

# Risk Factors Associated with the Pre-Eclampsia Incidence on Pregnant Women at Local Hospital of Bengkulu

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Preeclampsia is an obstetric emergency characterised by high blood pressure in pregnant women which has a risk of causing death. This research aimed to study the risk factors associated with the incidence of preeclampsia in pregnant women at the Local Hospital of Bengkulu. This study applied case control design. The population in this research were all multiparous pregnant women who were hospitalised in C1 room of RSUD Dr. M. Yunus of Bengkulu in 2018, which amounted to 484 pregnant women. Case sampling selection in this research was done by using 1:1 total sampling with systematic random sampling method. Data analysis was performed by using univariate and bivariate. Statistical test was conducted by calculating the *Chi-Square* ( $\chi^2$ ). While to determine the closeness of the relationship among the variables, the Contingency Coefficient (C) was used. The results of this research are : there was a relationship between maternal age and the incidence of preeclampsia in pregnant women; there was no relationship between history of previous preeclampsia with the incidence of preeclampsia in pregnant women; there was no relationship of multiple pregnancy with the incidence of preeclampsia in pregnant women. Preeclampsia can be influenced by several factors. The results showed the age factor can greatly influence the occurrence of preeclampsia. The importance of reproductive system education for mothers and adolescents aims to reduce the risk of death from pre-eclampsia. Therefore, it is expected to officers and health services to provide necessary information regarding this issue.

**Key words:** *age, history of previous preeclampsia, multiple pregnancy*

## **Introduction**

Maternal mortality rate (MMR) is one of the indicators of public health status. The MMR ratio still shows a high rate as targeted to be 70 per 100,000 live births by 2030 (WHO, 2019). The maternal mortality rate in the Association of South East Asia Nations (ASEAN) countries has occupied the position of 40-60 per 100 thousand live births. Maternity Mortal Rate (MMR) in Indonesia currently is still high compared to other ASEAN countries. The direct causes of maternal death are bleeding (39%), preeclampsia/eclampsia (21%), infections (7%), and others (33%) (Kemenkes RI, 2018). Hypertension disorder in pregnancy, including preeclampsia, is a major cause of maternal and infant morbidity and mortality (Jeyabalan, 2013; Young, Levine, & Karumanchi, 2010).

Preeclampsia generally occurs at the first pregnancy, particularly in adolescence and age at risk > 40 years (Mackay, Berg, & Atrash, 2001). According to the result of the research by Gustri, Januar Sitorus, & Utama (2016), maternal age influences the incidence of preeclampsia. Other risk factors are history of chronic high blood pressure before pregnancy, history of previous preeclampsia, history of preeclampsia in the family, obesity, carrying more than one baby, history of diabetes, kidney disorders, lupus or rheumatoid arthritis (Hardiana, 2017).

The New England Journal of Medicine noted that in the second and multigravida there was a risk of experiencing preeclampsia. This shows that in the second and the third pregnancy there was still a risk of experiencing preeclampsia, especially in women with a history of previous preeclampsia. If this condition is allowed to happen, then the mortality and morbidity rates in pregnant women will be even higher (Hardianti & Mairo, 2018).

Bengkulu Province Health Department in 2017 recorded that in absolute terms the number of maternal mortality was 28 people, consisting of 6 pregnant women, 10 labor deaths, and 12 postpartum maternal deaths. While the maternal mortality rate in Bengkulu Province in 2017 has reached the set target of 79 per 100,000 live births, this was a significant decrease from 2016 which amounted to 117 per 100,000 live births (Dinas Kesehatan Provinsi Bengkulu (DINKES) Provinsi Bengkulu, 2019).

Annual reports of maternal and child health showed that the number of cases of preeclampsia in Bengkulu City in 2015 were 64 cases; in 2016 there were as many as 31 cases, and in 2017 there were as many as 27 cases (Dinas Kesehatan Kota Bengkulu (DINKES) Kota Bengkulu, 2017).

Based on the data from Rumah Sakit Umum Daerah (RSUD) Dr. M Yunus Bengkulu in 2016 to 2018, the number of cases of preeclampsia experienced an increase. In 2016, there were 79

cases of preeclampsia, in 2017 there were 66 cases of preeclampsia, and in 2018 there were 88 cases of preeclampsia. In addition, it was found that the maternal mortality rate with preeclampsia cases in 2016 was 2 people, in 2017 there was 1 person and in 2018 there was 1 person.

Based on the aforementioned description, the researcher was interested in examining "risk factors associated with the incidence of preeclampsia in pregnant women at RSUD Dr. M Yunus Bengkulu ". It was intended so that medical personnel can perform early detection of risk factors associated with the incidence of preeclampsia in pregnant women so that midwives can provide appropriate measures for pregnant women.

## METHOD

The research was conducted at RSUD Dr. M Yunus of Bengkulu on 17<sup>th</sup> of June to 11<sup>th</sup> of July 2019. The research applied case control design that is a research conducted by comparing the case group with the control group, with the Independent Variables (maternal age, history of previous preeclampsia and multiple pregnancy) and the Dependent Variable (preeclampsia) at RSUD Dr. M Yunus of Bengkulu. The population in this study were all multiparous and grandemultant pregnant women who were hospitalised at RSUD Dr. M Yunus of Bengkulu; in 2018 there were 484 pregnant women. Case sampling selection in this research was done by using 1:1 total sampling with systematic random sampling method. The data collection on preeclampsia, maternal age, history of previous preeclampsia and multiple pregnancy in this research was performed by using secondary data taken from the register in the C1 room of RSUD Dr. M Yunus of Bengkulu. The collected data were analysed by using univariate and bivariate analysis. To determine the closeness of the relationship, Chi-Square ( $X^2$ ) statistical test was performed.

This study had received research permission from RSUD Dr. M. Yunus of Bengkulu number: 074/467BID-DIK, and received permission from the Office of Investment and One Door Integrated Services number: 503/82.650/634/DPMPTSP-P.1/2019.

## RESEARCH RESULT

### a. Univariate Analysis

**Table 1. Overview of the frequency distribution of preeclampsia incidence at RSUD Dr. M Yunus of Bengkulu**

<b>Preeclampsia</b>	<b>Frekuensi</b>	<b>Presentase (%)</b>
Pregnant women who experienced preeclampsia	51	50.0
Pregnant women who did not have preeclampsia	51	50.0
Summary	102	100.0

Source : Primary Data 2019

Based on table 1, it can be seen that from 102 pregnant women, there were 51 pregnant women who experienced preeclampsia and 51 pregnant women who did not have preeclampsia.

**Table 2. Description of the frequency distribution of maternal age with the incidence of preeclampsia at RSUD Dr. M Yunus of Bengkulu**

Age	Frekuensi	Percentage (%)
The highest frequency of preeclampsia in pregnant women aged <20 years and > 35 years	40	39.2
Tidak Beresiko (20-35 years)	62	60.8
Summary	102	100.0

Source : Primary Data 2019

Based on the table 2 it can be seen that from 102 pregnant women, there are 40 mothers aged <20 years and > 35 years, and 62 pregnant women aged 20-35 years.

**Table 3. Picture of the frequency distribution of the history of previous preeclampsia with the incidence of preeclampsia at RSUD Dr. M Yunus of Bengkulu**

History of previous preeclampsia	Frekuensi	Percentage (%)
Pregnant woman with a history of previous preeclampsia	1	1
Pregnant women with no history of previous preeclampsia	101	99
Summary	102	100.0

Source : Primary Data 2019

Based on table 3, it can be seen that from 102 pregnant women, there was 1 pregnant woman with a history of previous preeclampsia, and 101 pregnant women with no history of previous preeclampsia.

**Table 4. A description of the frequency distribution of multiple pregnancies with the incidence of preeclampsia at RSUD Dr. M Yunus of Bengkulu**

Pregnancy	Frekuensi	Percentage (%)
Multiple Pregnancy	2	2
Single Pregnancy	100	98
Summary	102	100

Sumber : data primer 2019

Based on table 4, it was revealed that from 102 pregnant women, there were 2 pregnant women who experienced a multiple pregnancy and 100 pregnant women with a single pregnancy.

#### b. Bivariate Analysis

**Table 5. The relationship between the maternal age and the preeclampsia incidence in pregnant women at RSUD Dr. M Yunus of Bengkulu**

Age	Preeclampsia incidence				Summary		X <sup>2</sup>	P	C	OR
	Pregnant women who experienced preeclampsia		Pregnant women who did not experience preeclampsia		f	%				
	a									
	F	%	F	%						
< 20 years > 35 years	26	51.0	14	27.5	40	39.2	4.997	0.026	0.234	2.749
20 years- 35 years	25	49.0	37	72.5	62	60.8				
Summary	51	100	51	100	102	100				

Source: Primary Data, 2019

Based on table 5 it can be seen that from 51 pregnant women who experienced preeclampsia, there were 26 pregnant women aged <20 years and> 35 years and 25 pregnant women aged 20-35 years. While from 51 pregnant women who did not experience preeclampsia there were 14 pregnant women aged <20 years and> 35 years and 37 pregnant women aged 20-35 years.

Furthermore, to determine the relationship of maternal age with the incidence of preeclampsia in pregnant women in RSUD Dr. M Yunus of Bengkulu, the *Continuity Correction* test was conducted. Based on the *Continuity Correction* test result, the value of (X<sup>2</sup>) = 4.997 with *Asymp.sig* value (p) = 0.026 <0.05 was obtained. Therefore, it was significant; Ho was rejected Ha was accepted, which meant that there was a significant

relationship between maternal age and the incidence of preeclampsia in pregnant women in RSUD Dr. M Yunus of Bengkulu.

From the *contingency coefficient* test, a C value of 0.234 was obtained. Because the value of  $C = 0.234$  was very far from the  $C_{\max}$  value of 0.707, then the relationship of age with the incidence of preeclampsia was very weak.

*Risk Estimate* test result obtained OR value = 2.749, which meant the age of pregnant women <20 years and > 35 years had a chance of preeclampsia in pregnant women by 2.749 times compared with the age of 20-35 years.

**Table 6. The relationship of the history of previous preeclampsia with preeclampsia incidence in pregnant women at RSUD dr. M Yunus Bengkulu**

The history of previous preeclampsia	Preeclampsia				Summary		P	C
	Preeclampsia		Not Preeclampsia		f	%		
	f	%	f	%				
Pregnant woman with a history of previous preeclampsia	1	2.0	0	0	1	1.0	1,000	0,099
Pregnant women with no history of previous preeclampsia	50	98.0	51	100.0	101	99.0		
<b>Summary</b>	51	100.0	51	100.0	102	100.0		

Source : Primary Data, 2019

Based on table 6, it can be seen that from 51 pregnant women with preeclampsia, there was 1 pregnant woman with a history of previous preeclampsia and 50 pregnant women with no history of previous preeclampsia. While from 51 pregnant women who did not experience preeclampsia, there were no pregnant women with a history of previous preeclampsia.

Furthermore, to determine the relationship between the history of previous preeclampsia with the incidence of preeclampsia in pregnant women in RSUD Dr M Yunus of Bengkulu, the Chi-square test was applied. The result of the chi-square test turned out to have cells with an expectation value of less than 5 so that what was read was *Fisher exact*. From the *Chi Square*

test (*Fisher's Exact Test*), the value of *Exact.sig* ( $p$ ) = 1,000 > 0.05, thus it was significant, so that  $H_0$  was accepted  $H_a$  was rejected, meaning that there was no significant relationship between the history of previous preeclampsia with the incidence of preeclampsia in pregnant women at RSUD Dr. M Yunus of Bengkulu.

The closeness of the relationship between the history of previous preeclampsia with the incidence of preeclampsia in pregnant women at RSUD Dr. M Yunus of Bengkulu was seen from the contingency coefficient ( $C$ ). The  $C$  value obtained was 0.099. Because the value of  $C = 0.099$  was very far from the  $C_{max}$  value of 0.707, the relationship between the history of previous preeclampsia with the incidence of preeclampsia was very weak.

**Table 7. The relationship of multiple pregnancy with the incidence of preeclampsia in pregnant women at RSUD dr. M Yunus of Bengkulu**

Multiple pregnancies	Preeclampsia				Summary		$P$	$C$
	Pregnant women who experienced preeclampsia		Pregnant women who did not experience preeclampsia		f	%		
	F	%	F	%				
Multiple pregnancies	2	3.9	0	0	2	2,0	0.495	0.140
Single pregnancies	49	96.1	51	100.0	100	98.0		
Summary	51	100.0	51	100.0	102	100.0		

Source: Primary Data, 2019

Based on table 7, it can be seen that from 51 pregnant women who experienced preeclampsia, there were 2 pregnant women who had multiple pregnancies, and 49 pregnant women with a single pregnancy. While in 51 pregnant women who did not experience preeclampsia there was no pregnant women with multiple pregnancies. To determine the relationship of multiple pregnancy with the incidence of preeclampsia in pregnant women at RSUD Dr. M Yunus of Bengkulu, the Chi-square test was performed.

The results of the chi-square test turned out to have cells with an expectation value of less than 5 so that what was read was *Fisher exact*. From the *Chi Square test (Fisher's Exact Test)*, the value of *Exact.sig* ( $p$ ) = 0.495 > 0.05 was obtained. So, it was classified as significant; thus  $H_0$  was accepted and  $H_a$  was rejected, which means that there was no

significant relationship between a multiple pregnancy and the incidence of preeclampsia in pregnant women at RSUD Dr. M Yunus of Bengkulu.

The closeness of the relationship of a multiple pregnancy with the incidence of preeclampsia in pregnant women at Dr. M Yunus Bengkulu was seen from the contingency coefficient (C). The C value obtained was 0.140. Because the value of  $C = 0.140$  was very far from the  $C_{\max}$  value of 0.707, the relationship of multiple pregnancy with the incidence of preeclampsia was very weak.

## DISCUSSION

### **Overview of the frequency distribution of preeclampsia incidence at RSUD Dr. M Yunus of Bengkulu**

Based on the research it can be seen that from 102 pregnant women, there were 51 pregnant women who experienced preeclampsia and 51 pregnant women who did not have preeclampsia. Based on the research results, the high number of pregnant women who experienced the incidence of preeclampsia at RSUD Dr. M Yunus of Bengkulu was caused by mothers of a risky age, a history of previous preeclampsia, a multiple pregnancy and parity at risk.

According to Arti, Wijayati, & Ivantarina (2017), risk factors causing preeclampsia include work, intervals of marriage to pregnancy, obesity or excessive weight gain during pregnancy, gestational age, maternal age, maternal education, parity, hereditary disease, stress, physical activity, history of preeclampsia and eclampsia in previous pregnancies, pregnancy with Diabetes Mellitus, hydatidiform mole, kidney disease and a multiple pregnancy.

Preeclampsia was influenced by several factors, such as primigravida or >10 years from the last birth, first pregnancy with a new partner, history of previous preeclampsia, and pregnancy intervals between births (Skjærven, Wilcox, & Lie, 2002).

### **Description of the frequency distribution of maternal age with the incidence of preeclampsia at RSUD Dr. M Yunus of Bengkulu**

Based on the research it can be seen that from 102 pregnant women, there are 40 mothers aged <20 years and > 35 years, and 62 pregnant women aged 20-35 years.

The highest frequency of preeclampsia in pregnant women aged <20 years and > 35 years based on research was caused by other risk factors that can cause preeclampsia, such as history of previous preeclampsia, a multiple pregnancy and parity at risk. The existence of preeclampsia at the age of <20 years is due to the high rate of marriage at a young age and lack of knowledge about reproductive health, the dangers of pregnancy and childbirth at the

age of <20 years due to the unprepared reproductive organs for pregnancy and childbirth. Physically and psychologically, the newlyweds are still lacking. Moreover, at the age of > 35 years old, generally it was caused by a woman who was busy with a career path that it took so long for her to get married and failed to use contraception.

At the age of 20-35 years in this research, those who experienced preeclampsia caused by pregnant women who experienced other factors that can cause preeclampsia such as a history of previous preeclampsia, a multiple pregnancy and productive age but accompanied by multigavide grande parity.

### **Picture of the frequency distribution of the history of previous preeclampsia with the incidence of preeclampsia at RSUD Dr. M Yunus of Bengkulu**

Based on the research it can be seen that from 102 pregnant women, there was 1 pregnant woman with a history of previous preeclampsia, and 101 pregnant women with no history of previous preeclampsia.

The highest frequency of experiencing preeclampsia was found in pregnant women with no history of previous preeclampsia. Because based on the research, it was affected by other risk factors that can cause preeclampsia such as age at risk, productive age but accompanied by multigavide grande parity, a multiple pregnancy and parity at risk. English, Kenny, & McCarthy (2015) states that preeclampsia occurs not only due to previous history but rather, there are other factors such as family history, nulliparity, egg donation, diabetes, and obesity.

### **A description of the frequency distribution of multiple pregnancies with the incidence of preeclampsia at RSUD Dr. M Yunus of Bengkulu**

Based on research results, it was revealed that from 102 pregnant women, there were 2 pregnant women who experienced a multiple pregnancy and 100 pregnant women with a single pregnancy. The highest frequency of experiencing preeclampsia was found in pregnant women who have a single pregnancy. Because based on research, it was influenced by other risk factors that can cause preeclampsia such as age at risk, productive age but accompanied by multigavide grande parity, history of previous preeclampsia and parity at risk. In addition, women with a multiple pregnancy and hypertension due to pregnancy show danger signs in infants like premature, hematological abnormalities such as thrombocytopenia, and nerve disorders that will have an impact on the growth process (Kalagiri et al., 2015).

### **The relationship between maternal age and the incidence of preeclampsia at RSUD Dr. M Yunus of Bengkulu**

The research results found that from 51 pregnant women who experienced preeclampsia there were 26 pregnant women aged <20 and > 35 years and there were 25 pregnant women aged

20-35 years. While from 51 pregnant women who did not experience preeclampsia, there were 14 pregnant women aged <20 years and> 35 years and 37 pregnant women aged 20-35 years.

Based on the results of the Continuity Correction test, there was a significant relationship between maternal age and the incidence of preeclampsia in pregnant women at RSUD Dr. M Yunus of Bengkulu. The closeness of the relationship between maternal age and the incidence of preeclampsia in pregnant women at RSUD Dr. M Yunus of Bengkulu seen from the value of the contingency coefficient (C) showed the relationship of age with the incidence of preeclampsia that was very weak. This was because in this study age was not the main factor; there were still other factors that influenced the incidence of preeclampsia such as history of previous preeclampsia and a multiple pregnancy. Furthermore, in the opinion of Sutrimah, Mifbakhudin, & Wahyuni (2015) risk factors causing preeclampsia include work, intervals of marriage to pregnancy, obesity or excessive weight gain during pregnancy, gestational age, maternal education, parity, hereditary disease, stress, physical activity, history of preeclampsia and eclampsia in previous pregnancies, pregnancy with Diabetes Mellitus, hydatidiform mole, kidney disease and a multiple pregnancy.

*Risk Estimate* test results obtained OR value = 2.749, which means the age of pregnant women <20 years and> 35 years had a chance of preeclampsia by 2.749 times compared with the age of 20-35 years. At age <20 years and> 35 years there were 26 pregnant women who experienced preeclampsia based on research due to age at risk and parity at risk. Pregnant women under <20 years are at risk of developing complications of preeclampsia because the reproductive organs are not ready to bear the burden of pregnancy. Besides, at this age women are usually not ready psychologically and physically. At the age of > 35 years, there is a degenerative process that results in structural and functional changes that occur in the peripheral blood vessels responsible for changes in blood pressure. At the age of <20 years and > 35 years, based on research, most women did not experience preeclampsia despite their age are at risk, parity is at risk and hypertension.

In line with research from Gustru (2016), it showed that maternal age influenced the incidence of preeclampsia. This result was in line with previous studies that mothers with ages <20 and> 35 years were more at risk for preeclampsia compared to other ages.

Researchers assume that maternal age during pregnancy is one of the factors that determines the level of risk of pregnancy and childbirth. Therefore, pregnant women should get early detection so that complications do not occur in obstetric conditions that can cause preeclampsia, by attending classes for pregnant women and doing *Ante Natal Care (ANC)* regularly during pregnancy.

## **The relationship of the history of previous preeclampsia with the incidence of preeclampsia in RSUD Dr. M Yunus of Bengkulu**

Based on the research it can be seen that from 51 pregnant women with preeclampsia there was 1 pregnant woman who had a history of previous preeclampsia and there were 50 pregnant women with no history of preeclampsia. While from 51 pregnant women who did not experience preeclampsia, there were no pregnant women with a history of preeclampsia. A history of preeclampsia in a previous pregnancy is a risk factor for preeclampsia. Pregnancy in pregnant women with a history of previous preeclampsia is associated with a high incidence of severe preeclampsia, early onset preeclampsia and adverse perinatal effects.

Chi-square test states that there were cells with an expectation value of less than 5, so that they were marked as *Fisher exact*. From the *Chi Square test (Fisher's Exact Test)*, the value of *Exact.sig (p) = 1,000 > 0.05*, was categorised as significant, so that  $H_0$  was accepted and  $H_a$  was rejected, meaning that there was no significant relationship between the history of previous preeclampsia with the incidence of preeclampsia in pregnant women at RSUD Dr. M Yunus of Bengkulu.

The closeness of the relationship between the history of previous preeclampsia with the incidence of preeclampsia in pregnant women at RSUD Dr. M Yunus of Bengkulu, seen from the value of the contingency coefficient (C) obtained that a history of previous preeclampsia with the incidence of preeclampsia to be very weak. This was because in this study the history of previous preeclampsia was not the main factor; there were still other factors that influence the incidence of preeclampsia such as maternal age and a multiple pregnancy. According to Cunningham et al., (2014) factors that influence preeclampsia include obesity, multifetal pregnancy, maternal age, parity, hyperhomocysteinemia and metabolic syndrome. This study did not support Hardianti (2018) which stated there were pregnant women who had a history of preeclampsia were at risk for preeclampsia. A history of preeclampsia also acts as a trigger for the occurrence of preeclampsia because pregnant women who have a history of preeclampsia will increase the risk of future pregnancies, since preeclampsia is a disease that is at risk of recurrence. While based on the theory, there are still many factors that can influence the incidence of preeclampsia in pregnant women such as: obesity, parity at risk, history of hypertension, genetic, education and employment.

This theory gap may be caused by the limited sample or lack of sample obtained in this study and it was not comparable with the sample obtained by previous researchers, so that the results of this study were obtained inversely proportional to the existing theory, since there was only 1 pregnant woman who had a history of previous preeclampsia.

## **The relationship of a multiple pregnancy with the incidence of preeclampsia at RSUD Dr. M Yunus of Bengkulu**

Based on the research results, it was revealed that from 51 pregnant women who had experienced preeclampsia, there were 2 pregnant women who had multiple pregnancies. In addition, there were 49 pregnant women with a single pregnancy but experienced preeclampsia. Whereas, there were 51 pregnant women who did not experience preeclampsia and no pregnant women had multiple pregnancies. From the results of the study, 2 pregnant women experienced multiple pregnancies due to excessive stretching of the uterus causing reduced blood flow to the uterus. It also tends to occur earlier in a multiple pregnancy. Preeclampsia can cause long-term damage to the kidneys and liver of the mother and can increase the risk of heart disease later in life. Preeclampsia which worsens and causes seizures in women is called eclampsia. If the symptoms of preeclampsia become severe and if they occur during pregnancy, the baby may need to be born immediately, even though the baby has not fully grown.

Excessive uterine tension causes excessive ischemia, leading to preeclampsia, as in a multiple pregnancy, women with twin gestations when compared to single gestations, showing 13% of preeclampsia. The theory also says that a multiple pregnancy shows 13% causes of the incidence of preeclampsia. In addition, women with a multiple pregnancy and hypertension due to pregnancy show danger signs in infants that cause fetal growth disturbance in the womb caused by reduced of carbohydrate, protein and other growth factors that should be accepted by the fetus. Furthermore, to determine the relationship of a multiple pregnancy with the incidence of preeclampsia in pregnant women at RSUD Dr. M. Yunus of Bengkulu, the *Chi-square* test was used. The results of the chi-square test turned out to have cells with an expectation value of less than 5 so that what was read was *Fisher exact*. The results of the *Chi Square test (Fisher's Exact Test)* obtained no significant relationship between a multiple pregnancy with the incidence of preeclampsia in pregnant women at RSUD Dr. M. Yunus of Bengkulu.

The closeness of the relationship of a multiple pregnancy with the incidence of preeclampsia in pregnant women at RSUD Dr. M. Yunus of Bengkulu, seen from the value of the contingency coefficient (C) obtained by multiple pregnancy with the incidence of preeclampsia, was very weak. This was because in this study a multiple pregnancy was not a major factor; there were still other factors that influence the incidence of preeclampsia such as age and history of previous preeclampsia. According to Karlina, Ermalinda, & Pratiwi (2016) there are several factors causing preeclampsia, namely grande multipara parity and primipara, age <20 and> 35 years, a history of preeclampsia or hypertension, socioeconomic, genetic and obesity.



This study is not in accordance with the theory of , which states that the danger for mothers in twin pregnancy is greater than in single pregnancy because of the more frequent anemia, preeclampsia and eclampsia, obstetric surgery and postpartum hemorrhage. Perinatal mortality for twins is higher than for single pregnancy children. The death of a child in a monozygotic pregnancy is greater than that of a dizygotic pregnancy because in the first case the umbilical cord can occur between the first and second fetuses.

The results of this research are supported by research of Sutrimah, et al (2015) about the factors associated with the incidence of preeclampsia in pregnant women which found there was no significant relationship between twin pregnancy and the occurrence of preeclampsia. This theory gap may be caused by the limited sample or lack of samples obtained by researchers and made it not comparable with samples obtained by previous researchers, thus the results obtained were in contrast to the existing theory.

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