

Literature Review: Risk Factors For Pre Eclampsia and Anemia Among Pregnant Women in Indonesia

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Abstract, Background: In Indonesia, the prevalence of anemia in pregnant women is 37.1%, the highest number in rural areas is 37.8%, the lowest in urban areas is 36.4%, in 2018 it increased to 48.9%. Pregnant women continue to experience the greatest rates of anemia in rural areas (49.5%) and urban areas (48.3%) (Ministry of Health of the Republic of Indonesia, 2019). In 2016, the Ministry of Health of the Republic of Indonesia reported that the three primary causes of direct maternal mortality in Indonesia during pregnancy and childbirth remain unchanged: 30.3% of the cases were connected to hemorrhage, 27.1% to hypertension during pregnancy, and 7.3% to infections. **Objective:** This study aims to identify risk factors for the incidence of pre-eclampsia and anemia in Indonesia. **Methods:** Uses the Study Literature Review method by taking data that has been published on trusted national research sites. **Results:** Based on research results through a review that had been carried out, researchers found 14 national studies that were included in the inclusion criteria. **Conclusion:** The most dominant risk factors for preeclampsia are history of preeclampsia, parity, pregnancy spacing and maternal age. Meanwhile, the most dominant risk factors for anemia in pregnant women in this study were: nutritional status, maternal age, parity and pregnancy spacing.

Keywords: Risk factors, Pre-eclampsia, Anemia in pregnant women

1. INTRODUCTION

The World Health Organization (2017) reports that the incidence of eclampsia is 0.1-0.7% and severe preeclampsia varies from 6-7% in affluent nations. According to the World Health Organization (WHO), preeclampsia incidence ranges from 0.51% to 38.4%, with impoverished countries estimated to have a seven-fold greater preeclampsia case rate than industrialized countries. Preeclampsia affects 1.3% to 6% of people in wealthy nations and 1.8% to 18% of people in developing nations.

In Indonesia alone, preeclampsia affects 128,273 pregnancies annually, or roughly 5.3% of all pregnancies (Ministry of Health, 2017). In 2016, the Ministry of Health of the Republic of Indonesia reported that the three primary causes of direct maternal mortality in Indonesia during pregnancy and childbirth remain unchanged: 30.3% of the cases were connected to hemorrhage, 27.1% to hypertension during pregnancy, and 7.3% to infections. Preeclampsia was 2.7% common in Indonesian pregnant women, according to Riskesdas (2019).

Worldwide, 43.9% of pregnant women suffer from anemia. According to estimates, the prevalence of anemia in pregnancy is 49.4% in Asia, 59.1% in Africa, 28.2% in America, and 26.1% in Europe. In underdeveloped nations, anemia in pregnancy is also thought to be a

contributing factor in almost 40% of maternal fatalities (WHO, 2017). In Indonesia, the percentage of pregnant women who suffer from anemia was 37.1% in 2018, with the highest percentage occurring in rural areas (37.8%) and the lowest in urban areas (36.4%). According to Riskesdas (2019), pregnant women still experience anemia at rates of 49.5% in rural areas and 48.3% in urban areas.

The results of data from the West Java Health Office (2021), cases of anemia in mothers Data from the world health organization (WHO), around 830 women worldwide die every day due to complications related to pregnancy and childbirth as much as 99%. In developing countries, in 2015 the maternal mortality rate reached 239 per 100,000 live births, compared to developed countries which reached 12 per 100,000 live births (WHO, 2017).

Hypertension in pregnancy is grouped into chronic hypertension, pre eclampsia, superimposed pre eclampsia chronic hypertension, and gestational hypertension. According to research by Liliek, Fitriani, & Anggraini, (2023), there is a relationship between age and the incidence of pre eclampsia, there is no relationship between education and the incidence of pre eclampsia, there is no relationship between work and the incidence of pre eclampsia, there is a relationship between pregnancy distance and the incidence of pre eclampsia, there is no relationship between gestational age and the incidence of pre eclampsia, there is a relationship between the history of hypertension and the incidence of pre eclampsia, and there is no relationship between gemelli or multiple pregnancies and the incidence of pre eclampsia. Research from Nurhayati (2021) Variables associated with the incidence of Pre eclampsia in laboring mothers are age ($p=0.000$), education ($p=0.000$), occupation ($p=0.009$), history of hypertension ($p=0.000$), history of DM ($p=0.000$) and ANC examination ($p=0.000$), while the unrelated variable is parity ($p=0.141$).

In addition to the problem of pre-eclampsia, from Riskesdas 2018, anemia of pregnant women in Indonesia increased from 2013 to 2018, from 37.1% to 48.9%. The causes of anemia in pregnant women from the theory of Mochtar (2012) stated are lack of nutrition, lack of iron in the food consumed, poor absorption and chronic diseases (such as tuberculosis, lung, heart).

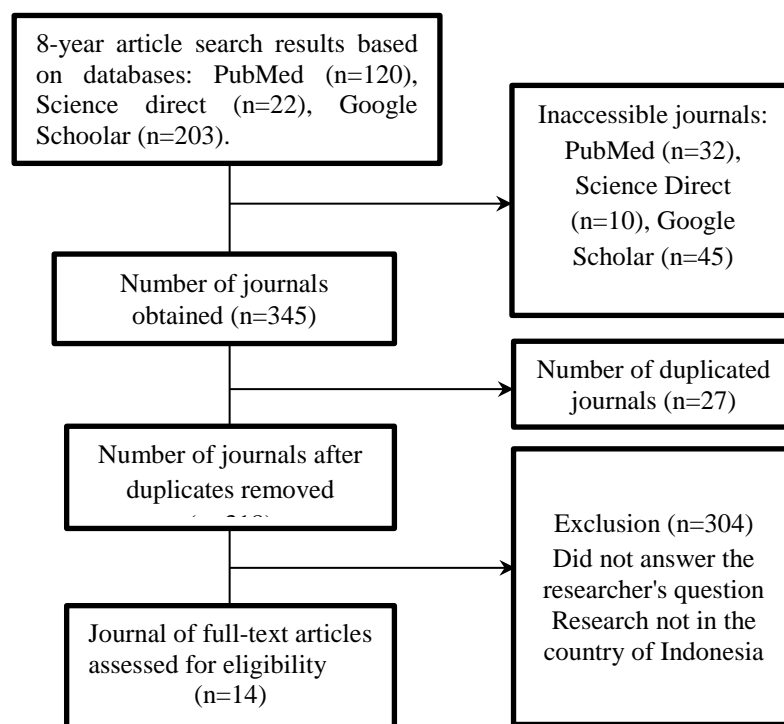
Based on pregnant women in West Java Province in 2019 exceeded 80,000 pregnant women/year and the figure fell in the following year, namely in 2020 around 60,000 pregnant women/year. Based on the same data processing source, pregnant women with anemia in Cirebon Regency in 2015 were 5691 people and decreased in 2020, namely 4105 people (Open Data Jabar, 2021). The impact of preeclampsia can cause maternal and perinatal death. Maternal deaths are acute vacular accident, damage to vital centers in the medulla oblongata,

trauma due to convulsions, postpartum hemorrhage or placental abruption hemorrhage, and total failure of vital organs (liver function failure, renal function failure, acute cord decompensation / cardiac arrest, intrauterine fetal perinatal death). Intrauterine fetal perinatal death consists of placental abruption, severe intrauterine asphyxia due to severe vasoconstriction, if the result of conception remains alive there can be low birth weight and intrauterine growth retardation (Novianda et al., 2022).

From the collaboration of several journals and the prevalence above, it turns out that it still needs to be examined regarding the risk factors for preeclampsia and anemia in pregnant women in Indonesia, because MMR is still high and this will certainly be useful if in the future it will become a reference for policy makers in Indonesia in reducing MMR (Maternal Mortality Rate) in Indonesia. So that based on the background described above, it is important to conduct a *literature review* on the risk factors for the incidence of preeclampsia and anemia in pregnant women in Indonesia.

2. METHODS

The research design carried out in this study uses a *literature review* or literature review. This *literature review* was conducted by searching for articles with google scholar using the results of research used from 2015-2022 regarding risk factors for the incidence of preeclampsia and anemia in pregnant women in Indonesia.



3. RESULTS

NO	Researcher/Title	Research method	Results
1.	Zul Fikar Ahmad, Siti Surya Indah Nurdin (2019). Risk Factors for Preeclampsia at Siti Khadijah Hospital Gorontalo.	This research was conducted at Siti Khadijah Hospital Gorontalo using <i>Case Control Study</i> design.	Mothers who did not work or become housewives experienced more preeclampsia at 82.1% / mothers with low education 28.2% experienced more preeclampsia events compared to mothers who had higher education which was only 21.8%. Mothers who had a history of preeclampsia had a 4.7 times risk (OR = 4.774, 95% CI: 0.944 - 24.156) of experiencing preeclampsia when compared to mothers who did not have a history of preeclampsia. Based on socioeconomic status, mothers who have more socioeconomic status experience preeclampsia at 34.6%. The results of this study indicate that socioeconomic status, maternal education, and history of preeclampsia are risk factors for the incidence of preeclampsia at Siti Khadijah Mother and Child Hospital Gorontalo.
2.	Elisabeth M.F. Lalita (2018). Analysis of risk factors for the incidence of preeclampsia in Manado	This study was conducted analytic observational with <i>case control study design</i> .	Respondents with a history of hypertension have a chance of experiencing preeclampsia (recurrent) by 5.3 times compared to mothers who do not have a history of hypertension. In addition, parity affects the incidence of preeclampsia, respondents with primigravida have a chance of preeclampsia by 3.

3.	Mia shofia, dewi laelatul badriah, esty febriani, mamlukah (2022). Factors associated with the incidence of preeclampsia in pregnant women in the working area of puskesmas Ciawi tasikmalaya district.	This study used descriptive analytic research with <i>cross sectional</i> .	There is a relationship between gravida status, pregnancy distance and the incidence of preeclampsia in pregnant women. The <i>Chi Square</i> test results show a <i>p value</i> of 0.0001 <0.05, it can be concluded that there is a relationship between gravida status and the incidence of preeclampsia. Pregnancy distance was found to be 60.6% categorized as unfavorable experiencing the incidence of preeclampsia, 37.1%. The <i>Chi Square</i> test results show a <i>p value</i> of 0.006 <0.05, so it can be concluded that there is a relationship between pregnancy distance and the incidence of Preeclampsia.
4.	Rismawati, soekidjo notoatmojo, (2021). Risk factors for preeclampsia in laboring mothers	This study used a <i>case control</i> type of research.	The results of the <i>chi square</i> test obtained a <i>p value</i> of 0.003 which is <0.05, so there is a significant relationship between the history of preeclampsia and the incidence of preeclampsia. there is a significant relationship between the history of hypertension and the incidence of preeclampsia.
5.	Mansur sididi, muh. Najib bustan, fatmah (2019). Analysis of risk factors for the incidence of preeclampsia in the maternal and child hospital siti fatimah Makassar city.	This study used analytic observations with a case control study.	The results of this study were mothers with parity > 4 times with age < 20 years or > 35 years at the time of delivery with junior high school education and anemia during pregnancy with LILA < 23.5 cm, the number of antenatal care visits < 4 times, then 3 times more at risk of preeclampsia.
6.	Fahira nur, adhar arifudin (2017). Risk factors for the incidence of preeclampsia in pregnant women at Anutapura General Hospital, hammer city.	This study used an analytic survey design with a case control approach.	This study found that primigravida is a risk factor for preeclampsia compared to multigravida. Obesity has a greater risk of preeclampsia. A history of hypertension is a risk factor for experiencing the results of ANC visits with an OR value of 7.933 with a lower limit value of 2.963, this indicates that anc visits are a risk factor for preeclampsia.

7.	Honesty Pujiyani (2018). Risk factors for preeclampsia	This study used a case-control design	The results of this study indicate the risk of experiencing preeclampsia in pregnant women who have a history of preeclampsia, hypertension and diabetes mellitus is 0.5%. History of preeclampsia obtained a <i>p</i> value of 0.047. Hypertension with a <i>p</i> value of 0.000. And diabetes mellitus with a <i>p</i> value of 0.05.
8.	Wasfaedy Alamsyah (2020). Factors associated with the incidence of anemia in pregnant women aged 1-3 months in the working area of puskesmas bontomaruannu gowa district	This study used observational with a cross sectional approach.	From the results of the <i>chi square</i> test, the <i>p</i> value is 0.004, which means that there is a relationship between the level of maternal knowledge and the history of anemia in pregnant women with 1-3 months of gestation. From the results of the <i>chi square</i> test of diet, the <i>p</i> value is 0.049, which means that there is a relationship between the mother's diet and the incidence of anemia in pregnant women. Meanwhile, from the results of the <i>chi square</i> test of the distance of maternal pregnancy, the <i>p</i> value is 0.001, which means that there is a relationship between the distance of maternal pregnancy and the incidence of anemia in pregnant women.
9.	Ratih subekti & dewie sulistyorini (2018). Analysis of risk factors causing anemia in pregnant women at the puskesmas in the banjarnegara district area	This research uses an anecdotal survey and uses	In this study there is a relationship between nutritional status and anemia the results of the chi square test with a <i>p</i> value of 0.002.
10.	Siti amalia, rahmalia afriyani and siska putri utami (2017). Risk factors for anemia among pregnant women in BARI hospital Palembang.	This type of research uses quantitative methods that are analytical surveys with a cross sectional approach.	From the results of this study there is a relationship between age (<i>p</i> value 0.032), parity (<i>p</i> value 0.005) with the incidence of anemia in pregnant women.

11.	Nurmalina, Asriwati and Anto (2020). Analysis of risk factors for anemia in pregnant women at the martua sudarlis pratama clinic in Medan.	This type of research uses an anaalytic survey with a case control approach.	From the results of this study there is a relationship between age, parity, nutritional status, frequency of antenatal care with risk factors for the incidence of anemia in pregnant women.
12.	Fauzi rahayuapriliani, ichayuen, humira (2020). Factors associated with the incidence of anemia in pregnant women in the tegal gundil puskesmas area in 2020	This study used a quantitative method with cros sectional. Data collection was done by filling out a questionnaire.	The relationship between Fe tablet consumption and the incidence of anemia in pregnant women, mothers who do not consume Fe tablets have a 2.51 times greater chance of experiencing anemia during pregnancy. There was no significant relationship between socioeconomic status and the incidence of anemia in pregnant women. The relationship between education and the incidence of anemia in pregnant women, pregnant women who have low education have a 2.51 times greater chance of experiencing anemia.
13.	Ikeu tanzih, M rizal, lalu juntra and risti rosmiati (2016). Risk factors for anemia among pregnant women in Indonesia	Data were collected through interviews and measurements by the riskesdas and balitbangkes teams of the Indonesian ministry of health.	From the results of this study, it was found that the prevalence of anemia in pregnant women in Indonesia was high in rural (37.9%) and urban (38.2%) communities. Chronic Energy Deficiency (CED) nutritional status is associated with the incidence of anemia. Pregnant women with SEZ nutritional status had a 1.975 times chance of developing anemia compared to pregnant women with normal nutritional status.
14.	Odi lodia, pies weraman, ignasensaia (2022). Risk factors for anemia in pregnant women	This type of research uses quantitative analytical methods with cross sectional desai	The results showed that the age of pregnant women <20 years was associated with the incidence of anemia in pregnant women. In pregnant women associated with the incidence of anemia if the child's pregnancy is too close or less than 2 years. In SEZ if the nutritional status is lacking before pregnancy and pregnancy is a factor that affects the incidence of anemia.

4. DISCUSSION

From the results of the *literature review*, it was found that education, history of preeclampsia, socio-economic factors, parity, age, pregnancy distance, diabetes and antenatal care visits had an effect on the incidence of preeclampsia in pregnant women. While the factors that influence anemia in pregnant women are maternal diet, pregnancy distance, parity, nutritional status, age, antenatal care, chronic undernutrition (SEZ). A history of hypertension is one of the risk factors for preeclampsia. According to the theory, pregnancy can cause hypertension in women in normal conditions or worsen hypertension that has previously experienced hypertension. Hypertension is one of the top 3 complications in pregnancy that is often found (Elisabeth, 2018).

Based on Mia shofia's research, (2022) shows a significant relationship between gravida status and the incidence of preeclampsia. The results of this study are in line with Rufaidah's research, (2019) which states that first-time mothers have a greater risk of preeclampsia compared to multigravida pregnant women. This is because in the first pregnancy there is often a failure in the formation of *blocking* antibodies to placental antigens, causing an immun response that leads to the occurrence of preeclampsia.

Age is also associated with the incidence of preeclampsia, the productive age of a woman is 20-35 years. This age is the safest for pregnancy and childbirth because at this age the risk of complications during pregnancy is lower. At the age of more than 35 years, a degenerative process occurs which causes changes in the structure and function of blood vessels, making them prone to preeclampsia (Rismawati, 2021). In addition, regarding the risk factors for preeclampsia, there is a relationship between parity and the incidence of preeclampsia because mothers who have many children affect non-compliance with the family planning program. Lack of knowledge about pregnancy spacing causes mothers to not realize the dangers to their pregnancy and fetus (Mansur, 2019).

According to research (Fahira, 2017) and (Honestiy, 2018), ANC services affect the incidence of preeclampsia because the ANC services received by pregnant women are not maximized. Pregnant women are encouraged to routinely make ANC visits, seek information and get health services in order to minimize the occurrence of complications during pregnancy. In addition to preeclampsia, the problem that often arises in pregnant women is anemia.

Based on the results of research (Nurmalina, 2021), the less often pregnant women do antenatal care checks can cause anemia because pregnant women get a lot of knowledge, advice and good advice in maintaining the health of mothers and their fetuses obtained when visiting

health checks to health facilities. Short pregnancy distance can cause anemia in pregnant women, a good pregnancy distance is 2 years to prepare the body to receive the fetus again. So that the iron in the mother's body is divided for body recovery and to prepare for the next pregnancy (Fauzi rahayu, 2020).

From the results of research (Ikeu tanzihah, 2016), pregnancy is associated with physiological changes that result in increased fluid volume and red blood cells and a decrease in the concentration of nutritional binding proteins in the bloodstream. During pregnancy is a period of growth and development of the fetus towards the birth period so that nutritional disorders during pregnancy will have an impact on the health of the mother and fetus.

5. CONCLUSION

From this study, the most dominant risk factors for preeclampsia were: history of preeclampsia, parity, pregnancy distance and maternal age. While the most dominant risk factors for anemia in pregnant women in this study are: nutritional status, maternal age, parity and pregnancy distance.

6. ADVICE

Pregnant women should visit antenatal care regularly to avoid problems during pregnancy and health workers are expected to provide information about health to pregnant women so as to prevent problems during pregnancy and childbirth.

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