Determinants Factors of Pre-Eclampsia Incidence

Sri Rahayu[1], Endah Kamila Mas'udah[2], Lisa Purbawaning Wulandari[3]
[1,2,3]Midwifery Department, Health Polytechnic of Malang, Indonesia

Article Information	Abstract
	Maternal Mortality Rate (MMR) is one indicator in describing the welfare of society in a country. MMR in Indonesia in 2020 has increased compared to 2019. In 2019, MMR in East Java Province reached 89.81 per 100,000 live births. This figure will increase in 2020 to 98.39 per 100,000 live births. An important issue in Malang Regency related to maternal and child health is the high MMR. Preeclampsia is the 3rd largest case along with cases of infection and postpartum bleeding. The purpose of this research was to see a description of the determinants associated with the incidence of preeclampsia and to find the most dominant determinants causing preeclampsia in Kanjuruhan Hospital, Malang Regency. The type of the research was descriptive with a documentation study approach from the medical records of RSUD Kanjuruhan Malang. The analysis technique used descriptive analysis. The results of the research showed that the age data of most of the pregnant women were in high risk age (more than 35 years) as many as 28 mothers (56%), the distance between pregnancies in pregnant women with preeclampsia was mostly more than 2 years (64%), the highest parity of women with preeclampsia was multipara (68%), most of the women had never had an abortion (72%) and the gestational age of most women with preeclampsia was term (76%). Factors that determine the incidence of preeclampsia are age, gestation interval, parity and gestational age. Further research is needed to determine other factors that cause preeclampsia. © 2022 Journal of Ners and Midwifery

INTRODUCTION

Maternal Mortality Rate (MMR) is one indicator in describing the welfare of society in a country. Maternal death according to WHO is death during pregnancy or within 42 days after termination of pregnancy, due to all causes related to or aggravated by pregnancy or its management, but not due to accident/injury. The number of maternal deaths compiled from the recording of family health programs at the Ministry of Health in 2020 shows 4,627 deaths in Indonesia. This number shows an increase compared to 2019 of 4,221 deaths. Based on the causes, the majority of maternal deaths in 2020 were caused by bleeding as many as 1,330 cases, hypertension in pregnancy as many as 1,110 cases, and disorders of the circulatory system as many as 230 cases (Kementrian Kesehatan RI, 2021). In 2019, the Maternal Mortality Rate in East Java Province reached 89.81 per 100,000 live births. This figure will increase in 2020 to 98.39 per 100,000 live births. The three highest causes of maternal death in East Java in 2020 were hypertension in pregnancy, which was 26.90% or 152 people, bleeding was 21.59% or 122 people, and other causes, namely 37.17% or 210 people. Other causes fell because some of them entered the criteria for causing metabolic disorders, and some of them entered the criteria for blood circulation disorders. Efforts to reduce maternal mortality due to hypertension in pregnancy and bleeding continue to be carried out and be alert to other causes (Dinas Kesehatan Provinsi Jawa Timur, 2021).

Preeclampsia is a specific multi-systemic disorder in pregnancy characterized by the onset of hypertension and proteinuria after 20 weeks of gestation (A. Setyawati et al., 2018). Handling of pregnant women with preeclampsia must be done quickly and appropriately, because preeclampsia can cause serious complications for the mother and fetus. The cause of preeclampsia is not known with certainty, but there are determinant factors associated with preeclampsia, including age, gestational age, parity, history of abortion and gestational age. In addition to being at risk during pregnancy, preeclampsia also greatly affects the fetus and baby born, the high incidence of preeclampsia in Indonesia also greatly affects the condition of the fetus and perinatal. The incidence of severe preeclampsia and eclampsia causes maternal mortality in the range of 1.5% to 25%, while infant mortality is between 45% to 50%.

Malang Regency is the second largest Regency and is the Regency with the largest population in East Java with the capital city located in Kepanjen. Important issues in Malang Regency related to maternal and child health, one of which is the high MMR and IMR as well as nutritional problems. In 2017, obstetric complications occurred as much as 43.89% and postpartum complications were recorded at 52.94%. This complication contributed to the death rate of 9 people in 2017. Preeclampsia was the 3rd largest case along with cases of infection and postpartum bleeding. The number of occurrences of preeclampsia in Kanjuruhan Kepanjen Hospital, Malang Regency itself in 2015 reached 219 events and increased to 292 events in 2016. Seeing these conditions, all health workers and all levels of society need to be alert to the signs of preeclampsia symptoms that appear, this can be attempted by looking for the determinant factors that have the most influence on the incidence of preeclampsia so that appropriate anticipation and treatment can be given early. The purpose of this research was to identify the determinants associated with the incidence of preeclampsia and to find the most dominant determinants causing preeclampsia in Kanjuruhan Hospital, Malang Regency.

METHOD

The type of research is descriptive with a documentation study approach from the medical records of RSUD Kanjuruhan Malang. The data taken were the medical records of patients diagnosed with preeclampsia from September to December 2021 in a total of 50 medical records. 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, gestational distance, parity, history of abortion and gestational age) with a frequency distribution. The author used a descriptive method because it was appropriate to describe the phenomenon being studied. This research has gone through an ethical test from the Health Research Ethics Committee of Kanjuruhan Hospital and obtained a Certificate of Ethics Eligibility with the number 072.1/EA.KEPK-021/35.07.208/2021

RESULTS

Characteristics of Respondents

Characteristics of research respondents are described based on education, occupation and religion. The following characteristics of respondents are presented in table 1.

Table 1: Characteristics of respondents

	Characteristics	Frequency	Percent (%)
A	**Education**		
1	Did not finish SD/equivalent	15	30
2	SD/ Equivalent	8	16
3	Middle School/Equivalent	13	26
4	High School/Equivalent	13	26
5	College	1	2
	Total	**50**	**100**
B	**Profession**		
1	Private	39	78
2	civil servant	0	0
3	Trader	1	2
4	Farmer	0	0
5	Teacher	0	0
6	Doesn't work	10	20
	Total	**50**	**100**
C	**Religion**		
1	Islam	50	100
2	Hindu	0	0
3	Budha	0	0
4	Kristen	0	0
5	Katolik	0	0
6	Kong Hu Cu	0	0
	Total	**50**	**100**

Source: Primary Data, 2021

Based on table 1 of the characteristics of the respondents above, it can be concluded that the majority of respondents have an education not graduated from elementary school/equivalent (30%). Most of the respondents have private jobs (78%), and all respondents are Muslim (100%).

Determinant Factors of Preeclampsia

Table 2 Determinant Factors of Preeclampsia

	Determinant factor	Frequency	Percent (%)
A	**Respondent Age**		
1	<20	2	4
2	20-35	22	44
3	>35	28	56
	Total	**50**	**100**
B	**Pregnancy Distance**		
1	<2 year	18	36
2	>2 year	32	64

Determinant factor		Frequency	Percent (%)
	Total	**50**	**100**
C	**Parity**		
1	Nullipara	1	2
2	Primipara	12	24
3	Multipara	34	68
4	Grandemultipara	3	6
	Total	**50**	**100**
D	**Abortion History**		
1	Once	14	28
2	Never	36	72
	Total	**50**	**100**
E	**Usia Kehamilan**		
1	Prematur	12	24
2	Aterm	38	76
3	Serotinus	0	0
	Total	**50**	**100**

Source: Primary Data, 2021

Based on the research data in table 2 of the Determinant Factors of Preeclampsia, it was found that the majority of pregnant women with preeclampsia were more than 35 years old (56%), with most of the pregnancy intervals being more than 2 years (60%). The majority of pregnant women with preeclampsia were multiparous (68%) and had never had an abortion (72%). Most of the pregnant women gave birth at term (78%).

Complications of preeclampsia in mother and newborn

Table 3: Complications of Preeclampsia in mothers and newborns

Characteristics		Frequency	Percentage
A	**Type of Delivery**		
1	Sectio Caesaria	38	76
2	Vaginal	12	24
	Total	**50**	**100**
B	**Penyulit Persalinan**		
1	Prematurity	12	24
2	Precipitatus	1	2
3	Bleeding	5	10
4	IUFD	3	6
5	IUGR	3	6
6	No complications	26	52
	Total	**50**	**100**
C	**Kondisi Bayi Baru Lahir**		
1	Asphyxia	28	56
2	LBW	24	48
3	Disabled/died baby	5	10
4	Normal	19	38

Source: Primary Data, 2021

DISCUSSION

Preeclampsia is a specific multi-systemic disorder in pregnancy characterized by the onset of hypertension and proteinuria after 20 weeks of gestation (A. Setyawati et al., 2018). Handling of pregnant women with preeclampsia must be done quickly and appropriately, because preeclampsia can cause serious complications for the mother and fetus. The cause of preeclampsia is not known with certainty, but there are determinant factors associated with preeclampsia.

Age is one of the determinants of the incidence of preeclampsia in pregnant women. Based on the results of research conducted on pregnant women with preeclampsia at Kanjuruhan Hospital, the age of most of the pregnant women is high risk age (more than 35 years) as many as 28 mothers (56%). This is in line with several previous studies, that there is a relationship between age and the incidence of preeclampsia (Hutabarat et al., 2016; Legawati & Utama, 2017; MOTHER, 2020). Pregnant women with a high risk age, namely less than 20 years and more than 35 years have a 2 times effect on the incidence of preeclampsia/eclampsia compared to reproductive age (Fatmawati et al., 2017). The risk of preeclampsia increases with increasing age of pregnant women. Research conducted at Dr. RSUP. M. Djamil Padang by Denantika showed the results that there was a 5 times increased risk of experiencing preeclampsia in pregnant women with high risk age compared to pregnant women at low risk age (Denantika et al., 2015). Mothers who are too young (<20 years old) have a uterus that is not mature enough to give birth so they are prone to preeclampsia. Pregnant women with the age of more than 35 years are classified as too old to give birth, especially in primitua and are at high risk of experiencing preeclampsia (Santoso & Kurniati, 2018). Pregnant women with a high risk age, both too young and too old, need more assistance to detect complications in pregnancy and childbirth, especially preeclampsia.

Based on the results of the research, the distance between pregnant women with preeclampsia was mostly more than 2 years (64%). Pregnancy spacing is one of the risk factors for preeclampsia. Research conducted by Meidini, et al (2020) showed that gestational distance had a significant relationship with the incidence of preeclampsia. Pregnant women with a gestational distance of >5 years have a 5.465 times greater risk than pregnant women with a gestational distance of less or equal to 5 years (Rahmah, Meidini CH, 2020). Several studies also suggest that there is a relationship between gestational distance and the incidence of preeclampsia in pregnant women (Widiastuti et al., 2019; Yuliani & Hastuti, 2019). Cormick et al (2016) conducted a study on gestational spacing and stated that when compared with 2-4 years of gestation, shorter gestational intervals (<2 years) were not associated with an increased risk of recurrent preeclampsia, but longer gestational intervals (>4 years). years) appears to increase the risk of preeclampsia (Cormick et al., 2016). This shows that pregnancy is too far apart or more than 2 years to be one of the factors that increase the risk of preeclampsia.

The results showed that the highest parity in mothers with preeclampsia was multipara (68%). Parity is a determinant factor for the occurrence of preeclampsia. Research conducted by Yenny, et al (2021) shows that there is a relationship between parity and the incidence of preeclampsia (Aulya et al., 2021). Parity is one of the most common causes for pregnant women to experience preeclampsia. The younger a person's pregnancy (primipara) or the more someone gives birth (Grandemultipara) the greater the chance that the pregnant woman will experience preeclampsia. This is due to the fact that women who are pregnant for the first time and at a young age are more prone to developing preeclampsia due to the immaturity of the reproductive organs to get pregnant, while women who have repeatedly experienced childbirth are more likely to have weak body and health conditions so that they are likely to get preeclampsia. larger (Prawirohardjo, 2014). A literature review conducted by Setyawati (2021) also confirms this. Of the 10 journals reviewed by the authors, all of them stated that there was a parity relationship with the incidence of preeclampsia in pregnant women (R. Setyawati, 2021).

Abortion history obtained in this research, most of the mothers had never experienced an abortion (72%) while 14 (28%). Research conducted by Yuni Retnowati stated that there was no significant relationship between a history of abortion and the incidence of preeclampsia (Retnowati, 2021). This is corroborated by several previous studies which stated that there was no relationship between a

history of abortion and the incidence of preeclampsia (Gustri et al., 2016). This happens because mothers who have a history of previous abortions tend to pay attention to the health conditions of themselves and the fetus they contain with antenatal care to health services.

Based on the results of the research, it is known that the gestational age of the majority of mothers with preeclampsia is term (76%). Research conducted by Ayatullah Harun et al at the Sheikh Yusuf Hospital Gowa showed that there was a relationship between gestational age and the incidence of preeclampsia (Harun et al., 2019). In line with this research, Marniati et al (2016) stated in their research that there was a relationship between gestational age and the incidence of preeclampsia with an OR value of 4,429, which means that mothers whose gestational age is in the third trimester have 4,429 times the risk of experiencing pre-eclampsia compared to mothers whose gestational age is in the second trimester (Marniati et al., 2019). Gestational age is also a factor that can cause a mother to suffer from preeclampsia. Gestational age is divided into three trimesters, namely the first trimester of gestational age 0 to 13 weeks, the second trimester 14 to 28 weeks and the third trimester 29 to 40 weeks. Considered vulnerable to the occurrence of severe pre-eclampsia is the third trimester of pregnancy (Prawirohardjo, 2014) According to Hasmawati (2012), the incidence of pre-eclampsia in the second trimester of pregnancy can occur and have the same opportunities as pregnancy in the third trimester. Therefore, early detection is very important for pregnant women with regular and quality antenatal care (Hasmawati, 2012).

The most dominant determinant factor influencing this research is the respondent's age. Because of the age of respondents who are at high risk of experiencing preeclampsia as much as 56% and have a 5-fold risk compared to pregnant women with a low-risk age. Coupled with the education level of pregnant women with preeclampsia, most of whom did not finish elementary school/equivalent (30%), it is very important to use a humanistic approach to the mother to detect preeclampsia early and prevent complications in the mother and the fetus she contains.

CONCLUSION

The results of the research conducted on 50 pregnant women with preeclampsia at Kanjuruhan Hospital, Malang Regency, found that the determinants of the incidence of preeclampsia were Age, Pregnancy Distance, Parity and gestational age.

SUGGESTION

It is necessary to conduct further research on other determinant factors that influence the incidence of preeclampsia. It is very important to develop a tool for self-screening of preeclampsia that is easy for pregnant women.

CONFLICTS OF INTEREST

The authors in this research do not have affiliation with or involvement in any organization or entities with financial or non-financial interests' interest in the subject matter or material discussed in this script.

AUTHOR CONTRIBUTIONS

The main author has thoughts based on the phenomenon of the still high incidence of pre-eclampsia pregnancies. Then the main author compiled a conceptual framework based on theory, determined the research design and designed a data collection plan. Author members discuss research plans, develop instruments and perform data collection and data analysis. After the data analysis was completed, the main author together with co-authors conducted discussions, compile articles, and conduct discussions based on the theory and results of previous research. The main author makes the final approval of the article to be published. Author member 1 as the corresponding author compiles journal manuscripts, submits journals and revises articles according to reviewer input.

REFFERENCES

Aulya, Y., Silawati, V., & Safitri, W. (2021). Analisis Preeklampsia Ibu Hamil pada Masa Pandemi Covid-19 di Puskesmas Sepatan Kabupaten Tangerang Tahun 2021. *Jurnal*

Akademika Baiturrahim Jambi, *10*(2), 375–384. http://jab.stikba.ac.id/index.php/jab/article/view/387

Cormick, G., Betrán, A. P., Ciapponi, A., Hall, D. R., & Hofmeyr, G. J. (2016). Inter-pregnancy interval and risk of recurrent pre-eclampsia: systematic review and meta-analysis. *Reproductive Health*, *13*(1), 1–10. https://reproductive-health-journal.biomedcentral.com/articles/10.1186/s12978-016-0197-x

Denantika, O., Serudji, J., & Revilla, G. (2015). Hubungan Status Gravida dan Usia Ibu terhadap Kejadian Preeklampsia di RSUP Dr. M. Djamil Padang Tahun 2012-2013. *Jurnal Kesehatan Andalas*, *4*(1). http://jurnal.fk.unand.ac.id/index.php/jka/article/view/224

Dinas Kesehatan Provinsi Jawa Timur. (2021). Profil Kesehatan Provinsi Jawa Timur 2020. In *Dinas Kesehatan Provinsi Jawa Timur*. www.dinkesjatengprov.go.id

Fatmawati, L., Sulistyono, A., & Notobroto, H. B. (2017). Pengaruh Status Kesehatan Ibu Terhadap Derajat Preeklampsia/Eklampsia di Kabupaten Gresik. *Buletin Penelitian Sistem Kesehatan*, *20*(2), 52–58. https://repository.unair.ac.id/99895/

Gustri, Y., Sitorus, R. J., & Utama, F. (2016). Determinan kejadian preeklampsia pada ibu hamil di RSUP Dr. Mohammad Hoesin Palembang. *Jurnal Ilmu Kesehatan Masyarakat*, *7*(3), 209–217. http://ejournal.fkm.unsri.ac.id/index.php/jikm/article/view/192

Harun, A., Anita, A., & Putri, N. B. (2019). Faktor yang Berhubungan Terhadap Kejadian Preeklampsia di RSUD Syekh Yusuf Gowa Tahun 2019. *Jurnal Kesehatan Delima Pelamonia*, *3*(1), 35–41. http://ojs.iikpelamonia.ac.id/index.php/delima/article/view/131

Hasmawati, D. (2012). Faktor-Faktor Yang Berhubungandengan Kejadian Pre Eklmapsi Pada Kehamilan di RSUD Embung Fatimah Kota Batam. Batam: Universitas Batam. *Jurnal FK Unand*.

Hutabarat, R. A., Suparman, E., & Wagey, F. (2016). Karakteristik pasien dengan preeklampsia di RSUP Prof. Dr. RD Kandou Manado. *E-CliniC*, *4*(1), 31–35. https://ejournal.unsrat.ac.id/index.php/eclinic/article/view/10936

Kementrian Kesehatan RI. (2021). Profil Kesehatan Indonesia 2020. In *Kementrian Kesehatan Republik Indonesia*. https://pusdatin.kemkes.go.id/resources/download/pusdatin/profil-kesehatan-indonesia/Profil-Kesehatan-Indonesia-Tahun-2020.pdf

Legawati, L., & Utama, N. R. (2017). Analisis faktor risiko kejadian preeklampsia berat di RSUD rujukan kabupaten dan provinsi Kalimantan Tengah. *Jurnal Surya Medika (JSM)*, *3*(1), 19–37. http://journal.umpalangkaraya.ac.id/index.php/jsm/article/view/210

Marniati, M., Rahmi, N., & Djokosujono, K. (2019). Analisis Hubungan Usia, Status Gravida dan Usia Kehamilan dengan Pre-Eklampsia pada Ibu Hamil di Rumah Sakit Umum dr. Zaionel Abidin Provinsi Aceh Tahun. *Journal Of Healthcare Technology And Medicine*, *2*(1), 99–109. http://jurnal.uui.ac.id/index.php/JHTM/article/view/353

MOTHER, I. N. P. (2020). Analisa Determinan yang Berhubungan dengan Preeklampsia Berat pada Ibu Hamil. *Jurnal SMART Kebidanan*, *7*(1), 41–46. https://scholar.archive.org/work/aqaiegyytfcppo5nq5wgabazn4/access/wayback/http://stikesyahoedsmg.ac.id/ojs/index.php/sjkb/article/download/298/pdf

Prawirohardjo, S. (2014). Ilmu Kebidanan Sarwono Prawirohardjo. In *Jakarta: PT. Bina Pustaka Sarwono Prawirohardjo*.

Rahmah, Meidini CH, R. D. S. N. Z. (2020). *Hubungan Umur, Paritas, dan Jarak Kehamilan dengan Kejadian Preeklampsia di RSUD Panembahan Senopati Bantul*. Universitas Gadjah Mada. http://etd.repository.ugm.ac.id/penelitian/detail/184464

Retnowati, Y. (2021). The Determinants Of Preeclampsia In Pregnant Women Of Tarakan. *International Journal of Science, Technology & Management*, *2*(5), 1808–1811.

https://ijstm.inarah.co.id/index.php/ijstm/article/download/350/306

Santoso, S., & Kurniati, A. (2018). *Faktor Risiko Preeklampsia Ibu Bersalin di RSUD Wonosari Tahun 2017 Risk Factors Preeclampsia On Intrapartum Mothers At RSUD Wonosari In 2017.* Poltekkes Kemenkes Yogyakarta. http://eprints.poltekkesjogja.ac.id/1462/

Setyawati, A., Widiasih, R., & Ermiati, E. (2018). Faktor-Faktor yang Berhubungan dengan Kejadian Preeklampsia di Indonesia. *Jurnal Perawat Indonesia*, *2*(1), 32–40. http://journal.ppnijateng.org/index.php/jpi/article/view/38

Setyawati, R. (2021). *Literature Review Hubungan Paritas Dengan Kejadian Preeklampsia Pada Ibu Hamil.* Stikes Insan Cendekia Medika Jombang. http://repo.stikesicme-jbg.ac.id/5856/

Widiastuti, Y. P., Rimawati, U., & Istioningsih, I. (2019). Indeks Massa Tubuh (IMT), Jarak Kehamilan dan Riwayat Hipertensi Mempengaruhi Kejadian Preeklampsia. *Jurnal Ilmu Keperawatan Maternitas*, *2*(2), 6–22. https://www.journal.ppnijateng.org/index.php/jikm/article/view/377

Yuliani, D. R., & Hastuti, P. (2019). HUBUNGAN JARAK KEHAMILAN DENGAN TEKANAN DARAH IBU HAMIL PREEKLAMPSIA. *Jurnal Sains Kebidanan*, *1*(1), 7–11. https://ejournal.poltekkes-smg.ac.id/ojs/index.php/JSK/article/view/5436.