

# Maternal and Neonatal Factors That Influence Perinatal Death in Cilacap General Hospital 2017-2018

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**Abstract ---** Perinatal is an episode of life at 28 or more gestational ages coupled with a baby less than 7 days old. During the perinatal period is very vulnerable to morbidity and death. Perinatal Mortality Rate (PPA) is the number of fetal deaths born at 28 weeks or older plus the number of infant deaths less than 7 days recorded for 1 year per 1,000 live births in the same year. Method: This type of research is descriptive correlational research with a cross-sectional approach. The number of samples in this study was 180 events. With a total sampling technique. The data collection tool uses a checklist with logistic regression analysis. Results: The factors that influenced the incidence of perinatal death were birth weight and asphyxiation with  $p < 0.05$ . That the birth weight has a chance of 10.799 and the incidence of asphyxia has a chance of 7.6 times for the occurrence of perinatal death. Conclusion: The factors that influence the incidence of perinatal death are birth weight and asphyxiation.

**Keywords:** *perinatal death, asphyxia, birth weight*

## I. INTRODUCTION

Perinatal is an episode of life at 28 or more gestational ages coupled with a baby less than 7 days old. During the perinatal period is very vulnerable to morbidity and death. Perinatal Mortality Rate (PPA) is the number of fetal deaths born at 28 weeks or older plus the number of infant deaths less than 7 days recorded for 1 year per 1,000 live births in the same year.

The number of perinatal deaths in several hospitals is as follows: Pirngadi Medan found the number of perinatal deaths as many as 30 babies, the period March - April 2017 (Mutia, Maya Sari, 2018), furthermore at Puskesmas Candi Kabupaten Sidoarjo during 2010 – 2011 was

identified that the numbers of perinatal death were 39 infants (Pratiwi, Dian Wahyu, 2012). Other data showed that the incidence of perinatal deaths in 2015 at . Dr. RD Kandou Manado Hospital as many as 85 babies from 1649 live births (Simamora. Wellina R, Tendean. Hermie M. M, Mamengko. Linda , 2016). Furthermore, in RSIA Siti Fatimah, Makassar City in 2011 - 2012 the number of perinatal deaths was 69 (1.5%) out of 4763 total deliveries. (Pongkapadang.MN, Ansar. J, Wahidudin, 2014) and in Batang District in 2011 there were 47 cases of perinatal deaths (Mahmudah. Ummul, Cahyati. Widya Hary, Wahyuningsih. Anik Setyo, 2011).

The number of perinatal deaths is determined by the sum between the infant mortality rate and the stillbirth rate. In 2015 the number of stillbirths was found to be 13 per 1000 live births and the infant mortality rate in 2015 was known to be 22.23 per 1000 live births (UNICEF, 2015). It can be concluded that in 2015 the number of perinatal deaths was 35.23 per 1000 live births. Perinatal mortality rates in Indonesia are not known for certain because there is no comprehensive survey. It is estimated in Indonesia at 460 per 100,000 each year (Mahmudah. Ummul, Cahyati. Widya Hary, Wahyuningsih. Anik Setyo, 2011).

The cause of perinatal death, when viewed from the cause of stillbirth death and infant death can be caused by known infant factors such as congenital abnormalities, pre-term births, asphyxia, LBW and sepsis. The results of Mutia's study, Maya Sari (2018) found that congenital abnormalities had a 6.4 times greater risk of perinatal death and sepsis had a 7.8 times risk of experiencing perinatal death and birth trauma at risk of 7.67 times to experience perinatal death. Referring to the research of Pongkapadang.MN, Ansar. J, Wahidudin (2014) note that asphyxia

neonaturum provides an opportunity of 3.72 times to experience perinatal death, as well as preterm birth with a chance of 5.09 for perinatal death and LBW 4.33 times the chance of perinatal death.

When viewed from maternal factors known to be caused by comorbidities from mothers when pregnant women such as hypertension, obesity and diabetes mellitus. Besides, infant deaths are obtained from mothers giving birth at less than 20 years old, complications during labor, antepartum bleeding and premature rupture of membranes and parity. The results of research at RSUD Dr. Pimgadi Medan is known, premature rupture of membranes and antepartum hemorrhage 15 times and 6 times for perinatal death, respectively. For concomitant diseases such as diabetes, preeclampsia and eclampsia, and anemia each has a risk in cases of 16%, 10%, 3% (Mutia, Maya Sari, 2018).

Results of research at Prof. RSUP Dr. RD Kandou Manado shows that the majority of perinatal deaths occur from mothers with 28-34 weeks gestation (51.7%), parity 2-4 (36.5%), spontan delivery (74.1%) (Simamora. Wellina R, Tendean. Hermie M. M, Mamengko. Linda, 2016). It is also known that childbirth complications have a 3.54 times chance of perinatal death events and risk parity is 2,988 times the chance of perinatal death (Mahmudah. Ummul, Cahyati. Widya Hary, Wahyuningsih. Anik Setyo, 2011 dan Pongkapadang. MN, Ansar. J, Wahidudin, 2014)

Based on this description, the researcher is interested in researching Perinatal Death and its Influence with Maternal and Neonatal Factors in Cilacap District Hospital 2017 - 2018. Variables from maternal factors consist of age, parity, gestation period, type of labor, accompanying diseases, complications of childbirth. For neonatal factors consisting of LBW, asphyxia, congenital abnormalities, sepsis, birth trauma.

II. MATERIAL AND METHOD

Research conducted was a descriptive correlational study. The design used in this study was cross sectional. The population of this study was maternity mothers with the incidence of perinatal death in Cilacap District Hospital in 2017-2018. In this study, a sample of cases, namely mothers with 90 perinatal deaths and 90 controls, was normal mothers. To test the hypothesis by determining the relationship between independent and dependent variables, through logistic regression tests.

III. RESULTS

A. Distribution of Maternal Factors of Age with Perinatal Death Events

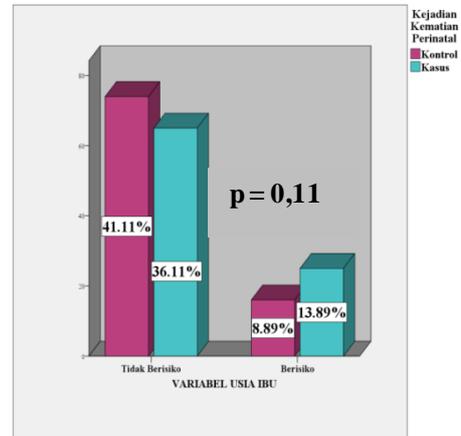


Figure 1. Distribution of Maternal Age Factors with Perinatal Death Events.

Based on Figure 1 it is known that the age of mothers at risk, namely the age of reproduction <20 years and > 35 years the majority (13.89%) experienced an incidence of perinatal death. While mothers with no-risk age, namely the majority of reproductive age 20-35 years (41.11%) in the control population. When viewed from the results of the p value obtained 0.11, this means that there is no influence between maternal age and the incidence of perinatal death.

B. Distribution of Maternal Parity Factors with Perinatal Death Events

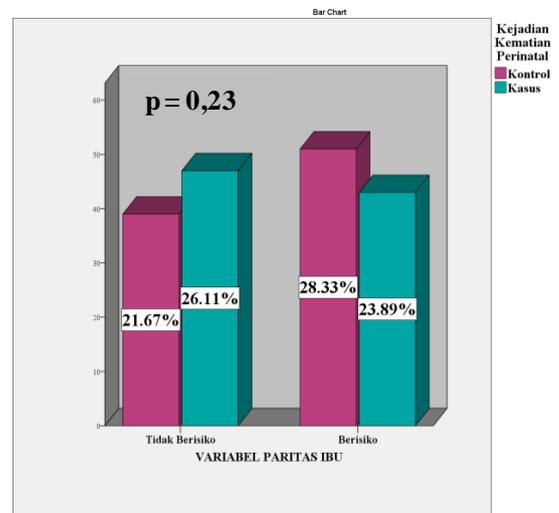


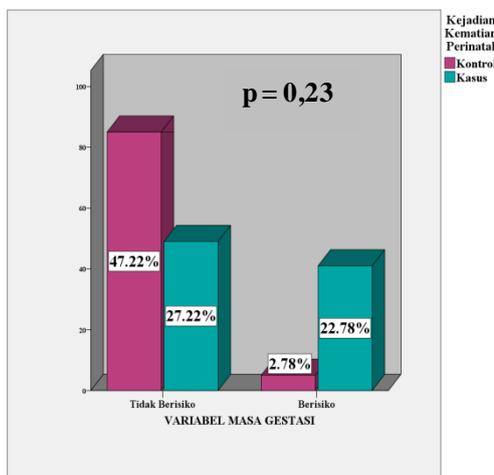
Figure 2. Distribution of Maternal Parity Factors with Perinatal Death Events.

The second maternal factor is the parity factor. In Figure 2 below it can be seen that the majority (26.11%) in the population of perinatal death cases is known to occur in mothers with no-risk parity, namely parity 2-4 and in the control population known to the majority (28.33%) of mothers with risk parity i.e. parity 1 and parity > 5. Obtained a p value of 0.23 which means there is no influence between parity and perinatal mortality events.

**C. Distribution of Maternal Factors during the Gestation Period with Perinatal Death Events**

The gestation period is the same as the term gestational age. Figure 3 shows that the majority (47.22%) of mothers with no-risk gestation were mothers with a control population.

Whereas for mothers with risky gestation, the majority (22.78%) is a case population. The result of p is 0.00 which means there is an influence between gestation and perinatal death.

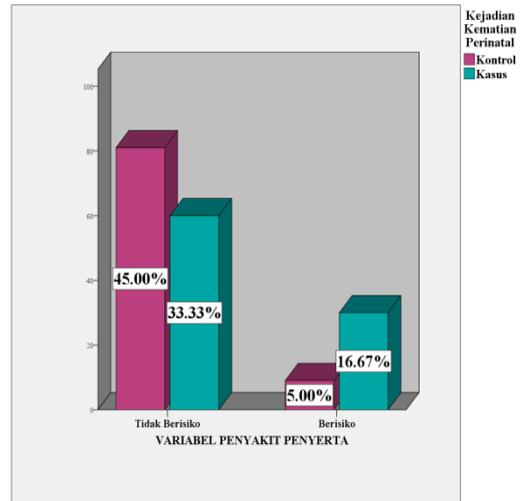


**Figure 3. Distribution Of Gestation Periods With Perinatal Mortality**

**D. Distribution of Maternal Factors of Concomitant Diseases with Perinatal Death Events**

The fourth factor is accompanying the disease. Accompanying diseases are events that occur during pregnancy until perinatal death. Factors of comorbidities were experienced by the majority (16.67%) of mothers who experienced perinatal death, while mothers who did not experience co-morbidities (45%) were experienced by mothers in the control group. The results of the p value indicate a correlation

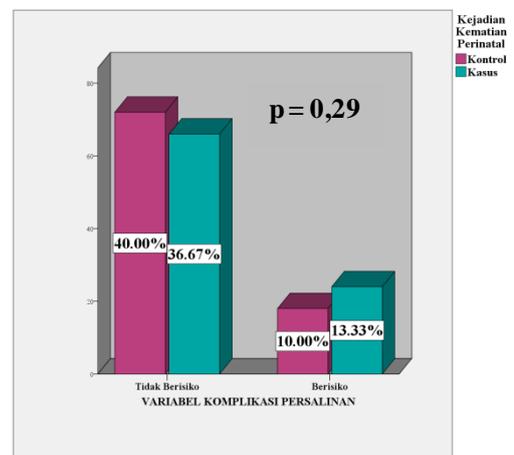
between comorbidities and the incidence of perinatal death.



**Figure 4. Distribusi Penyakit Penyerta Dengan Kematian Perinatal**

**E. Distribution of Maternal Factors in Complications of Labor with Perinatal Death Events**

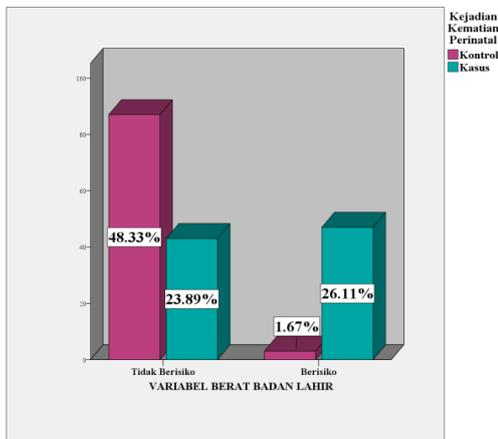
From Figure 5, the risk of delivery complications variable is dominated by the case group (13.33%), while the risk of delivery complications variable is not risk dominated by the control group (40%). The result of p value is 0.29, which means there is no influence.



**Figure 5. Distribution of Labor Complications with Perinatal Death**

**F. Distribusi Faktor Neonatal Berat Badan Lahir Dengan Kejadian Kematian Perinatal**

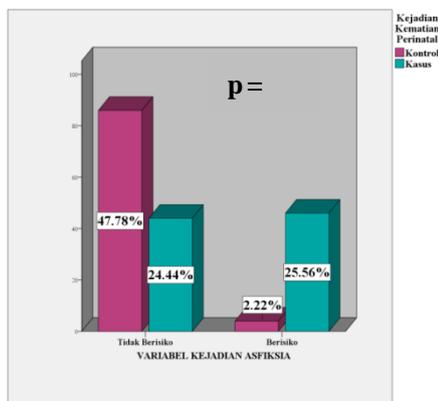
**p = 0,00**



**Figure 6. Distribution of Birth Weight Variables with Perinatal Death**

Based on the picture above, it is known that the incidence of low birth weight or referred to as the majority risk category (26.11%) is experienced by the case population and neonatal with normal weight or not at risk by the majority (48.33%) by the control population. The result of p shows that there is an influence between neonatal birth weight and the incidence of perinatal death

**G. Distribution of Factors for Asphyxia and Perinatal Death**

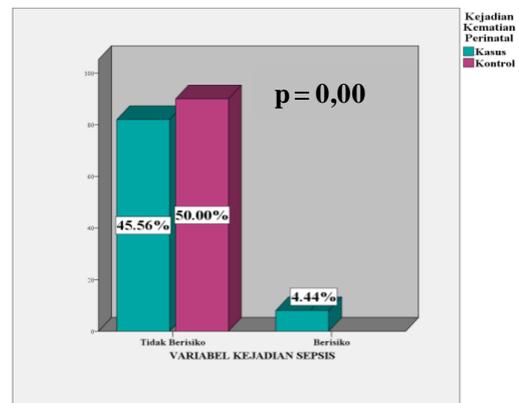


**Figure 7. Distribution of Variable Asphyxia Events with Perinatal Death**

Asphyxia, when seen in Figure 7 the majority experienced by neonates from the case population (25.56%) and neonates who did not experience asphyxia, the majority occurred in neonates in the control group (47.78%). From the results of the p value is known to influence the incidence of asphyxia and perinatal death

**H. Distribution of Neonatal Factors in the Occurrence of Sepsis with Perinatal Death**

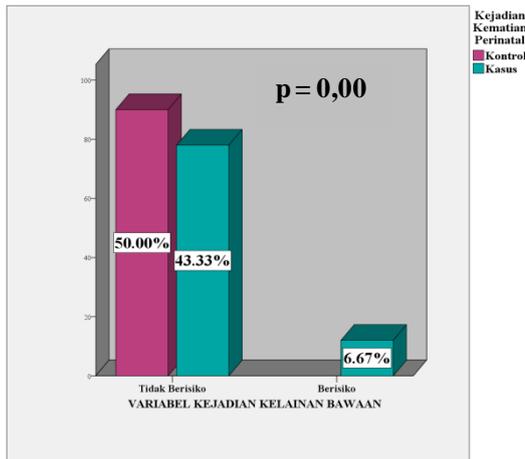
Based on the results of the study in Figure 8 known in the case population, there are 4.44% of patients with sepsis while the entire control population did not experience sepsis. The results of the p value indicate there is an influence between the incidence of sepsis and perinatal death.



**Figure 8. Distribution of Variable Occurrence of Sepsis with Perinatal Death**

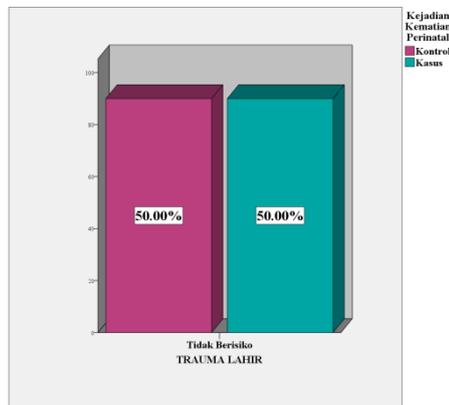
**I. Neonatal Factor Distribution of Congenital Abnormalities with Perinatal Death**

Congenital abnormalities are abnormalities of both organs and functions experienced by neonates. The results in Figure 3.9 show that none of the entire control population experienced congenital abnormalities while the congenital abnormalities occurred in both the case and control populations. The results of the p value indicate that there is an influence between congenital abnormalities and the incidence of perinatal death.



**Figure 9. Distribution of Congenital Abnormalities with Occurrence of Variable Events**

**J. Distribution of Neonatal Trauma Factors Born with Perinatal Death.**



**Figure 10. Distribution of Variables in Traumatic Birth Events with Perinatal Death**

In this last factor, birth trauma, it is known in Figure 10 that all populations, both control and case populations, did not experience birth trauma.

**K. Partial Influence Test of Mother Factors**

Tests for the influence of maternal factors partially can be seen based on the value of the variable in the equation, it is found that a significant value is obtained at the weight variable 0.001 and the incidence of asphyxia 0.001 and the odds ratio value on the birthweight variable has a chance of 10.799 and asphyxia has a chance of 7.6 times for occurrence of perinatal death.

So it can be interpreted with a 95% confidence level it can be concluded that the

variable birth weight and the incidence of asphyxia affects the incidence of perinatal death.

**L. Criteria for Results with Negalgarke R Square testing**

Negalgarke R Square test obtained a value of 0.576 which can be interpreted that as much as 57.6% of maternal factors that influence perinatal mortality, the rest is caused by other factors.

**M. Criteria Results with Classification plot testing.**

Based on the classification plot value of 82.2, then this shows that the logistic regression model used is quite good, because it can guess correctly 82.2% of the conditions that occur.

**IV. DISCUSSION**

The results showed that of the ten variables studied as independent variables, it was found that there were two variables that affected perinatal mortality, namely weight and asphyxia. The results of the study are in line with research by Pongkapadang.MN, Ansar. J, Wahidudin (2014) that the variable asphyxia neonatorum shows the risk percentage of neonatal asphyxia in the case group (43.7%) is greater than the control group (17.2%).

This shows that the incidence of neonatal asphyxia is more common in the case group. Odds Ratio test results at 95% confident interval values obtained lower limit value (LL) = 1.85 and upper limit (UL) = 7.49 which means the lower limit and upper limit values do not exceed 1, the OR is obtained at 3.72 . Because the lower limit and upper limit values do not exceed 1, the results are said to be significant, Ho is rejected, so the OR = 3.72 is significant. Thus the incidence of neonatal asphyxia is 3.72 times the risk of perinatal death

Asphyxia is a condition where at birth the baby does not cry right away. Based on the explanation from Achadi, EL (2019) found that as many as 7000 newborns die worldwide every day. As many as 3/4 out of 7000 neonatal deaths occur in the first week and 40% die within 24 hours. The results of Azizah I and Handayani, OK (2017) showed a significant risk of neonatal death by asphyxia with a p value of 0.001 (Azizah I dan Handayai, OK, 2017). When a neonate is born and experiences no crying, it is an emergency condition in which relief must be done

immediately within the first ninety seconds. If the first aid in the first 90 seconds successfully causes the baby to cry, the neonatal condition is saved. If in the first 90 seconds it has not been successful then it can be continued up to a maximum of 10 minutes and the risk is high for disability if the neonate is alive and can be at risk of death.

Factors affecting asphyxia include: maternal age, maternal parity, meconium amniotic fluid, poor obstetric history, premature rupture of membranes, birth weight, birth body with overall p value  $<0.05$  (Yuliana, U dan Anugrah, BE, 2018; Rahmawati, L dan Ningsih, MP, 2016; Fajarriyanti, IN, 2017).

The linkage of studies on asphyxia with the current author's research is that there are several variables that although they do not affect perinatal mortality, there are links to asphyxia events. The variable in the current author's research is labor complications, it is known that 23.3% of respondents give birth with complications. The complications of labor were found in the form of premature rupture of membranes wherein the study of cited asphyxia affected asphyxia.

Another variable, maternal age, based on multivariate analysis did not influence the incidence of perinatal death, although as many as 22.8% of all respondents were at risk of age  $<20$  and  $>35$  years. The parity variable also did not effect on perinatal mortality, although 52.2% of respondents with risk parity were known as parity 1 and parity  $>4$ . Age at risk and reproductive risk parity do indeed need to be vigilant about pregnancy preparedness and physical preparation for childbirth.

The birth weight variable in this study is a variable that influences perinatal mortality which has an opportunity of 10.799 times with a range of 2.70 to 43.11 times to experience perinatal death. The results of this study are in line with the research of Pongkapadang, MN, Ansar, J, Wahidudin (2014) which shows that the percentage of risk of LBW occurrence in the perinatal death group (60.9%) is greater than the control group (26.4%). The riskiest study samples ( $<2500$  grams) occurred in the case group of 53 people (60.9%). This shows that LBW events are more common in the case group. Odds Ratio test results at 95% confident interval values obtained lower limit value (LL) = 2.28 and upper limit (UL) = 8.24 which means the lower limit and upper limit values do not exceed 1, then the OR is 4.33. Because the lower limit and upper limit values do not exceed 1, the results are said to be significant so that  $H_0$  is rejected, so the value OR

= 4.33 is significant. Thus the incidence of LBW is 4.33 times the risk of perinatal mortality.

Neonates with low birth weight need more glucose to maintain body warmth. Meanwhile, neonatal metabolic abilities are not as perfect as babies. When neonates with low birth weight need to increase the metabolism of which fuel is oxygen and glucose, then the ability to breathe must also be increased where the respiratory organs in neonates are not functioning optimally and are still running anaerobically. Likewise, the fulfillment of glucose intake is not met in full through breast milk, due to the limited ability to eat and gastric capacity so that the dominant administration through the infusion. Limitations of the ability of respiratory and digestive functions of the neonate if not resolved at great risk of death.

Other neonatal factors that do not affect perinatal mortality are the incidence of sepsis, congenital abnormalities, and birth trauma. In a bivariate analysis for sepsis variables and congenital abnormalities, there is a relationship. This happens due to the incidence of sepsis and congenital abnormalities in the case population. Reality found in the field, the majority of congenital abnormalities are multiple congenital disorders. While the incidence of birth trauma was not found in all respondents.

## V. CONCLUSION

Based on the results of the research above, it can be concluded that the factors that influence the incidence of perinatal death are birth weight and asphyxiation with  $p < 0.05$ . That the birth weight has a chance of 10.799 and the incidence of asphyxia has a chance of 7.6 times for the occurrence of perinatal death.

A suggestion that can be given is the need for special attention during pregnancy examination to calculate the estimated fetal weight in anticipation of the possibility of intrauterine growth hormone so that if an estimated fetal weight is less than it should be, there is a great risk for perinatal death.

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