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Literature Review: Risk Factors For Hypertension In Pregnancy

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ABSTRACT

Hypertension in pregnancy is an important cause of severe acute morbidity, long-term disability and maternal and infant mortality. Hypertension in Pregnancy (HDK) is defined as blood pressure ≥140/90 mmHg in two or more measurements with onset more than 20 weeks of gestation, and no previous history of hypertension. In Indonesia, hypertension in pregnancy is the second highest cause of maternal death after bleeding. (4) The prevalence of hypertension in pregnancy in Indonesia was recorded as being found in 8341 cases (1.51%) of pregnant women from all samples of women aged 15–54 years. There are many risk factors that can cause an increase in blood pressure during pregnancy, such as primigravida, multiple pregnancies, hydatidiform mole, diabetes mellitus, hydrops fetalis, macrosomia, age less than 20 years or more than 35 years, family history of hypertension. pregnancy, previous history of hypertension, kidney disease, and obesity.

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INTRODUCTION

Hypertension in pregnancy affects approximately 10% of all pregnant women worldwide. Hypertension in pregnancy is an important cause of severe acute morbidity, long-term disability and maternal and infant mortality. Hypertension in Pregnancy (HDK) is defined as blood pressure ≥140/90 mmHg in two or more measurements with onset more than 20 weeks of gestation, and no previous history of hypertension. The incidence of hypertension in pregnancy can be influenced by several factors (multiple causation). Maternal age (<20 or ≥35 years), primigravida, nulliparity and increased Body Mass Index (BMI) are predisposing factors for hypertension in pregnancy. (Febyan., et al, 2020)

The incidence of hypertension in pregnancy is quite common. Five to ten out of one hundred pregnant women experience hypertension complications. Several factors that increase the risk of pregnant women developing hypertension are being overweight or obese, and diabetes mellitus. Pregnant women who experience hypertension during pregnancy have a higher risk of experiencing cardiovascular disease in the future, such as coronary heart disease and heart failure. (Indonesian Ministry of Health, 2022) WHO estimates that cases of hypertension in pregnancy, in this case preeclampsia, are seven

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times higher. in developing countries than in developed countries. (PNPK Diagnosis and Management of Preeclampsia, 2016)

In Indonesia, hypertension in pregnancy is ranked as the second highest cause of maternal death after bleeding. (Marlina, Y., et al, 2021) The prevalence of hypertension in pregnancy in Indonesia, recorded that there were 8341 cases (1.51%) of pregnant women from all samples of women who were found. aged 15–54 years. The prevalence of hypertension in pregnant women was 1062 cases (12.7%). Of 1062 cases of pregnant women with hypertension, 125 cases (11.8%) were found to have been diagnosed with hypertension by health workers. This shows that hypertension is a health problem that often arises during pregnancy and can cause complications in 2-3% of pregnancies. (Masriadi., et al, 2022)

There are many risk factors that can cause an increase in blood pressure during pregnancy, such as primigravida, multiple pregnancies, hydatidiform mole, diabetes mellitus, hydrops fetalis, macrosomia, age less than 20 years or more than 35 years, family history of hypertension. pregnancy, previous history of hypertension, kidney disease, and obesity. Data obtained from the South Sulawesi Provincial Health Office is that the number of pregnant women with hypertension in 2019 was 901 people. The Health Profile of South Sulawesi Province in 2016 shows that the prevalence of hypertension in Makassar City is 8% or there are 8 cases per 1000 population. Hypertension in pregnancy is a problem that requires special attention and is an emergency if treatment is not given immediately. (Syam, AN., et al, 2023). This study aims to determine the risk factors for hypertension in pregnancy by collecting data from various research journal sources that have been conducted previously.

METHODS

The method used in this research is a qualitative method. According to (Rachman, Arif., et al, 2024), Qualitative methods are in-depth and comprehensive research approaches to understand and explain phenomena in their natural context. This method makes room for complexity and context that cannot always be measured in numbers, allowing researchers to explore broader dimensions of social reality. This method allows collecting data that is descriptive and contextual in nature. (Rachman, Arif., et al, 2024)

a. Method of collecting data

   The data collection method in this research uses literature study. According to (Melfianora, 2019) what is meant by library research is research carried out only based on written works, including research results both that have been published and that have not been published. Even though it is research, research using literature studies does not require going into the field and meeting with respondents. The data needed in research can be obtained from library or document sources. Research using literature studies is research whose preparation is the same as other research, but the sources and methods for collecting data are by taking data from the library, reading, taking notes and processing research materials. (Melfianora, 2019)

b. Data analysis method

   The data analysis stages in this research consist of 3 types. Based on (Miles.,

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Huberman., Saldana, 2014) the components in data analysis are divided into the following:

1. Data condensation
   Data condensation refers to the process of selecting, focusing, simplifying, abstracting and transforming data that approaches the entirety of written field notes, interview transcripts, documents and empirical materials. The conclusion is that this data condensation process was obtained after the researcher conducted interviews and obtained written data in the field, which later the interview transcripts were sorted to obtain the research focus required by the researcher.
2. Data Presentation (data display)
   Data presentation is an organization, unification and conclusion of information. Data presentation here also helps in understanding the research context because it carries out a more in-depth analysis.
3. Drawing Conclusions (Conclusions drawing)
   Drawing conclusions here is carried out by the researcher from the beginning of the researcher collecting data, such as looking for understanding that does not have a pattern, noting the regularity of explanations, and the flow of cause and effect, at the final stage, summing up all the data obtained by the researcher. (Miles., Huberman., Saldana, 2014)

RESULTS AND DISCUSSION

Pathophysiology

Pathophysiology hypertension on pregnancy explained with differentiation trophoblast Which No appropriate during invasion endothelium Because regulations abnormal consequences production cytokines , adhesion molecules, molecule complex histocompatibility main, And *metalloproteinase* . Abnormal regulation of production these molecules cause hypoperfusion placenta And ischemia occurs . (Luger RK., Knight BP, 2022)_Hypoxia placenta the resulting induces incident inflammation annoying cascade balance factor angiogenic , and induce aggregation platelets , which everything result dysfunction manifested endothelium in a way clinical as syndrome preeclampsia a . (Braunthal, S., Brateanu A, 2019) Improvement pressure blood is consequence direct from imbalance between vasodilation and vasoconstriction of blood vessels Then trigger response inflammation. Enhancement Lots component system renin-angiotensin in circulation (RAAS) apparently own effect significant on enhancement pressure blood, proteinuria And stimulation cytokines inflammation. (Prejbisz, A., et al, 2019)

Risk Factors

Several risk factors can cause hypertension during pregnancy

Age

Age 20-30 years is the safest period for getting pregnant or giving birth. Women who are at the beginning or end of reproductive age are considered vulnerable to pregnancy complications. Two years after the first menstruation, a woman may still achieve pelvic growth of between 2-7% and height of 1%. Hypertension in pregnancy most often affects older women. It was explained that women aged over 35 years had a risk 3.37 times higher

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than women aged 20-30 years. Meanwhile, at the age of less than 20 years, the uterus and pelvis often have not yet grown to adult size. As a result, pregnant women at that age are at risk of experiencing complications during pregnancy due to the immaturity of the reproductive organs. At the age of 35 years, the mother's health begins to decline. In addition, in women over 35 years of age, stiffness of the cervix often occurs, causing heavy bleeding which, if not treated immediately, can cause maternal death. (Nurrahmadina, T, 2020)

Based on the results of research (Febyan., et al, 2020), from a sample of 531 pregnant women, 43 people (8.1%) had hypertension in pregnancy. The results of analysis using the Chi-square test of the relationship between maternal age and the incidence of hypertension in pregnancy showed that there were 15 out of 94 (16.0%) mothers with a high risk age of ≥35 years who experienced hypertension in pregnancy. (Febyan., et al, 2020)

Based on the results of research (Annisa, N, 2022) with a sample of 152 samples, it shows that the number of mothers with an age at pregnancy <20 years and >35 years was 65 respondents (74.7%), the results of the analysis using the Chi-square statistical test, it was said there is a significant relationship if the p-value <0.05. In this study, the p-value was 0.000. So it can be concluded that there is a significant relationship between the mother's age during pregnancy and the incidence of hypertension. (Annisa, N, 2022)

According to research results (Rohmani, A., et al, 2013) of 531 pregnant women, 43 people (8.1%) had hypertension in pregnancy with the number of pregnant women in the <35 years age group being 437 (82.3%) people. and pregnant women in the age group ≥35 years were 94 people (17.7%). The statistical test results obtained a value of p = 0.004 with OR = 2.774, so it can be concluded that there is a relationship between maternal age and the incidence of hypertension in pregnancy and mothers of high risk age have a 2.774 times chance of experiencing hypertension in pregnancy compared to mothers of low risk age.(Rohmani, A., et al, 2013)

Based on research (Marnita, D., et al, 2024) with 1948 respondents from medical records of pregnant women, the results obtained were that from 80 pregnant women whose age was at high risk, there were 48 pregnant women (14.5%) who had hypertension. In addition, it was found that 118 (35.5%) pregnant women experienced hypertension. Based on the results of the chi-square test, it shows a p-value of 0.04. The significance value is <0.05, there is a correlation between age and the incidence of hypertension in pregnant women. (Marnita, D., et al, 2024)

Table 1. Age risk factors for hypertension in pregnancy

Researcher Name	Research Title	Year of Research	Research Results
Febyan ., Pemaron, Ida Bagus R	Review of Risk Factors for Hypertension in Pregnancy at Bhayangkara Hospital, Denpasar	2020	Of the 531 samples of pregnant women, 43 people (8.1%) had hypertension in pregnancy. The results of analysis using the Chi-square test of the relationship between maternal age and the incidence of hypertension in pregnancy showed that there were

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Researcher Name	Research Title	Year of Research	Research Results
			15 out of 94 (16.0%) mothers with a high risk age of ≥35 years who experienced hypertension in pregnancy.
Annisa, Nurul	Factors That Influence the Occurrence of Hypertension in Pregnant Women in the Working Area of the Pattallassang Community Health Center, Takalar Regency in 2022	2022	Of the 152 samples, mothers with an age at pregnancy <20 years and >35 years were 65 respondents (74.7%), the results of the analysis using the Chi-square statistical test, it was said that there was a significant relationship if the p-value was <0.05. In this study, the p-value was 0.000. So it can be concluded that there is a significant relationship between maternal age during pregnancy and the incidence of hypertension.
Rohmani, Afiana., Setyabudi , M. Taufiqy., Puspitasari, Diana Ratih	Risk factors for hypertension in pregnancy . Muhammadiyah University Semarang	20 13	A sample of 531 pregnant women resulted in 43 people (8.1%) with hypertension in pregnancy with the number of pregnant women in the age group <35 years being 437 (82.3%) people and pregnant women in the age group ≥35 years being 94 people (17.7%). The statistical test results obtained a value of p = 0.004 with OR = 2.774, so it can be concluded that there is a relationship between maternal age and the incidence of hypertension in pregnancy and mothers of high risk age have a 2.774 times chance of experiencing hypertension in pregnancy compared to mothers of low risk age.
Marnita, Dinda Anggini ., Hasbie, Neno Fitriyani., Hadiarto, Rinto., Shariff, Fonda Octarianingsih	Analysis of Risk Factors for Hypertension in Pregnant Women	2024	The sample of respondents to the medical record data of pregnant women's patients was 1948 respondents. Results were obtained from 80 pregnant women whose age was at high risk, there were 48 pregnant women (14.5%) who had hypertension. In addition, it was found that 118 (35.5%) pregnant women experienced hypertension. Based on the results of the chi-

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Researcher Name	Research Title	Year of Research	Research Results
			square test, it shows a p-value of 0.04. The significance value is <0.05, there is a correlation between age and the incidence of hypertension in pregnant women

BMI

In pregnant women who have an excess body mass index or obesity, hypertension occurs due to increased plasma volume and increased cardiac output associated with hyperinsulinemia, hormonal changes, insulin resistance. Obesity itself has a negative impact on the mother and the fetus she is carrying, both during pregnancy, childbirth and postpartum. (Isnaniar., et al, 2019)

According to research results (Febyan, 2020), from 531 samples of pregnant women, 43 people (8.1%) had hypertension in pregnancy. The results of analysis using the Chi Square test showed that the relationship between body mass index and the incidence of hypertension in pregnancy was found to be 27 out of 219 (12.3%) people with a high risk body mass index, namely > 26.0 with a p value = 0.005, it can be concluded that there is a relationship between body mass index and the incidence of hypertension in pregnancy, which means that mothers with a high risk body mass index have the opportunity 2,602 times experienced hypertension in pregnancy compared to mothers who had a low risk body mass index. (Febyan., et al, 2020)

According to research results (Syam, A., et al, 2023) with a sample of 58 pregnant women. Where the percentage results show that pregnant women in the LILA category who are obese have hypertension (43.1%) more than those who do not have hypertension (22.4%). Meanwhile, less obese pregnant women have hypertension (56.9%) than those who do not have hypertension (77.6%). (Syam, A., et al, 2023)

Based on the results of research (Annisa, N, 2022) with a sample of 152 samples, it shows that the number of hypertensive mothers with mothers who are obese or have a BMI: ≥ 25 Kg/M2 is 81 respondents (69.2%). The results of the analysis can be concluded that there is a significant relationship between maternal obesity during pregnancy and the incidence of hypertension. (Annisa, N, 2022)

Based on the results of research (Arikah, T., et al, 2020) with a sample of 94 respondents, it was found that pregnant women who were obese were 49 respondents (52.1%) while pregnant women who were not obese were 45 respondents (47.9%), based on the research results. The P value obtained was 0.000 <0.05, meaning there is a relationship between obesity and the incidence of hypertension in pregnant women. The result of OR = 5.176 means that pregnant women who are obese are 5.1 times more likely to suffer from hypertension compared to pregnant women who are not obese. (Arikah, T., et al, 2020)

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Table 2. BMI risk factors for hypertension in pregnancy

Researcher Name	Research Title	Year of Research	Research Results
Febyan; Pemaron, Ida Bagus R	Review of Risk Factors for Hypertension in Pregnancy at Bhayangkara Hospital Denpasar	2020	Of the 531 samples of pregnant women, 43 people (8.1%) had hypertension in pregnancy . The results showed that the relationship between body mass index and the incidence of hypertension in pregnancy was 27 out of 219 (12.3%) people with high risk body mass index, namely >26.0 with a p value = 0.005, which means that mothers with a high risk body mass index have a 2.602 times chance of experiencing hypertension in pregnancy compared to mothers who have a low risk body mass index
Syam, Andi Nurfadilah; Tihardimanto, Andi; Azis, Asrul Abdul; Sari, Jelita Inayah; Maidin, Sabir	Factors Associated with the Incident of Hypertension in Pregnant Women	2023	From 58 samples of pregnant women, the percentage results obtained showed that pregnant women in the LILA category who were obese had hypertension (43.1%) more than those who did not have hypertension (22.4%). Meanwhile, less obese pregnant women experienced hypertension (56.9%) than those who did not experience hypertension (77.6%)
Annisa, Nurul	Factors That Influence the Occurrence of Hypertension in Pregnant Women in the Working Area of the Pattallassang Community Health Center, Takalar Regency in 2022	2022	From 152 samples, it shows that the number of hypertensive mothers with mothers who are obese or BMI: ≥ 25 Kg/M2 is 81 respondents (69.2%). The results of the analysis can be concluded that there is a significant relationship between maternal obesity during pregnancy and the incidence of hypertension.
Arikah, Titi; Rahardjo, Tri BW; Widodo, Sri	Risk Factors for Hypertension in Pregnant Women at the Kramat Jati Community Health Center, East Jakarta in 2019	2020	From the 94 sample respondents, 49 respondents were found who were obese pregnant women (52.1%), while non-obese pregnant women were 45 respondents (47.9%). Based on the research results, the P value was 0.000 < 0.05, meaning there was a relationship between obesity and the incidence of hypertension in pregnant

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Researcher Name	Research Title	Year of Research	Research Results
			women. The result of OR = 5.176 means that pregnant women who are obese are 5.1 times more likely to suffer from hypertension compared to pregnant women who are not obese.

Gravidity/Parity

Repeated labor will have many risks to the pregnancy. Parity 2 to 3 is the safest parity in terms of maternal mortality. This is because in every pregnancy the uterine muscles stretch. If the pregnancy continues continuously, the uterine muscles will become increasingly weakened so it is feared that problems will occur during pregnancy, childbirth and postpartum. (Nurrahmadina, T, 2020)

Based on the results of research (Annisa, N, 2022) with a sample of 152 samples, it shows that the number of hypertensive mothers with parity in primigravida and grande multigravida was 33 respondents (44.6%), the number of mothers in multigravida was 49 respondents (62.8%), mothers who did not primigravidas and grande multigravidas experienced hypertension as many as 41 respondents (55.4%) and pregnant women with multigravidas did not experience hypertension as many as 29 respondents (37.2%). The results of the analysis using the Chi-square statistical test, it is said that there is a significant relationship if the p-value is <0.05. In this study, the p-value was found to be 0.037, so there is a significant relationship between maternal parity during pregnancy and the incidence of hypertension. (Annisa, N, 2022)

Based on research (Marnita, D., et al, 2024) with 1948 respondents from medical records of pregnant women, the results of 332 pregnant women who experienced the most history of hypertension in pregnancy in the primipara category were 62 pregnant women (18.7%) while there were at least 5 pregnant women (1.5%) experiencing a history of hypertension during pregnancy. Based on the Fisher test results, it shows that the p-value is 0.007 which indicates a significance value (Sig.) < 0.05, which means there is a correlation between parity and the incidence of hypertension in pregnant women . (Marnita, D., et al, 2024)

According to research results (Arikah, T., et al, 2020) with a sample of 94 respondents, primigravida pregnant women were 38 respondents (40.4%) while multigravida pregnant women were 56 respondents (59.6%). Based on the research results, it was found that the P value was 0.047 and the OR result = 2, which means that pregnant women with primigravida parity are 2.5 times more likely to suffer from hypertension compared to pregnant women with multigravida parity. (Arikah, T., et al, 2020)

According to research results (Naibaho, F, 2021) of 30 samples of pregnant women, the majority were in the normal parity category 2-4 as much as 81.7%, while at risk parity was 18.3%. The Chi Square test results show that the probability value obtained is 0.020 where p < 0.05, meaning there is a significant relationship between parity and the incidence of hypertension. (Naibaho, F, 2021)

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Table 3. Parity risk factors for hypertension in pregnancy

Researcher Name	Research Title	Year of Research	Research Results
Annisa, Nurul	Factors That Influence the Occurrence of Hypertension in Pregnant Women in the Working Area of the Pattallassang Community Health Center, Takalar Regency in 2022	2022	Of the 152 samples, the number of hypertensive mothers with parity in primigravida and grande multigravida was 33 respondents (44.6%), the number of mothers in multigravida was 49 respondents (62.8%), mothers who did not experience hypertension in primigravida and grande multigravida were 41 respondents (55.4%). %) and multigravida pregnant women did not experience hypertension as many as 29 respondents (37.2%). The results of the analysis using the Chi-square statistical test, it is said that there is a significant relationship if the p-value is <0.05. In this study, the p-value was 0.037, so there was a significant relationship between maternal parity during pregnancy and the incidence of hypertension
Marnita, Dinda Anggini; Hasbie, Neno Fitriyani; Hadiarto, Rinto: Shariff, Fonda Octarianingsih	Analysis of Risk Factors for Hypertension in Pregnant Women	2024	Of the 1948 respondents, results were obtained from 332 pregnant women, the highest number of whom experienced a history of hypertension in pregnancy in the primipara category were 62 pregnant women (18.7%) while the least experienced a history of hypertension in pregnancy in the grande multipara category were 5 pregnant women. (1.5%). Based on the Fisher test results , it shows that the p-value is 0.007 which indicates a significance value (Sig.) < 0.05, which means there is a correlation between parity and the incidence of hypertension in pregnant women.
Arikah, Titi; Rahardjo, Tri BW; Widodo, Sri	Risk Factors for Hypertension in Pregnant Women at the Kramat Jati Community Health Center, East Jakarta in 2019	2020	From the 94 sample respondents, 38 respondents were primigravida pregnant women (40.4%), while multigravida pregnant women were 56 respondents (59.6%). Based on the research results, it was found that the P value was 0.047 and the OR result =

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Researcher Name	Research Title	Year of Research	Research Results
			2, which means that pregnant women with primigravida parity have a 2.5 times chance of suffering from hypertension compared to pregnant women with multigravida parity.
Naibaho, Flora	Factors Associated with the Incident of Hypertension in Pregnant Women at the Nunpene Community Health Center, North Central Timor Regency in 2018	2021	Of the 30 samples of pregnant women, the majority were in the normal parity category 2-4 as much as 81.7%, while at risk parity was 18.3%. The results of the Chi Square test show that the probability value obtained is 0.020 where p < 0.05, meaning that there is a significant relationship between parity and the incidence of hypertension.

CONCLUSION

In this study it can be concluded that several risk factors that influence hypertension in pregnancy are maternal age, BMI (Body Mass Index) and parity. However, not all research supports these findings. Another study suggested that there was no relationship between age and parity on the incidence of hypertension in pregnancy. In summary, although some studies show an association between maternal age, body mass index and parity, several other studies do not show an association between these risk factors. Further research is needed to better understand the factors that can influence the incidence of hypertension in pregnancy.

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