INTERNATIONAL JOURNAL OF HOLISTIC CARE

JOURNAL HOMEPAGE : HTTPS://JOURNAL.HAZIQCORP.COM/INDEX.PHP/IJHC

The Effect Of Giving Beetroot Juice On Increasing Hemoglobin Levels In Anemia Patients: A Literature Review

Rian Aldiansyah[1], Miftahul Falah[1]

[1] Nursing Department, Faculty of Health, Universitas Muhammadiyah Tasikmalaya, Tasikmalaya 46191, Indonesia

OPEN ACCESS

International Journal of Holistic Care

Volume 1 No.2 Hal. 54-59

Article Info

Submit	:	12 Maret 2025
Revision	:	20 April 2025
Accepted	:	11 May 2025
Available Online	:	28 July 2025

Corresponding Author
aldiansyahrian028@gmail.com

Website
International Journal of Holistic Care

P-ISSN : -
E-ISSN :-

ABSTRACT

Anemia in adolescent girls is a significant chronic health problem that remains prevalent in Indonesia, characterized by low hemoglobin levels due to inadequate iron intake and blood loss during menstruation. Although iron supplementation programs using Fe tablets have long been implemented, adherence among adolescents remains low because of gastrointestinal side effects, creating the need for alternative treatments that are safer, more acceptable, and affordable. One promising intervention is beetroot juice, which contains betacyanin, iron, folate, vitamin C, and antioxidants that support red blood cell formation and enhance iron absorption. This literature review aims to identify the effects of beetroot juice in increasing hemoglobin levels among anemic adolescent girls. This study used a Systematic Literature Review (SLR) method by searching relevant articles on Google Scholar published between 2019 and 2025. The analysis revealed that all included studies reported a significant increase in hemoglobin levels following the consumption of beetroot juice, either as a single intervention or in combination with dragon fruit or Fe tablets. Interventions lasting 7–14 days were shown to increase hemoglobin levels by 0.40–2.7 g/dL. These findings demonstrate that beetroot juice is highly effective and can serve as a supportive long-term management option for anemia, especially for adolescents with low adherence to Fe supplementation.

Keyword: Beetroot juice, hemoglobin, anemia, adolescent girls

INTRODUCTION

Anemia in adolescent girls is a significant health problem that is increasing in Indonesia and worldwide. Due to rapid growth and frequent blood loss during menstruation, adolescent girls are susceptible to anemia, according to Rohanah et al. (2024). This is in line with research by Windia Putri, Kurniawati, and Lestari (2025), which found that suboptimal anemia management and prevention are caused by adolescents' perception that anemia is not a serious problem. According to research by Sulistiana, Sari, and Yulanda (2022), 25% of Indonesian adolescents suffer from anemia. Long-term effects of this condition include developmental disorders, chronic fatigue, and the risk of future pregnancy complications.

The most common treatment is taking iron tablets. However, according to Munawaroh & Winarni (2023), due to side effects such as nausea and gastrointestinal problems, adolescent compliance with iron supplementation is still low. Therefore, developing alternatives that do not use pharmacological agents is crucial. Beetroot and dragon fruit are widely researched options. Beets are known to contain very high levels of betacyanin, iron, folate, vitamin C, and antioxidants that aid in red blood cell formation and increase hemoglobin levels. Rohanah et al. (2024) state that dragon fruit also contains many phytochemicals and prebiotics, which help the intestines absorb iron.

Several studies have shown that beetroot juice-based interventions may be beneficial. For example, research by Zuhraini et al. (2019) showed that adolescent girls who consumed beetroot juice for 7 days significantly increased their hemoglobin levels. Similar results were found in studies by Putri et al. (2025), Sulistiana et al. (2022), and Munawaroh & Winarni (2023). Furthermore, Rohanah et al. (2024) also found that beetroot juice or a mixture of beetroot and dragon fruit juice could be a safe, natural, and easily accepted alternative to help increase hemoglobin levels in adolescent girls. This is because conventional iron supplementation programs are ineffective due to the high rate of anemia in adolescents.

METHOD

Data Source

The data source used in the article search was Google Scholar, with publications spanning 2019-2025. Articles were selected based on their relevance to the topic of the effect of beetroot juice on reducing anemia.

Search Strategy

The search was conducted electronically on December 2, 2025, using the advanced search feature in Google Scholar. Keywords used in the search included: "beetroot juice on hemoglobin in adolescent girls," "beetroot anemia in adolescents," "beetroot juice on hemoglobin in adolescents," and "the effect of beetroot juice on Hb levels." Boolean operators such as AND, OR, and NOT were used to narrow the search.

The initial search process yielded several articles, which were then selected based on their relevance to the topic of the effect of beetroot juice on increasing hemoglobin levels. After filtering using the PRISMA standard, five articles met the criteria for further analysis.

To determine relevance, the authors used the PICO (population, intervention, comparison, outcomes) framework to formulate a clinical question as the basis for selection. The clinical question formulated was: "Does beetroot juice administration affect hemoglobin levels?"

Table 1 Research Question (PICO Framework)

Key Elements	Description	Terms
Population	Anemic adolescent girls with hemoglobin levels <12 g/dL. Age range: 12–19 years.	Adolescent girls, anemic adolescents, female students.
Intervention	*Beetroot juice*	beetroot juice, combination of beetroot and dragon fruit juice, iron tablets, A/B/C model.
Comparison	Control group administration of iron tablets	Pretest vs. posttest, control group with iron tablets, comparison between intervention groups.
Outcomes	Statistically significant increase in Hb ($p < 0.05$)	Increased Hb levels, increased hemoglobin, significant, effective increase in Hb.

Selection Criteria

Inclusion Criteria: Articles were included if they met the following criteria:

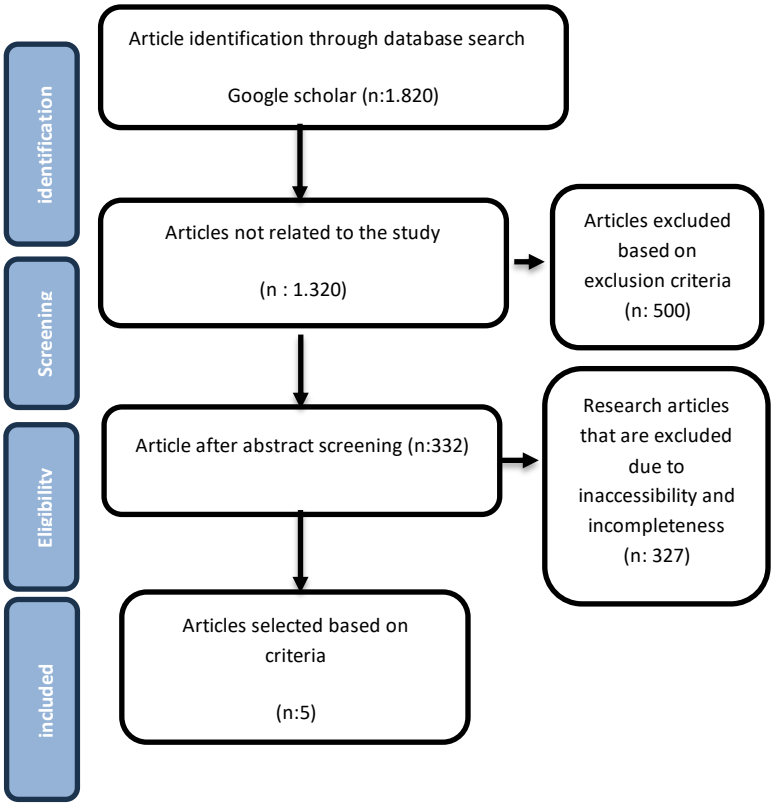
(a) The article was published between 2019 and 2025, (b) the publication year of the five journals used.

(c) The study population was adolescent girls (aged 12–19 years).

(d) Exclusion Criteria: Articles were excluded if they met any of the following criteria:

(a) Irrelevant Population, (b) Inappropriate Intervention, (c) Article Type (d) Incomplete Data, (e) Inaccessible

Chart 1 PRISMA DIAGRAM



RESULT

An analysis of the five articles showed that all studies showed similar results. In adolescent girls with anemia, hemoglobin (Hb) levels increased significantly when they were given beetroot juice, a combination of beetroot juice and dragon fruit juice, and iron tablets.

According to research conducted by Rohanah et al. (2024), all three interventions significantly increased Hb levels. The group receiving a combination of beetroot juice, dragon fruit juice, and iron tablets, as well as iron tablets alone, experienced the highest increase, from 11.08 g/dL to 13.84 g/dL.

Research by Windia Putri et al. (2025) also found that after a 14-day beetroot juice intervention, hemoglobin levels increased from 11.44 g/dL to 12.43 g/dL. Sulistiana et

al. (2022) also found a similar increase, increasing Hb from 10.6 g/dL to 11.3 g/dL after administering beetroot juice to adolescent girls suffering from anemia.

Munawaroh and Winarni (2023) found that consuming beetroot juice increased Hb levels from 11.41 g/dL to 11.75 g/dL. On the other hand, Zuhraini et al. (2019) found an increase from 10.68 g/dL to 11.08 g/dL within 7 days of intervention.

No	First Author	Year	Research Design	Sample Size	Objective and Results
1.	Rohanah et al.	2024	RCT	90	**Objective:** To find out the effectiveness of dragon fruit and beetroot juice with Fe tablets on increasing Hb.. **Results:** Significant increase in Hb in all groups; highest in the combination of beetroot juice + dragon fruit + Fe (11.08 → 13.84 g/dL)
2.	Windia putri et al.	2025	Pre-experimental (One Group Pretest–Posttest)	80	**Objective:** To determine the effect of beetroot juice consumption on Hb in adolescent girls **Results:** Hb increased significantly: 11.44 → 12.43 g/dL ($p < 0.001$)
3.	Sulistiana et al.	2022	Pre-experimental (One Group Pretest–Posttest)	20	**Objective:** Measuring the effect of beetroot juice on Hb in adolescent girls **Results:** Hb increased from 10.6 → 11.3 g/dL; significant ($p = 0.000$)
4.	Munawaroh & Winarni	2023	Pre-experimental (One Group Pretest–Posttest)	21	**Objective:** To determine the effect of giving beetroot juice to adolescent girls with anemia. **Results:** Hb increased from 11.41 → 11.75 g/dL; significant ($p = 0.001$)
5.	Zuhraini	2019	Quasi Experimental (One Group Pretest–Posttest)	**17**	**Objective:** Knowing the effect of beetroot juice on increasing Hb. **Results:** Hb increased from 10.68 → 11.08 g/dL; $p = 0.001$

DISCUSSION

The nutritional content of beetroot, including iron, folate, vitamin C, and betacyanin, which play a direct role in hemoglobin formation, contributes to beetroot juice's ability to increase hemoglobin levels in adolescent girls with anemia. Vitamin C aids the absorption of non-heme iron, resulting in increased red blood cell production (Windia Putri et al., 2025).

According to research conducted by Sulistiana et al. (2022) and Munawaroh & Winarni (2023), Exclusive administration of beetroot juice was sufficient to significantly increase Hb levels. All studies showed a p-value <0.05, although reported increases varied.

In these studies, the interventions lasted from 7 to 14 days, and studies with longer durations typically show greater Hb increases. For example, Windia Putri et al. (2025) for 14 days showed an increase of almost 1 g/dL, while Zuhraini et al. (2019) for 7 days showed an increase of 0.40 g/dL. This suggests that medium-term interventions (10–14 days) are more effective in increasing Hb.

In a study by Rohanah et al. (2024), the most significant results were obtained in the beetroot juice + dragon fruit + iron tablet intervention group. The highest Hb levels were achieved with the combination of natural nutrients and iron supplementation. Iron tablets contain the key components in hemoglobin synthesis, ferrous sulfate and folic acid.

These results suggest that combining natural and pharmacological interventions may be an alternative method for treating anemia, especially in adolescents with low adherence to iron tablets.

Due to menstruation, high iron requirements, and poor diet, adolescent girls are most susceptible to anemia. A study by Munawaroh and Winarni (2023) found that an intervention based on beetroot juice may be preferable to adolescents' iron tablets, which often cause intestinal side effects.

CONCLUSION

Based on the analysis of the five articles reviewed, it can be concluded that beetroot juice has been proven effective in increasing hemoglobin levels in adolescent girls with anemia. All studies showed a significant increase in Hb after the intervention, either through beetroot juice alone or in combination with dragon fruit juice and iron tablets. Beetroot contains iron, vitamin C, folate, betacyanin, and antioxidants that play a direct role in the process of red blood cell formation and non-heme iron absorption. The intervention duration of 7–14 days resulted in an increase in Hb varying between 0.40–2.7 g/dL, with the largest increase in the combination of beetroot juice, dragon fruit juice, and iron tablets. These findings indicate that beetroot juice is a safe, natural, inexpensive, and easily accepted non-pharmacological intervention, so it can be used as a companion to the iron tablet supplementation program in treating anemia in adolescent girls

SUGGESTION

Based on the study results, it is recommended that health workers utilize beetroot juice as a supporting intervention in anemia prevention and treatment programs for adolescent girls, given its proven effectiveness in increasing hemoglobin levels and its better acceptability compared to iron tablets alone. Adolescent girls are also encouraged to consume beetroot juice regularly for 7–14 days and maintain a diet high in iron and vitamin C to support optimal iron absorption. Future researchers need larger sample sizes, longer intervention durations, and stricter dietary controls to achieve more accurate and generalizable results.

REFERENCE

Rohanah, R., Ratih Puspita, R., Dara Wijaya, R., Dwi Pratiwi, R., & Rahma Safitri, E. (2024). The effectiveness of dragon fruit juice (hylocereus polyrhizus) and beetroot (beta vulgaris) with Fe tablets on increasing hemoglobin levels in adolescents.

Putri, W., Kurniawati, H. F., & Lestari, S. (2026). The Effect of Beetroot Juice Consumption on Increasing Hemoglobin Levels in Female Adolescents at SMA N 1 Minggir. Borneo Nursing Journal (BNJ), 8(1), 1283-1290.

Sulistiana, E., & Sari, H. (2022). P The Effect of Giving Beetroot Juice (Beta Vulgaris) on Increasing Hemoglobin Levels in Female Adolescents of Class X Ips at MAN 2 Model Medan in 2022. Journal of Midwifery & Reproductive Health Research, 5(1), 110-117.

Munawaroh, M., & Winarni, W. (2023). The Effect of Beetroot Juice on Increasing Hemoglobin Levels in Adolescent Girls with Anemia. Journal of Anesthesia, 1(4), 248-260.

Zuhraini, R., Anggraini, A., Kurniasari, D., & Suharman, S. (2021). The Effect of Beetroot Juice on Increasing Hb in Adolescent Girls. Midwifery Journal, 1(3), 144-149

Lepkowska, D. (2019). The impact of iron deficiency anaemia on teenage girls. *British Journal of School Nursing*, *14*(6), 293–294. https://doi.org/10.12968/BJSN.2019.14.6.293

Silitonga, H. T. H., Salim, L. A., & Nurmala, I. (2024). A systematic review of iron supplementation's effects on adolescent girls. *Jurnal Gizi Indonesia*, *12*(2), 60–69. **https://doi.org/10.14710/jgi.12.2.60-69**

Rahmatina, A. N., Ghozali, M., Adnani, Q. E. S., Hilmanto, D., Zuhairini, Y., Susiarno, H., & Panigoro, R. (2025). A Scoping Review of Nutritional Intake and Physical Activity in Adolescent Girls with Anemia. *International Journal of Women's Health*, *17*, 2891–2907. https://doi.org/10.2147/ijwh.s519269