Maternal Determinants of Preeclampsia Incidence in Arjawinangun Hospital, Cirebon District, West Java: A Case Study

Nunung Nurjanah, Noor Pramono, Anggorowati, Ariawan Soejoenoes
Department of Doctoral, Faculty of Medicine, Diponegoro University
Email: nung.bidan@gmail.com

Abstract

Most of these complications develop during pregnancy. The main complications accounting for 80% of maternal deaths are severe bleeding (mostly postpartum hemorrhage), infection (usually after delivery), high blood pressure during pregnancy (pre-eclampsia and eclampsia) and unsafe abortion. This was an analytic observational study with a case control design. The data taken were the medical records of patients diagnosed with preeclampsia from Januari to Desember 2024. The population of pregnant women at RSUD Arjawinangun, Cirebon was 2.780 pregnant women. The sample size was obtained by random sampling technique as many as 350 pregnant women in accordance with the inclusion and exclusion criteria determined for the study. Age (p-value 0.001, OR 5.678), Parity (p-value 0.001, OR 2.606), Occupation (p-value 0.026, OR 2.053), Pregnancy distance (p-value 0.002, OR 2.005), Nutritional Status (p-value 0.001, OR 3.898), History of Preeclampsia (p-value 0.001, OR 14.462), MAP (p-value 0.001, OR 7.644). Age, Gravida, Interpregnancy interval, BMI, History of preeclampsia, MAP, occupation are factors contributing to the occurrence of preeclampsia in pregnant women at Arjawinangun Hospital, Cirebon Regency. Pregnant women with a history of preeclampsia have a 153.342 times higher chance of experiencing preeclampsia in their current pregnancy. Age, Gravida, Interpregnancy interval, BMI, History of preeclampsia, MAP, occupation are factors contributing to the occurrence of preeclampsia in pregnant women at Arjawinangun Hospital, Cirebon Regency.

Keywords: Age; BMI; MAP; Parity; Preeclampsia

Introduction

Maternal deaths are divided into direct and indirect deaths. Direct maternal deaths are the result of complications of pregnancy, childbirth, or the postpartum period, and any interventions or inappropriate treatment of these complications. Indirect maternal deaths are the result of pre-existing diseases or diseases that arise during pregnancy, such as HIV/AIDS, and cardiovascular disease. (Hutahean, 2022) Based on data from the World Health Organization (WHO), the maternal mortality rate (MMR) in 2023 is 189/100,000 live births (KH), while in Indonesia the MMR in 2023 is 305/100,000 KH, the MMR in West Java in 2023 is 187/100,000 KH, this figure is still high considering the MMR target set by the Sustainable Development Goals (SDGs) is 70/100,000 KH by 2030. (Kemenkes RI.2023). Therefore, Indonesia faces serious challenges in reducing the Maternal Mortality Rate (MMR). Data from 2023 shows that the national MMR is significantly higher than the global average. Both at the national level and in provinces such as West Java, there is still a lot of work to be done to achieve the targets set by the Sustainable Development Goals (SDGs) by 2030.

In 2022 the number of maternal deaths in Cirebon district was 29 mothers out of 43,238 live births with causes: bleeding 6 cases (20.69%), hypertension in pregnancy 10 cases (34.48%), heart and blood vessel abnormalities 5 cases (17.24%) infection 1 case (3.45%), infection 1 case (1.92%), Covid-19 1 case (3.45%) others 6 cases. Based on the phase of maternal mortality, namely deaths in pregnant women as many as 9 people (31.03%) and delivery women 8 people (27.6%) and postpartum women 12 people (41.38%). Based on this data, hypertension in pregnancy is the first cause of maternal mortality in Cirebon Regency.

Most of these complications develop during pregnancy. The main complications accounting for 80% of maternal deaths are severe bleeding (mostly postpartum hemorrhage), infection (usually after delivery), high blood pressure during pregnancy (pre-eclampsia and eclampsia) and unsafe abortion. (Hutahean, 2022) Preeclampsia is an increase in high blood pressure of at least 140/90 mmHg. Preeclampsia is a risk that can harm the mother and fetus. (Situmorang dalam Liling Tumonglo et al., 2024). Preeclampsia is an increase in high blood pressure that occurs after approximately 20 weeks of gestation followed by rapid maternal weight gain due to body swelling and laboratory examination found protein in the urine. (Helga dalam Liling Tumonglo et al., 2024).

The exact cause of preeclampsia is still unknown, so preeclampsia is referred to as "the disease of theories". However, there are several risk factors that can support the onset of preeclampsia, including age, pregnancy spacing and multiple pregnancies, previous history of preeclampsia, family history and diseases that accompany pregnancy such as kidney disease and diabetes mellitus. (Juniarty & Mandasari, 2023). The age of 20-30 years is the safest period for pregnancy/birth. Women who are at the beginning or end of their reproductive years are considered prone to pregnancy complications. Two years after the first menstrual period, a woman may still achieve pelvic growth of between 2-7% and height of 1%. The impact of under-ageing can lead to complications during pregnancy. Every primigravida teenager has a greater risk of developing Hypertension in Pregnancy (HTN). Some factors associated with preeclampsia are being too young or too old at the time of delivery. (Hutahean, 2022). Research by Liling et al (2024) shows that there is a relationship between age and history of hypertension with preeclampsia in pregnant women at Paniai Regional Hospital, Paniai Regency, Central Papua in 2024. The impact of preeclampsia on the fetus, among others: Intrauterine growth restriction (IUGR) or stunted fetal growth, oligohydramnios, prematurity, low birth weight, placental abruption and death. (Yulita, 2020) Based on this, researchers are interested in conducting research on the determinants of preeclampsia at Arjawinangun Hospital in Cirebon Regency?

Research Methods

Research design

This was an analytic observational study with a case control design. The data taken were the medical records of patients diagnosed with preeclampsia from Januari to Desember 2024.

Research sample

The population of pregnant women at RSUD Arjawinangun, Cirebon was 2.780 pregnant women. The sample size was obtained by random sampling technique as many as 350 pregnant women in accordance with the inclusion and exclusion criteria determined for the study.

Data analysis

This study's statistical test was a logistic regression test, which was carried out using the SPSS program. The data obtained was then tabulated and analyzed. The analysis technique used descriptive analysis. The analysis was used to describe the data obtained from the patient's medical records regarding the determinants of preeclampsia (age, parity, occupation, pregnancy spacing, BMI, history of preeclampsia, MAP) with a frequency distribution.

Result And Discussion

Table 1 Subject Characteristics

Variable	Frequency	n (%)
	Age	
Risk	**94**	**26,9**
Not risk	**256**	**73,1**
	Parity	
Primigravida	**121**	**34,6**
Multigravida	**229**	**65,4**
	Occupation	
Work	**54**	**15,4**
Jobless	**296**	**84,6**
	Pregnancy Distance	
≤ 2 year	**164**	**46,9**
> 2 year	**186**	**53,1**
	Nutritional Status	
Normal	**18**	**5,1**
Overweight	**40**	**11,4**
Obesitas	**292**	**83,4**
	History of Preeclampsia	
Yes	**107**	**30,6**
No	**243**	**69,4**
	MAP	
> 90 mmHg	**172**	**49,1**
≤ 90 mmHg	**178**	**50,9**
	Occurrence of Preeclampsia	
Preeclamsia	**175**	**50**
No preeclampsia	**175**	**50**

Table. 1 showed the characteristics of pregnant women in RSUD Arjawinangun, Cirebon. The table showed that most pregnant women were no risk age with a percentage of 73,1 %,

multigravida with a percentage of 65,4%, jobless with a percentage of 84,6%, pregnancy distance > 2 years with a percentage of 53,1%, nutritional status obesitas with a percentage of 83,4%, not have history of preeclampsia with a percentage of 69,4%, and most of the respondents have MAP ≤ 90 mmHg with a percentage of 50,9%.

Table 2 Relationship of Age, Gravity, Occupation, Pregnancy Distance, BMI, History of Preeclampsia, and MAP with Preeclampsia Incidence

VARIABEL	PREECLAMPSIA		OR	CI	X2	P
	Ya	Tidak				
Age						
Risk (<20/>35 th)	**74**	**20**	**5.678**	**3.263 – 9.880**	**40.856**	**0.001**
Not Risk (20-35 th)	**101**	**155**				
Parity						
Primigravida (1)	**133**	**96**	**2.606**	**1.650 – 4.116**	**16.370**	**0.001**
Multigravida (2-4)	**42**	**79**				
Occupation						
Jobless	**156**	**140**	**2.053**	**1.123 – 3.753**	**4.927**	**0.026**
Work	**19**	**35**				
Pregnancy Distance						
≤ 2 year	**97**	**67**	**2.005**	**1.309 – 3.070**	**9.650**	**0.002**
> 2 year	**78**	**108**				
Nutritional Status						
Normal (18,5-24,9)	**36**	**11**	**3.898**	**1.912 – 7.950**	**14.350**	**0.001**
Gizi Lebih (>25)	**136**	**162**				
History of Preeclampsia						
Yes	**94**	**13**	**14.462**	**7.638 – 27.381**	**86.151**	**0.001**
No	**81**	**162**				
MAP						
> 90	**127**	**45**	**7.644**	**4.756 – 12.285**	**75.005**	**0.001**
≤ 90	**48**	**130**				

The results showed that the job variable had a significant effect on the incidence of preeclampsia with a p-value of 0.026. This is in line with research conducted by Siswari et al (2022) (Siswari et al., 2022) states that the Chi-Square test result obtained a p-value of 0.016. Since the p-value of 0.016 is less than α (0.05), it can be concluded that there is a significant association between the employment status of pregnant women and the occurrence of preeclampsia at Patut Patuh Patju General Hospital in West Lombok District. Employment is related to the physical activities performed by an individual on a daily basis. Physical activities influence stress levels and physical strength. The heavier the work, the greater the physical effort required. For pregnant women, heavy work can disrupt physical health because it requires them to exert more energy. If the activities performed are balanced with adequate rest and a regular diet, pregnant women may avoid stress. One of the reasons work becomes a risk factor for preeclampsia is because strenuous activities increase muscle activity and blood flow. Blood circulation in pregnant women increases blood volume as it must supply nutrients and oxygen to the fetus through blood vessels, which can cause the heart to work extra hard (Harahap & Situmeang, 2022).

The analysis results indicate that the interval between pregnancies influences the incidence of preeclampsia with a p-value of 0.002. The normal interval between pregnancies is more than two years, as this allows for adequate recovery of the reproductive organs. An interval of less than one year may result in the uterus being unprepared to accommodate the fetus and placenta. This study aligns with research conducted by Martanti et al., (2021) (Martanti et al., 2021) which states that the interval between pregnancies has a significant association with the occurrence of preeclampsia, with a p-value of 0.011, meaning < 0.05. The interval between pregnancies is one of the risk factors for preeclampsia because it can lead to various complications that may complicate pregnancy. The interval between pregnancies, defined as the time between the previous and current pregnancies, is one of the causes of preeclampsia. This risk is exacerbated in mothers with a history of hypertension or preeclampsia in previous pregnancies. An ideal interval between pregnancies can minimize the risk of mortality for both the mother and the baby (Juniarty & Mandasari, 2023)

The analysis results indicate that age affects the incidence of preeclampsia with a p-value of 0.001. Pregnant women are considered at risk if they are younger than 20 years old or older than 35 years old. Women of these ages are vulnerable to pregnancy complications (Kaimmudin et al., 2018). In mothers who are too young, their reproductive organs are not yet ready for pregnancy, leading to complications such as miscarriage, hypertension, preeclampsia, bleeding, and others. Meanwhile, in mothers over 35 years of age, the organs in their bodies have begun to decline in productivity, making them a risk factor for complications during pregnancy, one of which is preeclampsia caused by reduced heart function and circulatory system (Ratnaningtyas & Indrawati, 2023). This study aligns with research conducted by Masruroh & Nisa (2021) (Masruroh & Nisa, 2021), which states that there is a significant association between maternal age and the occurrence of preeclampsia, with a p-value of 0.001, meaning it is less than the significance level of 0.05. Age plays a role because it is related to the decline in bodily functions or the readiness of reproductive organs. The recommended age for pregnancy is between 20 and 34 years old. Pregnant women in this age group have reproductive organs that are ready to accommodate pregnancy, along with the physical and psychological changes that occur (Purborini & Rumaropen, 2023).

The analysis results show that parity affects the incidence of preeclampsia with a p-value of 0.001. Parity is the number of pregnancies a mother has had. The number of pregnancies a mother has had is related to the function of the reproductive system. The higher the parity, the lower the performance of the reproductive organs in women. The higher the parity, the greater the pressure on the reproductive organs, such as the uterus and cervix. Repeated childbirth can cause weakening or deterioration of the uterine muscle tissue, which can increase the risk of postpartum hemorrhage (Norbaiti Norbaiti

et al., 2024). This study aligns with research conducted by Mariati et al (2022)(Mariati et al., 2022), which states that parity has an influence on the occurrence of preeclampsia with a p-value of 0.034, meaning <0.05. In primigravida women, the immune system in the body is not yet fully prepared to handle the presence of a fetus in the uterus due to the presence of antigens in the placenta. Women who have not yet experienced pregnancy and childbirth lack sufficient experience, especially when it comes to seeking medical care. Meanwhile, women with high parity experience a decline in reproductive function and are often accompanied by pre-existing conditions such as hypertension and others.

This study shows that there is a relationship between nutritional status and the incidence of preeclampsia in pregnant women with a p-value of 0.001. This study is in line with Mariati et al., (2022) (Handayani & Nurjanah, 2021) Statistical calculations using the Spearman's rank test yielded a p-value of 0.000<0.05. Mothers with obesity have a link to preeclampsia because obesity is associated with metabolic disorders, including hypertension. Individuals with obesity tend to experience increased cardiac output and blood volume. The effect of obesity on hypertension can occur through two mechanisms: direct and indirect. The direct effect is caused by increased blood volume and cardiac output due to increased body mass. Increased body mass requires more blood to circulate oxygen and nutrients throughout the body. The indirect effect is mediated through the nervous system and hormonal mechanisms closely related to sodium and water retention in the kidneys, leading to increased blood volume (Poniedziałek-Czajkowska et al., 2023)

The study results indicate that there is a significant association between a history of preeclampsia in a previous pregnancy (p = 0.001) and the occurrence of preeclampsia. The OR value for a history of preeclampsia is 153.342, meaning that respondents with a history of preeclampsia have a 153.342 times higher likelihood of experiencing preeclampsia in their current pregnancy. A history of preeclampsia in a previous pregnancy is one of the triggers for the occurrence of subsequent preeclampsia. This is due to several factors that can influence the occurrence of preeclampsia in pregnant women, including obesity, parity, history of hypertension, genetics, education, and occupation (Masruroh & Nisa, 2021). Preeclampsia is a condition characterized by elevated blood pressure in pregnant women at 20 weeks of gestation, accompanied by proteinuria or other symptoms such as kidney issues, pulmonary edema, or liver dysfunction. A study conducted by Lestari et al (2024) (Lestari et al., 2024) found that women with a history of preeclampsia have a 153.342 times higher risk of developing preeclampsia in their current pregnancy. This risk may occur due to an increase in placental weight. If there is an increase in the size and weight of the placenta, it may lead to preeclampsia in subsequent pregnancies. This study aligns with research conducted by Hinelo et al., 2022 (Hinelo et al., 2022), which states that mothers with a history of preeclampsia have a 4.735 times higher risk of experiencing preeclampsia again. Another study conducted by Parantika et al., 2021 (Parantika et al., 2021) states that a history of preeclampsia has a significant association with preeclampsia, with a p-value of 0.000. Preeclampsia is a condition characterized by hypertension occurring in pregnant women and can increase morbidity and mortality. Preeclampsia can be associated with pregnancy outcomes such as premature birth and low birth weight. Preeclampsia presents with symptoms of hypertension, edema, and proteinuria. Preeclampsia typically develops after 20 weeks of gestation. This condition arises due to endothelial dysfunction in various organs, such as cardiovascular and metabolic disorders. Mothers with a history of preeclampsia may experience anxiety about their current pregnancy, leading to increased blood pressure due to elevated adrenaline levels (Dimitriadis et al., 2023). Research conducted by Azkiyah et al., 2025 (Azkiyah et al., 2025) states that one of the preventive measures for preeclampsia is a strict diet during pregnancy. Weight gain in pregnant women affects the functioning of the cardiovascular system, leading to circulatory disorders. Significant weight gain indicates symptoms of preeclampsia. Weight gain also affects the growth and development of the

placenta, placental tissue, and endothelial dysfunction. One thing that can be done is to provide health education about nutrition during pregnancy so that pregnant women do not make mistakes in their diet and are able to control their weight gain. .(Andarwulan et al., 2022)

This study shows that there is a relationship between MAP and the incidence of preeclampsia in pregnant women with a p-value of 0.001. In line with the study Sulistiawati et al., 2024 (Sulistiawati et al., 2024), which states that based on the results of statistical tests using the Fisher Exact Chi Square test with a confidence level of 95% (= 5) and the results of Exact. Sig. (2-Sided) of 0.000 (Exact. Sig. (2-Sided) < 0.05). Mean Arterial Pressure (MAP) is the average arterial pressure value calculated from diastolic and systolic measurements, with the average arterial value then determined. MAP is considered positive if the result is > 90 mmHg and negative if the result is < 90 mmHg. In pregnant women in the second trimester, MAP measurements are better at predicting preeclampsia than systolic and diastolic blood pressure (Amdadi et al., 2020). Pregnant women with positive MAP have a higher risk of developing preeclampsia at 27–32 weeks of gestation. This is because mean arterial pressure is determined by blood pressure volume. When a person's blood pressure volume is high, the mean arterial pressure value will also be high, and conversely, if blood pressure volume decreases, the mean arterial pressure will also decrease. At 11–19 weeks of gestation, it was found that the combination of a positive maternal health history and MAP could identify preeclampsia in 62.5% of cases. In the second trimester, MAP is a better predictor of preeclampsia than systolic and diastolic blood pressure. (Arini et al., 2024)

Table 3 Multivariate Analysis with Multiple Logistic Regression

Variabel	B	S.E	P	Exp (B)	95% C.I for Exp (B)	
					Lower	Upper
Age	0.989	0.348	0.005	2.688	1.358	5.320
Parity	0.871	0.314	0.006	2.389	1.291	4.420
Pregnancy Distance	1.128	0.300	0.001	3.090	1.171	5.564
Nutritional Status	0.631	0.264	0.017	1.879	0.121	3.150
History of Preeclampsia	2.098	0.370	0.001	8.150	3.944	16.840
MAP	1.564	0.295	0.001	4.778	2.680	8.518
Constant	-12.993	1.568	0.001	0.000		

Multivariate analysis using Multiple Logistic Regression test with Backward LR method. The analysis resulted in two steps, where the first step analyzed the variables of age, gravida, occupation, gestational distance, BMI, history of preeclampsia, and MAP. In the second step there was one variable, namely the occupation variable, which was permanently excluded from multivariate modeling because when the variable was excluded there was a change in OR <10%. The results of multivariate analysis showed that maternal employment variables did not affect the incidence of preeclampsia. The results of the analysis showed that the largest OR value was 8.150, namely the Preeclampsia history variable, meaning that pregnant women with a history of Preeclampsia were 8 times more at risk of developing preeclampsia compared to pregnant women who did not have a history of preeclampsia after being controlled by the variables of age, gravida, pregnancy distance, BMI and MAP. It can be concluded that the most dominant variable affecting the incidence of preeclampsia in pregnant women is a history of preeclampsia.

Conclusion

Age, Gravida, Interpregnancy interval, BMI, History of preeclampsia, MAP, occupation are factors contributing to the

occurrence of preeclampsia in pregnant women at Arjawinangun Hospital, Cirebon Regency. Pregnant women with a history of preeclampsia have a 153.342 times higher chance of experiencing preeclampsia in their current pregnancy.

References

Amdadi, Z. A., Afriani, A., & Sabur, F. (2020). Mean Arterial Pressure Dan Indeks Massa Tubuh Dengan Kejadian Preeklampsia Pada Ibu Hamil Di Rumah Sakit Bhayangkara Makassar. *Media Kesehatan Politeknik Kesehatan Makassar*, 15(2), 272. https://doi.org/10.32382/medkes.v15i2.1469

Andarwulan, S., Anjarwati, N., Alam, H. S., Aryani, N. P., Afrida, B. R., Bintanah, S., Citrawati, N. K., Erlinawati, N. D., Susilawati, D., Arlym, L. T., Jauharany, F. F., Kartikaningtias, C., & Nilakesuma, N. F. (2022). Gizi Pada Ibu Hamil. In *Sustainability* (Switzerland) (Vol. 11, Issue 1). Media Sains Indonesia. http://scioteca.caf.com/bitstream/handle/123456789/1091/RED2017-Eng-8ene.pdf?sequence=12&isAllowed=y%0Ahttp://dx.doi.org/10.1016/j.regsciurbeco.2008.06.005%0Ahttps://www.researchgate.net/publication/305320484_SISTEM_PEMBETUNGAN_TERPUSAT_STRATEGI_MELESTARI

Arini, A. D., Ambarwati, W., & Rahayu, K. T. (2024). *Literatur Review : Deteksi Dini Preeklamsia dengan Pengukuran Mean Arterial Pressure (MAP), Roll Over Test (ROT) dan Body Mass Indeks (BMI)*. 3(1), 827–836.

Azkiyah, S., Hidayat, A., & Putri, I. M. (2025). *KEJADIAN PREEKLAMSIA PADA IBU HAMIL DI RUMAH SAKIT*. 6, 3218–3226.

Dimitriadis, E., Rolnik, D. L., Zhou, W., Estrada-Gutierrez, G., Koga, K., Francisco, R. P. V, Whitehead, C., Hyett, J., da Silva Costa, F., Nicolaides, K., & Menkhorst, E. (2023). Pre-eclampsia. *Nature Reviews Disease Primers*, 9(1), 8. https://doi.org/10.1038/s41572-023-00417-6

Handayani, S., & Nurjanah, S. (2021). Hubungan Indeks Massa Tubuh Dengan Kejadian Preeklamsia Pada Ibu Hamil Di Rsud Trikora Salakan. *Jurnal Kebidanan*, 13(02), 212. https://doi.org/10.35872/jurkeb.v13i02.469

Harahap, N., & Situmeang, I. F. (2022). Determinan Kasus Preeklampsia pada Ibu Bersalin. *Jurnal Ilmu Kesehatan Masyarakat,* 11(04), 342–350. https://doi.org/10.33221/jikm.v11i04.1526

Hinelo, K., Sakung, J., Gunarmi, G., & Pramana, C. (2022). Faktor Risiko Kejadian Preeklampsia Di Rumah Sakit Umum Daerah Kabupaten Banggai Tahun 2020. *Jurnal Ilmu Kedokteran Dan Kesehatan*, 8(4), 448–456. https://doi.org/10.33024/jikk.v8i4.5184

Hutahean, N. (2022). Hubungan Umur dan Paritas Ibu Bersalin Dengan Preeklamsia Di Klinik Pratama Sudarlis Medan Tahun 2022. Journal of Economic Perspectives, 2(1), 1–4.
Juniarty, E., & Mandasari, P. (2023). Hubungan Umur Ibu Dan Jarak Kehamilan Dengan Kejadian Preeklampsia Pada Ibu Bersalin. Cendekia Medika : *Jurnal STIKES Al-Ma'arif Baturaja*, 8(1), 160–167.

Kaimmudin, L., Pangemanan, D., & Bidjuni, H. (2018). Hubungan Usia Ibu Saat Hamil Dengan Kejadian Hipertensi Di RSU GMIM Pancaran Kasih Manado. *E-Journal Keperawatan* (e-Kp), 1(6), 1–5.

Lestari, P. R., Hanifah, F. N., & Putri, S. (2024). *Determinan Kejadian Preeklampsia Berat pada Ibu Hamil di Rumah Sakit Ibu Anak Anugrah Kubu Raya Kalimantan Barat*. 2.

Liling Tumonglo, N., Rofiah, K., & Yunicha Viridula, E. (2024). Hubungan antara Umur dan Riwayat Hipertensi dengan Kejadian Preeklampsia Pada Ibu Hamil di RSUD Paniai Kabupaten Paniai Papua Tengah. *Jurnal Mahasiwa Kesehatan*, 5(2), 153–162.

Martanti, L. E., Sari, S. P., & Ariyanti, I. (2021). Jarak Kehamilan dan Obesitas sebagai Faktor Risiko Preeklamsia pada Kehamilan. *Higeia Journal of Public Health*

Research and Development, 5(3), 227–238.

Masruroh, N., & Nisa, F. (2021). Determinan Maternal Kejadia Preeklampsia Pada Ibu Hamil Trimester III di RS Prima Husada Sidoarjo. *Jurnal Bidang Ilmu Kesehatan*, 11(1), 94–104. https://doi.org/10.52643/jbik.v11i1.1072

Norbaiti Norbaiti, Rr. Sri Nuriaty, Didi Ariady, & Noor Anisa. (2024). Hubungan Paritas Dan Usia Ibu Dengan Kejadian Sectio Caesarea Di RSUD Ulin Banjarmasin Tahun 2023. *NAJ : Nursing Applied Journal*, 2(1), 105–112. https://doi.org/10.57213/naj.v2i1.171

Parantika, R. W., Hardianto, G., Miftahussurur, M., & Anis, W. (2021). Relationship Between Obesity, Twin-Pregnancy and Previous History of Preeclampsia With Preeclampsia. *Indonesian Midwifery and Health Sciences Journal,* 5(3), 307–316. https://doi.org/10.20473/imhsj.v5i3.2021.307-316

Poniedziałek-Czajkowska, E., Mierzyński, R., & Leszczyńska-Gorzelak, B. (2023). Preeclampsia and Obesity—The Preventive Role of Exercise. *International Journal of Environmental Research and Public Health*, 20(2). https://doi.org/10.3390/ijerph20021267

Purborini, S. F. A., & Rumaropen, N. S. (2023). Hubungan Usia, Paritas, dan Tingkat Pendidikan dengan Kehamilan Tidak Diinginkan Pada Pasangan Usia Subur di Surabaya. *Media Gizi Kesmas*, 12(1), 207–211. https://doi.org/10.20473/mgk.v12i1.2023.207-211

Ratnaningtyas, M., & Indrawati, F. (2023). Karakteristik Ibu Hamil dengan Kejadian Kehamilan Risiko Tinggi. *Higeia Journal of Public Health Research and Development*, 7(3), 334–344.

Siswari, B. D., Supiani, & Baktiasih, D. G. S. (2022). Hubungan Stres dan Status Pekerjaan Ibu dengan Kejadian Preeklampsia di RSUD Patut Patuh Patju Kabupaten Lombok Barat. *ProHealth Journal*, 19(2), 64–75. https://doi.org/10.59802/phj.202219261

Sulistiawati, A., Rosalinna, R., & Yulaikah, S. (2024). the Correlation Between Mean Arterial Pressure (Map) Examination and the Incidence of Preeclampsia. Placentum: *Jurnal Ilmiah Kesehatan Dan Aplikasinya*, 12(1), 22. https://doi.org/10.20961/placentum.v12i1.83236

Yulita, E. (2020). Hubungan Umur dan paritas ibu terhadap kejadian preeklampsia pada ibu bersakin di RSUD Arifin Achmad Pekan baru. *Suparyanto Dan Rosad* (2015, 5(3), 248–253.