E-ISSN: 2987-209X
International Journal of Midwifery and Health Sciences
Vol. 3, Issue 1 (2025), March

Dried Date Juice on Hemoglobin and Blood Glucose Levels in Pregnant Women at The Community Health Centre in Bogor Region

Novita Sari[1], Febry Mutiariami Dahlan[2*], Putri Azzahroh[3]

[1,2,3] Faculty of Health Sciences, Universitas Nasional, Indonesia

** Corresponding Author: Febry Mutiariami Dahlan, Universitas Nasional;*

febrymutia@civitas.unas.ac.id, +62 821-1092-2186.

Submission date: 24-03-2025; Date of received: 31-03-2025

Abstract

Background: The second highest MMR in Indonesia in 2023 was due to obstetric haemorrhage, which accounted for 17.16% of the total MMR of 4,129. One of the factors causing obstetric haemorrhage is anaemia. In 2023, the Indonesian Health Service Office reported that the proportion of anaemia in pregnant women in Indonesia was 27.7%, and in West Java in 2023 it was 10.44%. One of the non-pharmacological therapies to help overcome anaemia is the administration of date juice. **Purpose**: This study aims to determine the effect of date juice administration on haemoglobin levels and blood glucose levels in pregnant women with anaemia. **Method**: This type of research is a pre-experimental one-group pretest-posttest design. The population is pregnant women in the third trimester with anaemia. The sample in this study consisted of 20 people who were then given treatment. The sampling technique used purposive sampling. Bivariate analysis used the Wilcoxon test and Paired sample t test. **Result**: The results showed an increase in the average haemoglobin level before (10.11 g/dL) and after (11.60 g/dL) the providing of date juice. Meanwhile, the average blood glucose level before (96.30 mg/dL) and after (96.65 mg/dL) showed a slight increase. The results of the Wolcoxon test on haemoglobin levels showed a p value = 0.000, so there is a significant effect of date juice administration on haemoglobin levels. Meanwhile, from the results of the paired sample t test on blood glucose levels, the p value = 0.953, so there is no effect of date juice administration on blood glucose levels in pregnant women in the third trimester with anaemia. **Conclusion**: There is an effect of date juice on increasing haemoglobin levels and no effect on blood glucose levels in pregnant women in their third trimester with anaemia.

Keywords : Anemia, blood glucose, date juice, hemoglobin, TTD

Introduction

The second highest maternal mortality rate (MMR) in Indonesia in 2023 was caused by obstetric hemorrhage, accounting for 17.16% of a total of 4,129 maternal deaths. The percentage of obstetric hemorrhage cases in West Java in 2023 was 19.07%. One of the factors contributing to obstetric hemorrhage is anemia. The WHO estimates that 37% of pregnant women worldwide suffer from anemia and states that anemia increases the risk of infections, poor pregnancy outcomes, and mortality.

In 2023, the Indonesian Health Ministry reported that the proportion of anemia among pregnant women in Indonesia was 27.7%, with West Java reporting a rate of 10.44%. One non-pharmacological therapy to help inrease anemia is the providing of date Juice. However, the carbohydrate content in dates is quite high, consisting of glucose (fructose) at 67.97 g per 100 g, meaning about 68% of date Juice contains glucose.

A study mentioned that frequently consuming foods with high glucose content can affect blood glucose levels, potentially leading to hyperglycemia. Therefore, the researchers were interested in conducting a study on the effect of date Juice on hemoglobin levels and blood glucose levels in pregnant women with anemia.

.

Method

This type of research is a pre-experimental one-group pretest-posttest design. The population consists of third-trimester pregnant women with anemia in the Bogor Regency Public Health Center area. The sample in this study includes 20 individuals who were then given treatment. The sampling technique used is purposive sampling. The intervention given to the respondents was the provision of date juice three times 15 ml daily for 14 days.

This research data analysis uses the SPSS application. The bivariate analysis in this study aims to obtain results on the differences in mean hemoglobin and blood glucose levels before and after the intervention. To determine the significance of the intervention's effect on hemoglobin levels, the Wilcoxon test is used. Meanwhile, the bivariate analysis of blood glucose levels before and after the intervention will utilize the paired t-test to ascertain the effect of date Juice on blood glucose levels in third-

trimester pregnant women with anemia.

This research has passed the research ethics clearance test. Researchers collected data directly from respondents and the results of the study have been defended in a court session in front of examiners at the Faculty of Health Sciences Midwifery Study Program, National University.

Results

Table 1
Mean Hemoglobin Levels Before and After Providing of Date Juice

Variabel	N	Mean	Min	Max	SD
Hb Pretest	20	10,11	9,1	10,5	0,41
Hb Posttest	20	11,6	10,1	13,2	0,85

The table above shows that the average Hb level before the intervention of date Juice providing was 10.11 g/dL with a standard deviation of 0.41 g/dL, and after the providing of date Juice, the average Hb level increased to 11.47 g/dL with a standard deviation of 0.85 g/dL.

Table 2
Mean Blood Glucose Levels Before and After Providing of Date Juice

Variabel	N	Mean	Min	Max	SD
GDS Pretest	20	96,3	68	122	16,05
GDS Posttest	20	96,65	72	131	14,97

The analysis based on the table above states that the average Blood Glucose Level (GDS) before the administration of date Juice was 96.30 mg/dL with a standard deviation of 16.05 mg/dL, and after the administration of date Juice, the average GDS did not show a significant increase, rising to 96.65 mg/dL with a standard deviation of 14.97 mg/dL.

Table 3
Normality Test of Hb Data Before and After Providing of Date Juice

Variabel	df	Shapiro Wilk Sig.	α	Keterangan
Hb Pretest	20	0,007	0,05	Tidak Normal
Hb Posttest	20	0,646	0,05	Normal

The results of the normality test for both variables in the table above, using the Shapiro-Wilk test, showed a Sig. value for the pretest Hb level of 0.007, indicating that the Hb data before the providing of date Juice is not normally distributed, as the criterion for normal distribution in the Shapiro-Wilk test is a significance level > α (0.05). For the posttest Hb level, the Sig. value was 0.646, indicating that the Hb data after the providing of date Juice is normally distributed. Since the pretest Hb data is not normally distributed, hypothesis testing was performed using the Wilcoxon test.

Table 4
Normality Test of GDS Data Before and After Providing of Date Juice

Variabel	df	Shapiro Wilk Sig.	α	Keterangan
GDS Pretest	20	0,349	0,05	Normal
GDS Posttest	20	0,256	0,05	Normal

The table above shows the results of the normality test for GDS data using the Shapiro-Wilk test, with a Sig. value for the pretest GDS of 0.349 > 0.05, indicating that the GDS data before the providing of date Juice is normally distributed. For the posttest GDS, the Sig. value was 0.256 > 0.05, indicating that the GDS data after the administration of date Juice is also normally distributed. To test the hypothesis, the test used is the paired sample t-test.

Table 5
The Effect of Date Juice Providing on Hemoglobin Levels

Variabel	N	Negatif Rank (N)	Positif Rank (N)	Ties	Positif Mean Rank	Z	Asym. Sig (2-tailed)

Hb Posttest - Hb Pretest	20	0	20	0	10,5	-3,922	0

The results of the statistical test using the Wilcoxon test in the table above show that the calculated Z value is -3.922, which is smaller than the Z table value (-1.96), indicating that there is a significant difference between hemoglobin levels before and after the providing of date Juice. The negative value indicates that the posttest Hb level is higher than the pretest Hb level. The significance value (p-value) of 0.000 is less than 0.05, thus the statistical test results indicate that the null hypothesis (Ho) is rejected and the alternative hypothesis (Ha) is accepted. Therefore, it can be concluded that there is an effect of date Juice providing on increasing hemoglobin levels in third-trimester pregnant women with anemia in the Bogor Regency Public Health Center area.

Table 6
The Effect of Date Juice Providing on Blood Glucose Levels

Variabel	Selisih Mean	p-Value	N
GDS Pretest	0,35	0,953	20
GDS Posttest			

Based on the results of the paired sample t-test in the table above, the difference in mean values between the pretest and posttest GDS measurements is 0.35 mg/dL, and the p-value of 0.953 is greater than alpha (0.05). Therefore, the statistical test results indicate that the null hypothesis (Ho) is accepted and the alternative hypothesis (Ha) is rejected. It can be concluded that there is no significant difference between the Blood Glucose Level (GDS) in the pretest and posttest, meaning that there is no effect of date Juice administration on the Blood Glucose Level in third-trimester pregnant women with anemia in the Bogor Regency Public Health Center area.

Discussion

1. The Effect of Date Extract Providing on Hemoglobin Levels

Based on the research results, it was found that there is a significant effect of date extract providing on the increase in hemoglobin levels (p-value 0.000) in third-

trimester pregnant women with anemia. This is consistent with the study conducted by Widowati et al. (2019) titled "The Effect of Date Extract Administration on the Increase of Hemoglobin Levels in Pregnant Women," which showed a significant effect of date extract administration on increasing hemoglobin levels in second-trimester pregnant women with anemia.

Hemoglobin, which is found in erythrocytes, functions as an oxygen-carrying pigment and gives red color to red blood cells. Hemoglobin consists of two main components: heme and globin. As a protein in the blood, hemoglobin can also reflect the iron levels present in the bloodstream. The primary role of the heme group is to act as an oxygen-binding protein that supports muscle contraction, maintains intracellular oxygen levels during muscle activity, and facilitates the diffusion of oxygen from capillaries to tissues with high oxygen consumption, such as the heart tissue rich in mitochondria. Hemoglobin plays a role in transporting O2 and CO2. To ensure that the structure and function of hemoglobin operate effectively, several requirements must be met, including adequate iron intake (Wibowo et al., 2021).

Date extract contains 0.9 mg of iron per 100 g, which functions as a component for forming hemoglobin in red blood cells. This is beneficial for the formation of hemoglobin, which plays a crucial role as an oxygen binder for energy oxidation processes. In the long term, this iron intake is beneficial for erythropoiesis (Hardiansyah et al., 2011). This is supported by research conducted by Pulungan (2021) titled "Dates as an Alternative to Increase Hemoglobin Levels in Pregnant Women with Anemia," which showed that hemoglobin levels increased by 1.16 g/dL (12.78%) in pregnant women with anemia who were given iron tablets and date extract, compared to those who were given iron tablets alone, which showed an increase of only 0.5 g/dL (5.19%). Thus, this study indicates that date extract can be used as an additional option alongside iron tablets for pregnant women with anemia to enhance their hemoglobin levels.

Other nutritional components of dates, according to a post on nilaigizi.com, indicate that per 100 g of dates, there is 0.4 mg of vitamin C. Vitamin C (Ascorbic Acid) can form a chelate with iron (Fe3+) in the stomach at low pH, allowing iron to be absorbed in a basic environment in the duodenum. Therefore, vitamin C can help maximize iron absorption (Wibowo et al., 2021). The researchers assume that the vitamin C contained in date extract can aid in the absorption of iron sourced from the

dates themselves and from the iron tablets consumed regularly over 14 days, thereby positively influencing the increase in hemoglobin levels in third-trimester pregnant women with anemia. Additionally, although the intervention of date extract provided has not met the nutritional needs of pregnant women, other factors that may influence the increase in hemoglobin in this study include the daily nutritional intake consumed by each respondent to meet their nutritional adequacy during pregnancy.

2. The Effect of Date Extract Providing on Blood Glucose Levels

The carbohydrate content in dates is quite high, consisting of glucose (fructose) at 67.97 g per 100 g, or about 68% of date extract contains glucose (Hardiansyah et al., 2011). The results of the paired sample t-test performed by the researchers on blood glucose levels before and after the administration of date extract in third-trimester pregnant women with anemia showed that there was no significant difference (p-value 0.953) between the pretest and posttest Blood Glucose Levels (GDS), indicating that there is no effect of date extract providing on the Blood Glucose Levels of anemic third-trimester pregnant women in the Bogor Regency Public Health Center area.

These findings are not in line with the study conducted by Mulmuliana and Rachmawati (2022), which stated that 85.0% of respondents who frequently consumed foods with a high glycemic index experienced type II diabetes mellitus. In contrast, 66.7% of those who never consumed high glycemic index foods did not experience type II diabetes mellitus in the Mutiara Public Health Center area, Pidie District.

The researchers assume that the lack of a significant effect of date extract on blood glucose levels is because, although date extract has a high glycemic index, the amount of carbohydrates consumed does not exceed the recommended carbohydrate and calorie intake for pregnant women. According to PMK No. 28 of 2019, the daily carbohydrate requirement for pregnant women is 385-700 g, while the date extract intervention provided was 3 x 15 ml per day, or 45 ml per day, which the researchers estimate contains approximately 28.44 g of carbohydrates, based on the study by Hardiansyah et al. (2011), which states that per 100 g of date extract contains 63.2 g of carbohydrates. Similarly, the calorie intake from 45 ml of date extract is estimated to be around 116.1 kcal, referring to Hardiansyah et al. (2011), where per 100 g of date extract contains 258 kcal. Thus, the calorie intake does not exceed the daily

recommended intake for pregnant women, which is 2430 – 2550 kcal (Kemkes RI, 2019).

However, based on the analysis results, there was an increase in the average blood glucose levels before and after the providing of date extract. Therefore, it is necessary to check blood glucose levels before administering date extract to pregnant women. An increase in blood glucose levels in pregnant women is associated with an increased risk of complications during pregnancy, the delivery process, and pregnancy outcomes, both for the mother and the newborn. If the blood glucose level exceeds 130 mg/dL, further diagnostic procedures should be performed (PERKENI, 2021). It is essential to check the blood glucose levels before administering date extract to pregnant women to prevent the risk of hyperglycemia.

Limitation

In conducting this study, there were limitations in the research process that might affect the results of the study, such as the intervention of giving date juice was carried out by the respondents themselves at the respondents' homes so that the researchers did not directly control how the respondents drank date juice during the study and the researchers did not control other nutritional intake consumed by the respondents during the study.

Conclusion

There is an effect of date extract providing on hemoglobin levels before and after providing in third-trimester pregnant women with anemia, and there is no effect of date extract prociding on blood glucose levels before and after administration in third-trimester pregnant women with anemia in the Bogor Regency Public Health Center area. It is hoped that this research can contribute to addressing anemia with non-pharmacological therapy, specifically through the providing of date extract to increase hemoglobin levels and to understand the effect of date extract on blood glucose levels in pregnant women with anemia, as an effort to improve the health of pregnant women, particularly those with anemia. It is necessary to check blood glucose levels before administering date extract to pregnant women to prevent the risk of hyperglycemia.

Ethical Considerations

Declared to be ethically appropriate in accordance to 7 (seven) WHO 2011 Standards, 1) Social Values, 2) Scientific Values, 3) Equitable Assessment and Benefits, 4) Risks, 5) Persuasion/Exploitation, 6) Confidentiality and Privacy, and 7) Informed Concent, referring to the 2016 CIOMS Guidelines. This is as indicated by the fulfillment of the indicators of each standard.

Acknowledgment

Thank you to those who have helped in the research, namely the Dean of the National University, Supervisor of the Midwifery Study Program, Faculty of Health Sciences, Head of Cihideung Udik Health Center and staff, Head of Situ Udik Health Center and staff, all respondents and the researcher's family.

Conflict of Interest

The researcher has no conflict of interest between the authors.

Author contribution

In this study the role of authors one and two as supervisors. The third author as an intervention provider, data collection to data processing.

References

1. Achebe,M.M & Gvili,G,A, (2017), *How I treat anemia in pregnancy: iron, cobalamin, and folate. Blood,* ***129*** (8): 940–949, https://doi.org/10.1182/blood-2016-08-672246

2. Al-Farsi, Y. M., Brooks, D. R., Werler, M. M., Cabral, H. J., Al-Shafei, M. A., & Wallenburg, H. C. (2011). Effect of high parity on occurrence of anemia in pregnancy: a cohort study. BMC pregnancy and childbirth, 11, 7. https://doi.org/10.1186/1471-2393-11-7

3. Basagili, I, M., (2018), *Kurma: Informasi Nilai Gizi*, https://nilaigizi.com/gizi/detailproduk/1171/kurma, Diakses 10 November 2024.

4. Cholifah, S & Rinata, E, (2022), *Buku Ajar Kuliah Asuhan Kebidanan Kehamilan*, Sidoarjo: UMSIDA PRESS.

5. Dinkes Jawa Barat, (2024), *Profil Kesehatan Jawa Barat Tahun 2023*, Bandung, 68-221.

6. Emilia, D, (2022), Pengaruh Pemberian Sari Kurma Terhadap Kadar Haemoglobin

Pada Ibu Hamil Anemia di Wilayah Kerja Puskesmas Megang Sakti Kabupaten Musi Rawas, *Skripsi*, Program Studi Kebidanan Sekolah Tinggi Ilmu Kesehatan. Bengkulu.

7. Fatimah & Nuryaningsih, (2017), *Buku Ajar Asuhan Kebidanan Kehamilan*, Jakarta: Fakultas Kedokteran dan Kesehatan Universitas Muhammadiyah Jakarta

8. Hardinsyah, et.al. (2011), *Uji Preferensi, Nilai Antioksidan, Indeks Glikemik, Serta Pengaruh Konsumsi Sari dan Buah Kurma Terhadap Stamina*, Bogor: Departemen Gizi Masyarakat FEMA IPB, 1-37.

9. Kemenkes RI, (2023), *Survei Kesehatan Indonesia (SKI) Tahun 2023*.

10. Kementrian Kesehatan RI, (2019[a]), *Laporan Provinsi Jawa Barat RISKESDAS 2018*. Badan Penelitian Dan Pengembangan Kesehatan, Jakarta.

11. Kementrian Kesehatan RI, (2019[b]), *Laporan RISKESDAS Nasional 2018*, Badan Penelitian Dan Pengembangan Kesehatan, Jakarta.

12. Kemenkes RI., (2019[c]), *Permenkes Nomor 28 Tahun 2019 Tentang Angka Kecukupan Gizi Yang Dianjurkan Untuk Masyarakat Indonesia*, Kementerian Kesehatan Republik Indonesia, Jakarta.

13. Kementerian Kesehatan RI, (2023), *Laporan Akuntabilitas Kinerja Direktorat Gizi Kesehatan Ibu dan Anak Tahun Anggaran 2023*, Jakarta, 11

14. Khasanah N. (2011). Kandungan buah-buahan dalam Al-Qur'an: buah tin (ficus caracal), zaitun (Olea europea), delima (Punice granatum), anggur (Vitis Vinivera), dan kurma (Phoenix dactylifera) untuk kesehatan. Jurnal Kesehatan Walisongo, **1**(1): 23-27

15. Kurniawan, F, (2017). *Diabetes Melitus Gestasional*, https://p2ptm.kemkes.go.id/uploads/VHcrbkVobjRzUDN3UCs4eUJ0dVBndz09/2017/11/Diabetes_Melitus_Gestasional_Dr_Farid_Kurniawan.pdf, diakses 3 Februari 2025.

16. Marbun, et,al, (2023), *Asuhan Kebidanan Kehamilan*, Bandung: Widina Media Utama

17. Mulmuliana, Rahmawati, (2022), Dampak konsumsi pangan tinggi kandungan indeks glikemik dengan kejadian diabetes mellitus tipe-II di Kabupaten Pidie. *Jurnal SAGO: Gizi dan Kesehatan*, **3**(2): 163-167, http://dx.doi.org/10.30867/gikes.v3i2

18. Nadeem, M., T.M. Qureshi, I. Ugulu, M.N. Riaz, Q.U. Ain, Z.I. Khan, K. Ahmad, A. Ashfaq, H. Bashir and Y. Dogan, (2019), Mineral, vitamin and phenolic contents and sugar profiles of some prominent date palm (Phoenix dactylifera) varieties of Pakistan. *Jurnal Pak. J. Bot*, **14**(1): 171-178, http://dx.doi.org/10.30848/PJB2019-1(14)

19. Obianeli, C., Afifi, K., Stanworth, S., & Churchill, D. (2024). Iron Deficiency Anaemia in Pregnancy: A Narrative Review from a Clinical Perspective. Diagnostics (Basel, Switzerland), ***14***(20): 2306. https://doi.org/10.3390/diagnostics14202306

20. PERKENI, (2019), *Pedoman Pengelolaan dan Pencegahan Diabetes Melitus Tipe 2 Dewasa Di Indonesia 2019*, PB PERKENI, 1-3. Diakses 27 November 2024

21. PERKENI, (2021), *Pedoman Diagnosis dan Penatalaksanaan Hiperglikemia dalam Kehamilan 2021*, PB PERKENI, 1-52.

22. Pickering, D & Marsden, J. (2014), How to measure blood glucose. *Jurnal Community eye health / International Centre for Eye Health*, **27**(12): 56-7. https://www.researchgate.net/publication/275586243_How_to_measure_blood_glucose

23. Pulungan, A, S, Z, (2021), Kurma Sebagai Alternatif untuk Meningkatkan Kadar Hemoglobin Ibu Hamil dengan Anemia, *Jurnal Penelitian Kesehatan Suara Forikes*, **12**(3), 337-340.

24. Ratnaningtyas, M. A., Indrawati, F. (2023). Karakteristik Ibu Hamil. *HIGEIA*, **7**(3), 334-344. https://doi.org/10.15294/higeia/v7i3/39818

25. Riyanto & Putra, R.A, (2022), *Metode Riset Penelitian Kesehatan & Sains*, Yogyakarta: Deepublish, 12-36.

26. Sugiyono & Pusphandhani, E, M., (2020), *Metode Penelitian Kesehatan*, Bandung: Alfabeta, 140-257.

27. Vayalil, P. K. (2012). Date Fruits (*Phoenix dactylifera* Linn): An Emerging Medicinal Food. *Critical Reviews in Food Science and Nutrition*, ***52***(3), 249–271. https://doi.org/10.1080/10408398.2010.499824

28. WHO, (2016), WHO Recommendations On Antenatal Care For A Positive Pregnancy Experience, World Health Organization, Luxembourg, 48.

29. WHO, (2024), *World health statistics 2024: monitoring health for the SDGs, sustainable development goals*. https://www.who.int/publications/i/item/9789240094703, diakses 20 Oktober 2024

30. Wibowo, N., Irwinda, R & Hiksas, R. (2021), *Anemia Defisiensi Besi Pada Kehamilan*, Jakarta:UI Publishing, 1-73.

31. Widowati, R., Kundaryanti, R., & Lestari, P. P. (2019). Pengaruh-Pemberian-Sari Kurma-Terhadap Ibu Hamil, *Jurnal Al-Azhar Indonesia Seri Sains Dan Teknologi*, ***5***(2), 60–65.

32. Wiyono, S., (2016), *Buku Ajar Epidemiologi Gizi Konsep dan Aplikasi*, Jakarta: CV. Sagung Seto, 151-161.