

SYSTEMATIC REVIEW: THE RELATIONSHIP BETWEEN MOTHER'S AGE AND HYPERTENSION IN PREGNANCY

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ABSTRACT

Background: The high maternal mortality rate is caused by a high risk of pregnancy. High risk is a condition that can endanger the mother and fetus and is associated with pregnancy, childbirth and the puerperium. 90% of maternal deaths are caused by obstetric risk complications and increasing 15% in mothers who have risk factors. Hypertension in pregnancy is a high risk for pregnant women and can be caused by several risk factors. Several risk factors of hypertension in pregnancy are age, history of hypertension, family support, and stress levels. The purpose of this study was to determine the relationship between maternal age and the incidence of hypertension in pregnancy. Method: This research is a systematic review with inclusion criteria are Indonesian journal from 2020 - 2022, full article, and open access. Researchers will exclude any other journal not in Indonesian or English, not an open acces article and not a research study of mother's age and hypertension in pregnancy. This research is a literature study using descriptive method and conducting journal searches on several scientific websites with keywords relationship, factors, age, and hypertension in pregnancy. **Results:** Based on a literature study of the 5 journals found, it was found most of the mothers are at risk of experiencing hypertension in pregnancy. Age at risk is more susceptible to experiencing hypertension in pregnancy, it is caused by the development of reproductive organs that are not optimal enough in mothers who are too young and degenerative processes in old mothers. **Conclusion**: Age at risk or < 20 years and > 35 years has a significant relationship with hypertension in pregnancy.

Keywords: relationship, age, hypertension in pregnancy



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DOI: 10.20473/imhsj.v9i1.2025.14-24

INTRODUCTION

In Indonesia, maternal and child health problems are still one of the main problems in the health sector (Dyan et al., 2022). World Health Organization (2023), has stated the maternal mortality rate in the world has reached 303,000, while in ASEAN it is 235 per 100,000 live births. The maternal mortality rate in Indonesia significantly increasing, in 2019 it reached up to 4,221 cases of death, in 2020 it became 4,627 cases of death and increase in 2021 to 7,389 cases of death. In 2019 the maternal mortality rate reached 89.81 per 100,000 live births in East Java. In 2020 the maternal mortality rate has increased by 98.39 per 100,000 live births while in 2021 it is increasing to 234.7 per 100,000 live births (Dinas Kesehatan Provinsi Jawa Timur, 2021). The maternal mortality rate is one of the global Sustainable Development Goals (SDGs) targets in reducing the MMR to 70 per 100,000 live births by 2030 (Ministry of Health, 2019). 80% of deaths of pregnant women in the world are caused by bleeding (25%), hypertension in pregnant women (12%), obstructed labor (8%), abortion (13%), and other reasons (7%) Fajri & Sari (2019). Cases of maternal death caused by hypertension in pregnancy in 2019 amounted to 1,066 cases of death, then increased in 2020 to 1,110 and decreased in 2021 to 1,077 cases (Profil Kesehatan Indonesia, 2021).

One of the causes of maternal death is by high-risk pregnancies. High risk is a condition that can endanger the mother and fetus and is also associated with pregnancy, childbirth and the postpartum period (Brauthal & Andrei, 2019). 90% of maternal deaths are caused by obstetric complications and increasing 15% in mothers who have risk factors (Rangkuti & Harahap, 2020). Pregnancy hypertension is one of the high risks in pregnancy which is a cause of maternal and fetal death worldwide (Kemenkes RI, 2019). Hypertension in pregnancy is the second highest cause of maternal death in East Java. Hypertension is a condition of high blood pressure reaching \geq 140/90 mmHg (Johnson et al., 2020). Hypertension in pregnancy can be classified into several based on the ISSHP, namely, chronic hypertension, gestational hypertension, white coat hypertension, masked hypertension are kidney disease, HELLP syndrome, liver failure, cesarean section delivery, placental abruption, and death (Malha et al., 2018). The impact of hypertension not only attacks the mother but also the fetus. The impact that can be caused is 17% in the form of fetal death and 34% in low birth weight (LBW) (Hans & Ariwibowo, 2020).



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Basri et al., (2018) and Fajri & Sari (2019) said that several risk factors for hypertension in pregnancy are age, history of hypertension, stress, and weight gain. Rahmawati et al., (2022) said that most mothers who experience hypertension in pregnancy are of a risky age. Mothers aged < 20 years and > 35 years are at risk of experiencing complications during their pregnancy. Age at risk has 4 times greater chance of experiencing hypertension in pregnancy compared to age not at risk. Efforts to reduce maternal mortality have been carried out for a long time, one of which is by providing quality health services such as health services for pregnant women and referrals for complications and high risks. Mothers with high risk are likely to experience emergency conditions during pregnancy and childbirth (Sudaryanti et al., 2023). This research aims to focuses on the relationship between maternal age and the incidence of hypertension in pregnancy.

METHOD

This research is a systematic review using Critical Appraisal Checklist from The Joanna Briggs Institute (JBI) to screened journals on Google Scholar, Science Direct, and several other scientific sites. The keywords used in the search were relationships, factors, age, and hypertension in pregnancy. Inclusion criteria are Indonesian and English journal from 2020 – 2022, full article, and open access. Researchers will exclude any other journal not in Indonesian or English, not an open access article and not a research study of mother's age and hypertension in pregnancy. In the initial stage of literature search, 15 journals were found which were then filtered based on inclusion and exclusion criteria. The filtered search results were selected using the CAC instrument and 5 journals were obtained and arranged based on journal title, author, year of publication, research instrument, and results.

RESULT AND DISCUSSION

Table 1. Relationship between Water har Age and Hypertension in Freghancy					
No	Title	Authors	Year	Method	Result
1	Factors Associated with the Incidence of Hypertension in Pregnant Women in the Working Area of the Payung Sekaki Public Health Center, Pekanbaru City.	Muhammad Musthofa Hilmi, Riri Maharani, Yesica Devis	2021	This research is using observational analytic with cross sectional design with a sample of 74 people taken by consecutive sampling. Data analysis was performed univariately and bivariate with the chi-square statistical test.	The results of the study is the p value of $0.046 < \alpha 0.05$ which means that there is a relationship between age and the incidence of hypertension in pregnant women.
2	Relationship between Age and Parity with the Incidence of Hypertension in Pregnant Women at the Rajabasa Indah Health Center.	Rosy Yurianti, Mareza Yolanda Umar, Psiari Kusuma Wardhani, Feri Kameliawati	2020	In this study the method used was cross sectional with a total sample of 939 people taken by total sampling technique. The analysis used is the chi-square test.	Based on the results of statistical tests, it was obtained that the p value was 0.000 which has a value less than 0.05. It can be seen there is a relationship between maternal age and the incidence of hypertension in pregnant women.
3	Relationship between high risk of pregnant women's age and the incidence of hypertension in pregnancy at the Batu Aji Health Center.	Siti Husaidah, Nurbaiti	2020	This study uses an observational analytic design with cross sectional. The sampling technique was purposive sampling with a total sample of 59 people. Analysis in research using chi- square test.	The statistical test resulted in a p value of $0.03 < \alpha 0.05$ which means there is a relationship between age at risk and the incidence of hypertension in pregnancy.
4	The Relationship among Age and Parity with the Incidence of Hypertension in Pregnant Women in Grinting Village, Bulakamba Sub- District, Brebes Regency.	Susy Sriwahyuni, Darmawan, Lili Eky Nursia N, Arif Iskandar, Khairunnas	2020	The design used in this research is observational analytic with cross sectional approach. The sampling technique used purposive sampling and a total sample of 49 people. Research analysis using the chi-square test.	The results of the study showed that 29 mothers with gestational hypertension were at risk and 20 others were not at risk. The statistical test obtained a p-value of $0.002 < \alpha 0.05$, which means there is a relationship between maternal age and the incidence of pregnancy hypertension.
5	Analysis of Risk Factors for Hypertension in Pregnancy in Third Trimester Pregnant Women at the Cempaka Health Center, East Oku Regency.	Diana Rahmawati, Suprida, Turiyani	2022	This study used an analytic survey method with a cross sectional approach. The sample used in this study was 51 taken using systematic random sampling. Data analysis was tested using the chi-square test.	The results in the study found a p value of $0.044 < \alpha 0.05$. It was statistically proven that there was a relationship between age at risk and the incidence of hypertension in pregnancy.

Table 1. Relationship between Maternal Age and Hypertension in Pregnancy



Based on table 1, there are 5 literature studies with the results that maternal age has a significant relationship with the incidence of hypertension in pregnancy. Hypertension in pregnancy is included in the high risk category in pregnancy and is one of the causes of maternal death in the world, several other causes are bleeding, infection, and others. Hypertension in pregnancy contributes greatly to maternal and perinatal morbidity and mortality, causing 30,000 maternal deaths annually at the global level (Nath et al., 2021). According to the World Health Organization, the prevalence of hypertension is 22% of the world's population and Southeast Asia is in third position with a prevalence of 25% of the population. In Indonesia, cases of maternal death with hypertension in pregnancy are the second highest cause of maternal death after bleeding (Kemenkes RI, 2019).

In the first research journal conducted by Hilmi, Maharani & Devis, (2021) the results of bivariate analysis found a p value of $0.003 < \alpha 0.05$, which means there is a relationship between age and the incidence of gestational hypertension. Maternal mortality in mothers aged <20 years increased 2-5 times compared to mothers aged 20-30 years. Maternal mortality has again increased in women aged > 35 years. The International Society for the Study of Hypertension in Pregnancy explains that hypertension in pregnancy is an increase in blood pressure $\geq 140/90$ mmHg and can be chronic and occurs before pregnancy or after 20 weeks of gestation. Hypertension in pregnancy can be classified into chronic hypertension, gestational hypertension, white coat hypertension, masked hypertension, preeclampsia, and severe preeclampsia. Severe preeclampsia is the highest cause of complications to death in the hypertension group in pregnancy (ISSHP, 2018). The cause of hypertension in pregnancy is currently not known with certainty, but there are several theories that explain the occurrence of hypertension in pregnancy (Prawirohardjo, 2016). Risk factors for hypertension in pregnancy include maternal age, gravida, parity, history of hypertension, and obesity. Basri et al, (2018) added that apart from age, risk factors for hypertension in pregnant women include family support, stress levels, and weight gain. Hypertension in pregnancy can have an impact on the mother and fetus. The possible impacts on pregnant women with hypertension are hemorrhage, liver damage, HELLP syndrome, cesarean section delivery, preterm birth, growth disorders, and fetal death (Malha et al., 2018).

The same results were found by Yurianti et al., (2020) in the second journal. Pregnant women with advanced maternal age are at greater risk of experiencing hypertension. The results of data analysis in this study obtained an OR value of 3.934 which means that mothers aged <20 years and >35 years are 3.934 times more at risk of suffering from hypertension in their pregnancy. A person's age can anticipate health problems and actions to be taken. Ndiaye et al., (2020) said that teenage pregnancies and pregnancies of elderly mothers have a high risk of experiencing complications for the mother and her baby. Mothers who suffer from hypertension in pregnancy have the potential to experience hypertension in subsequent pregnancies. Mothers who are too young have a greater risk of experiencing hypertension in pregnancy. This is due to the age that is too young, the development of the reproductive organs is not optimal, while at an age that is too old it can cause complications (Yurianti et al., 2020). High blood pressure in mothers aged <20 years can be caused by contraction of the arteriole blood vessels which have decreased and headed for important organs in the body resulting in metabolic disorders and blood tissue disorders (Sulastri, 2021). In mothers aged > 35 years, hypertension in pregnancy can be caused by a degenerative process that causes structural and functional changes in the peripheral blood vessels which are responsible for regulating changes in blood pressure. Structural and functional changes cause the lumen to become narrow and the walls of blood vessels to become more rigid, therefore there is an increase in systolic blood pressure (Astuti, Husain and Sujawaty, 2022; Mutmainnah & Malka, 2021).

In the third journal, it was found that 29 pregnant women were at risk and 10 pregnant women were not at risk of suffering from hypertension in pregnancy. The P value in this study was $0.003 < \alpha$ value of 0.05. The results of the bivariate analysis showed that there was a significant relationship between maternal age and the incidence of hypertension in pregnancy. Mothers aged < 20 years and > 35 years are 2 times more at risk of experiencing hypertension in pregnancy compared to those who are not at risk. Maternal age is an important part of reproductive status. Age is closely related to an increase or decrease in one's bodily functions. The best age for a mother in pregnancy or giving birth is at an age that is not at risk, namely 20-35 years. This is because at that age the uterus and other body parts are ready to



accept pregnancy so that when the mother is 20-35 years old, the mother has the least risk of complications (Astuti, Husain & Sujawaty, 2022). Complications in pregnancy that may be experienced by women of at-risk age are preeclampsia, gestational diabetes, low birth weight, premature birth, and miscarriage.

The fourth journal out of 49 pregnant women, 29 of them are at risk and 20 other mothers are not at risk. Most of the mothers who experienced hypertension in pregnancy were at risk age and the p-value was 0.002 <0.05 which indicated that there was a relationship between maternal age and the incidence of hypertension in pregnancy. According to Lopian, Kashani-ligumsky & Many (2023), there are still many elderly pregnant women affected by social and cultural advances in women's rights to delay pregnancy, as well as increased access to contraception and legal abortion. The term advanced maternal age is used for mothers who are > 35 years old at the time of delivery. When an elderly mother gives birth, this can increase the risk of chromosomal abnormalities and miscarriage. It also allows mothers to experience gestational diabetes, premature birth, stillbirth, preeclampsia, to morbidity and mortality in both mother and baby. The prevalence of hypertension in pregnancy is expected to increase based on the growing trend of delaying pregnancy in the world.

The fifth journal also found the relationship between age at risk and the incidence of hypertension in pregnancy which was statistically proven with a p value of $0.044 < \alpha 0.05$. The OR value in the statistical test was 4.722 which means that aged <20 years and > 35 years have a 4 times greater chance of experiencing hypertension in pregnancy. Mothers who experience hypertension in pregnancy have the potential to have offspring with cardiovascular health problems, neurodevelopment, mental health, metabolism, behavior, and the risk of death in the future. Offspring born to mothers who suffer from severe preeclampsia are at risk of dying more than 6 times compared to those who do not. Therefore, it is important for pregnant women with hypertension in pregnancy (Huang et al., 2022). Researchers believe that reproductive organs at risk ages that are not fully ready or have experienced decreased function are factors that cause hypertension in pregnancy.

The high maternal mortality rate caused by hypertension in pregnancy encourages the government to create various programs with the aim of reducing maternal mortality. Good management for pregnant women with hypertension in pregnancy is monitoring the mother's blood pressure during pregnancy and administering antihypertensive drugs (Huang et al., 2022). Handling of hypertension in pregnancy can be done by pharmacological and nonpharmacological methods. Pharmacological treatment can be carried out by giving antihypertensive drugs while non-pharmacological treatment can be carried out by means of Dietary Approaches to Stop Hypertension, namely reducing sodium consumption, avoiding smoking, alcohol consumption, and controlling stress levels (Sulastri, 2021). Healthy lifestyles such as exercising regularly and losing weight for obese mothers can help reduce the risk of hypertension in pregnancy (Ogunwole et al., 2021). Chronic hypertension is a risk factor that plays a role in the development of preeclampsia. Based on the results of the CHAP (Control of Hypertension in Pregnancy) trial, it was found that chronic hypertensive patients with blood pressure $\geq 140/90$ mmHg who were given antihypertensive drugs had a 20% reduction in the risk of developing preeclampsia (Lopian, Kashani-ligumsky & Many 2023). Antenatal examinations during pregnancy are required at least 6 visits with distribution of 2 times in the first trimester, 1 time in the 2nd trimester, and 3 times in the third trimester. This needs to be done to detect risk factors, prevent and treat complications (Kementrian Kesehatan Republik Indonesia, 2021).



CONCLUSION AND SUGGESTION

Hypertension in pregnancy is one of the high risks during pregnancy and is a cause of maternal death. Age at risk or < 20 years and > 35 years has a significant relationship with hypertension in pregnancy. Routine antenatal checks, blood pressure monitoring, and appropriate treatment are needed to treat hypertension in pregnancy and prevent complications

DECLARATION

Conflict of Interest

This study has no conflicts of interest.

Authors' Contribution

All contributors were involved in every stage of the study, from the initial concept to the drafting of the article, so collaborative efforts were required in this study.

Funding Source

The source of funding for this study uses the researcher's personal funds

Data Availability

In this part, data supporting the research findings are available upon request.

Acknowledgments

Thank you to all members of the research team and respondents who have provided support and participation in completing this research

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