table 5.

Table 5: Relationship between parity factors and hypothermic LBW babies

<table>
<thead>
<tr>
<th>Parity</th>
<th>hypothermic LBW babies</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Moderate n %</td>
<td>Moderate n %</td>
<td>Moderate n %</td>
<td>Total n %</td>
<td></td>
</tr>
<tr>
<td>Not at risk</td>
<td>32 58.2</td>
<td>23 41.8</td>
<td>55 100.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risky</td>
<td>22 64.7</td>
<td>12 35.3</td>
<td>34 100.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>54 60.7</td>
<td>35 39.3</td>
<td>89 100.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\[p = 0.697 \quad \chi^2 = 0.151 \text{ (continuity correction)} \quad OR = 0.759\]

Source: Prepared By the Author (2023)

Based on table 5, shows that hypothermic LBW babies are more common in non-risk parity mothers, namely 32 people (58.2%) than parity at risk mothers, namely 22
people (64.7%). Whereas in LBW infants with severe hypothermia there was also a tendency for parity of mothers not to be at risk, namely 23 people (41.8%).

Based on the results of data analysis using the Chi-Square test, the result is $p$ (probability) = 0.697, this value is greater than the significance level $\alpha$ (0.05), which means that $Ho$ is accepted. These results indicate that there is no significant relationship between maternal parity factors and hypothermic LBW babies.

The results of research on the relationship between pregnancy complication factors and low birth weight hypothermia can be seen in table 6.

Table 6. Relationship between Pregnancy Complication Factors and Hypothermic LBW Babies

<table>
<thead>
<tr>
<th>Pregnancy Complications</th>
<th>hypothermic LBW babies</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Moderate n %</td>
<td>Severe n %</td>
</tr>
<tr>
<td>No complications</td>
<td>42 66.7</td>
<td>21 33.3</td>
</tr>
<tr>
<td>Complications</td>
<td>12 46.2</td>
<td>14 53.8</td>
</tr>
<tr>
<td>Total</td>
<td>54 60.7</td>
<td>35 39.3</td>
</tr>
</tbody>
</table>

$p = 0.118 \ X^2 = 2.443$ (continuity correction) OR = 2.333  
Source: Prepared By the Author (2023)

Based on Table 6, it shows that hypothermic LBW babies are more common in mothers without pregnancy complications, namely 42 people (66.7%) than mothers with pregnancy complications, namely 12 people (46.2%). Whereas in LBW babies with severe hypothermia there is also a tendency for mothers to have no complications of pregnancy, namely 21 people (33.3%).

Based on the results of data analysis using the Chi-Square test, the result is $p$ (probability) = 0.118, this value is greater than the significance level $\alpha$ (0.05), which means that $Ho$ is accepted. These results indicate that there is no significant relationship between pregnancy complications and hypothermic LBW babies.

The results of research on the relationship between the number of fetuses and low birth weight hypothermia can be seen in table 7.
Based on Table 7, it shows that hypothermic LBW babies are more common in single fetuses, namely 43 people (59.7%) than gameli fetuses, namely 11 people (64.7%). Whereas in LBW babies with severe hypothermia there is also a tendency for single fetuses, namely 29 people (40.3%).

Based on the results of data analysis using the Chi-Square test, the result is \( p = 0.918 \), this value is greater than the significance level \( \alpha (0.05) \), which means that \( H_0 \) is accepted. These results indicate that there is no significant relationship between the number of fetuses and hypothermic LBW babies.

The results of research on the relationship between fetal age and low birth weight hypothermia can be seen in table 8.

Based on Table 8, it shows that hypothermic LBW babies are more common in term fetuses, namely 31 people (73.8%) than preterm fetuses, namely 23 people (48.9%). Whereas in LBW infants with severe hypothermia there was a tendency for preterm fetuses, namely 24 people (51.1%).

Based on the results of data analysis using the Chi-Square test, the result is \( p = 0.029 \), this value is smaller than the significance level \( \alpha (0.05) \), which means that \( H_0 \) is rejected. These results indicate that there is a significant relationship between fetal age during pregnancy and hypothermic LBW babies.
The research results of factor analysis of maternal age, parity, pregnancy complications, number of fetuses and fetal age on LBW Hypothermia can be seen in table 9.

Table 9. Factor Analysis of Maternal Age, Parity, Pregnancy Complications, Number of Fetuses and Fetal Age on Hypothermic LBW Babies in the Perinatology Room

<table>
<thead>
<tr>
<th>LBW baby factor</th>
<th>X²</th>
<th>p-value</th>
<th>OR</th>
<th>Significancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal Age</td>
<td>0,590</td>
<td>0,443</td>
<td>1,731</td>
<td>Not Significance</td>
</tr>
<tr>
<td>Parity</td>
<td>0,151</td>
<td>0,697</td>
<td>0,759</td>
<td>Not Significance</td>
</tr>
<tr>
<td>Pregnancy Complications</td>
<td>2,443</td>
<td>0,118</td>
<td>2,333</td>
<td>Not Significance</td>
</tr>
<tr>
<td>Number of Fetuses</td>
<td>0,010</td>
<td>0,918</td>
<td>0,809</td>
<td>Not Significance</td>
</tr>
<tr>
<td>Fetal Age</td>
<td>4,756</td>
<td>0,029</td>
<td>2,941</td>
<td>Significance</td>
</tr>
</tbody>
</table>

Source: Prepared By the Author (2023)

Based on Table 9 it can be seen that of all the variable factors of maternal age, parity, pregnancy complications, number of babies born and the age of the fetus born, only the age factor of the fetus was born which was associated with hypothermia experienced by LBW babies.

There is a significant effect of fetal age (p value = 0,029) and (OR = 2,941) on LBW infants with hypothermia. The factor of preterm fetal age has a tendency of 2,941 times greater for severely hypothermic LBW babies compared to term fetal age.

LBW babies are babies born with a birth weight of less than 2,500 grams regardless of gestational age. (Prawirohardjo, 2006). WHO (1961) replaced the term premature babies with low birth weight babies. This is done because not all babies weighing less than 2,500 grams at birth are premature babies. Premature babies will quickly lose body heat and become hypothermic, because the body's heat regulation center is not functioning properly and their metabolism is low. Maryunani, A. (2013), LBW babies tend to have abnormal temperatures caused by poor heat reproduction and increased heat loss. Failure to produce adequate heat is due to the absence of brown adipose tissue (which has high metabolic activity), weak respiration with poor oxygen combustion, and low food intake.

One of the main causes of LBW is premature birth. When compared with full-term babies, premature babies have a shorter time to grow and develop in the mother's womb. In addition to premature birth, LBW conditions can also be caused by the condition of the mother during pregnancy, including: suffering from an infection during
pregnancy, having given birth to a baby with similar conditions in a previous pregnancy, carrying twins so that the space in the uterus is not optimal for the baby’s growth and development, experiencing complications of pregnancy, especially those affecting the placenta and premature rupture of membranes.

A study by Raj Sarma et al (2015) showed that the dominant factor for LBW was a history of preterm labor and mothers with a history of preterm birth had a 5.24 times greater risk of giving birth to a LBW baby compared to mothers who did not have a history of preterm birth. Gant, Norman F, (2011) Mothers who have a history of preterm labor have the possibility of giving birth to LBW babies in subsequent deliveries.

5 CONCLUSION

Based on the results of this study, it can be concluded as follows, Of the 89 respondents with hypothermia, it was found that the majority were moderate hypothermia, namely 54 people (60.67%). The success rate of handling 89 respondents with hypothermia was successful, namely 51 people (57.30%). This study shows that there is a significant relationship between hypothermic LBW infants and the success rate of hypothermic treatment during incubator, with a p-value (of 0.000). The results of multivariate analysis showed that only fetal age had a significant effect (p value = 0.029) and (OR = 2.941) on LBW infants with hypothermia. The factor of preterm fetal age has a tendency of 2.941 times greater for severely hypothermic LBW babies compared to term fetal age.
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