LITERATURE REVIEW: THE EFFECT OF GIVING PURPLE SWEET POTATO ON HAEMOGLOBIN (HB) LEVELS

Maharani[1], Ardina Rezky Noeraini[2*]

[1]Department of Midwifery, Polytechnic of Health-Ministry of Health, Aceh, Indonesia
[2]Universitas Nusantara PGRI Kediri, Indonesia
*Corresponding Email : ardina.rezky@unpkdr.ac.id

ABSTRAK : LITERATUR REVIEW: PENGARUH PEMBERIAN UBI JALAR UNGU (*Ipomoea batatas L.*) TERHADAP KADAR *Haemoglobin* (Hb) PADA IBU HAMIL TERHADAP ANEMIA

Latar Belakang: Angka kejadian anemia pada ibu hamil sekitar 38,2 juta jiwa di dunia, sedangkan di Asia tenggara terdapat 11,5 juta ibu hamil yang mengalami anemia. Prevalensi anemia pada ibu hamil di Indonesia mengalami peningkatan yaitu pada tahun 2013 sebanyak 37,1% meningkat menjadi 48,9% pada tahun 2018. Untuk menangani kejadian anemia saat hamil, ibu dapat mengkonsumsi makanan yang mengandung zat besi salah satunya ubi jalar ungu, setiap 100 gr mengandung 0,7 mg zat besi.

Tujuan: Untuk melakukan *review* pada beberapa literatur terkait pengaruh ubi jalar terhadap perubahan kadar *Haemoglobin* (Hb) pada ibu hamil dengan Anemia.

Metode: Penelitian ini menggunakan studi *literature review* yang mengkaji pengaruh ubi jalar terhadap kadar Hb. Penelitian ini menggunakan data sekunder berupa artikel sebanyak empat artikel yang kemudian direview. Pengumpulan data menggunakan metode dokumentasi. Sumber Jurnal yang digunakan diperoleh dari *Google Scholar* dan *Blossom Journal of Midwifery*. Analisis data dilakukan dengan tiga tahap, yaitu kompilasi, analisis dan simpulan yang sesuai dengan rumusan dalam penelitian ini.

Hasil: Hasil penelitian menunjukkan bahwa tiga artikel signifikan menunjukkan ubi jalar berpengaruh terhadap kadar Hb dan satu artikel pada ibu dengan menggunakkan air rebusan daun ubi jalar.

Kesimpulan: Empat artikel yang di*review*, tiga diantaranya menunjukkan perubahan yang signifikan terhadap kadar Hb setelah di intervensi dengan ubi jalar.

Saran: Peneliti berharap agar ibu hamil bisa memanfaatkan manfaat ubi jalar untuk memperbaiki kadar Hb terutama bagi ibu hamil dengan anemia.

Kata kunci: Anemia, Kadar Hb,Ubi Jalar

ABSTRACT

Background: Anemia in pregnant women affects approximately 38.2 million women worldwide, with 11.5 million pregnant women suffering from anemia in Southeast Asia. The prevalence of anemia in pregnant women in Indonesia has increased from 37.1% in 2013 to 48.9% in 2018. To deal with the incidence of anemia during pregnancy, mothers can consume foods that contain iron, one of which is purple sweet potato, in which every 100 grams contains 0.7 mg of iron.

Purpose: To review some of the literature related to the effect of sweet potatoes on changes in hemoglobin (Hb) levels in pregnant women with anemia.

Methods: This study used a literature review to examine the effect of sweet potatoes on Hb levels. This study uses secondary data in the form of four articles, which are then reviewed. Data collection uses the documentation method. Journal sources used were obtained from Google Scholar and the Blossom Journal of Midwifery. Data analysis was carried out in three stages, namely compilation, analysis, and conclusions according to the formulation in this research.

Results: The result showed that three significant articles showed that sweet potatoes had an effect on Hb levels, and one article focused on mothers using sweet potato leaf-boiled water.

Conclusion: Conclusion in this study four articles were reviewed, three of which showed significant changes in Hb levels after intervention with sweet potatoes.

Suggestions: Researchers hope that pregnant women can take advantage of the benefits of sweet potatoes to improve Hb levels, especially for pregnant women with anemia.

Keyword: Anemia, Haemoglobin Levels, Sweet Potato

INTRODUCTION

Anemia is an indirect factor causing maternal death. The incidence of anemia in pregnant women in the world is around 38.2 million, while in Southeast Asia there are 11.5 million pregnant women who experience anemia (World Health Organization, 2015). The prevalence of anemia in pregnant women in Indonesia has increased, namely in 2013 as much as 37.1%, increasing to 48.9% in 2018 (Kementrian Kesehatan Republik Indonesia, 2019). The prevalence of anemia in pregnant women in Aceh Besar District, which was recorded from 2019 to November, was 32% with Hb levels between 8 and 11 mg/dL and 50% in pregnant women with severe anemia (Hb levels 8 mg/dL) (Kementerian Kesehatan RI, 2020). Meanwhile, the prevalence of anemia in pregnant women at the Darul Health Center in 2016 was 61.2%, and in 2017 it decreased to 38.5%. However, the proportion of pregnant women suffering from anemia increased to 52.2% in 2018.

Anemia in pregnancy is the condition of the mother with Hb levels 11 g/L in the first and third trimesters, while in the second trimester, the Hb level is 10.5 g/L. This is because there are differences in the condition of non-pregnant women because hemodilution mainly occurs in the second trimester (Millah, 2019; Sarwono, 2016). Iron deficiency anemia in the mother can affect the growth and development of the fetus or baby during pregnancy and postpartum (Kemenkes RI, 2015). Lack of iron in food can be one of the causes that can lead to anemia. Iron is a mineral that the body needs to form red blood cells (hemoglobin); iron also plays a role as a component in forming myoglobin (a protein that carries oxygen to muscles), collagen (a protein found in bone, cartilage, and connective tissue), as well as enzymes. Iron also functions in the body's defense system (Kemenkes RI, 2015). Pharmacological prevention involves administering as many as 90 iron tablets during pregnancy. PERMENKES 1464 of 2010 is the basic law that regulates the administration of blood-boosting tablets as well as being a government effort to suppress anemia. However, the side effects caused by consuming iron tablets cause some pregnant women to feel uncomfortable, and they often skip taking them. This can trigger an increase in the incidence of anemia in pregnant women (Restianti, Sutrisno, & Laili, 2013).

Prevention of anemia in pregnant women is actually not only pharmacological but also non-pharmacological, namely by consuming foods that contain iron. Sweet Potato is a food that is rich in benefits. Sweet potatoes contain anthocyanins which can function as antidiabetic, antihypertensive, anticancer, anti-inflammatory, antiaging, antimutagenic, anticarcinogenic, and prevent memory loss. Anthocyanins can inhibit the rate of cell damage or cell growth which cannot be controlled due to continuous oxidation. Continued oxidation can form lipid peroxide or malondialdehyde (MDA) which can damage cells and lead to cell death in all body tissues. In addition to anthocyanin, purple sweet potato contains protein, fat, carbohydrates, calcium, phosphorus, vitamin A, vitamin C and vitamin B1 and iron. The iron content in 100 grams of sweet potato is 0.7 mg. Sweet potatoes that are consumed regularly can help increase iron in the body so that it can prevent anemia.

Based on the above, anemia during pregnancy is a serious problem that must be resolved immediately. Prevention of anemia can be done by giving iron tablets, but this has uncomfortable side effects for pregnant women. Consumption of foods that contain iron can be used as an alternative in preventing anemia. One of the foods that contain iron is sweet potato. Therefore, researchers are interested in writing a literature review on the effect of giving sweet potatoes on increasing Hb levels in pregnant women so as to prevent anemia during pregnancy.

RESEARCH METHOD

This research design uses a literature review, which is an assessment of the concepts and theories used based on the available literature, especially from articles published in various scientific journals (Sujarweni, 2014). The type of data in this research is secondary data. The intended secondary data is data obtained from the results of research that has been carried out by previous researchers. The sources in this study were taken from 4 journals obtained from Google Scholar and the Blossom Journal of Midwifery using the keywords "Haemoglobin", "Sweet Potato", "Sweet Potato", "Anemia". The data analysis in this study included three stages, namely compilation, analysis, and conclusion, so that it was in accordance with the formulation of the problem in this study, namely the effect of sweet potato administration on increasing Hb levels in pregnant women with anemia.

RESEARCH RESULT

Similarity and Dissimilarity

An analysis of the similarities in these four articles focuses on the benefits of sweet potatoes that can increase Hb levels in pregnant women with anemia, according to the results of research written in the first, second, and fourth articles. The third

article also has similarities, where sweet potato leaves can also increase Hb levels.

The analysis of the dissimilarity between the four articles is found in research design, research samples, and sampling techniques. In the first article, it uses a *quasi eperimental one-group pretest-posttest design*. The sample used 7 pregnant women with anemia. The Sampling technique uses purposive sampling. The second article uses the design of an experiment with a sample of 10 people. The sampling technique used was purposive sampling with inclusion criteria. The third article uses the design of true experiments with a sample of four people. The sampling technique used is purposive sampling. The variable used is sweet potato leaves. The fourth article uses a quasi experimental pretest-posttest with a control group design. The study included 44 pregnant women in their third trimester, divided into two groups. The sampling technique used is purposive sampling.

Result

The results of a literature review of four articles (two international and two national) found that three journals conducted on pregnant women showed a significant effect of sweet potatoes on Hb levels, and one journal showed a change in Hb after intervention with sweet potato leaf extract. The results of the article can be seen in Table 1.

Tabel 1
Literature Reviewed

Author, Title, Journal	Method Design	Result
Felinan, M. (2020). Sweet Potatoes Comsumption on Increased Haemoglobin Levels in First Trimester Pregnant Women.	*Quasi Experimental one-group pretest-posttest design*	After being given an intervention for 7 days with 100 grams of purple sweet potato, there was a change in Hb levels in pregnant women. The average Hb level before the intervention was 10.075 g/dL, and after the intervention, the Hb level increased to 10.257 g/dL. Hb levels in pregnant women were checked twice: before the intervention and 9 days after the sweet potato was given to the mother.
Pujiastutik, Y. E., Refina, R. C., Firdausi, A., Winarno, P., & Yuliana, E. T. (2020). Efikasi Fortifikasi sebagai Determinan Anemia Kehamilan dengan Biskuit Sweet Potato (Ipomoea Batatas L.). *Jurnal Wiyata*, *7*(1), 69–77	*True Experiment*	The results showed that the hemoglobin level of pregnant women was an average of 9.87 g/dL before the intervention and an average of 11.89 g/dL after the intervention, with the incidence of anemia. Before consuming sweet potatoes, most of them experienced mild anemia, but after consuming sweet potatoes, they became normal.
Hutabarat, N. C., & Widyawati, M. N. (2018). The Effect of Sweet Potato Leaf Decoction and Iron Tablet against Increased Hemoglobin Levels in Pregnant Women (Pengaruh Pemberian Rebusan Daun Ubi Jalar dan Tablet Fe terhadap Peningkatan Kadar Hemoglobin Ibu Hamil). *Indonesian Journal of Health Research*, *1*(2), 59–65.	*Pre-post Experiment*	Research shows that the treatment of 100 grams of sweet potato leaf decoction for 10 days can increase hemoglobin levels in each respondent by R1 1.7 gr%, R2 2.1, R3 2.2, and R4 2.7 gr%.
Yuliandani, F. A., Dewi, R. K., & Ratri, W. K. (2017). Pengaruh Pemberian Konsumsi Ubi Jalar terhadap Peningkatan Kadar Hemoglobin Ibu Hamil Trimester III. *Jurnal Riset Kesehatan*, *6*(2), 28–34.	*Quasi Experimental Pre-post test with control group*	The average hemoglobin level of pregnant women after being given the intervention in the intervention group was 11.4318 g/dL, and in the control group it was an average of 10.6455 g/dL with anemia. Before consuming Fe tablets, most of them had mild anemia (15 respondents (68.2%)), and after consuming Fe tablets, they were still mildly anemic (12 respondents

 DOI 10.33024, http://ejurnalmalahayati.ac.id/index.php/kebidanan

	(54.5%)). Sweet potato consumption has an effect on increasing Hb levels in pregnant women.

In the first article, a study conducted in Bukittinggi found that after an intervention with sweet potato administration for 7 days, there was an increase in the average hb level in pregnant women from 10,075 g/ddl to 10,257 g/ddl. Sweet potatoes contain vitamins A, C, B1, riboflavin, iron (Fe), phosphorus (P), and calcium (Ca). The content of sweet potatoes is useful as an anti-anemia agent or can increase hemoglobin levels in the blood. Because sweet potato decoction is more easily absorbed than meat or other ingredients, it can be consumed daily by pregnant women and have an effect on increasing hemoglobin levels in pregnant women (Felinan, 2020).

The second article, a study conducted on pregnant women, showed that the hemoglobin level of pregnant women before the intervention was given an average of 9.87 and after the intervention, an average of 11.89, with anemia before consuming sweet potatoes. Most of them had mild anemia, but after consuming sweet potatoes, they became normal because sweet potatoes had iron content so that they could prevent anemia or blood deficiency (Pujiastutik, Refina, Firdausi, Winarno, & Yuliana, 2020).

Third Article, Research conducted on pregnant women obtained results by giving a decoction of sweet potato leaves 100 grams for 10 days, which increased hemoglobin levels in each respondent by R1 (1.7 gr%), R2 (2.1 gr%), R3 (2.2 gr%), and R4 (2.7 gr%). Giving a decoction of sweet potato leaves to pregnant women has been shown to help increase Hb levels in pregnant women. The amount of folic acid in 100 grams of sweet potato leaves, as much as 80 µg, is very beneficial for pregnant women (Hutabarat & Widyawati, 2018).

In the fourth article, there was a change in average Hb levels from 10.8545 gr/dl before the intervention to 11.4318 gr/dl after the intervention in a study conducted in Semarang. The results of this study showed p = 0.004, namely the influence of purple sweet potatoes to increase Hb levels in pregnant women, which was carried out on 7 pregnant women with anemia who were given an intervention for 7 days (Yuliandani, Dewi, & Ratri, 2017).

DISCUSSION

Anemia during pregnancy is a condition where the hemoglobin (Hb) level <11 g/dL in the first and third trimesters. Meanwhile, Hemoglobin levels <10.5 g/dL during the second trimester. Pregnancy anemia is referred to as a potential risk to both mother and child, which is why anemia requires immediate attention from all parties involved in health care (Manuaba, 2010).

During pregnancy, there is an increase in blood volume because the body's metabolic needs increase due to the presence of the fetus in the body. Blood volume will increase with gestational age, and hemoglobin and hematocrit concentrations will decrease. This decrease in hemoglobin concentration is called delusional anemia. The hemoglobin level decreases by 1-2 g/dL until the end of the second trimester and stabilizes in the third trimester when blood volume decreases. Iron is especially needed for the formation of hemoglobin. Iron requirements during pregnancy will increase. At 1000 mg of iron that the mother needs while pregnant, about 300 mg are needed for the fetus and placenta (Cunningham et al., 2018; Utama & Hilman, 2018). Insufficient iron will inhibit the formation of hemoglobin, which can cause anemia (Yuliandani et al., 2017).

A government program that involves the administration of 90 iron tablets during pregnancy is one method of preventing anemia in pregnant women.In addition, the prevention of anemia can also be done by consuming foods that contain iron. Foodstuffs that contain iron are very easy to get; one of them is purple sweet potatoes, where every 100 grams of sweet potatoes contains 0.7 mg of iron (Maharani et al., 2021; Ratnawati, Maryanti, & Sentan, 2012). Sweet potatoes containing 0.7 mg of iron are very helpful in raising Hb levels if consumed regularly because purple sweet potatoes contain iron that the body needs to transport oxygen from the lungs to tissues and transport electrons in the process of forming energy in cells. so that it can prevent pregnant women from experiencing anemia and prevent the risks that can be caused by iron deficiency.

CONCLUSION

The results of a review of four articles that had interventions with sweet potatoes found that sweet potatoes are one of the foods that can have an effect on increasing Hb levels in pregnant women who experience anemia. In addition, sweet potato leaves can also help increase Hb levels. Pregnant women are expected to consume iron-rich foods to prevent anemia, one of which is the purple sweet potato, which is widely available, inexpensive, and can be

used as a substitute for Fe tablets in pregnant women with anemia.

SUGGESTIONS

Researchers hope that pregnant women can take advantage of the benefits of sweet potatoes to improve Hb levels, especially for pregnant women with anemia. The researchers also hope that sweet potatoes can be used as an alternative to iron supplement tablets for pregnant women with anemia who have discomfort consuming Fe tablets.

REFERENCE

Cunningham, F. G., Leveno, K. J., Spong, C. Y., Dashe, J. S., Casey, B. M., Hoffman, B. L., & Bloom, S. L. (2018). *Williams Obstetrics, 25th Edition*. McGraw-Hill Education.

Felinan, M. (2020). *Sweet Potatoes Consumption on Increased Haemoglobin Levels in First Trimester Pregnant Women*.

Hutabarat, N. C., & Widyawati, M. N. (2018). The Effect of Sweet Potato Leaf Decoction and Iron Tablet against Increased Hemoglobin Levels in Pregnant Women (Pengaruh Pemberian Rebusan Daun Ubi Jalar dan Tablet Fe terhadap Peningkatan Kadar Hemoglobin Ibu Hamil). *Indonesian Journal of Health Research*, *1*(2), 59–65. Retrieved from https://www.e-journal.stikesjembrana.ac.id/index.php/IJHR/article/download/11/11

Kemenkes RI. (2015). *Kesehatan dalam Kerangka Sistainable Development Goals (SDG'S).* Jakarta: Kementerian Kesehatan RI.

Kementerian Kesehatan RI. (2020). Profil Kesehatan Indonesia 2019. In *Journal of Chemical Information and Modeling*. Jakarta: Kementerian Kesehatan RI.

Kementrian Kesehatan Republik Indonesia. (2019). *Laporan Riskesdas 2018 Nasional.pdf* (p. 674). p. 674.

Maharani, M., Nurbaiti, N., Lajuna, L., Fitri, Y., Santi, P., & Sutrisno, S. (2021). The influence of giving sweet potato leaf boiled water to the acceleration of breastmilk production in nursing mothers in the kuta baro health center, aceh besar, indonesia. *Open Access Macedonian Journal of Medical Sciences*, *9*(E), 246–249. https://doi.org/10.3889/oamjms.2021.5706

Manuaba, P. D. I. B. G. (2010). *Ilmu Kebidanan, Penyakit Kandungan & KB Untuk Pendidikan Bidan* (2nd ed.). Jakarta: EGC. Retrieved from https://books.google.co.id/books?id=o7rIQ70xKjYC

Millah, A. S. (2019). Hubungan Konsumsi Tablet Fe Dengan Kejadian Anemia Pada Ibu Hamil Di Desa Baregbeg Wilayah Kerja Puskesmas Baregbeg Kabupaten Ciamis Tahun 2018. *Jurnal Keperawatan Galuh*, *1*(1), 12. https://doi.org/10.25157/jkg.v1i1.1787

Pujiastutik, Y. E., Refina, R. C., Firdausi, A., Winarno, P., & Yuliana, E. T. (2020). Efikasi Fortifikasi sebagai Determinan Anemia Kehamilan dengan Biskuit Sweet Potato (Ipomoea Batatas L.). *Jurnal Wiyata*, *7*(1), 69–77.

Ratnawati, D., Maryanti, E., & Sentan, A. M. (2012). Aplikasi Ekstrak Umbi Ubi Jalar Ungu (Ipomoea batatas varayamurasaki) Sebagai Pengawet dan Pewarna Alami Tahu. *Journal Gradien*, *8*(1), 739–745.

Restianti, S. M., Sutrisno, & Laili, F. J. (2013). Gambaran Faktor Rendahnya Konsumsi Tablet Fe Ibu Hamil Trimester III Di Desa Kranjingan Kecamatan Sumbersari Kabupaten Jember. *Jurnal Kesehatan Dr.Soebandi*, *3*(1), 169–175.

Sarwono, P. (2016). *Ilmu Kebidanan* (4th ed.; A. B. Saifuddin, T. Rachimhadhi, & G. H. Wiknjosastro, Eds.). Jakarta: PT Bina Pustaka Sarwono Prawirohardjo.

Sujarweni, V. W. (2014). *Metode Penelitian: Lengkap, Praktis, dan mudah dipahami*. Yogyakarta: Pustaka Baru Press.

Utama, I. B. E., & Hilman, L. P. (2018). Anemia Defisiensi Besi pada Ibu Hamil dan Stunting Iron Deficiency Anemia in Pregnant Women and Stunting. *Majalah Kedokteran UKI*, *34*(3).

World Health Organization. (2015). The global prevalence of anaemia in 2011. In Elysium (Ed.), *Geneva*. Switzerland: World Health Organization. Retrieved from https://apps.who.int/iris/handle/10665/177094

Yuliandani, F. A., Dewi, R. K., & Ratri, W. K. (2017). Pengaruh Pemberian Konsumsi Ubi Jalar terhadap Peningkatan Kadar Hemoglobin Ibu Hamil Trimester III. *Jurnal Riset Kesehatan*, *6*(2), 28–34.