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PROVISION OF AVOCADO AND HONEY IN REDUCING HYPERTENSION IN PREGNANT WOMEN

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ABSTRACT

High blood pressure or hypertension in pregnant women can cause low birth weight baby. Based on the results of previous studies, provision of avocados can stabilize blood pressure become, gradually decrease and can be used as an alternative to non-pharmacological drugs. Local honey is also used because it has many health benefits and as a natural sweetener. The purpose of the study was to analyze the effect of avocados and local honey provision on hypertension in pregnancy at the Gorontalo City Health Center. This type of research is quantitative with pseudo-experimental methods with a one group pretest and posttest design approach. Avocados were given as much as 100 grams and local honey as much as 20 ml, avocado fruit is stirred together with local honey, then consumed after meals in the morning or evening. The sampling technique used is purposive sampling. Wilcoxon's test results showed 29 respondents experienced a systolic decrease and 10 respondents experienced a diastolic decrease after being given processed avocado and honey for seven days. It was found that there was an effect of giving processed avocados and honey on a significant decrease in systolic pressure with a p value < 0.005, but there was no effect of giving processed avocados and honey on reducing diastolic pressure p > 0.005 (0.767). In conclusion, processed avocados and honey can lower the blood pressure of pregnant women so it can be used as food alternatives consumed by pregnant women.

Keywords: avocado, honey, hypertension, pregnancy

ABSTRAK

Tekanan darah tinggi atau hipertensi pada ibu hamil dapat menyebabkan bayi yang dilahirkan memiliki berat badan lahir rendah, bahkan kematian. Berdasarkan hasil penelitian sebelumnya, pemberian buah alpukat dapat membuat tekanan darah seseorang menjadi stabil dan berangsur-angsur menurun serta dapat digunakan sebagai salah satu alternatif pengganti obat non farmakologi. Madu lokal juga digunakan karena memiliki banyak manfaat kesehatan dan sebagai pemanis alami. Tujuan penelitian untuk menganalisis pengaruh buah alpukat dan madu lokal terhadap hipertensi dalam kehamilan di Puskesmas Kota Gorontalo. Jenis penelitian ini adalah kuantitatif dengan metode eksperimen semu dengan pendekatan one group pretest and posttest design, alpukat yang diberikan sebanyak 100 gram dan madu lokal sebanyak 20ml, buah alpukat di aduk bersamaan dengan madu lokal, kemudian dikonsumsi setelah makan pada pagi atau sore hari. Teknik pengambilan sampel yang digunakan adalah purposive sampling. Hasil uji Wilcoxon menunjukkan 29 responden mengalami penurunan sistolikdan 10 responden mengalami penurunan diastolik setelah diberikan olahan alpukat dan madu selama tujuh hari. Ditemukan bahwa ada pengaruh pemberian olahan alpukat dan madu terhadap penurunan tekanan sistolik secara signifikan dengan p value < 0,005 namun tidak ada pengaruh pemberian olahan alpukat dan madu terhadap penurunan tekanan diastolik p > 0,005 (0,767). Kesimpulannya, olahan alpukat dan madu dapat menurunkan tekanan darah ibu hamil sehingga dapat dijadikan alternatif konsumsi bagi ibu hamil.

Kata kunci: *alpukat, hipertensi, kehamilan, madu*

INTRODUCTION

Indonesia experiences a *double burden* of diseases, namely non-communicable diseases and communicable diseases that occur at the same time. Hypertensive in pregnancy is a vascular disorder that occurs before pregnancy or appears during pregnancy or during the puerperium. Hypertension in pregnancy often occurs and is still one of the causes of maternal death (Sari et al., 2016). It affects about 10% of all

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pregnant women worldwide. These diseases and conditions include preeclampsia and eclampsia, gestational hypertension and chronic hypertension. Hypertension in pregnancy is an important cause of severe acute morbidity, long-term disability and maternal and infant mortality (Bekti et al., 2020).

Pregnant women who experience anxiety and stress can cause their blood pressure to rise. High blood pressure or hypertension in pregnant women can cause babies born to have low birth weight, even death, and can also have an impact on imperfect fetal growth, premature birth, low birth weight, even maternal and infant mortality (Chabibah & Khanifah, 2018). In pregnant women who suffer from hypertension, the anxiety felt can affect the psychological condition of the mother even to the condition of the fetus (Ary et al., 2022).

Data from the World Health Organization (WHO) in 2015 showed that about 1.13 billion people in the world have hypertension, meaning that 1 in 3 people in the world is diagnosed with hypertension. The number of people with hypertension continues to increase every year, it is estimated that in 2025 there will be 1.5 billion people affected by hypertension, and it is estimated that every year 10.44 million people die from hypertension and its complications (P. K. Kesehatan, 2019). Data from the Gorontalo Provincial Health Office in 2018 obtained data on the number of people with hypertension as many as 23,684 people, with the highest number in Gorontalo City 12,263 people (Podungge, 2020).

Indonesia, which is a low-to-middle income country, MMR is still 205 per 100,000 live births in 2020 and this is still far from the SDGs target of 70 deaths per 100,000 live births. In Gorontalo Province, there has been an increase in MMR from 2019 by 29 to 40 cases in 2020. The cause of maternal death is pre-eclampsia, which is one of the criteria for hypertension in pregnancy Indonesia which is a middle-income country (K. Kesehatan, 2018).

In the Province, the maternal mortality rate (MMR) in 2020 is 56 per 100,000 KH spread across Gorontalo City 9 people, Gorontalo Regency 20 people, Boalemo Regency 3 people, Pohuwato Regency 4 people, Bone Bolango Regency 7 people and North Gorontalo Regency 13 people. The causes of AKI are eclampsia 13, bleeding 13, infection 5, anemia 2, blood disorder 2 and others 23.

Based on the results of previous studies, giving avocados in a certain period of time can make a person's blood pressure stable and gradually decrease. Provides significant results and can be used as an alternative in replacing non-pharmacological drugs. Therapy using avocados and honey has been found to have desirable effects and be useful in the treatment of certain diseases (Natar Fitri Napitupulu1, Mastiur Napitupulu2, 2020).

Honey is a liquid that resembles syrup produced by honey bees. The honey given is trigona honey or Tahudu produced locally in Gorontalo Province. In addition to benefits in lowering blood pressure, honey is also used as a natural sweetener and adds to the attractiveness of pregnant women in consuming avocados (Aini et al., 2018; Podungge et al., 2022)

Based on this background, researchers are interested in further examining how the effect of processed avocados and local honey on hypertension in pregnancy in the Gorontalo City Health Center area.

METHODS

This research is quantitative research with *quasi-experimental methods* using *one group pretest* and *posttest design approaches*. The study population was all pregnant women who had a diagnosis of hypertension at the Gorontalo City Health Center, with a total sample of 30 respondents. The sampling technique used in this study is *purposive sampling*, which is determining samples with certain considerations. Samples are taken if they meet the following inclusion criteria: age ≥20 years and <40 years, gestational age ≥20 weeks to <36 weeks, blood pressure ≥140 mmHg and <160/110 mmHg, diastolic ≥90 mmHg, do not have kidney disease or diabetes and do not have multiple pregnancies. This research was conducted from June to December 2022. This research procedure measures blood pressure in respondents, if the blood pressure is high followed by giving avocado fruit and local honey which will be consumed for 7 days, after consumption

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of avocado fruit and honey, blood pressure checks are carried out again to assess whether the blood pressure of pregnant women drops or not. Data analysis was carried out with the Wilcoxon test and processed using SPSS version 16.0.

The research was conducted starting with compiling research recommendations and continued with research coordination activities at the Head of the Puskesmas to obtain permission to conduct research and request data on hypertensive pregnant women from the Coordinating Midwife. The determination of respondents is based on objective criteria (*purposive sampling).*

Blood pressure of respondents was measured and given avocados and local honey for seven days with assistance from the research team who then measured their blood pressure again after treatment time. The research data were tested with *the Wilcoxon test*.

RESULTS AND DISCUSSIONS

The results of a study of 30 pregnant women with hypertension spread across 7 districts in Gorontalo City showed that the highest number of pregnant women with hypertension with the standard criteria used were in Hulonthalangi District and Kota Timur, (23% and 30%, respectively) (Table 1).

Blood pressure measurement was done 2 times, before and after intervention. The results of these measurements were then tested statistically to determine the effect of giving avocados and honey on hypertension in pregnant women. The results of descriptive analysis showed that the mean systolic value before treatment (pre) was 143.67 mmHg and after treatment (post) decreased to 119.67 mmHg. While the mean diastolic value before treatment (pre) was 84 mmHg and after treatment (post) became 83.67 mmHg.

Table 1. Respondent distribution

Puskesmas	n	%
Kota Barat	4	13.3
Kota Utara	3	10.0
Kota Tengah	2	6.7
Kota Selatan	2	6.7
Kota Timur	9	30.0
Dumbo Raya	3	10.0
Hulonthalangi	7	23.3

The results of the *Wilcoxon test* showed that 29 respondents experienced a systolic decrease and 10 respondents experienced a diastolic decrease after being given processed avocado and honey for 7 days. Based on these results, it was found that there was an effect of giving avocados and local honey on a decrease in systolic pressure with a pvalue of <0.005 but no effect of giving avocados and local honey on a decrease in diastolic pressure p> 0.005 (0.767). In accordance with the results of Margowati's research (2016), the significance value of systolic blood pressure before and after giving avocados on day 1 to day 7 is <0.05, meaning there is an effect of avocados on reducing systolic blood pressure. While on day 7 diastolic blood pressure was not significant >0.419, meaning it had no effect on reducing diastolic blood pressure (Margowati et al., 2016).

Hypertension is a major risk factor for cardiovascular disease and a leading cause of heart failure, sudden death, stroke, coronary heart disease and renal insufficiency (Tika, 2021). Non-pharmacological treatments for hypertension need to be developed such as consuming honey (Ainurrafiq et al., 2019). Hypertension or high blood pressure occurs due to a continuous increase in blood pressure in the arteries that exceeds the normal limits of blood pressure. If a person has a history of hypertension, blood pressure is more than 140/90 mmHg. Meanwhile, the normal limit of systolic blood pressure is 120 mmHg and diastolic blood pressure is 80 mmHg. Hypertension consists of two types, namely controlled hypertension and uncontrolled hypertension. Controlled hypertension defined if a person has regular blood pressure checks, and manages a good treatment pattern. However, uncontrolled hypertension eventually results in adverse effects such as heart attack, stroke, as well as kidney disorders and blindness (Rustiawati & Sulastri, 2021; Wanda Millenia Alwie, Nur Masyitah Z, 2020).

Hypertension is often caused by various factors such as obesity, lack of physical activity, smoking behavior, a diet containing sodium and saturated fat. Hypertension is one of the number one causes of death globally. It also lead to coronary heart disease, cardiac infarction (blockage

of blood vessels causing tissue damage) (54%), stroke (36%) kidney failure (32%) (Ferrara, 2020; James-Martin et al., 2023).

Hypertension in pregnancy affects about 10% of all pregnant women worldwide. These diseases and conditions include preeclampsia and eclampsia, gestational hypertension and chronic hypertension. It is an important cause of severe acute morbidity, long-term disability and maternal and infant mortality. Almost one-tenth of all maternal deaths in Asia and Africa are related to hypertension in pregnancy, while a quarter of all maternal deaths in Latin America are caused by complications. Most deaths associated with hypertensive disorders can be avoided by providing adequate time and effective treatment for women, especially those with complications (Nursila & Sutarno, 2022; Rohmani et al., 2015; Sari et al., 2016)

Avocado (*Persea americana*) is a fruit that is often found. This versatile fruit has many benefits and properties for humans. There are many substances rich in benefits contained in this fruit. The parts of avocados used for herbs are fruit flesh (*Perseae fructus*), leaves (*Perseaefolium*), seeds (*Perseae cement*), and tree bark (*Perseae cortex*). Avocados contain high potassium and flavonoids so that they can lower blood pressure (Jimenez et al., 2021)

According to Novi (2016), avocados can treat and prevent hypertension or lower blood pressure. This is because it contains flavonoids that are efficacious as diuretics. Diuretic ability, which secretes a number of fluids and electrolytes and toxic substances. The impact that there is a decrease in the amount of water and salt will indirectly relax and blood pressure will fall. In this case, avocados play a role in lowering high blood pressure because they contain oleic acid, macro and micro minerals. The macro minerals found in avocados are calcium, potassium, sodium, magnesium and phosphorus, while micro minerals include iron, manganese and zinc. Per 100 gr of avocado contains 1166 mg potassium, 67 mg magnesium, 30 mg calcium, and 18 mg sodium. Avocados contain potassium which can lower blood pressure by increasing sodium excretion, suppressing renin secretion, dilating arterioles and reducing response to androgen vasoconstriction. In this case, flavonoids affect the renin-angiotensin system so that it can lower blood pressure (Sari et al., 2016).

In dealing with cardiovascular disease, avocados have a considerable influence because they have important compounds, namely folic acid, pantothenic acid, niacin, vitamins B1, B6, C, and E. Avocados also contain minerals, namely phosphorus, iron, potassium, magnesium, and glutathione, also rich in fiber and monounsaturated fatty acids. Then in the Yusri et al (2016) study, giving avocado juice on the blood pressure of hypertensive patients at WK Batoh Puskesmas Leung, Banda Aceh City, it was found that the average blood pressure before giving avocado juice was 95.75 mmHg and the average pressure after giving avocado juice was 83.25. In this case there was a decrease in blood pressure of 12.4 mm Hg. There was a significance effects of giving avocado juice for a decrease in low blood pressure $P = 0.000$ ($P < 0.05$). Thus it can be said that avocado juice treatment has an effect on lowering blood pressure (Yusra et al., 2016).

Avocado have many benefits, almost all parts of the avocado plant have medicinal properties. The part of the avocado plant that has many benefits is the fruit. In avocados contain oils that regulate levels of bad cholesterol (LDL) in the blood with good cholesterol (HDL), and increase the bioavailability of vitamins and fat-soluble phytochemicals. Avocado is also a good source of folic acid which is needed to develop fetal nerves which are important for the brain (Munhuweyi et al., 2020)

CONCLUSION

Provision of avocado and honey can reduce blood pressure of pregnant women so as to prevent complications of hypertension in pregnancy. Suggestions for future researchers are to increase sample size and examine the food intake of pregnant women and risk factors that can affect pregnant women's blood pressure.

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