Indonesian Journal of Global Health Research
Volume 7 Number 3, June 2025
e-ISSN 2715-1972; p-ISSN 2714-9749
http://jurnal.globalhealthsciencegroup.com/index.php/IJGHR

THE EFFECT OF RED SPINACH TEA *(AMARANTHUS TRICOLOR L)* ON BLOOD PROFILE IN ADOLESCENT GIRLS WITH ANEMIA

Annie Cristyana Purba*, Sri Sumarni, Irmawati
Poltekkes Kemenkes Semarang, Jl. Tirto Agung, Pedalangan , Banyumanik, Semarang, Central Java 50268, Indonesia
*anniepurba123@gmail.com

ABSTRACT

Anemia continues to be a major nutritional problem in Indonesia, especially among school children and adolescents, which in turn can inhibit growth, reduce learning achievement, and weaken endurance due to reduced concentration and can cause complications during pregnancy, so researchers innovate in preventing these nutritional problems by providing Red Spinach Tea (Amaranthus Tricolor L) and Blood Addition Tablets. Analyzing the effect of Red Spinach Tea (Amaranthus Tricolor L) dose of 2 gr plus 60 mg fe tablets given once a day for 14 days on hemoglobin, hematocrit and erythrocyte levels in adolescent girls with anemia. True Experiment research with pretest-postest design with control group, consisting of 2 groups. The population was female students at Poltekkes Kemenkes Medan with the age of 17-19 years with a total sample of 20 respondents per group. The intervention was given a dose of red spinach tea 2 g given once a day for 14 days and 60 mg blood supplement tablets once a day for 14 days. Bivariate test for paired groups with non-normally distributed data using the Wilcoxon test. Bivariate tests for anpaired groups of pre and post data are not normally distributed, then use the Mann-Whitney test. It was found that the average hemoglobin, hematocrit and erythrocytes in adolescent girls in the intervention group with the administration of Red Spinach Tea and Blood Addition Tablets were higher than the control group with the consumption of Blood Addition Tablets. There is an effect of giving Red Spinach Tea and Blood Addition Tablets on increasing hemoglobin, hematocrit and erythrocyte levels in anemic adolescent girls with p-value = 0,000 (<0.05). Red Spinach Tea (Amaranthus Tricolor L) can potentially be used as a companion to blood supplement tablets to improve anemia status in adolescent girls. Thus, Red Spinach Tea can be utilized as an alternative to complementary therapy in preventing anemia.

Keywords: adolescent girls; anemia; erythrocyte levels; hematocrit level; hemoglobin level; red spinach tea

How to cite (in APA style)
Purba, A. C., Sumarni, S., & Irmawati, I. (2025). The Effect of Red Spinach Tea (Amaranthus Tricolor L) on Blood Profile in Adolescent Girls with Anemia. Indonesian Journal of Global Health Research, 7(3), 327-334. https://doi.org/10.37287/ijghr.v7i3.6122.

INTRODUCTION

Adolescence is a vulnerable phase with increased health risks. Rapid body growth during adolescence requires adequate nutritional intake, but this need is often neglected by adolescents, which can lead to various health problems such as anemia (Kusnadi, 2021). Based on the 2018 Basic Health Research (Riskesdas) data, the prevalence of anemia in Indonesia is highest in the 15-24 years age group, reaching 84.6%. In addition, the 2018 Riskesdas report also shows an increase in anemia cases among adolescent girls. In 2013, around 37.1% of adolescent girls experienced anemia, and this figure increased to 48.9% in 2018, especially in the age groups of 15-24 years and 25-34 years (*Hasil Utama Riskesdas 2018*, 2018). According to data from Indikator North Sumatra in 2020, around 54.53% of women aged 10 to 49 years experienced symptoms of anemia. This data shows that anemia in adolescent girls remains a significant health problem (Nurrahmaton et al., 2023).

Adolescent girls have a ten times higher risk of anemia than adolescent boys, due to monthly menstruation and greater iron requirements during growth. In addition an imbalance in nutritional intake is also a cause of anemia in adolescents. Adolescent girls are often very

concerned about their body shape, so many limit their food intake and avoid various types of food. Reduced food intake can cause iron reserves in the body to be depleted more quickly, accelerating the onset of anemia. As a result, adolescent girls are more prone to iron deficiency anemia (Astuti & Kulsum, 2020). According to the Nutrition Status Monitoring conducted by the Kesga and Nutrition Section of the Public Health Division of the North Sumatra Provincial Health Office in 2020, the coverage of giving Blood Addition Tablets (TTD) for adolescent girls reached 32.55% and decreased from 52.71% in 2019. Some health centers in the district are also still many who have not given blood supplement tablets such as in lecture places or faculties where adolescents are not given blood supplement tablets at all (*Profil Kesehatan Provinsi Sumatera Utara Tahun 2020*, n.d.).

The high incidence of anemia in adolescent girls is also influenced by their indiscretion in taking blood supplement tablets, which often cause side effects such as nausea, stomach pain, vomiting, and sometimes diarrhea or difficulty in defecating. In addition, factors such as laziness, forgetting to take the tablets, and feeling that they do not need them also contribute (Rahayu et al., 2024). To address this issue, in addition to providing blood supplement tablets, it is important to provide health education and increase iron intake through food (Norlita et al., 2023). In addition to pharmacological treatments, non-pharmacological treatments such as vegetable consumption are also very important. Iron sources can be found in both animal and plant foods, with animal sources generally having higher iron levels despite being more expensive. One source of plant-based iron is red spinach Amaranthus tricolor L), which is a multipurpose plant and contains much higher ron than ordinary spinach (Spinacia oleracea).[8] In addition to iron, red spinach is also rich in important nutrients such as vitamin C, Vitamin A, folate, and vitamin B12. Vitamin C helps in the absorption of iron, while folate and vitamin B12 are necessary for the production of red blood cells. With its rich nutritional content red spinach can be a source of minerals such as calcium, iron, potassium and nasgnesium, which are effective in overcoming iron deficiency and anemia (Endang Sari, Mekar Zenni Redhia, 2024).

Several ways are used to increase consumer interest and reduce the distinctive taste of herbal drinks from red spinach tea, one of the efforts is to add stevia leaves (Stevia rebaudiana) as a natural sweetener. Stevia leaves contain various phytochemical compounds such as alkaloids, saponins, tannins, steroids phenolics, triterpenoids, and glycosides. Another benefit if making red spinach tea combined with stevia leaves, in order to produce herbal drinks with optimal antioxidant activity and flavor characteristics. However, this stevia leaf is only a flavor and aroma enhancer, the dose given is also only a little, therefore it does not affect hemoglobin levels in overcoming anemia (Murhadi et al., 2023). Based on description above, this study aimed to improve hemoglobin, hematocrit, and erythrocyte levels in adolescent girls by providing 2 grams of red spinach tea per day for 14 days.

METHOD

This type of research uses True Experiment design with pretest and posttest desīgn with control group. This research design involves two groups namely the intervention group in this study was given Red Spinach Tea Amaranthus tricolor L) as much as 2 grams per day, and 60 mg Fe tablets for 14 days. the control group in this study was given Fe tablets for 14 days. The affordable population in this study were 20 female students aged 17-19 years who experienced mild and moderate anemia. The sampling technique used was probability sampling using simple random sampling. This research instrument ased observation sheets for compliance with drinking red spinach tea and blood supplement tablets. To measure hemoglobin levels, hematocrit and erythrocyte count using hematology analyzer. Confounding variables (menstrual cycle, age. and BMI) were measured using observation

sheets. This study already has an ethical clearance certificate issued by the Poltekkes Kemenkes Semarang with No.1152/EA/F.XXIII.38/2024. Univariate data analysis was used to analyze the characteristics of respondents, namely age. nenstrual cycle and BMI. Bivariate data analysis of normality test using Shapiro Wilk test, then homogeneity test with Levene test. Bivariate test for paired groups with non-normally distributed data using the Wilcoxon test. Bivariate tests for anpaired groups of pre and post data are not normally distributed, then use the Mann-Whitney test.

RESULT

Table 1.
Organoleptic Test Results

Taste	Percentage Strongly and Moderately Favorable			
	A1	A2	B1	B2
Really like	4	0	4	12
Just Like	24	36	56	56
Less Like	68	64	40	32
Do not like	4	0	0	0
Very Dislike	0	0	0	0
Total Very Like and Fairy Like	28%	36%	60%	68%
Aroma	Percentage of Very Like and Quite Like			
	A1	A2	B1	B2
Really like	8	4	4	20
Just Like	4	28	28	52
Less Like	88	64	64	28
Do not like	0	4	4	0
Very Dislike	0	0	0	0
Total Very Like and Moderately Like	12%	32%	32%	72%
Texture	Percentage of Very Like and Quite Like			
	A1	A2	B1	B2
Really like	0	0	12	16
Just Like	36	44	68	76
Less Like	64	56	20	8
Do not like	0	0	0	0
Very Dislike	0	0	0	0
Total Very Like and Fairy Like	36%	44%	80%	92%
Color	Percentage of Very Like and Quite Like			
	A1	A2	B1	B2
Really like	0	4	4	24
Just Like	36	32	72	60
Less Like	52	56	24	16
Do not like	12	8	0	0
Very Dislike	0	0	0	0
Total Very Like and Fairy Like	36%	36%	76%	84%

Based on Table 1 results organoleptic test average based on parameters of taste, aroma, texture and color can seen in Figure 1.

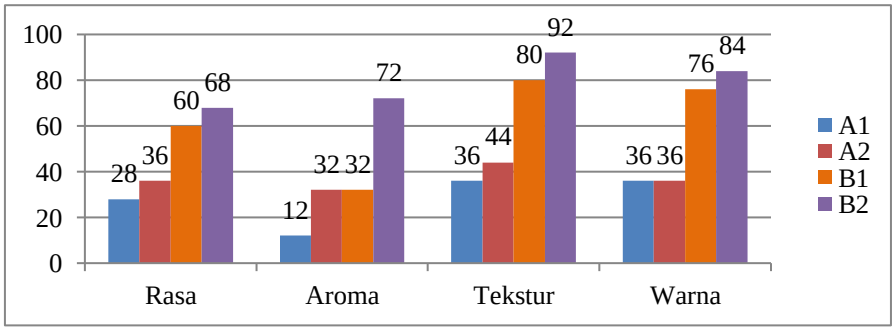

Figure 1. Organoleptic Test Graph

Based on organoleptic test that has been conducted to 25 panelists, the results of formulation B2 are the most preferred from the presentation of taste, aroma, texture, and color. So this research uses formulation B2.

Table 2.
Characteristics of Confounding Variables

Variables	Intervention			Control			*p-value*
	N	%	*Mean* ± SD	N	%	*Mean* ± SD	
Age							
Min-Max	17-19		17.95±0.605	17-18		17.75±0.444	
17 years	4	20		5	25		
18 years	13	65		15	75		0.965
19 years old	3	15		0	0		
Menstrual Cycle							
Min-Max	22-36		27.20±2.567	20-37		27.20±3.071	
<21 Days	0	0		1	5		
21-35 Days	19	95		18	90		0.719
>35 Days	1	5		1	5		
IMT							
Min-Max	10.80-33.73		20.75±4.6640	17.70-27.16		22.26±2.3694	
IMT							
<18.5	6	30		3	15		
18.5-25.0	12	60		16	80		0.148
>27	2	10		1	5		

Based on table 2, The study found that the intervention and control groups were similar in terms of age, menstrual cycle, and Body Mass Index (BMI). In both groups, the majority of respondents were 18 years old, with a homogeneity test result of $p = 0.965$. Regarding the menstrual cycle, most participants had a cycle of 21-35 days, with homogeneity confirmed at $p = 0.719$. For BMI, the majority fell within the normal range (18.5-25.0), with homogeneity indicated by $p = 0.148$. These results suggest that the two groups were comparable across these variables.

Table 3.
Normality Test

Variables	Group		Group	
	Intervention (n=20)		Control (n=20)	
	p-value *	Information	*p-value* *	Information
Hemoglobin *Pre*	0.218	Normal	0,000	Abnormal
Hemoglobin *Post*	0,000	Abnormal	0.043	Abnormal
Hemoglobin Difference	0.035	Abnormal	0,000	Abnormal
Hematocrit *Pre*	0,000	Abnormal	0.199	Normal
Hematocrit *Post*	0,000	Abnormal	0.825	Normal
Hematocrit Difference	0.612	Normal	0.015	Abnormal
Pre Erythrocytes	0.208	Normal	0.037	Abnormal
Erythrocyte *Post*	0.497	Normal	0.180	Normal
Erythrocyte Difference	0.329	Normal	0.545	Normal

**Shapiro-Wilk*

Table 4.
Homogeneity Test

Variables	Intervention Group	Control Group	*p-value**
	Mean ± SD	*Mean* ± SD	
Hemoglobin *Pre*	11.20±0.3300	11.14±0.7074	0.100
Hematocrit *Pre*	33.87±1.3074	33.70±1.1945	0.465
Pre Erythrocytes	3.52±0.1905	3.58±0.2279	0.199

**Lavene's Test*

Based on table 3, the results of the normality test using Shapiro-Wilk in table 3, it shows that not all data are normally distributed with a p-value <0.05. So the test used is a non-parametric

test. The tests used were Wilcoxon test and Mann Whitney because they were not normally distributed. Data processing using the SPSS program by comparing the asymp. sig (2-tailed) value with a (0.05).

Based on table 4 above, it is known that in testing the homogeneity test using *lavene's test*, the *p-value* > 0.05 is obtained, so that concluded that all variables in study are homogeneous.

Table 5.
Effect of Red Spinach Tea (*Amaranthus Tricolor L*) on Hemoglobin Levels

Variables	Intervention Group (n=20)	Control Group (n=20)	*p-value***
	Mean ± SD	*Mean* ± SD	
Hb *pre*	11.20±0.3300	11.14±0.7074	0.541
Hb *post*	12.49±0.4217	12.07±0.3683	0.001
*p-value**	0,000	0,000	
Δ Hb *pre* – Hb *Post*	1.28±0.3829	0.90±0.5114	0.001

**Wilcoxon*
***Mann Whitney*

Based on table 5, the intervention group given red spinach tea (Amaranthus Tricolor L) 2 grams once a day and blood supplement tablets 60 mg once a day for 14 days was able to increase hemoglobin levels by 1.28 grams/dL. In the control group that was given blood supplement tablets alone for 14 days only increased hemoglobin levels by a mean delta value of 0.90gr/dL. It can be interpreted that there is a significant effect of giving red spinach tea (Amaranthus Tricolor L) 2 gr once a day and blood supplement tablets 60 mg once a day for 14 days compared to blood supplement tablets 60 mg once a day for 14 days with a p-value of 0.001. Table 5 also explains that the intervention group has a higher hemoglobin level of 0.38gr/dL compared to the control group. Based on this difference in accordance with the Wilcoxon test seen from the p-value of 0.001 (<0.05) which means there is a significant difference in hemoglobin levels in the intervention group and control group. In the Mann Whitney test, both groups in the pre-test found no difference between the two groups before treatment with a p-value of 0.541. In the post-test group, there was a difference between the two groups after treatment with a p-value of 0.001.

Table 6.
Effect of Red Spinach Tea (*Amaranthus Tricolor L*) on Hematocrit Levels

Variables	Intervention Group (n=20)	Control Group (n=20)	*p-value***
	Mean ± SD	*Mean* ± SD	
Hematocrit *pre*	33.87±1.3074	33.70±1.1945	0.978
Hematocrit *post*	39.42±1.8970	36.46±1.2947	0,000
*p-value**	0,000	0,000	
Δ Hematocrit *pre* – Hematocrit *Post*	5.54±2.0748	3.11±1.648	0,000

**Wilcoxon*
***Mann Whitney*

Table 7.
Effect of Red Spinach Tea (*Amaranthus Tricolor L*) on Erythrocytes Counts

Variables	Intervention Group (n=20)	Control Group (n=20)	*p-value***
	Mean ± SD	*Mean* ± SD	
Pre erythrocytes	3.52±0.1905	3.58±0.2279	0.297
Erythrocyte *post*	4.13±0.2727	3.90±0.1533	0.006
*p-value**	0,000	0,000	
Δ *Pre -erythrocytes – Post- erythrocytes*	0.61±0.2843	0.32±0.1498	0.001

**Wilcoxon*
***Mann Whitney*

Based on table 6, The study found that administering 2 grams of red spinach tea along with 60 mg of blood supplement tablets daily for 14 days resulted in a greater increase in hematocrit levels (5.54%) compared to taking blood supplement tablets alone (3.11%). This indicates a significant effect of red spinach tea supplementation, as evidenced by a *p*-value of 0.000.

Based on table 7, the intervention group given red spinach tea (Amaranthus Tricolor L) 2 g once a day and blood supplement tablets 60 mg once a day for 14 days was able to increase erythrocyte levels by 0.60 million/mm^3. Whereas in the control group that was given blood supplement tablets alone for 14 days only increased erythrocyte levels by 0.32 million/mm^3. It can be interpreted that there is a significant effect of giving red spinach tea (Amaranthus Tricolor L) 2 gr 1 time a day and blood supplement tablets 60 mg 1 time a day for 14 days compared to blood supplement tablets 60 mg 1 time a day for 14 days with a p-value of 0.006. Table 7 also explains that the intervention group had higher erythrocyte levels of 0.28 million/mm^3 compared to the control group. Based on this difference, it is consistent with the Wilcoxon test seen from the p-value of 0.001 (<0.05) which means that there is a significant difference in hematocrit levels in the intervention group and the control group. In the Mann Whitney test, both groups in the pre-test found no difference between the two groups before treatment with a p-value of 0.297. In the post-test group, there was a difference between the two groups after treatment with a p-value of 0.006.

DISCUSSION

The results showed an average increase in hemoglobin levels in the intervention group increased to 1.28 gr/dL. Research conducted by Patimah Siti (2019) showed that before being given red spinach juice, hemoglobin (Hb) levels in the respondent group had a minimum value of 11.00 gr/dl and a maximum of 11.90 gr/dl, with an average of 11.51 gr/dl, a median of 11.50 gr/dl, and a standard deviation of 0.245. After being given treatment in the form of consumption of red spinach juice, Hb levels increased with a minimum value of 11.60 gr/dl and a maximum of 13.00 gr/dl, an average of 12.21 gr/dl, a median of 12.10 gr/dl, and a standard deviation of 0.381. These results indicate an increase in hemoglobin levels after giving red spinach juice (Patimah et al., 2022). Consistent with Zulmi et al., (2022) study, 90.5% of the intervention group that consumed red spinach incorporated into noodles experienced an increase in hemoglobin (Hb) levels, compared to only 71.4% in the control group, which showed no improvement. This finding suggests that red spinach can positively influence blood profiles by increasing hemoglobin levels in young women suffering from anemia. Additionally, Kusbandiyah et al., (2023) study concluded that red spinach (*Amaranthus tricolor* L.) is a potential anti-anemia treatment due to its high flavonoid and phenol content, which enhances iron absorption. The combination of red spinach and chrysanthemum extract was found to contain a total flavonoid content of 85.33 mg QE/g and a total phenol content of 25.22 GAe/g. These compounds can improve iron bioavailability, making red spinach a beneficial option for addressing anemia, particularly in adolescents.

The results showed that the average hematocrit level in the intervention group increased by 5.54%. A study conducted by Wilandri et al., (2023) examined the effects of red spinach-containing snacks on hemoglobin and hematocrit levels in anemic adolescent girls. The study found a significant increase in hemoglobin levels (0.4 g/dL) and hematocrit levels (2.1%) after 14 days of treatment, indicating that red spinach can serve as an effective alternative food to help manage anemia. Hematocrit is a measure of the number of red blood cells in the blood. A hematocrit test is performed to determine the ratio of the number of red blood cells to the total blood volume, which can provide information about health conditions, such as anemia or dehydration (Subhan et al., 2023).

The results howed an average increase in erythrocyte levels in the intervention group increased by 0.60 million/mm3. Erythrocytes play an important role in the oxidation process of body tissues by binding oxygen, thanks to the presence of hemoglobin (Rais et al., 2022). To prevent and overcome anemıa in adolescent girls, there are two approaches that can be taken. Pharmacological approach, which is by taking 1 Fe tablet every day to fulfill the iron requirement. The non-pharmacological approach is to use the easily available red spinach around us, which is rich in iron and other essential nutrients, as a natural way to overcome anemia (Nurhayati Panjaitan, 2021). Red spinach can be processed into tea using about 54 fresh leaves or about 100 grams, which can help increase iron consumption effectively. Red spinach is a plant-based food source rich in various nutrients, especially iron, which is contained at 7 mg per 180 grams of red spinach leaves (Rohmatika & Wulandari, 2019).

Red blood cells have an average life span of about 120 days and are a major part of the circulating blood. When the need for erythrocytes increases, cells that are not fully mature can be released into circulation. The results of this study are expected to be a contribution and recommendation in midwifery services as an alternative therapy to treat anemia in adolescent girls. Its use as a complement to blood supplement tablets is expected to increase the effectiveness of iron absorption from the tablets. In addition, Red Spinach Tea (Amaranthus Tricolor L), which is proven effective in increasing hemoglobin, hematocrit, and erythrocyte count, has the potential to be mass-produced commercially.

CONCLUSION

Giving red spinach tea (Amaranthus Tricolor L) dose of 2 gr plus Fe tablets 60 gr consumed once a day for 14 days has the effect of increasing hemoglobin levels, hematocrit levels and erythrocyte levels in anemic adolescent girls. Marked by an increase in the average hemoglobin level in the intervention group increased to 1.28 gr/dL, hematocrit levels in the intervention group increased by 5.54% and erythrocyte levels in the intervention group increased by 0.60 million/mm³.

REFERENCES

Astuti, D., & Kulsum, U. (2020). Pola Menstruasi Dengan Terjadinya Anemia Pada Remaja Putri. *Jurnal Ilmu Keperawatan Dan Kebidanan*, *11*(2), 314–327.

Endang Sari, Mekar Zenni Redhia, H. Z. S. (2024). The Effect of Red Spinach Juice on Hemoglobin Levels in Pregnant Women : A Randomized Controlled Trial. *Sriwijaya Journal of Obstetrics and Gynecology*, 92–102.

Hasil Utama Riskesdas 2018. (2018).

Kusbandiyah, J., Puspadewi, Y. A., & Maghfiroh, D. O. (2023). Analysis Of Total Flavonoid And Phenol Content From The Combination Of Red Spinach (Amaranthus Tricolor L.) Ethanolic Extract And Chrysanthemum Flower (Chrysanthemum Morifolium) Ethanolic Extract As A Potential Anti-Anemic. *Jurnal Pendidikan Keperawatan Indonesia*, *9*(1), 37–48. https://doi.org/http://dx.doi.org/10.17509/jpki.v9i1.58209

Kusnadi, F. N. (2021). Hubungan Tingkat Pengetahuan Tentang Anemia Dengan Kejadian Anemia Pada Remaja Putri. *Jurnal Media Hutama*, *03*(01), 1293–8.

Murhadi, Eriska, S., Nur, M., & Rizal, S. (2023). The Effect Of Addition Of Mint Leaf (Mentha piperita L.) And Stevia Leaf (Stevia rebaudiana) On The Sensory Characteristics Of Moringa (Oleifera) Tea. *Jurnal Agroindustri Berkelanjutan*, *2*(2), 264–271.

Norlita, W., Isnaniar, & Hardiyanti, R. (2023). Tingkat Kepatuhan Remaja Putri dalam Mengonsumsi Tablet Tambah Darah di SMK Abdurrab Pekanbaru. *Jurnal Kesehatan As-Shiha*.

Nurhayati Panjaitan, M. (2021). Pengaruh Rebusan Bayam Merah terhadap Peningkatan

Kadar Hemoglobin Remaja Putri di Kelurahan Losung Kecamatan Padangsidimpuan Selatan Kota Padangsidimpuan Tahun 2020. *Jurnal Kesehatan Ilmiah Indonesia*, *6*(1), 80. https://doi.org/https://doi.org/105.51933/health.v6il.414

Nurrahmaton, Ramini, H. N., Sartika, D., & Lucitari, A. M. (2023). Pemberian Puding Buah Bit (Beta Vulgaris) Terhadap Peningkatan Kadar Hemoglobin Pada Remaja Putri Dengan Anemia. *Jurnal Kebidanan*, *12*(2), 1–6.

Patimah, S., Rahmandari, F., & Kurnia, H. (2022). Perbandingan Pemberian Jus Bayam Merah Dan Jus Bayam Hijau Terhadap Kadar Hb Pada Remaja Putri. *Jurnal Bidan Komunitas*, *5*(1).

Profil Kesehatan Provinsi Sumatera Utara Tahun 2020. (n.d.).

Putri, A. R. A., & Anjelin, R. (2023). Pengaruh Bayam Merah dalam Peningkatan Status Anemia di Puskesmas Kota Jambi. *Pharmacon Journal*, *1*(1).

Rahayu, P., Farahdiba, I., Ariyanti, R., Yulianti, I., Permatasari, A. E., & Noviani, D. (2024). Pengaruh Pemberian Tablet Tambah Darah dan Buah Kurma Sukari (Phoenix dactylifera) terhadap Kadar Hemoglobin Ibu Hamil Anemiadi Puskesmas Karang Rejo. *Jurnal Penelitian Inovatif*, *4*(3), 1323–1330.

Rais, M. D. A., Arif, F., Arifuddin, M. F., Muhammad, M., Kaswar, A. B., & Kurnia Prima Putra. (2022). Metode Otomatis untuk Menghitung Sel Darah Merah Menggunakan Image Processing. *Journal of Embedded System Security and Intelligent System*, *3*(2), 102.

Rohmatika, D., & Wulandari, I. S. (2019). Analisis Dampak Terapi Kombinasi Jus Bayam Hijau, Jambu dan Madu terhadap Kadar Hemoglobin dan Prestasi Belajar Mahasiswa. *Jurnal Kebidanan Indonesia*, *10*(1), 86.

Subhan, F. A. F., Andika, I. G., & Prihandono, D. S. (2023). Perbedaan Nilai Hematokrit Metode Mikrohematokrit Menggunakan Darah Kapiler Pada Posisi Duduk Dan Berbaring. *Jurnal Kesehatan Tambusai*, *4*(4), 6462–6468.

Wilandri, G. L., Kusumawardani, N., Viray, D. T., & Aprilia, V. (2023). Red spinach-containing snack food improved hemoglobin and hematocrit levels of girl adolescents in Riau Archipelago. *Indonesian Journal of Nutrition and Dietetics*, *11*(3), 152–159. https://doi.org/http://dx.doi.org/10.21927/ijnd.2023.11(3)

Zulmi, D., Rusli, D. A., Nufus, H., Andini, K. P., Soviah, S., & Yuliyani, L. (2022). Mie Lidi Bayam Merah untuk Meningkatkan Haemoglobin pada Remaja Putri. *Jurnal Obstretika Scientia*, *10*(2), 132–151.