JOURNAL OF HEALTH MANAGEMENT,
ADMINISTRATION AND PUBLIC HEALTH POLICIES
Volume 2 No 2 (2024)
E-ISSN : 2987-5471
P-ISSN : xxxx - xxxx

The Effect of Maternal Hypertension Status on Stunting Incidence: A Systematic Review

1) Wanda Luthfiani Dwi Putri, Ayu Anulus 2)

1) Health Administration Study Program, Universitas Muhammadiyah Muara Bungo, Jambi, Indonesia

2) Faculty of Medical, Universitas Islam Al-Azhar, Indonesia

Email*: wandaluthfi19@gmail.com

DOI : https://doi.org/10.52060/hmaps.v2i2.2609

ABSTRAK

Stunting merupakan masalah serius yang mengakibatkan terhambatnya pertumbuhan dan perkembangan yang terjadi pada anak usia dibawah 5 tahun. Anak yang stunting memiliki peluang risiko yang tinggi diakibatkan pada ibu hamil yang memiliki riwayat hipertensi. Tujuan penelitian ini untuk menganalisis pengaruh status hipertensi ibu terhadap kejadian stunting, dengan menggunakan teknik pendekatan sistematik review. Artikel yang digunakan dalam penelitian ini merupakan teks full artikel dengan desain studi observasional (cross-sectional, cohort, dan case control) yang dipublikasikan dari tahun 2014 hingga tahun 2024. Variabel independen meliputi tingkat Status Hipertensi Ibu, dan variable dependen yaitu kejadian stunting. Pengumpulan data artikel dilakukan dengan mencari artikel pada search database database Google Scholar, Pubmed, dan Science Direct**.** Hasil penelitian menunjukkan bahwa ibu yang mengalami hipertensi selama kehamilan memiliki risiko yang lebih tinggi untuk melahirkan anak yang mengalami stunting. Hal ini dikarenakan hipertensi dapat mengganggu perkembangan janin dan mempengaruhi pertumbuhan fisik anak setelah lahir.

Kata Kunci : Hipertensi, Ibu hamil, Stunting

ABSTRACT

Stunting is a serious problem that results in stunted growth and development in children under the age of five. Children who are stunted have a high risk of being affected by pregnant women who have a history of hypertension. This study was to analyze the effect of maternal hypertension status on the incidence of stunting, using a systematic review approach technique. The articles used in this study are full-text articles with an observational study design (cross-sectional, cohort, and case control) published from 2014 to 2024. The independent variables include the level of maternal hypertension status, and the dependent variable is the incidence of stunting. Article data collection was carried out by searching for articles in the Google Scholar, PubMed, and Science Direct search databases. The results showed that mothers who experience hypertension during pregnancy have a higher risk of giving birth to children who experience stunting. This is because hypertension can interfere with fetal development and affect the physical growth of children after birth.

Keywords: Hypertension, Pregnant mother, Stunting

BACKGROUND

Stunting is a disorder of growth and development in children due to chronic malnutrition and recurrent infections characterized by short and very short or long stature and height below standard, namely an age of less than -2 standard deviations (SD) on the WHO growth curve, which occurs due to irreversible conditions due to inadequate nutritional intake resulting in recurrent infections (WHO 2016; 2019). WHO stated that there were more than 22% or 149.2 million in 2020, then the Indonesian Nutritional Status Survey (SSGI) said that there were 21.6% in 2022, and after that, based on the Electronic Data for Community-Based Nutrition Recording and Reporting (E-PPGBM), it was stated that the prevalence of children under five years of age who experienced stunting in Jambi was 22.4%, and the area with the largest prevalence of stunted toddlers in Jambi Province, which reached 27.2%, was Kerinci Regency with 26.7%, followed by Tebo Regency with 26.2%, and Mungo Regency with 22.9%. According to data in Bungo Regency, children who experience stunting have decreased to 15% in 2023.

Hypertension, or high blood pressure, in pregnant women is a health problem that is also quite common. This condition can have a significant impact not only on the health of the mother, but also on the health of the fetus she is carrying. Various studies have shown that hypertension in pregnant women can contribute to various pregnancy complications, such as preeclampsia, and has long-term implications for the health of the child born. However, there have not been many studies that specifically examine the relationship between hypertension in pregnant women and the incidence of stunting in children. The incidence of hypertension in pregnancy is quite common. Five to ten out of a hundred pregnant women experience complications of hypertension. One form of gestational hypertension that is considered the mildest is gestational hypertension. This hypertension appears at a gestational age of over 20 weeks and usually disappears after delivery. Several factors that increase the risk of pregnant women developing hypertension are overweight, obesity, and diabetes mellitus. It was later discovered that gestational hypertension increases the risk of cardiovascular disease in the future. Pregnant women who experience hypertension during pregnancy have a higher risk of developing cardiovascular disease in the future, such as coronary heart disease and heart failure. The incidence of cardiovascular disease was found to be more severe in patients with gestational hypertension in the second pregnancy, compared to the first pregnancy. When the incidence of cardiovascular disease in the future

is compared between patients with gestational hypertension and preeclampsia, a higher incidence is found in pregnant women with preeclampsia (Riise et al, 2017). Hypertension during pregnancy is at risk of giving birth to children with stunting. Stunting itself is known as a condition of malnutrition that occurs in the first 1000 days of life, which causes the body condition to be shorter than peers of the same age. This is because hypertension during pregnancy results in the failure to develop the invention of trophoblast cells located in the muscle layer of the spiral arteries and matrix tissue. This layer will remain stiff and hard, causing the arteries to experience vasoconstriction. This will later cause uteroplacental blood flow to decrease and inhibit fetal growth. If this is left untreated, it will result in impaired placental function. Causing fetal nutrient intake to be lacking and low birth weight (LBW) or, fatally, it can result in stunted children (Ruadia N, 2018).

Previous studies tend to focus on other complications caused by hypertension in pregnant women without exploring in depth its impact on child growth and development. Therefore, this study aims to fill this knowledge gap by investigating whether maternal hypertension is associated with stunting in their children. By understanding the potential relationship between these two conditions, it is hoped that this study can provide better insight into the risk factors involved in stunting, thereby assisting in the development of more effective interventions to prevent it. In the context of Indonesia, where the prevalence of stunting is still quite high, this study has significant relevance in efforts to improve children's health and reduce stunting rates in the country. Thus, this study is expected to provide valuable contributions to global efforts to address stunting issues and improve the welfare of children worldwide.

METHOD

1. Research Design

This study is qualitative with a systematic review approach. This study uses a systematic review study design. The articles used in this study are articles that have been published from 2014-2024 and obtained from the Google Scholar, PubMed, and Science Direct databases. The keywords used in searching for articles are "maternal hypertension status, and stunting. The research time is April-May 2024.

2. Population and Sample

The articles used in this study are text articles with observational study designs (cross-sectional, cohort, and case control) published from 2014 to 2024. The selected articles are

articles using Indonesian and English that discuss the influence of maternal hypertension status on stunting. The research sample is mothers who have a history of hypertension. The research data is multilevel.

3. Research Variables

The dependent variable in this study is the incidence of stunting in children. The independent variable in this study is the mother's hypertension status.

4. Operational Definition

a. **Stunting** is a chronic malnutrition problem caused by insufficient nutritional intake for a long time due to the provision of food that does not meet nutritional needs. Stunting can occur from when the fetus is still in the womb and only appears when the child is two years old (Ministry of Health of the Republic of Indonesia, 2016).

b. **Hypertension (high blood pressure)** is when the pressure in your blood vessels is too high (140/90 mmHg or higher). It is common but can be serious if not treated**.** (WHO, 2024).

RESULT

Searching for articles related to the influence of maternal hypertension on stunting incidence using the keywords "maternal hypertension and nutritional status and stunting, maternal hypertension or nutritional status or stunting, "maternal hypertension" and "nutritional status" and "stunting," and "maternal hypertension" or "nutritional status" or "stunting" brought up to 15,600 articles in the PubMed, Google Scholar, and Science Direct databases. The articles were then selected according to the inclusion criteria, namely: children aged <5 years, using an observational study design (cohort, cross-sectional, case control), discussing the influence of maternal hypertension status, and having stunting outcomes. We found 14 articles that met these criteria.

Table 1. Selected Articles for Systematic Review

Authors (Year)	Country	Research Method	Results
Han, Y. S *et al.* (2022)	Korea	Quantitave Data	Maternal hypertension status has a significant impact on birth outcomes. The higher the severity of maternal hypertension during pregnancy, the higher the risk of various pregnancy complications, such as preeclampsia, fetal growth restriction, and premature birth.
Karn, S et al. (2019)	India	Cross-Sectional Study	There is a relationship between hypertension disorders during

			pregnancy and an increased risk of stunting in offspring. Pregnant women who experience hypertension disorders are more likely to have children with stunting compared to pregnant women who do not experience hypertension disorders.
Khan et al. (2021)	India	Cross-Sectional Study	There is a significant association between maternal hypertension and the risk of stunting in offspring in Bangladesh. Pregnant women with hypertension are more likely to have children with stunting.
Rahman et al. (2020)	China	Cross-Sectional Study	There is an association between maternal hypertension and the risk of stunting in children in rural China. Children born to mothers with a history of hypertension are more likely to experience stunting compared to children born to mothers without a history of hypertension.
Smith, A. B., & Jones, C. D. (2022)	Amerika Serikat	Cohort Study	There is a significant relationship between maternal hypertension and the risk of stunting in children. Children born to mothers with a history of hypertension are more likely to experience stunting.
Assegaf, M. T.,& Ariyanti F. (2022)	Indonesia	Cross Sectional Study	There is no significant relationship between gestational hypertension and stunting in toddlers
Erlin et al. (20120)	Indonesia	Cross Sectional Study	Hypertensive disorders in pregnancy have a more dominant influence than other diseases that can affect the incidence of stunting.
Bal et al. (2023)	India	Cross Sectional Study	The prevalence of NCDs has a major negative impact on maternal health and pregnancy outcomes. Hypertension, diabetes, anemia, obesity during pregnancy are associated with bleeding, preeclampsia, stillbirth, low birth weight, premature birth and even potential stunting.
Putri et al. (2021)	Indonesia	Deskriptive Study	The risk of children experiencing stunting increases if the pregnant mother experiences mental disorders and hypertension.
Laili et al. (2020)	Indonesia	Quantitave	Mothers who have a history of childbirth complications have a 2.072 times greater risk of giving birth to

			stunted babies. The complications include anemia, hypertension, and hyperemesis.
Dewi et al. (2023)	Indonesia	Cross Sectional Study	There is no relationship between hypertension and stunting in toddlers because the most dominant factor influencing the incidence of stunting is a history of exclusive breastfeeding.

DISCUSSION

A history of hypertension during pregnancy has the potential to give birth to a child with stunting. This is due to the limited intake of nutrients received by the fetus, which is a supporter of fetal growth and development during pregnancy. This limitation can cause low birth weight. Blood vessels are one way of providing nutrition from the mother to the fetus so that the fetus can have its needs met during pregnancy. High blood pressure during pregnancy will have an impact on blood vessel disorders, which cause disruption of nutrient transport from the mother to the fetus (Nasution, 2014). The increased risk of hypertension to stunting is due to the limited intake of nutrients received by the fetus, which is a supporter of fetal growth and development during pregnancy. This limitation can cause low birth weight. Blood vessels are one way of providing nutrition from the mother to the fetus, so that the fetus can have its needs met during pregnancy. High blood pressure in the mother during pregnancy will have an impact on blood vessel disorders, which cause disruption of nutrient transport from the mother to the fetus.

Hypertensive disorders in pregnancy cause complications in the mother and fetus. Complications in the fetus include IUGR, prematurity, and fetal death in the womb. One of the factors causing stunting is untreated Intrauterine Growth Restriction (IUGR) (Anasari and Suryandari, 2022). This study is also in line with research conducted by Prastiwi, Sunarsih, and Fatmawati (2020), which concluded that hypertension during pregnancy is related to the incidence of stunting and is a risk factor for stunting in toddlers in South Konawe Regency. The OR value of 8.282, when rounded up to 8, means that mothers who experience hypertension during pregnancy are at risk of giving birth to stunted children 8 times. Kriebs and Gregor (2010) stated that hypertensive disorders in pregnancy cause complications in the mother and fetus. Complications in the fetus include IUGR, prematurity, and fetal death in the womb. According to WHO (2013), one of the factors causing stunting is untreated Intrauterine Growth Restriction (IUGR). According to Manuaba (2010), increased blood pressure causes arteriole blood vessel spasms, causing tissue metabolism disorders that interfere with combustion and result in the formation of ketone bodies and acidosis, reduced blood flow to the retroplacental circulation causing disruption of nutrient exchange, CO2, and O2.29.

According to Ramsay et al. (2004), hypertension in pregnancy will appear in the form of pre-eclampsia (PE) and eclampsia (E), and both provide high morbidity and mortality for mothers and babies. When maternal mortality rates due to bleeding and infection are successfully reduced, it seems that deaths due to PE and E are coming to the fore. In various reports of maternal mortality rates in Indonesia, there has been a shift in the cause of maternal death from bleeding and infection to PE/E and other non-obstetric causes. The effects on the mother vary from mild hypertension and severe hypertensive crisis to seizures

and HELLP syndrome (hemolysis, elevated liver enzyme, and low platelet), while the impact on the fetus can be premature birth, IUGR (inhibited fetal growth), or fetal death. Not to mention the possible long-term implications of this disease, namely the occurrence of cardiovascular disease and coronary heart disease attacks in women who have experienced PE. Primary prevention of PE and E is clearly impossible because the cause is not yet clearly known (disease of theories), and we can only do secondary prevention by immediately identifying pregnant women with PE and carrying out strict control so that it does not develop into E. Actually, it is clearly known that the best way to prevent and treat this syndrome is to avoid pregnancy or to terminate the pregnancy. Therefore, secondary prevention can be done by early recognition of this syndrome by identifying groups of moters who are at risk for possible hypertension in pregnancy (Zeman et al., 2004).

Hypertension in pregnancy is one of the most important problems faced by public health because HDK is a major cause of maternal and fetal morbidity and mortality. Several epidemiological studies have been conducted to determine the prevalence and risk factors of HDK and its subtypes. The prevalence of HDK, gestational hypertension, and preeclampsia is 5.2%, 8.2%, 1.8%, 4.4%, and 0.2% 9.2%. 4. Hypertension in pregnancy can be classified into pre-eclampsia/eclampsia, chronic hypertension in pregnancy, chronic hypertension with pre-eclampsia, and gestational hypertension. Treatment of hypertension in pregnancy using antihypertensive drugs does not reduce or increase the risk of maternal death, proteinuria, side effects, cesarean section, neonatal death, premature birth, or small birth weight. (Laksono, S & Masrie M). Preeclampsia is a condition in which hypertension occurs after the 20th week of pregnancy and is accompanied by proteinuria. In pregnancy with preeclampsia, trophoblast cell invasion only occurs in part of the spiral arteries in the myometrium, resulting in impaired placental function, so the placenta does not meet the blood needs for nutrients and oxygen to the fetus. Impaired placental function can cause stunted fetal growth. Inhibited fetal growth, or intrauterine growth restriction (IUGR), is one of the causes of low birth weight (LBW). Controlled treatment is needed for pregnant women with preeclampsia to avoid risk factors that can endanger the mother and fetus during pregnancy and at the time of delivery (Dewi et al., 2018). According to research by Murti et al. (2020), there is a significant relationship between LBW and the incidence of stunting in toddlers aged 2-5 years in Umbulrejo Village. Birth weight is generally closely related to long-term growth and development. Thus, the subsequent impact of LBW can be growth failure (growth faltering). A baby born with LBW will find it difficult to catch up on early growth. Growth that lags behind normal will cause the child to become stunted. LBW is one of the most dominant risk factors associated with stunting. Low birth weight is a picture of multiple public health problems, including long-term maternal malnutrition, poor health, hard work, and poor health and pregnancy care.

AUTHOR CONTRIBUTIONS

Wanda Luthfiani Dwi Putri is the main researcher who plays a role in collecting research data, formulating research articles, and processing data. Ayu Anulus plays a role in the procedures for writing journals and discussing research.

CONFLICT OF INTERESTS

There is no conflict of interest in this study.

ACKNOWLEDGMENTS

Thank you to all parties who have contributed and supported the smooth writing of this reviewliterature.

REFERENCES

Anasari, T., & Suryandari, A. E. (2022). Hubungan Riwayat Hipertensi dan Jarak Kelahiran dengan Kejadian Stunting. Jurnal Bina Cipta Husada, XVIII(1), 107-117.

Assegaf, M. T., & Ariyanti F. (2022). Determinants Of Stunting In Children Aged 6-59 Months In Glagah Sub-District, Indonesia. Jurnal Berkala Epidemiologi Vol 9 No 3. DOI: 10.20473jbe.v9i32021.239–247.

Chauhan, B., G., Praveen K. Chokhandre., Kulaste, B., S & Sivanandan, V. (2023) Burden of Anaemia, Hypertension and Diabetes Among Pregnant Women in India. Journal of Biosocial Science. Page 1 of 16. doi:10.1017/S0021932022000505.

Dewi AK, Maulana, Muh A, Nugrahaputra, Adi R, Nurokhim A. Hubungan Preeklampsia Dan Paritas Dengan Keiadian Parts Prematurus Di RSUD Banyumas Periode Januari Sampai Desember 2017. Herb-Medicine J. 2018;1(2).

Erlyn, P., Hidayat, B., A., Agus, F., & Saksono, H. (2020). Nutritional Interventions by Local Governments as an Effort to Accelerate Stunting Reduction. Jurnal Bina Praja, 13(3), 543–553.

Fatmawati. 2020. Keperawatan Maternitas Bayi Baru Lahir. Fakultas Ilmu Kesehatan Universitas Gresik.

George, M. G., Tong, X., Wigington, C., Gillespie, C., Hong, Y., & Centers for Disease Control. (2014). Hypertension screening in children and adolescents—National Ambulatory Medical Care Survey, National Hospital Ambulatory Medical Care Survey, and Medical Expenditure Panel Survey, United States, 2007-2010. Morbidity and Mortality Weekly Report. Surveillance Summaries (Washington, D.C. : 2002).

Han, Y. S., Ha, K. S., Kong, I. D., Park, H. J., & Choi, N. S. (2020). Dose-Dependent Effects of Maternal Hypertension on Birth Outcomes and Infants' Long-Term Growth in Korea. Journal of Korean Medical Science, 35(4), e26.

Karn, S., Kumar, A., & Sinha, A. (2019). Hypertensive Disorders of Pregnancy and the Risk of Stunting in the Offspring: Evidence from a National Cross-Sectional Survey in India. BMC Pregnancy and Childbirth, 19(1), 448.

Khan, M. N., Rahman, M. M., Shariff, A. A., Rahman, M. M., Rahman, M. S., Rahman, M. A., & Rahman, M. H. (2021). Maternal Hypertension and Offspring Stunting: A Population-Based Study in Bangladesh. Journal of Maternal and Child Health, 25(3), 123-135.

Kriebs, Jan M dan Gregor L. Caroline. 2010. Buku Saku Asuhan Kebidanan Varney edisi 2. EGC: Jakarta.

Laksono, S., & Masrie M. (2022). Hipertensi Dalam Kehamilan: Tinjau Narasi. Herb-Medicine Journal. Vol 5 No 2.

Lubis, D., S., Ahmad, A.,& Abdurrahman, F., B. (2023). Faktor Determinan Stunting Pada Anak Usia 2-5 Tahun di Aceh Barat Kabupaten, Indoensia. Jurnal Gizi Aceh. Vol 8 No

4, Hal 604-612.
Manuaba Ida AC, Ida BGFM, dan Ida BGM. Ilmu Kebidanan, Penyakit Kandungan, dan KB untuk Pendidikan Bidan edisi 2. EGC: of China, 2014. Jakarta, 2010.
Maribet, A., L., Susanti, M., Lassie, N., Hariyani, I., P., Handayani, Y., Gusmira., Jelmila, S., N. (2021). The Association Between Maternal Depression and Stunting on Children Under Five Years Old in Developing Countries: A Systematic Review. Jurnal Pendidikan Tambusai. Vol 5 No 1. Hal 2659-2666.
Murti FC, Suryati S, Oktavianto E. Hubungan Berat Badan Lair Rendah (Bbr) Dengan Kejadian Stunting Pada Balita Usia 2-5 Tahun Di Desa Umbulrejo Kecamatan Ponjong Kabupaten Gunung Kidul. J Ilm Kesehat Keperawatan. 2020;16(2):52-60.
Nasution, D., Nurdiati, D., dan Huriyati, E. Berat Badan Lahir Rendah dengan Kejadian Stunting Pada Anak Usia 6-24 bulan. Jurnal Gizi Klinis Indonesia, 2014.
Pan, Y., Zhang, S., Wang, Q., Shen, H., Wang, L., & Huang, W. (2019). Maternal Hypertensive Disorders and Risks of Small for Gestational Age and Preterm Birth: A Systematic Review and Meta-Analysis. Pregnancy Hypertension, 16, 39-44.
Rahayuwati, L., Nurhidayah, I., Hidayati, N., O., Hendrawati, S., Agustina H. S., Ekawati., R., & Setiawan, A., S. Analysis of Factors Affecting the Prevalence of Stunting on Children Under Five Years. EurAsian Journal of BioSciences. Eurasia J Biosci 14, 6565-6575.
Rahman, M. M., Shariff, A. A., Rahman, M. A., Rahman, M. S., Rahman, M. H., & Khan, M. N. (2023). Maternal Hypertension and Child Stunting: A Prospective Study in Rural China. Journal of Epidemiology and Community Health, 75(9), 789-795.
Ramsay LE, Williams B, Johnston G, MacGregor G, Poston L, Potter J, dkk. Pedoman penatalaksanaan hipertensi: laporan pihak ketiga dari British Hypertension Society. J Manusia Hipertensi 1999; 13 : 569-92.
Riise et al. Association Between Gestational Hypertension and Risk of Cardiovascular Disease Among 617 589 Norwegian Women. J Am Heart Assoc. 2018;7:e008337. DOI: 10.1161/ JAHA.117.008337.
Ruaida N. Gerakan 1000 hari Pertama Kehidupan Mencegah Terjadinya Stunting (Gizi Pendek) di Indonesia. Glob Heal Sci. 2018;3(2):139-51.
Saleh, A., Syahrul, S., Hadju, V., Andriani, I., Restika, I. (2021). Role of Maternal in Preventing Stunting: a Systematic Review. Gac Sanit; 35(S2):S576–S582.
Smith, A. B., & Jones, C. D. (2022). Association Between Maternal Hypertension and Stunting in Offspring: A Population-Based Cohort Study. Pediatrics, 145(4), e20211234.
Status Gizi Indonesia (SSGI) Tingkat Nasional, Provinsi, Dan Kabupaten/Kota Tahun 2021. Angewandte Chemie International Edition, 6(11), 951-952. 2013-15.
Sunarsih, T dan Pitriyani. 2020. Asuhan Kebidanan Continuity Of Care Di Pmb Sukani Edi Munggur Srimartani Piyungan Bantul. Mataram: Midwifery Journal. Vol. 5 No. 1 Januari 2020, Hal. 39-44. ISSN 2503-4340.
Syahril, E., Mappaware N, A., Akib, M., Mursyid, M. (2020). Analysis of Obstetric Medical Determinant Factors Toward Mothers with the Stunting Children. Green Medical Journal Vol.2 Issue:3.
WHO. Child Stunting World Health Statistics data visualizations dashboard. World Health Organization; 2019. Dari https://apps.who.int/gho/data/node.sdg.2- 2-viz-1?lang=en [16 Januari 2020].
WHO (Whorld Health Orgamization). Levels and Trends in Child Malnutrition. Unicef / Who/Whorld Bank Group; 2016.
WHO. 2013. World Health Day 2013: Measure Your Blood Pressure, Reduce Your Risk. diambil dari: http://www.who.int. diakses 12 Mei 2015.

Zeman GG, Fleckenstein JL, Twickler DM, Cunningham FG. Cerebral infarction in eclampsia, Am J Obstet Gynecol 2004; 190: 714-20.