ABDIMAS: Jurnal Pengabdian Masyarakat Universitas Merdeka Malang
Vol.10(2) May 2025, 368-375
p-ISSN: 2721-138X e-ISSN: 2548-7159
http://jurnal.unmer.ac.id/index.php/jpkm

LPPM
UNMER
MALANG

Health education method to improve anemia prevention knowledge in adolescents

Adelia Firandi[1], Ika Norcahyanti[1], Mikhania Christiningtyas Eryani[2]

[1]Department of Clinical and Community Pharmacy, Faculty of Pharmacy, [2]Department of Pharmaceutical Technology, Faculty of Pharmacy, Universitas Jember
JL. Kalimantan No 37, Kampus Tegalboto, Jember, East Java, 68121, Indonesia

ARTICLE INFO:

Received: 2025-02-04
Revised: 2025-03-11
Accepted: 2025-04-25
Published: 2025-05-30

Keywords:

Adolescents, Anaemia, Education, Prevention

ABSTRACT

Based on data from Riskesdas, the highest prevalence of anemia occurs in pregnant women (48.9 percent and adolescent girls aged 15-24 years (32 percent. Adolescent girls are a high-risk group for anemia due to blood loss during menstruation and the possibility of micronutrient deficiencies. Other identified causes include improper eating patterns and low adherence to consuming iron supplementation tablets (IST). To increase public knowledge about anemia, education is needed, one of which can be conducted through outreach in schools. This counseling aims to determine the students' level of understanding regarding anemia, which can subsequently enhance their knowledge and compliance with iron tablet consumption. The counseling was conducted at SMP Negeri 14 Jember on February 25, 2025, and attended by 32 student council members. The material was delivered through a PowerPoint presentation, leaflets, and games. Evaluation was conducted using a comparison of pre-test and post-test results to measure changes in students' knowledge about anemia. The results show an increase in knowledge among 71.88 percent of students, and from the statistical test results using the paired T-test, a significant result was obtained $p<0.05$. Based on this, educational activities aimed at preventing anemia using a counseling approach can enhance adolescents' understanding of anemia.

How to cite: Firandi, A., Norcahyanti, I., Eryani, M. C. (2025). Health education method to improve anemia prevention knowledge in adolescents. *Abdimas: Jurnal Pengabdian Masyarakat Universitas Merdeka Malang, 10*(2), 368-375. https://doi.org/10.26905/abdimas.v10i2.15446

1. INTRODUCTION

Indonesia faces a triple burden of nutritional issues, including malnutrition (stunting and wasting), overnutrition (overweight and obesity), and micronutrient deficiencies, such as anemia. Anemia is a condition when hemoglobin (Hb) concentration in the blood that is under the normal level. Hemoglobin acts to transport oxygen and distribute it to all the body's tissue. Oxygen lack in tissues affects the function, leading to impaired concentration in learning, decreased productivity, and a compromised immune system. Riskesdas 2018 indicates that the prevalence of anemia in children aged 5-14 years is 26.8 percent, whereas in individuals aged 15-24 years, it is 32 percent (Kemenkes RI, 2023). The World Health Organization (WHO) in the World Health Statistics 2021 indicates that the global prevalence of anemia among women of reproductive age in 2019 was approximately 29.9 percent, while the prevalence among non-pregnant women aged 15-49 years, including adolescents, was 29.6 percent (Aulya et al., 2022).

✉ Corresponding Author: **Andik Asmara**: Tel. +62 274 586168 | E-mail: andikasmara@uny.ac.id

Adolescent girls are susceptible to anemia due to substantial blood loss during menstruation and face the risk of developing anemia during pregnancy. This can adversely affect fetal growth and development, perhaps resulting in problems during pregnancy and childbirth, and may even lead to the demise of both mother and child (Puspitasari et al., 2023). Adolescents suffering by anemia experience weakness, weariness, lethargy, hue, dizziness, and diminished attention, which can affect physical development, cognitive function, and work efficiency. Consequently, the prevention of anemia in teenagers is crucial (Lubis et al., 2022).

The Ministry of Health, via the Jember District Health Office, has initiated initiatives to deal with anemia among teenagers in junior and senior high schools; nevertheless, it has not yet achieved a reduction in the prevalence of anemia (Ekowati, 2024). Anemia in pregnant women and teenage girls is related to food intake, comorbid conditions, and inadequate consumption of Iron Supplement Tablets (IST). The proportion of adolescent females following to iron tablet consumption guidelines remains notably low at 1.4 percent, whereas the percentage of pregnant women exceeding these levels is 38.1 percent (Kemenkes RI, 2018).

SMP Negeri 14 Jember is a junior high school primarily attended by kids from the local Antirogo Village. However it also enrolls students from the city of Jember. The location, which is readily accessible, is anticipated to attract students from the urban region encouraging them to apply at SMPN 14 Jember. The varied backgrounds of the students at this school, including those originating from lower-middle economic status, frequently lead to restricted access to health and nutrition information, resulting in many students being unaware of to the significance of balanced nutrition for supporting their growth and development, particularly regarding anemia concerns. School reports indicate that students, particularly female students, frequently show symptoms such as weakness, pallor, and syncope, which are typically inadequately addressed. The contributing causes include an imbalanced diet, inadequate intake of iron-rich foods, and a deficiency in awareness regarding the signs, preventive measures, and treatment of anemia. Moreover, social stigma and lack of resources for gaining proper information increase this condition.

In response to this issue, one initiative that might be undertaken is to conduct an education program for students at SMP Negeri 14 Jember, providing comprehensive knowledge about anemia, including its causes, symptoms, consequences, prevention, and treatment. This activity aims to enhance students understanding of the importance of a nutritious diet and balanced nutrition, along with the utilization of iron supplements pills. This program aims to coincide with governmental initiatives to reduce anemia in teenagers and enhance overall public health.

2. METHODS

Design, Time, Location, Targets

The method used for conducting this educational activity uses PowerPoint presentation,, discussion, and answering questions. The used media consists leaflet. The leaflet provides an overview and definition of anemia, its causes, symptoms, effects, prevention, therapy, and the utilization of iron supplements. The counseling session occurred on February 25, 2025, in SMP Negeri 14 Jember, involving 32 members of the student council (OSIS) as participants. The counseling process begins with the preparation stage, including an assessment of the environment and the partner's situation, with a review of relevant literature on anemia. The implementation part start with a pre-test, followed by a PowerPoint presentation, a discussion, a question-and-answer session, and completed with a post-test.

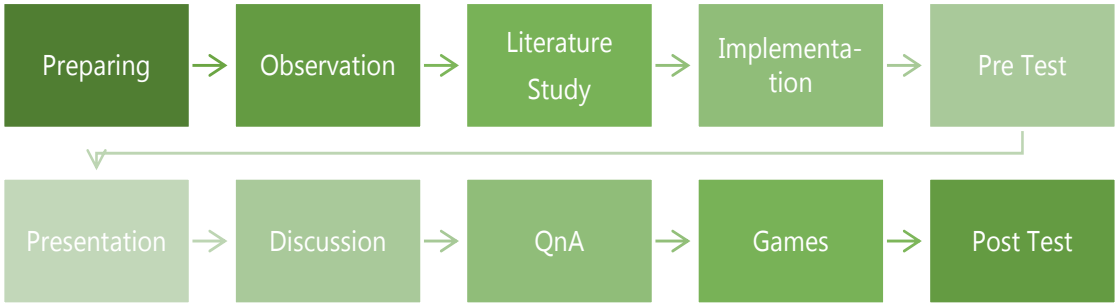

Figure 1. Stages of activity implementation process

Implementation

The Preparation Stage involves assessing the site at SMP Negeri 14 Jember and understanding the circumstances and requirements of students concerning anemia. This includes the examination of various risk factors, including inadequate nutrition in food, health, and students awareness of anemia. A literature research was performed to collect data concerning anemia, including its causes, symptoms, effects, preventative strategies, therapies, and the utilization of iron supplements pills. This will establish a solid and genuine basis to educate and address students questions.

The Implementation Stage includes a Pre-test given prior to the beginning of counseling activities to evaluate the students baseline knowledge of anemia. This is also useful for assessing the efficacy of the following measure in relation to the post-test outcomes. A comprehensive and interesting PowerPoint presentation on anemia was delivered, including an introduction as well as strategies for prevention and therapy with iron supplements. Subsequently, we engaged in a discussion and Q&A session to stimulate critical thinking, encourage personal experience sharing, and further explore concepts that may still be unclear to the students. A leaflet summarizing essential facts on anemia was distributed. This leaflet might additionally function as a supplementary educational resource for students and parents.

The preliminary assessment stage includes a post-test to measure the improvement of students knowledge following participation in the activity, as a measure for the activity's efficacy. Description of the pre-test and post-test materials are presented in Table 1.

Evaluation

The instrument used to evaluate the efficacy of this program is a series of questions that participants have to respond to in a pre-test before start taking the class and a post-test following its completion. The questionnaire consist of 10 items with a score of 10 for each question, a minimum score of 0, and a maximum score of 100. A table showing pre-test and post-test outcomes will be presented in the results section. This counseling activity will be assessed based on three criteria for completion. The achievement criteria for participants include an improvement in knowledge evaluated via pre-test and post-test results concerning student's comprehension of anemia, a change in mindset among the students for implementing a nutritious diet to prevent anemia, an increase in participants awareness of anemia, and the commitment and awareness regarding sufficient daily iron intake. The results of the difference between pre-test and post-test will be shown in the results section, along with statistical analysis and graphical presentation.

Table 1. Pre-test and postest list of multiple-choice questions

Question Items
What is the definition of anemia?
Who is most susceptible to anemia?
What are the common causes of anemia?
Why are woman more susceptible to anemia than man?
Which condition is not a symptom of anemia?
What is the minimum daily intake of water?
Here are the habits that make teenage girls often experience anemia, except?
Which foods or drinks should be avoided to prevent anemia?
How to take iron tablets suplementation properly?
Why should anemia be a concern in adolescents?

3. RESULTS AND DISCUSSION

Result

This community service program carried out by the team aims to educate and improve the participants's knowledge of anemia in adolescents including its causes, effects, and strategies for prevention and therapy. This program was conducted in collaboration with the principal and stakeholders at SMP Negeri 14 Jember with a total of 32 student council members. Of the 32 participants, 34.4 percent were male and 68.75 female.

Figure 2. Opening by lecturer
Figure 3. Participants from student council members of SMPN 14 Jember

The session began with a pre-test and presentation on anaemia, signs and symptoms, prevention, foods that are high in folate and iron, and the importance of taking iron supplements. The leaflet in figure 7 was given to participants to help them understand and remember the material without having to do much note-taking. Discussion was held along with a question-and-answer session to check the participants' understanding and games to review the material presented. The event was then closed with a post-test.

A quantitative evaluation was performed following the implementation, using statistical analysis via SPSS version 27. The statistical analysis of the pre-test and post-test data proceeded with a paired t-test to assess the difference in knowledge scores before and after the discussion. Table 2 shows a significant increase in knowledge, and understanding of anemia following this educational intervention. Before the presentation, the average knowledge of participants about anemia was 50.37 (±20.865),

indicating the lack a comprehensive understanding of the general overview of anemia including signs and symptoms, its causes, and methods for prevention and treatment before the learning material, and increased to 71.88 (±15.120) indicated a statistically significant difference with p-value < 0.05 after the discussion. These results showing a significant rise in knowledge following this educational intervention. The distribution of leaflets carrying important role to enhance students' comprehension and retention of the provided knowledge.

Figure 4. Participants working on pre-test

Table 2. Statistical analysis results

Indicator	Pre-Test (Mean ± SD)	Post-Test (Mean ± SD)	Sig. (p)
Knowledge of anemia	50.37 (±20.865)	71.88 (±15.120)	0.000

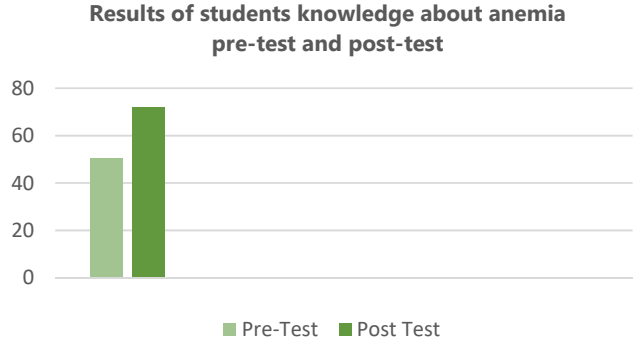

Figure 5. Pre-test and post-test of knowledge of students about anemia

Discussion

Anemia is a condition defined by a reduction in hemoglobin levels. Hemoglobin occurs in red blood cells, acting as oxygen carriers throughout the body (Hidayat et al., 2023). Anemia impacts 30 percent of women in reproductive age worldwide, with higher prevalence in regions of low socioeconomic level due to iron deficiency and poor dietary habits (Rahman et al., 2021). This leads to symptoms including fatigue, weakness, dizziness, and dyspnea. The optimum hemoglobin concentration required for physiological requirements differs based on age, gender, altitude, smoking habits, and pregnant status. Anemia may result from various factors, including nutritional deficiencies due to insufficient diets or impaired nutrient absorption, infections (e.g., malaria, parasitic infections, tuberculosis, HIV), inflammation, chronic illnesses, gynecological disorders, and hereditary blood cell disorders (WHO, 2025).

Figure 6. Education with presentation
Figure 7. Leaflet

Anemia, similar to stunting, remains a significant global concern, with over 50 percent of cases related to iron deficiency (WHO, 2017). Moreover, anemia increases the susceptibility of adolescent girls in the ability to bear a generation of stunted offspring (Handayani, 2021). Prior studies have indicated that deficits in many nutrients, such as iron, folate, vitamin B12, vitamin A, and vitamin D, can elevate the risk of anemia. Additional data suggest that mild to moderate food instability may elevate the risk of anemia (Moradi et al., 2018). Consequently, to support the government's initiative in providing the next generation for national growth, it is essential to implement broad education and counseling for adolescents concerning anemia and its management, aimed at enhancing awareness, preventing its incidence, and sustaining community quality of life.

The health education initiative regarding anemia at SMP Negeri 14 Jember has been effectively completed by the team. This community service program has demonstrated that their understanding and problem-solving abilities concerning anemia have improved. Community service serves as a primary way for the sharing of knowledge, technology, and resources from educational and research systems to the community, enhancing their quality of life (Zunaidi, 2024). The execution of these activities necessitates appropriate strategies to ensure a beneficial and enduring impact. A systematic and guided approach allows activities to operate efficiently and successfully, providing specific benefits for the target population (Hadiningrat et al., 2023).

The promotion of public involvement in service activities requires broad participatory and collaborative strategies to improve engagement, comprehension, and active participation during the event, including group discussions that enable participants to exchange their experiences, ideas, and opinions regarding the challenges met and optimal solutions (Zunaidi, 2024). Research by Riesmiyatiningdyah et al. (2021) demonstrates that nutrition counseling effectively enhances awareness of anemia in adolescent girls. Educational interventions significantly improve knowledge, perceptions, and behaviors for anemia prevention, with almost all studies showing statistically significant outcomes ($p < 0.05$). The outreach

was executed via many media, including print materials like leaflets, booklets, posters, and comics, alongside digital formats such as animated films. Moreover, interactive methodologies, including peer group education and instructional games, have shown efficacy.

The community service initiative we are using educates children on its importance of understanding, preventing, and managing anemia. This program gives education on anemia, including its symptoms, effects, and strategies for prevention and treatment, which are crucial for improving public health. Following the educational intervention, there was a significant improvement in participants' knowledge as assessed by pre-test and post-test results. The change in perception may be affected by various factors, including systematic and comprehensive education that delivers clear and comprehensible information, interactive learning techniques such as discussions and question-and-answer sessions that help participants in accepting knowledge and applying it practically, and repetition of information along with assessments during activities that strengthen learning and ensure ability of the content (Yunanto et al., 2024).

4. CONCLUSION AND RECOMMENDATIONS

The aim of this program has successfully improved students' understanding of anemia and its management. This program includes two stages: (1) The Education Phase, which includes PowerPoint presentations, leaflet distribution, and games; (2) The Evaluation Phase, this program shows an improvement in knowledge from 50.3 percent before to the education session to 71.88 percent following to it, showing a statistically significant difference with a p-value <0.05. Education is essential for preventing the prevalence of anemia through more effective interventions within the school setting. Therefore, extending the program in other schools is crucial for ensuring that the knowledge acquired may be implemented in their lives. However, this program is limited by the school's insufficient facilities, restricting the offer of counseling for every student. To enhance its efficacy, one option is to expand the ongoing education program by implementing regular health counseling to improve students' understanding of health. To improve this program, several suggestions can be considered : Expanding the ongoing education program, Implement theoretical concepts into learning materials applicable to daily life, Engaging parents in the educational program via specific seminars or counseling to enhance healthy eating habits at home, Using digital technologies, including social media and digital platforms, to spread information regarding anaemia and other health concerns that may be easier accessed by students and parents.

REFERENCES

Aulya, Y., Siauta, J. A., & Nizmadilla, Y. (2022). Analisis anemia pada remaja putri. *Jurnal Penelitian Perawat Profesional*, *4*(4), 1377-1386. https://doi.org/10.37287/jppp.v4i4.1259

Ekowati, D. (2024). Remaja sehat, cantik dan cerdas tanpa anemia di Desa Glagahwero. *Al-Khidmah Jurnal Pengabdian Masyarakat*, *4*(1), 41-48. https://doi.org/10.56013/jak.v4i1.2870

Hadiningrat, J. K., Tiong, P., Dewi, S. R., Samad, A. W., Pratikno, Y., Santoso, R., Rony, Z. T., Hehamahua, A., Afiat, D. D., Ismail, D. H., Ghofar, A., Kadiman, S., & Samihardjo, I. (2023). *Manajemen pelatihan*. Pradina Pustaka.

Handayani, N. (2021, January 25). *Remaja sehat bebas anemia*. Rumah Sakit Paru Respira. Retrieved from: https://rsprespira.jogjaprov.go.id/remaja-sehat-bebas-anemia/

Hidayat, F., Yogie, G. S., Firmansyah, Y., Santoso, A. H., Kurniawan, J., Amimah, R. M. I., Gaofman, B. A., & Syachputri, R. N. (2023). Gambaran kadar hemoglobin dan hematokrit pada wanita usia produktif. *MAHESA: Malahayati Health Student Journal*, *3*(11), 3629-3636. https://doi.org/10.33024/mahesa.v3i11.11398

Kementerian Kesehatan Republik Indonesia (Kemenkes RI). (2018). *Laporan nasional Riskesdas 2018*. Kementerian Kesehatan Republik Indonesia.

Kementerian Kesehatan Republik Indonesia (Kemenkes RI). (2023). *Buku saku pencegahan anemia pada ibu hamil dan remaja putri*. Kementerian Kesehatan Republik Indonesia.

Lubis, D. R. (2022). Deteksi dini anemia melalui pemeriksaan kadar hemoglobin pada remaja puteri. *Jurnal Pengabdian Masyarakat Bakti Parahita*, *3*(01), 24–35. https://doi.org/10.54771/jpmbp.v3i01.377

Moradi, S., Arghavani, H., Issah, A., Mohammadi, H., & Mirzaei, K. (2018). Food insecurity and anaemia risk: A systematic review and meta-analysis. *Public health nutrition*, *21*(16), 3067-3079. https://doi.org/10.1017/S1368980018001775

Puspitasari, E., Kemala, S., Fatmasari, R., Yunieswati, W., Widhi, A. S., & Yulianingsih, I. (2023, October). Penyuluhan pencegahan anemia pada remaja dengan tablet tambah darah di SMA Muhammadiyah 1 Jakarta. In *Prosiding Seminar Nasional Pengabdian Masyarakat LPPM UMJ*, *1*(1).

Rahman, M. A., Rahman, M. S., Aziz Rahman, M., Szymlek-Gay, E. A., Uddin, R., & Islam, S. M. S. (2021). Prevalence of and factors associated with anaemia in women of reproductive age in Bangladesh, Maldives and Nepal: Evidence from nationally-representative survey data. *Plos one*, *16*(1), e0245335. https://doi.org/10.1371/journal.pone.0245335

Riesmiyatiningdyah, R., Putra, K. W. R., & Sulistyowati, A. (2021). The effect of health education on adolescent knowledge about anemia. *Nurse and Health: Jurnal Keperawatan*, *10*(1), 59-64. https://doi.org/10.36720/nhjk.v10i1.273

World Health Organization (WHO). (2017, May 26). *World health statistics 2017: Monitoring health for the SDGs, sustainable development goals*. World Health Organization (WHO). Retrieved from: https://www.who.int/publications/i/item/9789241565486

World Health Organization (WHO). (n.d.) *Anaemia*. World Health Organization (WHO). Retrieved from: https://www.who.int/health-topics/anaemia#tab=tab_1

Yunanto, R. A., Salsabila, A. N., Maysaroh, S., Toni, A. A., Rohmawati, N., & Bumi, C. (2024). Optimizing the empowerment of rural agricultural communities in creating healthy agricultural villages based on agronursing. *Abdimas: Jurnal Pengabdian Masyarakat Universitas Merdeka Malang*, *9*(4), 765-776. https://doi.org/10.26905/abdimas.v9i4.13912

Zunaidi, A. (2024). *Metodologi pengabdian kepada masyarakat pendekatan praktis untuk memberdayakan komunitas*. Yayasan Putra Adi Dharma.