

Effects of Tomato Juice and Honey on Haemoglobin Level of Pregnant Women

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ABSTRACT

Pregnancy is a very important event for pregnant women and their partners, and this is also a crisis of maturity. Haemoglobin levels in pregnancy periodically decrease in the third trimester because of haemodilution. Currently therapies that are often used are giving tomato juice with honey to haemoglobin levels in pregnant women. Tomatoes have significant effect on increasing level of haemoglobin (hb) for pregnant women who have anaemia. So it can be stated if tomatoes are one of the factors that can increase Hb levels of anaemic pregnant women. The purpose of this study was to determine the effect of giving tomato juice with honey on haemoglobin levels of pregnant women in the working area of Lubuk Basung health centre in 2019. The research design was "One Groups Pre-test – Post-test Design", with accidental sampling technique using 24 respondents. The results showed that before giving tomato juice with honey to haemoglobin levels in pregnant women with an average of 10,440 and after giving tomato juice with honey to haemoglobin levels in pregnant women the average pain was 11,000. The paired t-test showed that $p = 0,000$, where $p < 0.05$. So it can be concluded that there is an effect of giving tomato juice with honey on haemoglobin levels of pregnant women. So it is expected that further studies can examine other factors that can influence the administration of tomato juice with honey on maternal haemoglobin levels pregnant.

Keywords : *Tomato Juice, Haemoglobin, Pregnant Women*

1. INTRODUCTION

Pregnancy is a very important event for pregnant women and their partners, and it is also a crisis of maturity. Besides pregnancy can cause an event of change in the condition of the existence of two possibilities that will be faced by pregnant women. The situation in the form of pregnant women can experience normal pregnancies and high-risk pregnancies. When pregnant women are categorized as high risk pregnancies, this is the most critical issue in nursing care and medical care. When a mother is declared pregnant, the expectation of the mother and partner is that the pregnancy is normal, the fetus conceived is healthy and in the end the fetus can be born in a healthy mother and baby condition [1].

Pregnancy is a crucial stage in a child's development since the prospective mother and the baby she is carrying require a lot of food. Malnutrition in both the mother and the fetus can lead to serious complications. Anemia, bleeding,

irregular body weight, and developing infectious infections are all potential concerns for the mother. If this risk is not addressed, it can result in death [2].

Anemia in pregnancy will have an adverse effect on the mother, both in pregnancy, childbirth and childbirth and subsequent periods. Various problems can arise due to anemia such as increasing the risk of low birth weight babies, premature births, miscarriages, risk of bleeding that can cause death of mother and baby. In infants in the womb can experience growth and development disorders, cannot reach optimal height and the child becomes less intelligent[3].

According to the World Health Organization (WHO), the global prevalence of anemia in pregnant women is 41.8 percent, with Asia coming in second behind Africa with 48.2 percent of pregnant women suffering from anemia. According to Puspongoro and Anemia World Map's research, Indonesia was one of the Asian countries with the

highest rate of anemia in pregnancy (51% in 2012)[4].

According to the Basic Health Research (Riskesdas) in 2018, the prevalence of anemia in pregnant women in Indonesia was 37.1% (Ministry of Health of the Republic of Indonesia (Kemenkes RI), 2013) The survey results of anemia in pregnant women in 15 districts / cities in 2010 showed that the prevalence anemia in West Sumatra is 78.6%, this figure is still higher than the national figure of 71.2% (West Sumatra Provincial Health Office (West Sumatra Provincial Health Office, 2010). Anemia that occurs during pregnancy is one of the many major problems occurred in developing countries Based on the 2014 Annual Report of the Maternal and Child Health of the West Sumatra Provincial Health Office the incidence of anemia in the province of West Sumatra was 2,7%[5].

In January 2019 there were 1,634 pregnant women in Agam district and those who had hemoglobin (hb) levels below 11 gr% were 140 pregnant women (Dinkes Agam, 2019). Anemia that occurs during pregnancy can be caused by the large number of women who start a pregnancy with insufficient food reserves or before becoming pregnant. Pregnant women need more iron intake than before pregnancy. Insufficient food intake causes insufficient available iron for hemoglobin synthesis due to iron deficiency in food. Iron deficiency will result in the speed of formation of hemoglobin and its concentration in blood circulation decreases[6].

The government's anemia prevention program involves providing blood-added tablets, specifically Fe preparations, with the goal of reducing the number of anemia cases in toddlers, pregnant women, postpartum mothers, teenage girls, and WUS (Fertile Age Women). Pregnant women are given 90 Fe tablets to prevent anemia during their pregnancy. The goal of giving Fe 90 pills does not meet 100% of the time. The government's challenge is getting pregnant women to take blood-boosting pills[5].

Wrong eating pattern results in reduced intake of nutrients which was the biggest cause of nutritional anemia. In addition to give blood supplement tablets pregnant women must also be able to maintain their body condition, especially the stability of the hemoglobin content in the body. For example, by maintaining a diet and eating foods and fruits that contain lots of iron and vitamins and other substances that are good for people with anemia. One of them is by consuming tomato juice and honey. Because tomatoes contain lots of vitamin C and other compounds that are good for

health. The content of tomatoes in 180 grams is 24.66 mg of vitamin C, 0.49 mg of iron, 27 mcg of folic acid. Folic acid is needed by pregnant women, because the need for folic acid will increase during pregnancy[7].

The provision of spinach and tomato juice is very influential on increasing levels of hemoglobin (hb) pregnant women who have anemia. So it can be stated if tomatoes are one of the factors that can increase the Hb levels of anemic pregnant women[6].

While honey has a lot of nutritional content that can increase the formation of red blood cells and hemoglobin (Fady MFA, 2012). Long before advanced medical science as it is now, people in various parts of the world have a belief that honey is one of the panaceas for all kinds of diseases[8].

In addition, honey has the content of pyridine as an antagonist and other benefits of honey can help maintain stamina and health during pregnancy and help high nutritional intake for fetal growth in the womb

2. METHOD

2.1 Design.

This was an experimental study with a pretest-posttest design for one group. Specifically, the research design that included a pretest before therapy and a posttest after treatment. As a result, it may be determined more precisely because it can be compared to what was held prior to therapy. Tomatoes weighing up to 200 grams and two teaspoons of honey were given to pregnant women once a day for seven days.

2.2 Population and Samples.

Population was pregnant women in the first and third trimester. Samples were women in the first and third trimester who visit public health Lubuk Basung. Sample size was 24 by using purposive sampling.

2.3 Data Collect.

These studies take place in Lubuk Basung Public Health in 2019. Data collected by using observation sheet, and checklist paper. Hemoglobin level was taken and checked by laboratory staff in public health.

2.4 Data Analysis.

Univariate analysis has been done to analyze hemoglobin level of pregnant women before and after intervention. Bivariate analysis has been done by using dependent t-test.

3. RESULT

Table 1. Average of Haemoglobin Level before Tomato Juice and Honey for Pregnant Women

Variabel	n	mean	SD	Min-Max
pretest	24	10.44	0.37	10.3-11.4

It was found that from 24 respondents before being given an intervention with an average of haemoglobin level as much as 10.440

Table 2 . Average of Haemoglobin Level After Tomato Juice and Honey Intervention

Variabel	n	mean	SD	Min-Max
Post Test	24	11.00	0.34	10.4-11.4

It was found that from 24 respondents after being given the intervention with an average of haemoglobin level as much as 11.000.

Table. 3 Effects of Tomato Juice and Honey on Haemoglobin Level of Pregnant Women

Variable	Mean	SD	P-value
Pre-test	10.440	0.096	0.001
Post-test	11.000	0.3464	

P Value = 0.001 which indicates there was a significant effect of Tomato juice and honey on haemoglobin level in pregnant women in their first and third trimester.

4. DISCUSSION

4.1 Haemoglobin Level before Tomato Juice and Honey Intervention

From the results of research conducted in the Lubuk Basung Puskesmas area in 2019, the average haemoglobin (Hb) level before being given honey tomato juice combination was 10.440 categorized as anaemic pregnant women. Anaemia is a state of decreased levels of haemoglobin (Hb), haematocrit and the number of erythrocytes below normal values. In people with anaemia, more often called blood deficiency, red blood cell levels are below normal values. Iron anaemia in pregnancy is a condition of mothers with Hb levels below 11 gr% in pregnant women[7]. Anaemia during pregnancy has a very big impact. Pregnant women who have anaemia can experience excitement, born prematurely, low birth weight, bleeding before and during labour can even lead to death in the mother and fetus[9].

This is in accordance with the opinion of Ai Yeyeh Rukiyah and Lia Yulianti, (2010) the cause of anaemia can be due to lack of nutrients for blood formation, the minute iron, folic acid and vitamin B12. But what often happens is anaemia due to iron deficiency[10].

The results of this study are almost the same as the study about the effectiveness of combination therapy of tomato juice and honey to increase haemoglobin levels in pregnant women with anaemia, where the results of the analysis obtained by the average value of haemoglobin levels in pregnant women before given combination therapy Tomato juice and honey is 8.48[11].

According to the researchers' assumptions, namely low levels of haemoglobin in pregnant women in the intervention group before being given honey tomato juice combination, could be caused by lack of intake of iron and protein from food, presence of intestinal absorption disorders, acute or chronic bleeding, and increased need for iron in pregnant women, and poor diet, and poor fulfilment of mothers' nutrition such as the lack of mothers consuming vegetables and fruit. Therefore, examination of haemoglobin levels during pregnancy is very important, and the fulfilment of healthy and balanced nutrition so as not to experience a significant decrease in haemoglobin levels

4.2 Haemoglobin Level after Tomato Juice and Honey Intervention

From the results of research conducted in the Lubuk Basung Puskesmas area in 2019, the average haemoglobin (Hb) level after giving honey tomato juice combination was 11,000 categorized as pregnant women without anaemia. One effort to increase haemoglobin levels is not only by consuming iron tablets, but also must pay attention to daily nutritional intake that is by consuming foods that contain lots of iron such as eggs, milk, fish, meat, beans (tofu, oncom, soybeans, green beans, green vegetables, green vegetables (spinach, cassava shoots, pumpkin shoots, tomatoes, oranges, and honey drinks, guava and bananas. Tomato fruit in Indonesia has also been spread evenly, almost everywhere. all archipelagos have tomatoes, because besides the easy way of planting and maintaining tomatoes can indeed be a reliable food source[13].

Tomatoes are a good source of iron, vitamins C and A, and antioxidants, and are usually ingested in the form of juice. Organic acids, such as vitamin C ascorbic acid, can aid iron absorption by

converting ferrites to ferrous elements that can be absorbed 3-6 times more easily. Vitamin C is typically found in vegetables and fruits. This study is very identical to one conducted by on the effectiveness of a tomato juice and honey combination therapy to raise haemoglobin levels in pregnant women with anaemia, where the investigation found that the average value of haemoglobin levels in pregnant women increased by an average of 11.2 after the intervention. According to the researchers, the increase in the average haemoglobin level of pregnant women following the intervention of tomato juice and honey is due to tomato juice and honey containing iron and vitamin C, which can aid iron absorption by reducing ferrites to ferrous materials that are easily absorbed 3-6 times in pregnant women [14][9].

Honey is a food ingredient that has the potential as a base. Alkaline elements are potassium, sodium, calcium, magnesium. The benefits of honey are so great that is able to feel the atmosphere of the stomach and monosaccharide content that is very easy and quickly absorbed by the body. So if honey is consumed by pregnant women who have anaemia it will alleviate complaints during pregnancy because of increased hormones that reduce mortality.

According to the researchers' assumptions, tomatoes and honey contain substances that function to facilitate the circulation of oxygen in the blood, one of which is iron which is needed for the formation of blood haemoglobin. Vitamin C and vitamin A which have antioxidant properties. Vitamin C also helps the percentage of iron absorption, so it is expected to help increase blood haemoglobin levels.

4.3 The effect of Tomato Juice and Honey on Haemoglobin Level.

The results of the statistical test using the Paired T-Test, the p-value = 0.001 was obtained. ($p < 0.05$) given the intervention was 11,000. More than the average haemoglobin level before and given a combination of tomato juice that is 0.5600. Iron is a chemical required by pregnant women, and vitamin C is required for maximum iron absorption. Iron plus vitamin C supplements is more effective than iron or vitamin C alone in boosting haemoglobin levels and red blood cell counts. Tomatoes are an iron-rich fruit that also contains health-promoting compounds. Tomatoes have 0.5 milligrams of iron, 40 milligrams of vitamin C, and 15 milligrams of folic acid per 100 gram serving. Pregnant women require folic acid because their

demand for the vitamin increases during pregnancy[15].

Tomato fruit is one type of fruit that can help children, adults, and pregnant women meet their vitamin needs. Tomatoes are high in vitamin C, which is an antioxidant that helps with endurance. According to scientific studies, eating vitamin C-rich fruits on a regular basis might help boost the body's immunity against infection-fighting chemicals and lower damaging free radicals that cause cancer. Vitamin C is also required for the synthesis of collagen in the body. Collagen is the most important structural protein in the human body, as it keeps blood vessels, skin, organs, and bones healthy[7].

Honey is a food ingredient that is recommended as a base. The basic elements are Potassium, sodium, calcium, magnesium. The benefits of honey are good for making stomach taste and contents of monosaccharides that are very easily and quickly absorbed by the body. From the results of Wulandari's research in 2015, Minerals, sugar, vitamin C, vitamin A, iron (Fe), and vitamin B12 all have a role in the formation of red blood cells and haemoglobin in honey. As a result, it may be inferred that honey consumption can help pregnant women avoid iron deficiency anemia[9]. So, if honey is consumed by anaemic pregnant women it will alleviate complaints during pregnancy due to an increase in hormones that decrease the digestive tract mortality, so long emptying of the stomach also stimulates increased HCl secretion, nausea stimulation can be anticipated if the body can compensate for glycogen metabolism in the liver which occur in the morning with honey consumption before rising from bed[10].

The number of respondents who have 9-10 gr% Hb experienced mild anaemia caused by the lack of consumption of tomatoes and honey. The content of vitamin C in tomatoes and honey has many health benefits for the body. Some of the benefits include maintaining the immune system, preventing gestational diabetes, helping to overcome iron deficiency, preventing anaemia in pregnant women, reducing cholesterol, and preventing digestive disorders in pregnant women. (Buckle et al, 2010). Therefore, by consuming red tomatoes and honey, haemoglobin levels will increase and anaemia rate decreases.

This study is in line with research conducted by Merida Fitri (2013) on the effectiveness of combination therapy of tomato juice and honey on increasing haemoglobin levels in pregnant women with anaemia, where the analysis results obtained P

(0.013) $< \alpha$ (0.05), it can be concluded that therapy the combination of tomato juice and honey is effective against increasing haemoglobin levels in pregnant women with anaemia. In addition to the factors above nutritional intake, ante natal care control and combination of Fe associated with anemia[15].

According to the researchers' assumptions, there is an effect of giving honey combination tomato juice to haemoglobin levels in pregnant women. Where in tomato juice can increase the Haemoglobin levels of pregnant women due to tomato juice containing iron which can help iron absorption. Besides containing a lot of iron, tomatoes are also a delicious fruit to consume and contain many vitamins and substances needed during pregnancy. And honey is a supernatant liquid sugar. Honey contains Vitamin C, vitamin A, iron (Fe), and Vitamin B12 which function as forming red blood cells and haemoglobin. So it can be concluded that consuming honey can prevent iron deficiency anaemia in pregnant women[16].

5. CONCLUSION

There was significant effect of Tomato Juice on Haemoglobin level. It is expected to be an input that will be followed up at the maternal and child health section at the Lubuk Basuk Public Health Centre, it is hoped that the results of this study can be one of the inputs in order to be able to handle the problem of anaemia by using a non-pharmacological type.

REFERENCES

- [1]. Indriyani D. (2013). Keperawatan Maternitas Pada Area Perawatan Antenatal, Graha Ilmu, Yogyakarta.
- [2]. Kementerian Kesehatan. Pusat Data Dan Informasi Profil Kesehatan Indonesia 2010. Kementerian Kesehatan RI, Jakarta, 2011.
- [3]. Kementerian Kesehatan. Pusat Data Dan Informasi Profil Kesehatan Indonesia 2014. Kementerian Kesehatan RI, Jakarta
- [4]. WHO. Guideline: Daily iron and folic acid supplementation in pregnant women. Geneva, World Health Organization, 2012.
- [5]. Profil Kesehatan Provinsi Sumatera Barat. 2017. Padang: Sumatera Barat
- [6]. Dheny, Rohmatika. Supriyana. Perbandingan Pengaruh Pemberian Ekstrak Bayam Hijau Dengan Preparat Fe Terhadap Perubahan Kadar Hemoglobin Ibu Hamil Pasien Puskesmas. 2016; 8.
- [7]. Besuni A, Jafar N, Indriasari R, Studi P, Gizi I, Kesehatan F, Et Al. Nutrients Intake Relationship Forming Red Blood Cells With Hemoglobin Levels In Pregnant Women In Gowa. 0:1–10. 13.
- [8]. Fady MFA. Perbedaan efektivitas perawatan luka menggunakan madu dan sorfratulle terhadap penyembuhan luka diabetik pasien diabetes mellitus di wilayah kerja puskesmas Rambipuji Jember. Jember (Indoesia): Universitas Jember; 2012.
- [9]. Tarwoto dan Wasnidar. 2013. Buku Saku Anemia pada Ibu Hamil: Konsep dan Penatalaksanaannya. Jakarta: Trans Info Media.
- [10]. Ai Yeyeh, Rukiyah, dkk. et al. (2010). Asuhan Kebidanan 1. Jakarta: CV. Trans Info Media
- [11]. Evika Rachmaniar Hk. Pemanfaatan Sari Buah Jambu Biji Merah (Psidium Guajava Linn) Sebagai Antioksidan Dalam Bentuk Granul Effervescent. J Ji, Sci P. 2016;1. 11.
- [12]. Isnaeni A. Pengaruh Konsumsi Jus Jambu Biji Terhadap Peningkatan Kadar Hemoglobin Pada Ibu Hamil Anemia Di Puskesmas Lebaksiu Kabupaten Tegal. 2017; 12.
- [13]. Fifi. M. Liow, Nova. H. Kapantow Nmb. Hubungan Antara Status Sosial Ekonomi Dengan Anemia Pada Ibu Hamil Di Desa Sapa Kecamatan Tenga Kabupaten Minahasa Selatan. Univ
- [14]. Sam Ratulangi Manad. 2013; 14. Lulu. Faktor Yag Berhubungan Dengan Status Anemia Pada Asuhan Antenatal Dipuskesmas Kecamatan Pasar Minggu Jakarta Selatan. Depok: Fkm Ui; 2009. 15.
- [15]. Dameria Magdalena Tambunan. Gambaran Kejadian Anemia Ibu Hamil Dan Faktor-Faktor Yang Berhubungan Di Wilayah Kerja Puskesmas Sei Apung Kabupaten Asahan Tahun 2011. In Depok: Universitas Indonesia; 2011. 16.
- [16]. Murray. Biokimia Harzper. Jakarta: Ecg; 2003. 17. Almtsier S. Prinsip Dasar Ilmu Gizi. Jakarta: Pt Gramedia Pustaka Utama; 2009.