Factors Associated with Pregnancy at Risk for Obstetric Emergency in Pregnant Women at Koya Barat Health Center Jayapura City Papua

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Abstract

Background: Indonesia is currently still faced with a high maternal mortality rate (MMR). To end this maternal mortality rate, one of the national priority commitments is to end maternal mortality during pregnancy and childbirth. The maternal mortality rate (MMR) for Papua Province according to the Papua Province Health Profile 2019 are 61.3/100,000 deliveries and the Infant Mortality Rate (IMR) are 6/100,000 live births, while the case of maternal mortality in 2018 in Jayapura City are 58/100,000 live births. **Objectives:** This study aims to determine the factors associated with Pregnancy at Risk for Obstetric Emergency in pregnant women at the Koya Barat Health Center. **Methods:** This research is an analytical research with a cross sectional approach using Maternal and Child Health (MCH) records at the Koya Barat Health Center in 2020. The population of this study was pregnant women at the Koya Barat Health Center in 2020, as many as 261 mothers. The sampling technique is saturated sampling. The data was processed using the Chi-square test, the Prevalence Ratio Test, and Logistic Regression. **Result:** The results of the bivariate analysis showed that Education ($p < 0.001$; RP = 1.72; 95% CI: 1.3-2.1), age ($p = 0.00<0.05$; RP = 1.98; 95% CI: 1.6-2.4), parity ($p < 0.001$; RP = 2.08; 95% CI: 1.68-2.5), Hb level ($p = 0.005$; RP = 1.44; 95% CI: 1.11-1.83 , the state of the birth canal ($p < 0.001$; RP = 2.25; 95% CI: 1.76-2.88), and the state of the fetus ($p < 0.001$; RP = 1.88; 95% CI: 1.53-2.31) had a significant relationship with pregnancy at risk of obstetric emergency in pregnant women at Koya Barat Health Center, while history of disease ($p = 0.44$; RP = 1.14; 95% CI: 0.86-1.52) did not have a significant relationship with risk of obstetric emergency in pregnant women at Koya Barat Health Center. The most dominant risk factor for pregnancies at risk for Obstetric Emergency in pregnant women at the Koya Barat Health Center was the condition of the fetus ($p = 0.001$; RP = 13.4 3.507; 95% CI: 3.09 - 58.1).

Keywords: *Pregnancy, risk, obstetric emergenc, koya barat health center*

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Introduction

Indonesia is currently still faced with a high maternal mortality rate (MMR). To end this maternal mortality rate, one of the national priority commitments is to end maternal mortality during pregnancy and childbirth. The results of the 2015 Inter-Census Population Survey (SUPAS), Indonesia's MMR is still high at 305 per 100 thousand live births.[1]

According to the research of the director of the Women Research Institute, Edriana Noerdin, the main causes of maternal mortality in Indonesia are bleeding and infection. One of the causes of these two things is abortion. 15 percent of abortions in Indonesia occur in women under the age of 20 years and about 2.3 million abortions occur every year in Indonesia. As many as 1 million spontaneous miscarriages, 700 thousand due to unwanted pregnancies and 600 thousand due to family planning failures.[2]

The maternal mortality rate (MMR) for the province of Papua according to the Papua Province Health Profile 2019 are 61.3/100,000 deliveries and the Infant Mortality Rate (IMR) are 6/100,000 live births,[3] while the case of maternal mortality in 2018 in Jayapura City are 58/100,000 live births.[4]

Some pregnancies are at risk for an obstetric emergency, which is unpredictable or unavoidable. The risk of a possible pregnancy at risk of an obstetric emergency in each mother is different according to the conditions during pregnancy whether the woman is pregnant without experiencing problems (low risk pregnancy group) or pregnant woman has problems / risk factors (high risk pregnancy group and very high-risk pregnancy group). The higher the level of risk of risk factors in pregnant women, the higher the mother will experience childbirth complications.[5]

The results of the research by Sari and Absari (2018) also mention that there is a significant relationship between the condition of the fetus (fetal distress) with Section Caesarea in the moderate category and having a mother with fetal distress has a 1.358 times risk for section caesarean compared to mothers without emergency fetus.[6]

The results of Paat's research (2015) say that risky pregnancies such as the location, shape of the fetus and birth canal factors are the cause of delivery complications (dystocia).[7] Under normal circumstances, the lowest position of the fetus is the back of the head, the baby's shape, weight, position and location in its development until the end of pregnancy and is ready to be born, the baby has the power to push himself out so that labor is spontaneous.[7]

The data on Maternal and Child Health reports at the Koya Barat Health Center is known that most pregnant women at the Koya Barat Health Center in 2020 are included in the category of high-risk pregnancies experiencing Obstetric Emergency, namely 133 respondents (51.0%), and 128 respondents (49.0%) with low-risk pregnancies.[8]

The results of the screening of pregnant women at the Koya Barat Health Center in 2020 with a Poedji Rochjati Scorecard that not only found one complication that accompanies pregnancy in the mother but there were several complications found in one mother including anemia, poor obstetric history, maternal problems with a history of co-morbidities, the presence of complications of the birth canal, and the state of the fetus with indications of some problems in pregnancy. Many pregnant women were declared to have a high-risk pregnancy condition at the monitoring of the ANC examination at the Koya Barat Health Center.[8]

Based on the data above, it encourages researchers to find out what factors are associated with risky pregnancies in pregnant women at the Koya Barat Health Center in 2020?

Materials and Method

The type of research used was analytical research with a cross sectional approach, namely research where the independent and dependent variables were measured at one time.[9] The study was conducted in February 2021. The sampling technique used was saturated sampling based on the secondary data from the Koya Barat Health Center. The number of samples was 261 pregnant women at the Koya Barat Health

Center in 2020. The data were analyzed using chi-square and multiple logistic regression for multivariate data analysis.

Findings

a. Univariate Analysis

Table 1. Distribution of variables related to pregnancy at risk of Obstetric Emergency in pregnant women at the Koya Barat Health Center

Variable	Category	Frequency (n)	Percentage (%)
Mother's Education	Elementary (Middle School)	86	33.0
	Advanced (> Middle School)	175	67.0
Age	At risk (<20 yr and >35 yr)	69	26.4
	No Risk (20-35 years old)	192	73.6
Parity	≥ 4	72	27.6
	< 4	189	72.4
Hb level	Anemia	134	51.3
	No Anemia	127	48.7
History of	There's History	59	22.6
co-morbidities	No History	202	77.4
Birth Road Condition	There are Complications	103	39.5
	No complications	158	60.5
Fetal State	Presentation Not Head	25	9.6
	Head Presentation	236	90.4
Risky Pregnancy	High Risk	133	51.0
Obstetric emergency	Low Risk	128	49.0

Source: Secondary data, 2020

b. Bivariate Analysis

Table 2. Relationship of independent variables with Pregnancy at Risk for Obstetric Emergency in pregnant women at Koya Barat Health Center

Variable	Risky pregnancy						P-Value	RP	CI (95%)	
	High Risk		Low Risk		Total					
	n	%	n	%	n	%			Lower	Upper
Education Elementary	60	69.8	26	30.2	86	100	0.000	1.72	1.3	2.15
Advanced	71	40.6	104	59.4	175	100				
Age At risk	52	80.0	13	20.0	65	100	0.000	1.98	1.6	2.4
No risk	79	40.3	117	59.7	196	100				
Parity ≥4	58	80.6	14	19.4	72	100	0.000	2.08	1.68	2.5
<4	73	38.6	116	61.4	189	100				
Hb level Anemia	79	59.0	55	41.0	134	100	0.005	1.44	1.11	1.83
No Anemia	52	40.9	75	59.1	127	100				
History of co-morbidities There's History	28	56.0	22	44.0	50	100	0.44	1.147	0.865	1.52
No History	103	48.8	108	51.2	211	100				
Birth Road Condition There are Complications	78	75.7	25	24.3	103	100	0.000	2.25	1.76	2.88
No complications	53	33.5	105	66.5	158	100				
Fetal State Presentation Not Head Head Presentation	21 110	87.5 46.4	3 127	12.5 53.6	24 237	100 100	0.000	1.88	1.537	2.31

Source: Secondary data, 2020

Based on table 2 above, it can be seen that of the seven variables studied, it was known that there was only one variable that was not significant, namely the history of disease with a P value of 0.44 or greater than alpha 0.05. Meanwhile, other variables such as education, age, parity, HB levels, the condition of the birth canal and the condition of the fetus were all significantly related to pregnancies at risk for Obstetric Emergency.

c. Multivariate Analysis

Table 3. Final Results of the Multivariate Logistics Regression Model Pregnancy at risk of Obstetric Emergency in pregnant women at the Koya Barat Health Center

No.	Risk Factor	Category	OR	CI 95%	P-value
1.	**Fetal State**	**Presentation Not Head Head Presentation**	**13.4**	**3.09-58.1**	**0.001**
2.	Parity	≥ 4	9.83	4.47-21.5	< 0.01
		< 4			
3.	Age	At risk	6.82	2.88-16.14	< 0.01
		No risk			
4.	Birth Road Condition	There are Complications	4.13	2.1-8.07	0.001
		Normal			
5.	Hb level	Anemia	3.55	1.78–7.08	< 0.01
		No Anemia			

Source: Secondary data, 2020

Based on table 3 above, it was known that the dominant factors for pregnancy at risk of obstetric emergency in pregnant women at the Koya Barat Health Center were the condition of the fetus, parity, age, birth canal condition, and HB levels.

Discussion

1. Relationship of age with pregnancy risk of obstetric emergency.

The relationship between age and pregnancy at risk for obstetric emergencies shows that mothers at risk of giving birth at the age of ≤ 19 years and > 35 years are most likely to have the potential to experience pregnancies at risk for obstetric emergencies. 80% of pregnant women with the age of ≤ 19 years and > 35 years have risky pregnancies. The results of the chi-square test obtained p-value = 0.000 (<0.05), it is concluded that there is a significant relationship between maternal age and the incidence of risky pregnancies in pregnant women at the Koya Barat Health Center.

The Prevalence Ratio (RP) of maternal age ≤ 19 years and > 35 years for at-risk pregnancies at Koya Barat Health Center is 1.98 with 95% CI (1.6-2.4).

This means that pregnant women with a risky age (age ≤ 19 years and > 35 years) have a 1.98 times greater risk of having a risky pregnancy than mothers with an age > 19 years and ≤ 35 years. The results of the logistic regression test showed that age was the dominant factor in the incidence of pregnancy at risk of obstetric distress.

The Results of research conducted by Dr. Deirdre Murphy of Trinity College in Dublin in 2011 showed that a woman's age at delivery can influence the risk of birth complications. They found that women who gave birth in their teens were at risk of giving birth prematurely. Meanwhile, women who give birth at an old age are at risk of giving birth by caesarean section. Murphy and colleagues conducted a study on 36,916 women who gave birth for the first time between 2000 and 2011. Researchers mainly looked at women who gave birth too young or too old. The result, only about six percent of mothers aged 20-34 years who gave birth prematurely, compared with 10 percent of mothers aged under 20 years who gave birth prematurely. Even so, women who are young at the time of delivery are at a lower risk of giving birth by caesarean section.[10]

According to Susanti (2008) in Rinata and Andayani (2018), that maternal age < 20 years and ≥ 35 will have an impact on feelings of fear and anxiety before the delivery process. Because if the mother is pregnant at that age, her pregnancy is included in the category of high-risk pregnancy and a mother who is older will have a high potential to give birth to a baby with birth defects.[11]

According to Manuaba (2019), that at the age of a woman is too young or under 20 years old, she does not yet have mature reproductive organs and the condition of the uterus is not perfect for pregnancy and childbirth so that it can harm the health of the mother as well as the development and growth of the fetus. Meanwhile, for women who are more than 35 years old, it is possible for obstetric complications to occur because their reproductive health has declined and the mother is too weak to push during childbirth.[12] According to Mappaware (2019) that at a too young age, a woman's reproductive organs are not overall good and her psychological development is not ready to become a mother and accept her pregnancy where this can result in pregnancy disorders that can increase maternal and perinatal mortality.[13]

2. Relationship of Parity with Pregnancy at risk of obstetric emergency

The relationship between parity and pregnancy at risk for obstetric emergency shows that women giving birth with a number of children ≥ 4 are most likely to have the potential to have pregnancies at risk for obstetric emergencies. As many as 80.6% of mothers with parity ≥ 4 are included in the category of pregnancy at risk for obstetric emergencies. The results of the chi-square test obtained p-value = 0.000 (< 0.05), it is concluded that there is a significant relationship between parity and pregnancy at risk of obstetric emergency in pregnant women at the Koya Barat Health Center.

The prevalence ratio (PR) of parity to pregnancies at risk for obstetric emergencies at the Koya Barat Health Center is 2.08 with a 95% CI (1.68-2.5). This means that mothers who give birth with a number of children ≥ 4 have a 2.08 times greater risk of having a pregnancy at risk of an obstetric emergency than mothers with a number of children <4.

The results of research by Rinata and Andayani (2018) on parity and anxiety showed that most (69.6%) pregnant women with multigravida parity, while the rest (30.4%) with primigravida parity. According to him, a woman's parity can affect the psychological health of pregnant women, especially in the third trimester pregnant women who will face the delivery process.[11] The same thing was stated by

Triana that the higher the parity of the mother, the poorer the endometrium. This can affect the next pregnancy because the condition of the mother's uterus has not recovered to get pregnant again due to reduced vascularity or atrophic changes in the decidua due to past deliveries so that it can result in fetal death in the womb.[14]

According to Hall, et al. (2015) the number of previous deliveries was associated with preterm delivery (p-value > 0.05).[15] According to Yetti (2010), reproductive status factors related to the incidence of pregnancy at risk of obstetric distress are parity of one or ≥ four children, the presence of pregnancy complications and a history of previous childbirth complications.[16] A woman who has been pregnant 6 or more times, is more likely to have weak contractions during labor (because her uterine muscles are weak), bleeding after delivery (because her uterine muscles are weak), rapid labor which can increase the risk of heavy vaginal bleeding, placenta previa (low-lying placenta).[12]

3. Relationship of Hb Levels with pregnancy at risk of obstetric emergency

The relationship between Hb levels and pregnancies at risk for obstetric emergencies shows that pregnant women with anemia are more likely to have a pregnancy at risk for obstetric emergencies. Pregnant women with anemia of 59% experienced pregnancy at risk of obstetric emergency. The results of the Chi-Square test obtained p-value = 0.000 (< 0.05), it is concluded that there is a significant relationship between Hb levels and pregnancy at risk of obstetric emergency in pregnant women at the Koya Barat Health Center.

The prevalence ratio (PR) of anemia to the incidence of pregnancy at risk for obstetric emergencies at the Koya Barat Health Center is 1.44 with a 95% CI (1.11-1.83). This means that pregnant women with anemia have a 1.44 times greater risk of having an obstetric emergency risk pregnancy than mothers who are not anemic.

Mothers with low hemoglobin levels are at risk for infection, prolonged labor due to fatigue of the uterine muscles in contracting (uterine inertia), postpartum bleeding due to the absence of uterine muscle contractions (uterine atony), shock, abortion, premature birth, and severe anemia that can cause decompensation cordis. Hypoxia due to anemia causes shock and maternal death in childbirth. Repeated pregnancies in a short time can also be a factor in the mother experiencing anemia because this will deplete the mother's iron reserves. Good pregnancy spacing (at least 2 years) is important to note so that the mother is ready to receive the fetus again without depleting her iron reserves.[17]

The results of Triana's research at Arifin Achmad Hospital Pekanbaru in 2012 found that maternal Hb levels < 11 g% caused IUFD.[14] Therefore, for recommendations, efforts are needed to make the mother's Hb during pregnancy more than 11 g%, namely by increasing the standard of ANC services through the 14 T program, one of which is the administration of Fe tablets. In addition, health workers can motivate pregnant women through counseling to consume lots of food.

4. Relationship of history of comorbidities with pregnancy at risk of obstetric emergency

The results of a bivariate analysis between a history of comorbidities and pregnancies at risk of an obstetric emergency showed that as many as 28 (56%) mothers who had a history of comorbidities experienced pregnancies at risk for an obstetric emergency. Meanwhile, among mothers who did not have a history of comorbidities, there were 103 (48.8%) who experienced childbirth complications. The results of the chi-square test obtained p-value

= 0.44 > (0.05), so it can be concluded that there is no relationship between history of comorbidities and pregnancy at risk of obstetric emergency at Koya Barat Health Center.

The prevalence ratio (RP) of medical history to the incidence of childbirth complications at the Koya Barat Health Center is more than 1, which is 1.11 with a 95% CI (0.984-1.739). This means that pregnant women who have a history of comorbidities have a risk of 1.11 times, but it is not significant.

According to the results of Indriyaswari's research (2019), it is known that the most common comorbidities in pregnancy are Preeclampsia at 81.5%, Anemia (13.4%), Hepatitis (4.5%), and the lowest is DM (0.6%).[18] High-risk pregnancy is a pregnancy that can threaten the life of the fetus and mother. This requires a more comprehensive approach to high-risk pregnancies, there are categories based on threats to pregnancy health such as biophysical, psychosocial, sociodemographic, and environmental. According to Lowdermik (2013) in Indriyaswari (2019) that pregnancy is at risk of pregnancy complications if it occurs in pregnant women, it can increase perinatal morbidity and mortality.[18] Early detection of high-risk pregnancies is very important in order to identify and prevent problems in pregnancy, and childbirth. During pregnancy, there will be changes in circulation that are influenced by hormones. Increased weight in the mother and the extra tissue needed for the fetus to grow and develop in the womb. According to Jumaiza, Elvira, & Panjaitan (2018) in Indriyaswari (2019) that blood pressure will drop in the first 6 months of pregnancy, this occurs due to a decrease in peripheral vascular resistance caused by stretching of smooth muscles by the hormone progesterone after 24 weeks of pressure blood will rise continuously. This increase occurs along with the enlargement of the uterus and the size of the conceptus. This condition will cause the uptake of oxygen in the uterine blood too much during pregnancy, if the blood flow to the placenta is delayed then the oxygen and nutrients that will be delivered to the fetus will be reduced, so it will slow down the growth and development of the fetus, and increase the risk during childbirth.[18]

5. Relationship of Birth Canal Condition with pregnancy at risk of obstetric emergency

The relationship between birth canal conditions and pregnancies at risk for obstetric emergencies shows that pregnancies with birth canal conditions with complications are likely to have the potential to experience labor complications. Mothers giving birth by birth canal with complications of 56% of pregnancies are at risk of obstetric emergency. The results of the chi-square test obtained p-value = 0.000 (<0.05), it was concluded that there was a significant relationship between the condition of the birth canal and the incidence of labor complications in women giving birth at the Koya Barat Health Center.

The prevalence ratio (PR) of mothers with birth canal conditions with complications to pregnancies at risk for obstetric emergencies at the Koya Barat Health Center is 2.25 with a 95% CI (1.76-2.88). This shows that mothers who give birth with complicated birth canals are at risk of 2.25 times greater risk of having an obstetric emergency risk pregnancy than mothers with normal/uncomplicated birth canals.

The pelvis is the birth canal for the fetus to exit the vagina during the birth process. This is in line with Prawiraharjo who stated that the pelvis is one of the important parts and affects the delivery process.[17] Various pelvic abnormalities can cause labor to last for a long time, including: pelvic deformities such as the type of narrow pelvis, oblique, bone disease, narrow transverse and pelvic size abnormalities both the outer and inner pelvis.[17]

6. The relationship between the condition of the fetus and pregnancy at risk of an obstetric emergency

The relationship between the condition of the fetus and pregnancies at risk for obstetric emergencies shows that women who give birth with a non-headed fetal presentation are most likely to have a pregnancy at risk for obstetric emergencies. Pregnant women with non-head fetus presentation by 87.5% experienced childbirth complications. The results of the Chi-Square test obtained p-value = 0.000 (<0.05), so it was concluded that there was a significant relationship between the condition of the fetus and the incidence of labor complications in women giving birth at the Koya Barat Health Center.

The Prevalence Ratio (PR) of mothers presenting with non-head fetuses to the incidence of childbirth complications at the Koya Barat Health Center is 1.88 with a 95% CI (1.53-2.31). This shows that pregnant women with birth canal conditions with complications have a 1.88 times greater risk of having a pregnancy at risk for obstetric emergencies than mothers with the percentage of the fetus is head.

Based on the results of multivariate logistic regression, the relationship between the condition of the fetus and the incidence of labor complications obtained p-value 0.000 <0.05, meaning that it was significantly proven at the 95% confidence level that there was a significant relationship between the condition of the fetus and maternal labor complications. With a RP value = 82.342, the risk of pregnant women with non-headed presentation of the fetus to experience childbirth complications is quite varied, ranging from 10.3 to 652 times greater than mothers with normal birth canal.

The results of the research by Sari and Absari (2017) also mention that there is a significant relationship between fetal distress and Section Caesarea in the moderate category and having a mother with fetal distress has a 1.358 times risk for a caesarean section compared to mothers without fetal distress.[6] The results of Paat's research (2015) say that the location, shape of the fetus and birth canal factors are the causes of labor complications (dystocia).[7]

Conclusion

1. Education was significantly related to pregnancies at risk for Obstetric Emergency in pregnant women at the Koya Barat Health Center (p < 0.001; RP = 1.72; 95% CI: 1.3-2.1);
2. Age was significantly associated with pregnancies at risk for Obstetric Emergency in pregnant women at Koya Barat Health Center (p < 0.001; RP = 1.98; 95% CI: 1.6-2.4);
3. Parity was significantly associated with pregnancies at risk for Obstetric Emergency in pregnant women at Koya Barat Health Center (p < 0.001; RP = 2.08; 95% CI: 1.68-2.5);
4. HB levels were significantly associated with pregnancies at risk for Obstetric Emergency in pregnant women at Koya Barat Health Center (p = 0.005; RP = 1.44; 95% CI: 1.11-1. 83);
5. Birth canal conditions were significantly associated with pregnancies at risk for Obstetric Emergency in pregnant women at Koya Barat Health Center (p < 0.001; RP = 2.25; 95% CI: 1.76-2.88);
6. Fetal condition was significantly associated with pregnancies at risk for Obstetric Emergency in pregnant women at Koya Barat Health Center (p < 0.001; RP = 1.88; 95% CI: 1.53-2.31);
7. History of disease was not significant with pregnancy at risk of Obstetric Emergency in pregnant women at Koya Barat Health Center (p = 0.44; RP = 1.14; 95% CI: 0.86-1.52);
8. The most dominant risk factor for pregnancies at risk for Obstetric Emergency in pregnant women at the Koya Barat Health Center is the state of the fetus (p = 0.001; RP = 13.4 3.507; 95% CI: 3.09 – 58.1).

Conflict of Interest: Nil

Source of Funding: Self

Ethical Clearance: Not required

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