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## Factors Analisis of The Event of Premature Rupture of Membranes with Mothers in Labor During a Pandemic Covid-19

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### ABSTRACT

Premature rupture of membranes (PROM) is the rupture of the membranes before delivery. The incidence of PROM in the world is still high, at 50-60%, while in Indonesia, it is around 65%. Various factors cause PROM that needs to be known so that mothers with PROM can be treated appropriately, namely age, parity, education, infection, and history of PROM. This study aimed to determine the frequency distribution and the relationship of age, parity, education, infection, and history of PROM with the incidence of PROM in women giving birth during the Covid-19 pandemic at RS Sentosa Bogor in 2022. This research methodology is analytic observational with a case control research design. The study was conducted at Sentosa Hospital, Bogor, from May to July 2022. This study's population is mothers giving birth at Sentosa Hospital in 2022. The research sample amounted to 108 people with a total sampling technique. The data in the study were carried out by univariate and bivariate analysis using chi-square statistical tests and computerized programs. The results showed that there was a relation between the incidence of PROM in the mother with knowledge (p 0.020), anemia (p 0.015) parity one and >3 (p-value 0.009), infection (p-value 0.037), and history of PROM (p-value 0.005). Meanwhile, there is no relationship between maternal education level (p-value 0.546) and the incidence of PROM in pregnant women. Age, parity, infection, and history of PROM are factors in the occurrence of PROM in pregnant women. It is hoped that there will be counseling for prospective mothers regarding PROM to avoid the occurrence of PROM in pregnant women.

Keywords: Parity, Education, Infection, History of PROM, Knowledge

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## INTRODUCTION

On January 30, 2020, the World Health Organization (WHO) referred to this outbreak as a Public Health Emergency of International Concern (PHEIC). On February 12, 2020, WHO gave the name to this virus with the name novel coronavirus " Coronavirus Disease 2019 "(COVID-19) (Qiao, 2020). Pneumonia caused by COVID-19 is highly contagious, causing concerns about its intrauterine transmission from mother to fetus because viral pneumonia is one of the leading causes of death during pregnancy worldwide <sup>1</sup>

The path of transmission of COVID-19 from mother to fetus intrauterine is debatable, because some studies detect that newborns are infected with COVID-19, while some other studies report babies of infected mothers born in good health and not infected <sup>2</sup>

Reports from the Bogor district health office as many as 12 cases of maternal death or 56.83/100 thousand live births who experienced Early Rupture Amniotic (KPD) (3%). The cause of maternal death is still dominated by the incidence of Hypertension 28%, bleeding 29% and Early Rupture Amniotic (KPD) 10.7% of all deliveries. Meanwhile, the number of AKB in West Java is 1,866 babies from 868,655 live births. And for the Bogor Regency area, the number of reported infant deaths was 44 people (117,040 live births), infections in the intranatal period were mostly caused by early ruptured amniotics as much as 65% <sup>3</sup>

Early rupture amniotic (KPD) is the rupture of the amniotic membrane (Amnion and Chorion) without followed by childbirth in term pregnancy or amniotic rupture in preterm pregnancy, which is a complication of pregnancy and inflammation that requires special attention. Early amniotic rupture is associated with premature birth complications and the occurrence of chorioamnionitis infections that can increase perinatal morbidity and mortality rates.

The causes of KPD have not been seen exactly what causes a person's amniotic rupture early, but the factors include infections that occur directly on the amniotic membrane that are abnormal in factors that include parity, the amount of amniotic water, abnormalities in the location of the pelvic disproportion, and abdominal contracting. <sup>4</sup> By diagnosing the occurrence of early rupture amniotics in maternity mothers using the PH Test to determine the acidity of the vagina, if the feeling is balanced, you can make sure the fluid that comes out is amniotic fluid. And do an ultrasound to find out the location of the fetal position <sup>4</sup>

During the COVID-19 pandemic, the cause of amniotic rupture early in pregnancy as known by COVID-19 is the spread of viruses that affect human health. The COVID-19 epidemic began in Wuhan,

the capital of Hubei province, China and quickly spread to other countries making it a serious world health problem<sup>5</sup>

From the data on childbirth in the RS Sentosa Bogor Maternity Room in 2020 there were labor data, namely from 374 deliveries including 187 KPD cases, in 2021 384 childbirths with KPD cases as many as 192 KPD cases and in 2022 until June 2022 with a total of 208 deliveries and KPD cases as many as 108 cases.

### METHOD

This type of research is observational analytics with a cross-sectional research design. The study was conducted at Sentosa Hospital Bogor from May to July 2022. The population of this study, namely maternity mothers at Sentosa Hospital in 2022. The study sample was 108 people with total sampling techniques. The data in the study were carried out with univariate and bivariate analysis using chi-square statistical tests and the SPSS version 17 program.

### RESULT

Table 1

Characteristics of Respondents to the Incidence of KPD in Maternity Mothers During the Covid-19 Pandemic in the Case Group and Control Group

Variable	Premature rupture of amniotic events			
	Case		Control	
	n	%	n	%
<b>Knowledge</b>				
Not good enough	37	60,7	24	39,3
Good	17	36,2	30	63,8
<b>Parity</b>				
Primigravida	8	27,6	21	72,4
Multigravida	46	58,2	33	41,8
<b>Education</b>				
Low	21	55,3	17	44,7
Tall	33	47,1	37	52,9
<b>History of SARs Virus</b>				
Ever	17	70,8	7	29,2
Never	37	44,0	47	56,0
<b>History of Anemia</b>				
Yes	25	67,6	12	32,4
Not	29	40,8	42	59,2
<b>Sum</b>	<b>54</b>	<b>50,0</b>	<b>54</b>	<b>50,0</b>

Based on table 1 of the characteristics of respondents from 54 respondents in the case group (experiencing KPD), there were 37 people (60.7%) respondents whose knowledge was not good, while of the 54 people in the control group (did not experience KPD), there were 17 people (36.2%)

respondents whose knowledge was less than k, there were 8 people (27.6%) with primigravida parity, while of the 54 people in the control group (not experiencing KPD), there were 21 people (72.4%) with primigravida parity, there were 21 people (55.3%) with low education, while of the 54 people in the control group (not experiencing KPD), there were 17 people (44.7%) with low education. there were as many as 17 people (70.8%) respondents who had experienced infection, while of the 54 people in the control group (did not experience KPD), there were 7 people (29.2%) respondents who had experienced infection, there were 25 people (67.6%) respondents who had anemia, while of the 54 people in the control group (did not experience KPD), there were 29 people (40.8%) respondents who had anemia.

**Table 2**  
**The Relationship of Parity with the Incidence of KPD in Maternity Mothers During the Covid-19 Pandemic**

Parity	Premature rupture of amniotic events				Total	P Value	OR
	Case		Control				
	n	%	n	%			
Primigravida	8	14,8	21	38,9	29	26,9	
Multigravida	46	85,2	33	61,1	79	73,1	0,009
<b>Sum</b>	<b>54</b>	<b>100</b>	<b>54</b>	<b>100</b>	<b>108</b>	<b>100</b>	

Based on table 2 that there is a parity relationship with the incidence of KPD in maternity mothers during the Covid-19 pandemic, a p value = 0.009 ( $p < 0.05$ ) with a value of OR = 0.273 means that multigravida mothers have a 0.273 times greater chance of experiencing early rupture amniotics than primigravida mothers.

**Table 3**  
**The Relationship Between Education and the Incidence of KPD in Maternity Mothers During the COVID-19 Pandemic**

Education	Premature rupture of amniotic events				Total	P Value
	Case		Control			
	n	%	n	%		
Low	21	38,9	17	31,5	38	35,2
Tall	33	61,1	37	68,5	70	64,8
<b>Sum</b>	<b>54</b>	<b>100</b>	<b>54</b>	<b>100</b>	<b>108</b>	<b>100</b>

Based on table 3, there is no relationship between education and the incidence of KPD in maternity mothers during the Covid-19 pandemic with a p value = 0.546 ( $p > 0.05$ ).

**Table 4**  
**Relationship of Infection with KPD Incidence in Maternity Mothers During the COVID-19 Pandemic**

Infection	Premature rupture of amniotic events				Total	P Value	OR
	Case		Control				
	n	%	n	%			
Ever	17	31,5	7	13,0	24	22,2	0,037
Never	37	68,5	47	87,0	84	77,8	
<b>Sum</b>	<b>54</b>	<b>100</b>	<b>54</b>	<b>100</b>	<b>108</b>	<b>100</b>	

Based on table 4, there is a relationship between infection and the incidence of KPD in maternity mothers during the Covid-19 pandemic with a p value = 0.037 ( $p < 0.05$ ) with a value of OR = 3.085 and it can be interpreted that mothers who have had a history of SARs infection have a 3,085 times greater chance of experienced an early rupture of the amniotic compared to a mother who had never had an infection.

**Table 5**  
**Relationship of KPD History with KPD Incidence in Maternity Mothers During the COVID-19 Pandemic**

History of KPD	Premature rupture of amniotic events				Total	P Value	OR
	Case		Control				
	n	%	n	%			
Exist	26	48,1	11	20,4	37	34,3	0,005
None	28	51,9	43	79,6	71	65,7	
<b>Sum</b>	<b>54</b>	<b>100</b>	<b>54</b>	<b>100</b>	<b>108</b>	<b>100</b>	

Based on table 5, there is a relationship between the history of KPD and the incidence of KPD in maternity mothers during the Covid-19 pandemic with a p value = 0.005 ( $p < 0.05$ ) and an OR value = 3.630 which can be interpreted to mean that mothers who have a history of KPD are 3,630 times more likely to be at risk experienced an early rupture of the amniotic compared to mothers with no history of KPD.

**Table 6**  
**The Relationship of Knowledge with the Incidence of KPD in Maternity Mothers During the COVID-19 Pandemic**

Knowledge	Premature rupture of amniotic events				Total	P Value	OR
	Case		Control				
	n	%	n	%			
Not good enough	37	68,5	24	44,4	61	56,5	0,020
Good	17	31,5	30	55,6	47	43,5	
<b>Sum</b>	<b>54</b>	<b>100</b>	<b>54</b>	<b>100</b>	<b>108</b>	<b>100</b>	

Based on table 6, there is a relationship between knowledge and the incidence of KPD in maternity mothers during the COVID-19 pandemic. With a p value of 0.020 ( $< 0.050$ ) with a value of OR= 2.721 which means that mothers who known are not good have a 2,721 times greater chance of experiencing an early rupture amniotic than mothers who have good knowledge.

**Table 7**  
**Relationship of History of Anemia with the Incidence of KPD in Maternity Mothers During the COVID-19 Pandemic**

History of Anemia	Premature rupture of amniotic events		Total		P Value	OR
	Case	Control	n	%		
Yes	25	12	37	34,3	0,015	3,017
Not	29	42	71	65,7		
<b>Sum</b>	<b>54</b>	<b>54</b>	<b>108</b>	<b>100</b>		

Based on table 7, there is a relationship between the history of anemia and the incidence of KPD in maternity mothers during the Covid-19 pandemic with a p value = 0.015 ( $p < 0.05$ ) and an OR value = 3.017 meaning that mothers who have a history of anemia have a 3,017 times greater chance of experiencing early rupture amniotics than mothers who are not anemic.

## DISCUSSION

In the results of this study that there is a parity relationship with the incidence of KPD in maternity mothers during the Covid-19 pandemic and occurs in multigravida mothers, this is caused because decreased capacity of blood circulation to the uterus and decreased myometrial function so that vascularization to the uterus is inadequate, especially in the lower part of the uterus which results in the connective tissue of the amniotic membrane is easily fragile, so that the amniotic membrane ruptures

Based on the KPD Theory in line with research that High parity affects the occurrence of early rupture amniotics, where when there is an increase in parity results in cervical damage during the previous birth process so that it can be at risk of amniotic rupture before complete opening<sup>6</sup>

The case of KPD in the multipara maternal group, this is influenced by a decrease in reproductive function because the uterus that gives birth to many children, tends to work inefficiently in childbirth, reduced connective tissue, vascularization of the uterus is disturbed and the cervix has opened one cm due to past labor and is also influenced by the consistency of the thin cervix<sup>7</sup>

Anemia is one of the predisposing factors for the occurrence of KPD. In mothers with anemia, the level of hemoglobin as a carrier of iron in the blood is reduced, resulting in the fragility of some areas of the amniotic membrane, resulting in leakage in the area. In anemia it can cause hypoxia and

iron deficiency so that it can increase the concentration of serum norepinephrine which can induce maternal and fetal stress, which stimulates the synthesis of corticotropin releasing hormone (CRH). CRH concentration is an increase in the main risk factor for childbirth with premature rupture amniotics<sup>6</sup>

In mothers who experience KPD because of the history of previous KPD events can be described in The pathogenesis of the occurrence of amniotic rupture briefly is due to a decrease in collagen content in the membrane so as to trigger the occurrence of early rupture amniotic and premature rupture of amniotic preterm, especially in high-risk patients. Women who experience amniotic rupture early in pregnancy or before delivery, then in the next pregnancy women who have experienced an early ruptured amniotic will be more at risk of experiencing it again between 3-4 times than in women who did not experience an early ruptured amniotic before, due to the composition of the membrane that becomes easily brittle and the collagen content that decreases in the next pregnancy.<sup>8</sup>

Knowledge can affect the occurrence of KPD because of the lack of knowledge of the mother to take care of the female organs so that it causes vaginal discharge so that germs will infect the amniotic membrane area so that the membrane becomes very thin and when pressure occurs it will cause rupture of the amniotic membrane and lack of knowledge to recognize danger signs in pregnancy, childbirth and puerperium<sup>9</sup>

SARS-CoV-2 appears to be a considerable risk factor for early amniotic rupture, premature labor (20-47%), intrauterine growth inhibition (10%), fetal tachycardia and fetal distress when infection occurs in the last trimester of pregnancy. This prematurity can be caused by COVID-19-induced hypoxemia or may be caused by other factors such as preeclampsia in the mother and premature amniotic rupture, So far there is still limited evidence showing transmission of transmission through intrauterine, but various complications and emergency symptoms that occur as a result of COVID-19 infection in pregnancy have been reported, including: pneumonia, miscarriage, multiple organ dysfunction syndrome (MODS), acute respiratory distress syndrome (ARDS), intrauterine growth restriction (IUGR), premature rupture of amniotics, premature labor, fetal tachycardia and fetal distress.<sup>10</sup>

According to the researcher's assumption, the absence of a relationship between education and the incidence of KPD is caused that mastery of knowledge is closely related to a person's level of education. The higher a person's education, the better his knowledge of something. In pregnant women with low levels of education, sometimes when they do not get enough information about their health, they do not know how to do good pregnancy care.

Educational also plays a major role in the quality of care and examination of her pregnancy. Information related to pregnancy care is urgently needed to increase mother's knowledge about her pregnancy<sup>11</sup>.

In pregnant women with low levels of education, sometimes when they do not get enough information about their health, they do not know how to do good pregnancy care. Low respondents' education will complicate the process of teaching and providing information, so knowledge about the risk factors of a disease is also limited<sup>11</sup>.

## CONCLUSION

There is a relationship between knowledge, parity, history of SARS infection, history of anemia and previous history of KPD with the incidence of KPD in maternity mothers during the covid 19 pandemic and There is no educational relationship with the incidence of KPD in maternity mothers during the covid 19 pandemic, it is hoped that subsequent researchers will be able to examine other factors as triggers for the occurrence of KPD in maternity mothers such as a history of multiple pregnancies, polyhydramnios, and fetal weight. It is recommended for women of reproductive age to be able to prepare for pregnancy without risk to reduce the occurrence of complications in pregnancy and childbirth by maintaining health protocols such as wearing masks and washing hands.

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