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# Effectiveness of Cau Raja (Green Grass Jelly with Red Ginger Flavor) on Blood Pressure in Pregnant Women with Hypertension

**Susanti[1)], Mardiyono[2)], Dina Indrati Dyah Sulistyowati[2)]**

[1)]Applied Master's Program, Postgraduate School, Health Polytechnic, Ministry of Health, Semarang, Indonesia
[2)]Health Polytechnic, Ministry of Health, Semarang, Indonesia

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## ABSTRACT

**Background:** Hypertension in pregnancy is a global health problem that can increase the risk of complications for the mother and fetus. Cau Raja is a combination of 100 grams of Green Grass Jelly (*Cyclea barbata Miers*) and 25 mg of dried Red Ginger (*Zingiber officinale var. Rubrum*), containing 24 mg of flavonoids and 107 mg of potassium. These compounds can lower blood pressure in pregnant women with mild hypertension. The study aimed to prove the effectiveness of Cau Raja in reducing blood pressure in pregnant women with mild hypertension.
**Subjects and Method:** This study used a true experimental design and a pretest-posttest with a control group. The study was conducted at the Purwokerto Timur I Community Health Center in November 2025. A total of 32 subjects were divided into two groups: (1) The intervention group was given 250 ml of Cau Raja (green grass jelly with red ginger flavor) for 14 days (n = 16); and (2) The control group was given standard therapy (n= 16). The dependent variable was blood pressure. The independent variables were Cau Raja (green grass jelly with red ginger flavor) and standard therapy for control group. Blood pressure was measured using a Onemed brand digital tensiometer. Data were analyzed using a Paired Samples T-test.
**Results:** The average systolic blood pressure in the intervention group after being given Cau Raja (green grass jelly with red ginger flavor) was lower (Mean = 118.88; SD = 7.16) compared to before the intervention (Mean= 129.81; SD= 4.96) and was statistically significant (p <0.001). The average diastolic blood pressure in the intervention group after being given Cau Raja (green grass jelly with red ginger flavor) was lower (Mean= 76.50; SD = 5.36) compared to before the intervention (Mean= 83.94; SD= 4.37) and was statistically significant (p <0.001).
**Conclusion:** Giving Cau Raja (green grass jelly with red ginger flavor) has been proven to be effective in lowering blood pressure in pregnant women with mild hypertension, so it can be used as a safe and practical non-pharmacological therapy alternative.

**Keywords:** cau raja, green cincau, red ginger, pregnancy hypertension, blood pressure.

**Correspondence:**
Susanti. Applied Master's Program, Postgraduate School, Health Polytechnic, Ministry of Health, Semarang. Jl. Tirto Agung, Pedalangan, Banyumanik, Semarang, 50239, Central Java, Indonesia. Email: santibaimbidan1979@gmail.com.

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## BACKGROUND

Hypertension in pregnancy (HIP) can lead to serious complications, such as organ failure, impaired blood flow to the fetus, premature delivery, and even maternal or infant death. Data from the World Health Organization (WHO) shows that hypertension accounts for approximately 14% of all maternal deaths worldwide. In Indonesia, the maternal mortality rate remains quite high, at around 189 per 100,000 live births (Word Health Organization, 2023).

Risk factors for hypertension in pregnancy include a history of chronic hypertension, obesity, very young or old maternal age, first pregnancy, and a family history of preeclampsia. Furthermore, lack of access to quality healthcare facilities, limited medical personnel, and a lack of understanding among pregnant women about the dangers of hypertension exacerbate the situation. Efforts to reduce maternal mortality due to hypertension involve various aspects, such as increasing access to quality prenatal care, educating the public about pregnancy warning signs, routine blood pressure checks during pregnancy, and appropriate hypertension management. With this comprehensive approach, it is hoped that maternal mortality due to hypertension can be significantly reduced (Kemenkes RI, 2020).

Hypertension during pregnancy is the third leading cause of maternal death, after hemorrhage and maternal infection. This condition is particularly dangerous in resource-limited countries because they lack adequate medical facilities and prenatal care. In developing countries, many cases of preeclampsia are detected late, increasing the risk of maternal and infant death. However, in developed countries, the incidence is lower and early detection is possible due to more widespread prenatal care (Word Health Organization 2023).

The maternal mortality rate (MMR) in Indonesia in 2024 was 183 per 100,000 live births. The leading causes of maternal death in 2022 were hypertension during pregnancy, or preeclampsia, with 801 cases, followed by hemorrhage with 741 cases, heart disease with 232 cases, and other causes with 1,504 cases (Indonesian Ministry of Health, 2022). Preeclampsia cases in Central Java Province account for more than 20% of maternal deaths each year in this province (Central Java Provincial Health Office, 2023). The incidence of preeclampsia is reported to be around 2-3% of all pregnancies.

Meanwhile, there were 19 maternal deaths in Banyumas Regency in 2023. In 2023, there were 22,677 registered pregnant women, of whom 6,213, or 27.39%, were high-risk pregnancies, including preeclampsia, chronic energy deficiency (CED), and anemia or low hemoglobin (HB) in pregnant women over 35 years of age (Banyumas District Health Office, 2023).

The government program to reduce maternal mortality (MMR) and infant mortality (IMR) caused by preeclampsia uses early detection of preeclampsia screening carried out by health workers at a gestational age of less than 20 weeks using the maternal and child health book which includes moderate risks of preeclampsia including multipara with a new partner, pregnancy with reproductive technology, maternal age over 35 years, nullipara, gap of more than 10 years, obesity, Mean Arterial Pressure (MAP) more than 90 mmHg, positive urine protein more than 1. For high risks include multipara with a history of preeclampsia, multiple pregnancies, chronic hypertension, kidney disease, Systemic lupus erythematosus, recurrent abortion, intrauterine fetal death (IUFD), and premature birth. Pregnant women are referred to the hospital if at least 2 moderate risks and 1 high risk are found for further examination

by an obstetrician (Maternal and Child Health Book, 2024).

Management of hypertension in pregnancy is tailored to the stage of disease progression. Strategies for managing hypertension in pregnancy aim to prevent cardiovascular complications in the mother without endangering fetal well-being. The administration of antihypertensive drugs to pregnant women with mild to moderate hypertension (systolic blood pressure <160 mmHg or diastolic blood pressure <110 mmHg) remains controversial, given its efficacy and fetal safety. Pharmacological treatment is not recommended for pregnant women with mild to moderate hypertension. The underlying cause of this condition is endothelial dysfunction and vascular changes affecting the placenta and maternal organs. Aggressive blood pressure reduction can reduce uteroplacental perfusion, worsening fetal well-being. The etiology of preeclampsia is not limited to blood pressure but also includes placental and endothelial dysfunction, so antihypertensives do not address the underlying cause. Antihypertensive therapy can reduce the risk of severe hypertension but does not prevent the progression to preeclampsia, eclampsia, edema, and fetal death (Astuti et al., 2024). Several previous studies on non-pharmacological treatment for pregnant women with hypertension through the use of plants such as green grass jelly leaves, ginger and tomatoes to reduce blood pressure, increase potassium and increase nitric oxide (Salangka et al., 2024).

Research conducted by Tiara et al., (2021) revealed that green grass jelly resulted in a significant decrease in blood pressure in the treatment group compared to the control group, with a p value of 0.001, which indicates a strong effect of Cyclea barbata in lowering blood pressure (Li'wuliyya, 2024). Another study reported a significant reduction in systolic and diastolic blood pressure among hypertensive patients after administration of green grass jelly leaf juice, with a p value of 0.000, as a natural remedy considered safe, without side effects (Tiara et al., 2021).

Green grass jelly contains S-S-tetandrine, an alkaloid compound with vasodilator properties, which works by dilating blood vessels and reducing peripheral resistance. The flavonoids and tannins in green grass jelly act as antioxidants to protect the vascular endothelium and reduce oxidative stress that worsens hypertension. Green grass jelly also contains a high-water content and is rich in fiber (Ożarowski et al., 2022). Adequate fiber intake is very important to prevent constipation which often occurs during pregnancy due to hormonal changes and pressure on the intestines (Indonesian Ministry of Health, 2020). Its water content also helps maintain body hydration, which is crucial for good blood circulation and prevents dehydration, which can worsen hypertension (Word Health Organization, 2024).

Ginger is a spice that has a distinctive aroma and slightly spicy taste, for pregnant women, ginger may be one of their "best friends", especially when facing nausea and vomiting or better known as morning sickness. The content of bioactive compounds in ginger, such as gingerol works by inhibiting Angiotensin-Converting Enzyme (ACE), reducing the production of angiotensin II, thereby lowering blood pressure, gingerol also increases the release of nitric oxide (NO) from the endothelium, is also believed to have a calming effect on the digestive tract, so it is effective in relieving the sensation of nausea (Azimirad, 2023).

Ginger contains shogaols, a phenolic compound with anti-inflammatory and vasorelaxing effects. Minerals like potassium found in ginger can help regulate blood

pressure. The antioxidants in ginger can help reduce inflammation in the body and fight free radicals, all of which contribute to overall health. For pregnant women with hypertension, ginger's ability to improve digestion can also be a plus, and it can reduce discomfort that may trigger increased stress (Ayustaningwarno et al., 2024).

A study by Mashadi et al. (2023) found that administering red ginger extract significantly reduced systolic and diastolic blood pressure in pregnant women with gestational hypertension. The intervention group, which received 500 mg of red ginger extract along with antihypertensive medication, showed a decrease in systolic blood pressure of 29.35 mmHg and diastolic blood pressure of 16.00 mmHg compared to the control group, which received only antihypertensive medication and a placebo (Mashadi NS et al., 2013).

The combination of green grass jelly and ginger is generally relatively safe for consumption by pregnant women with hypertension. Green grass jelly acts as a vasodilator, reducing peripheral resistance, while ginger helps relieve nausea, provides anti-inflammatory effects, and inhibits the ACE enzyme, which can affect blood pressure. Excessive ginger, especially in high-dose supplement form, can potentially increase the risk of bleeding, and the risk is very low at doses commonly found in food or beverages. Similarly, excessive consumption of green grass jelly can trigger diarrhea in some people due to its high fiber content (Ayustaningwarno et al., 2024).

Based on the description above, the effect of green grass jelly leaves and ginger has a role in reducing blood pressure, so that research was conducted on Cau Raja (green grass jelly with red ginger flavor) as a product made from natural ingredients that are widely found around the house, as a companion to hypertension medication that can affect changes in blood pressure in hypertensive pregnant women in the Purwokerto Timur I Health Center area, Banyumas Regency.

## SUBJECTS AND METHOD

### 1. Study Design

This study used True Experimental and Pretest-Posttest with Control Group Design. The research location was at Purwokerto Timur I Health Center. Research data collection was carried out in November 2025.

### 2. Population and Sample

The target population was pregnant women with mild hypertension at the Purwokerto Timur I Community Health Center. The total sample was 32 respondents.

### 3. Study Variable

The dependent variable studied was blood pressure, and the independent variables were Cau Raja (green grass jelly with red ginger flavor) and therapy according to standard operating procedures.

### 4. Operational Definition of Variable

Cau Raja (green grass jelly with red ginger flavor) is a green grass jelly drink with ginger flavor, given once daily, 1 cup (250 ml) for 14 days. Therapy according to standard operating procedure provides 1000 mg of calcium and 80 mg of aspirin/day. Systolic blood pressure is the highest blood pressure reached when the heart contracts. Diastolic blood pressure is the lowest blood pressure in the arteries when the heart muscle is relaxing.

### 5. Study Instrument

Blood pressure was measured using a digital tensiometer.

### 6. Data Analysis

The data analysis used was Excel and with the help of the SPSS program. The average difference between paired groups was tested using the paired sample t-test.

### 7. Research Ethics

Research ethics issues, including informed consent, anonymity, and confidentiality, were carefully addressed throughout the research process. A research ethics approval letter was obtained from the Research Ethics Committee of the Ministry of Health Poly-technic of Semarang, Indonesia, No. 1134/-EA/F.XXIII.38/2025, on September 9, 2025.

## RESULTS

Table 1. shows the characteristics of the respondents, the age characteristics show that the average age in the intervention and control groups is 32 years old, the parity characteristics, the average parity in the intervention and control groups is having 2 children, the characteristics of the history of hypertension in both groups show that they have no history of hypertension. In the Food Recall characteristics, the average sodium in the intervention group is 684.86 and the control group is 475.48, in potassium the average intervention group is 2508.55 and the control group is 1709.09, in magnesium the average intervention group is 380.55 and the control group is 317.15, and in calcium the average intervention group is 1534.68 and the control group is 1316.77.

Table 2 shows the analysis of the effect of Cau Raja (green grass jelly with red ginger flavor) on systolic blood pressure. After the intervention, the average systolic blood pressure in the intervention group (mean = 118.88; SD = 7.16) was lower than the control group (mean = 128.19; SD = 5.74) and was statistically significant (p<0.001).

Table 3 shows the effect of Cau Raja (green grass jelly with red ginger flavor) on diastolic blood pressure. The average diastolic blood pressure in the intervention group (mean = 76.50; SD = 5.36) was lower than the control group (mean = 82.25; SD = 3.09) and was statistically significant (p<0.001).

**Table 1. Sample Characteristics**

| Characteristics | Intervention | | Control | |
|---|---|---|---|---|
| | Mean | SD | Mean | SD |
| Age | 32.44 | 5.69 | 32.31 | 5.09 |
| Parity | 2.38 | 1.02 | 2.19 | 0.83 |
| Hipertention History | 1.88 | 0.34 | 1.81 | 0.40 |
| Food Recall | | | | |
| Natrium | 684.86 | 280.48 | 475.48 | 247.44 |
| Kalium | 2508.68 | 569.82 | 1709.09 | 896.89 |
| Magnesium | 380.55 | 71.96 | 317.15 | 310.92 |
| Calsium | 1534.68 | 321.79 | 1316.77 | 134.70 |

**Table 2. Analysis of the effect of cau raja (green grass jelly with red ginger flavor) on systolic blood pressure in pregnant women with mild hypertension**

| Systole | Mean | SD | p |
|---|---|---|---|
| **Intervention** | | | |
| Pre | 129.81 | 4.96 | |
| Post | 118.88 | 7.16 | <0.001 |
| **Control** | | | |
| Pre | 129.94 | 5.91 | |
| Post | 128.19 | 5.74 | <0.001 |

**Table 3. Analysis of the effect of cau raja (green grass jelly with red ginger flavor) on diastolic blood pressure in pregnant women with mild hypertension**

| Diastole | Mean | SD | p |
|---|---|---|---|
| **Intervention** | | | |
| Pre | 83.94 | 4.37 | |
| Post | 76.50 | 5.36 | <0.001 |
| **Control** | | | |
| Pre | 83.44 | 3.42 | |
| Post | 82.25 | 3.09 | <0.001 |

## DISCUSSION

### The effect of Cau Raja (green grass jelly with red ginger flavor) on blood pressure in pregnant women with mild hypertension

Based on the results of the analysis of the effectiveness of Cau Raja as much as 1 cup containing 250 ml with a dose of 60 mg flavonoids and 267.5 mg potassium taken regularly once a day for 14 consecutive days is very effective in reducing blood pressure in pregnant women can be seen in the systolic and diastolic variables with a p-value <0.000, which is much smaller than the significance level of 0.05. This can be concluded that there is an effect of giving boiled green cincau leaves on reducing blood pressure in hypertension sufferers (Patang et al., 2025).

The study concluded that the intervention had a statistically significant effect on lowering blood pressure. The study on Cau Raja showed a decrease in mean systolic and diastolic blood pressure, which can be interpreted as a result of a more optimal functional formulation that combines the properties of green grass jelly with red ginger, compared to the use of a single decoction as in the comparative study. This proves that Cau Raja is not only effective, but also offers a more practical, preferred formulation and has the potential to provide a stronger therapeutic effect in the population of hypertensive pregnant women (Astuti and Ambarwati, 2021).

Green grass jelly contains antioxidant compounds such as flavonoids and phenolic substances, which function as inhibitors of the Angiotensin-Converting Enzyme (ACE) and exert vasodilatory effects by widening blood vessels. These mechanisms directly contribute to the reduction of blood pressure. In addition, red ginger is rich in bioactive compounds such as gingerol and shogaol, which act as vasodilator agents and help relax vascular smooth muscle, thereby improving blood circulation and supporting blood pressure reduction (Patang, Widyandari and Wiradani, 2025). Similar mechanisms related to ACE inhibition and vasodilation by plant-derived flavonoids have also been reported in international studies (Ożarowski et al., 2022).

This research is in line with Nurchairina and Aziz, (2020) which reported that the consumption of *Premna oblongifolia* among elderly individuals with hypertension resulted in a reduction in blood pressure when comparing measurements before and after consumption. Furthermore, Siregar (2023) reported that green grass jelly is a plant with potential antihypertensive properties, while Putri, (2022) demonstrated that red ginger drink therapy was effective in lowering blood pressure in patients with hypertension. These findings are also consistent with international evidence indicating that ginger supplementation may reduce systolic and diastolic blood pressure through its antioxidant and anti-inflammatory effects (Ayustaningwarno et al., 2024).

Researchers assume that green grass jelly drink with red ginger flavor can lower blood pressure in pregnant women with mild hypertension due to the combination of flavonoids and potassium in green grass jelly, which act as vasodilators, and gingerol compounds in red ginger, which have anti-inflammatory effects and promote blood vessel relaxation. The synergy of these two ingredients is thought to help reduce peripheral vascular resistance, potentially lowering blood pressure naturally and safely for pregnant women.

## AUTHOR CONTRIBUTION

In compiling this journal, Susanti, Mardiyono dan Dina Indrati DS collaborated on the development of the manuscript. Susanti prepared all research administrative documents (research permits) and data collection. Susanti, Mardiyono dan Dina Indrati DS analyzed, interpreted, and published the data.

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## CONFLICT OF INTEREST

There is no conflict of interest in this study

## REFERENCES

Astuti DW, Ambarwati M (2021). Pengaruh pemberian cincau hijau terhadap penurunan tekanan darah penderita hipertensi ringan. Jurnal Ilmu Keperawatan Indonesia. 2(1): 23–29. https://doi.org/10.57084/jikpi.v2i1.-578.

Astuti ER, Claudia JG (2024). Tinjauan literatur: penatalaksanaan hipertensi pada ibu hamil literature review. Jambura Jurnal of Health Science and Research. 6(2):186–200. Available at: https://doi.org/10.35971/jjhsr.v6i2.24067.

Ayustaningwarno F, Anjani G, Ayu AM, Fogliano V (2024). A critical review of Ginger's (Zingiber officinale) antioxidant, anti-inflammatory, and immunomodulatory activities. Frontiers in Nutrition, 11(June): 1–16. Available at: https://doi.org/10.3389/fnut.2024.1364836.

Azimirad A (2023). Pregnancy in adolescence: It is time to get ready for generations Z and Alpha. Gynecology and Obstetrics Clinical Medicine. 3(4): 71–75. Available at: https://doi.org/-10.1016/j.gocm.2023.04.004.

Banyumas District Health Office (2023) Profil Kesehatan Kabupaten Banyumas 2023. Banyumas. [internet].

Central Java Provincial Health Office (2023). Tengah Tahun 2023 Jawa Tengah. [internet].

Indonesian Ministry of Health (2022) Profil Kesehatan Indonesia 2022. [internet].

Li'wuliyya S (2024). Alternatif pilihan intervensi non-farmakologi terhadap penurunan tekanan darah penderita hipertensi: systematic review. Quality : Jurnal Kesehatan, 18(1): 27–38. Available at: https://doi.org/10.360-82/qjk.v18i1.1247.

Mashhadi NS, Ghiasvand R, Askari G, Hariri M, Darvishi L, Mofid MR (2013). Anti-oxidative and anti-inflammatory effects of ginger in health and physical activity: review of current evidence. Int J Prev Med. 4(1):S36-42.

Maternal and Child Health Book (2024) Buku KIA Kesehatan Ibu dan Anak.

Nurchairina N, Aziz NA (2020). Pengaruh konsumsi premna oblongifolia meer

terhadap tekanan darah pada lansia dengan hipertensi di Wilayah Kerja Puskesmas Tanjung Bintang Lampung Selatan Tahun 2018. Jurnal Ilmiah Keperawatan Sai Betik. 16(1): 39–45. https://doi.org/10.26630/jkep.v16i1.-1889.

Ożarowski M, Karpiński TM, Szulc M, Wielgus K, Kujawski R, Wolski H, Seremak-Mrozikiewicz A (2021). Plant phenolics and extracts in animal models of preeclampsia and clinical trials-review of perspectives for novel therapies. Pharmaceuticals (Basel). 4(3):269. doi: 10.3390/ph14030269.

Patang NH, Widyandari NMAS, Wiradan NLK (2025). Pengaruh rebusan cincau hijau terhadap penurunan tekanan darah penderita hipertensi di Puskesmas II Denpasar Barat. Jurnal Ilmiah Ilmu Kesehatan, 11(1): 137–145. https://doi.org/10.47506/945exy58.

Putri R (2022). Penerapan terapi minuman jahe merah dalam menurunkan tekanan darah pada pasien hipertensi di Gampong Geuceu Meunara Kecamatan Jaya Baru Kota Banda Aceh. Jurnal Keperawatan Akimba. 6(1). https://doi.org/10.63404/juka.v6i1.-97.

Salangka A, Rante A, Rasyid D (2024). Terapi non farmakologi dalam pengendalian tekanan darah pada pasien hipertensi: literature review. Media Publikasi Promosi Kesehatan Indonesia. 7(5): 1094–1100. https://-doi.org/10.56338/mppki.v7i5.4995 Review Articles 1094.

Siregar N (2023). Studi literatur: herbal indonesia berkhasiat sebagai anti hipertensi. Herbal Med J. 6(2).

Tiara, Jamil SNA, Indarti S, Sari R (2021). Efektifitas daun cincau hijau (Cocculus orbiculatus) terhadap penurunan tekanan darah pada pasien hipertensi', Jurnal Wacana Kesehatan, 6(2): 80–84. https://doi.org/10.528-22/jwk.v6i2.282.

Word Health Organization (2024). World Health Statistics 2024.

Word Health Organization (2023). Maternal mortality. https://doi.org/10.1016/-S0140-6736(05)60664-2.