Original Research
Indonesian Midwifery and Health Sciences Journal

Volume 8 No. 3. July 2024
Received: 19 May 2024 Revised: 2 June 2024
Accepted: 19 June 2024 Published: 28 July 2024
Available online at: http://e-journal.unair.ac.id/index.php/IMHSJ

THE EFFECT OF IRON SUPPLEMENTATION AND OTHER SCHOOL-BASED SUPPORT ON ANEMIA STATUS IN ADOLESCENTS: A SYSTEMATIC LITERATURE REVIEW

Zahiroh Amani [1], *Susy Katikana Sebayang,* [2,3]

[1]Public Health Study Program, Faculty of Health, Medicine and Life Sciences, Universitas Airlangga, Banyuwangi, Indonesia
[2]Division of Maternal and Child Health, Public Health Study Program, Faculty of Health, Medicine and Life Sciences, Universitas Airlangga, Banyuwangi, Indonesia
[3]Research Group for Health and Well-being of Women and Children, Universitas Airlangga, Banyuwangi, Indonesia

Correspondence address:
Banyuwangi, Jawa Timur
Email : zahiroh.amani-2020@fkm.unair.ac.id

Abstract

Background: Anmia among adolescent girls is still problematic. The 2018 RISKESDAS Indonesia survey revealed that anemia among pregnant women was linked to the high prevalence of anemia among adolescents (25%) and women of reproductive age (17%). School support is considered important to help overcome the problem of anemia among adolescent girls. This research aims to assess the effectiveness of school support in providing iron supplements and other support for anemia status in adolescents. **Method:** This was Systematic Literature Review of publications found on Google Scholar and Pubmed databases using the following inclusion criteria: published in Indonesian or international journals between 2018 – 2023 and written in Bahasa Indonesia or English. The article search utilized the following keywords on Google Scholar: *"dukungan sekolah dan tablet tambah darah dan status anemia remaja dan kepatuhan" and "dukungan sekolah dan ttd dan status anemia remaja dan kepatuhan"*. The keywords used on PubMed were: "school AND (iron OR fe) AND suppl* AND (teen* OR adolescent*) AND (anemia OR anaemia)". The search for publications using these keywords in the databases resulted 1593 articles. Then, all articles entered the screening stage based on title relevance, duplicate articles, abstract, and full text access. Five articles were found to be eligible for review. **Result:** From the five articles obtained, the results showed that the provision of iron supplements coupled with health education and counseling about anemia in schools can reduce the risk of anemia in adolescents by 16%-48%. Both supports are considered effective in overcoming the problem of anemia among adolescent girls. **Conclusion:** Providing iron supplements coupled with health education and counseling about anemia at school can reduce the risk of anemia in adolescent girls.
Keyword: school support, anemia, adolescent girls, iron supplementation, malnutrition

INTRODUCTION

Anemia is a condition where the Hemoglobin (Hb) level in the blood is below the normal value for age, sex, and physiological condition. Normally, the Hb level in adolescents is >12 g/dL (Kaimudin, Lestari and Afa, 2017). Anemia is a

e-ISSN 2656-7806 ©Authors.2024

DOI: 10.20473/imhsj.v8i3.2024.312-325

nutritional problem among adolescents caused by various factors, including physiological factors, sex, age, race, infection, genetic disorders, social behavior, and environmental factors (Sari *et al.*, 2022). Adolescence is a phase that requires adequate nutritional intake, including iron. Anemia is more common in adolescent girls than in adolescent boys. This is because adolescent girls experience menstruation every month (Eni Elawati *et al.*, 2023). RISKESDAS 2018 data shows the occurrence of anemia in pregnant women caused by the high prevalence of anemia in adolescent girls (25%) and women of childbearing age (17%) (Amir and Djokosujono, 2019).

Providing iron supplementation containing folic acid to adolescent girls is one of the efforts to address the problem of anemia among adolescents. School-aged children who are already menstruating are recommended to consume 30-60 mg of elemental iron daily for three consecutive months in a year (Samson, Fischer and Roche, 2022). A study shows that consuming iron supplements can improve adolescents learning concentration (Falkingham *et al.*, 2010). Indonesian government deploys a program to provide free iron supplements to female adolescents in junior high school and senior high school, which is regulated in the Circular Letter of the Ministry of Health of the Republic of Indonesia No. HK.03.03/V/0595/2016 concerning the Provision of Iron Tablets for Adolescent Girls and Women of Childbearing Age.

School-based iron supplementation is considered an effective way to address anemia in adolescents. According to research conducted in Bogor City in 2017 showed that teacher support factors greatly influenced adolescents compliance in consuming iron tablets (Nuradhiani*, et al.,*2017). A study in Ghana also showed that school-based iron supplementation is highly recommended to address anemia in adolescents (Gosdin *et al.*, 2021). Research at SMAN 3 Pekalongan, Indonesia, reported that Focus Group Discussion (FGD) in schools is an effective activity that can encourage compliance of iron supplementation consumption, proper food selection, and thus can be an alternative program to overcoming anemia in adolescent girls (Fitranti *et al.*, 2022).

Several studies have shown that school-based iron supplementation can reduce the prevalence of anemia. Some research has also found a link between

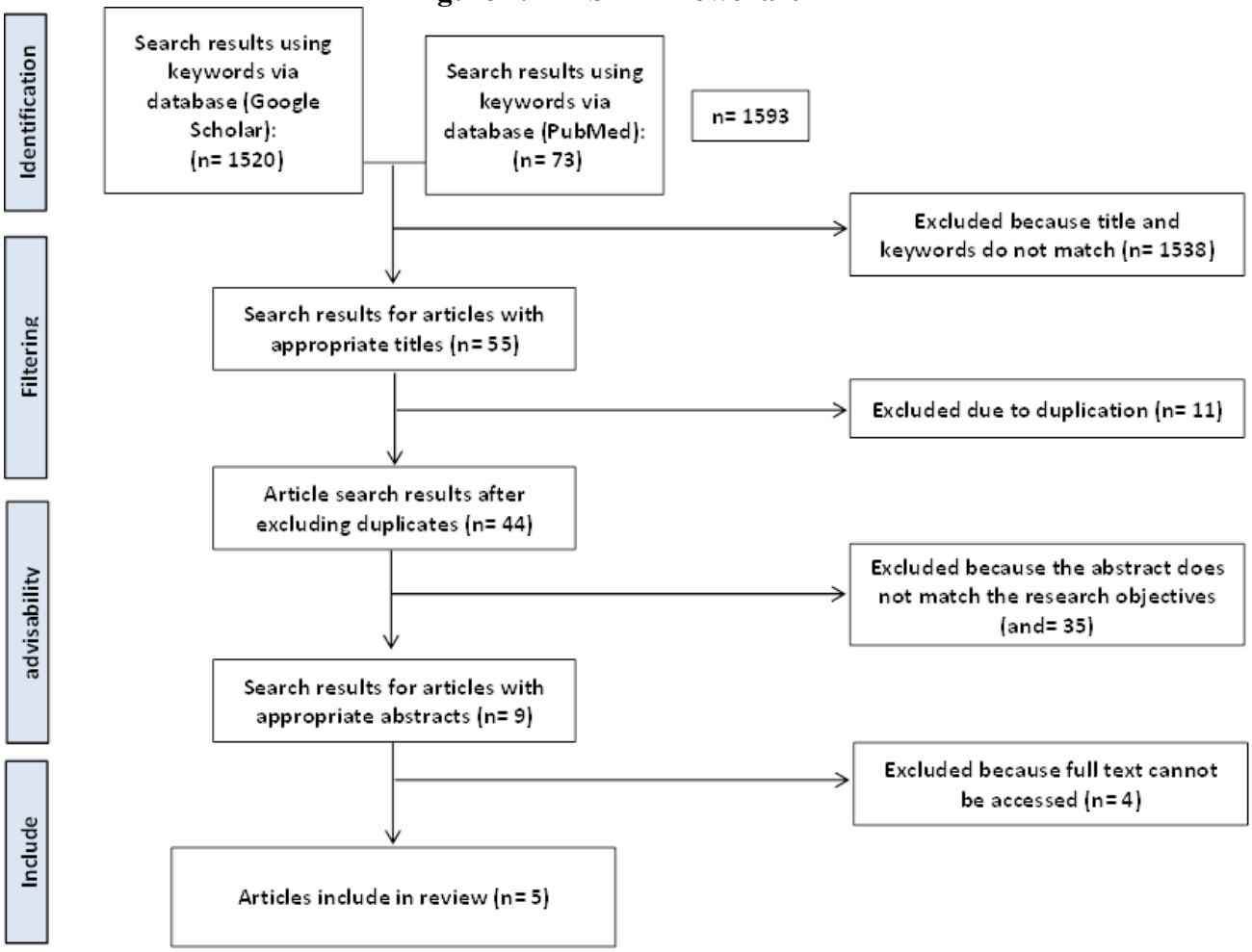
school support and a decrease in anemia rates among adolescent girls. A literature review conducted in 2022 discussed the effectiveness of iron supplementation in influencing anemia status in adolescents (Nurhayati and Susilowati, 2022), but there is a scarcity of literature reviews that discusses the forms of school support that influence adolescents anemia status. Based on this, this study aims to examine the effectiveness of iron supplementation support and other school-based support on anemia status in adolescents. This literature will also provide an overview of what forms of support are more effective in improving the influence of anemia status in adolescent girls.

METHOD

This research employed the Systematic Literature Review method by searching for relevant articles in the Google Scholar and PubMed databases. The article search was conducted in May 2023 using the following keywords on Google Scholar: *"dukungan sekolah dan tablet tambah darah dan status anemia remaja dan kepatuhan" and "dukungan sekolah dan ttd dan status anemia remaja dan kepatuhan".* The keywords used on PubMed were: "school AND (iron OR fe) AND suppl* AND (teen* OR adolescent*) AND (anemia OR anaemia)". The inclusion criteria for this study were as follows: (1) articles published in both national and international journals, (2) articles in either Indonesian or English, (3) full-text articles accessible, and (4) articles published within the 2018-2023 timeframe.

The eligibility criteria for the publications are: (1) The population is female students or women worldwide, (2) The exposure is the provision of iron supplementation and school support, (3) The outcome of is anemia status. Results of the search is provided with PRISMA standard.

Figure 1. PRISMA Flowchart



RESULT AND DISCUSSION

The search for publications using keywords in the databases resulted in 1593 articles, 1520 publications of which came from the Google Scholar database and 73 publications came from the PubMed database. Then, all articles entered the screening stage based on title's relevancy to the inclusion criteria and 1538 articles were excluded because the titles did not discuss school support and therefore did not match the research topic. Of the 55 articles selected after title screening, duplicate articles were edited using the Mendeley application and 11 articles were found to be duplicates and excluded. The remaining 44 articles were screened based on the research abstract, and 35 articles had to be excluded because the abstract did not meet the research criteria. From the remaining articles, 4 articles were excluded

because the full text could not be accessed. After all identifications, 5 articles were found to be eligible for review (Figure 1).

Some research from the articles reviewed were conducted in schools located in several provinces in Indonesia, such as Lampung, Yogyakarta, West Java, and East Nusa Tenggara. In addition to schools in Indonesia, one article involved research in a school in New Delhi, India. From the five articles, four articles by Wio, Jutomo and Boeky, (2022), Rahmadi, (2018), Singh, Rajoura and Honnakamble, (2020), dan Novrita *et al.*, (2020) conducted research in schools with female students as respondents, and one article by Sari, Surtimanah and Ruhyat, (2022) was conducted with female student in Islamic boarding school as respondents.

Two articles only discussed the impact of iron supplementation (Wio, Jutomo and Boeky, 2022; (Rahmadi, 2018), two articles compared the impact of adding health education to iron supplementation (Singh, Rajoura and Honnakamble, 2020; Sari, Surtimanah and Ruhyat, 2022), and one other article discussed the impact of adding counseling to an iron supplementation program (Novrita *et al.*, 2020) (Table 1).

Table 1. Summary Results of Literature Search for The Systematic Review

Author, Year, Country	Research Title	Method	PECO (Population, Exposure,Comparison, Outcome)	Results
Article on Providing Iron Supplementation Only				
Adrianus Wio, Lewi Jutomo, Daniela L. A. Boeky. 2022. Indonesia	Relationship of Fe Supplement Consumption With Anemia In Students of SMAK Tunas Gloria and SMAS Beringin, Kupang City	**Design:** Cross Sectional **Sample:** 61 female student **Method of collecting data:** Questionnaire and measurement of Hb levels with the Easy Touch (GCHb) tool **Analysis:** Chi-Square test.	**P:** Female students **E:** Providing Iron Supplementation once a week for one month **C: -** **O:** Effect of providing iron tablet on the anemia status of female students	The results of the chi-square analysis indicate a significant relationship between iron supplementation consumption and anemia incidence, with a p-value of 0.018 and a PR of 6.66. This means that students who do not consume iron tablets are 6.66 times more likely to develop anemia.
Antun Rahmadi. 2018. Indonesia	*Perbedaan Status Anemia Gizi Besi Remaja Putri Yang Bersekolah di SMA Program Dan Non-Program Suplementasi Tablet Tambah Darah* (Differences in Iron Anemia Status of Adolescent Girls Attending High Schools with Programs and Non-Programs for Blood Supplementation Tablets)	**Design:** Cross Sectional **Sample:** 75 program school students and 72 non-program school female students **Method of collecting data:** Questionnaire and measurement of Hb levels **Analysis:** Chi-Square Test.	**P:** Female students **E:** Students in program school receive one iron supplementation every week. Non Program school do not provide iron supplementation **C:** - **O:** Effect of providing iron tablet on the anemia status of female students	A total of 31 female students (43%) from non-program schools were found to be anemic, while only 18 students (24%) from program schools were anemic. The results of the Chi-Square test analysis showed a p-value of 0.023 and an OR of 2.4. Female students in non-iron supplementation program schools are 2.4 times more likely to develop anemia.

Articles on Providing Iron Supplementation with Health Education				
Monika Singh, Om Prakash Rajoura, Raghavendra Appasaheb Honnakamble. 2020. India	Assessment of Weekly Iron–Folic Acid Supplementation with and without Health Education on Anemia in Adolescent Girls: A Comparative Study	**Design:** Comparative Study **Sample:** 210 female students. **Method of collecting data:** Hb measurements were carried out before and after the study using the Hemocue method **Analysis:** T Test and Paired T Test	**P:** Female student **E:** Over a period of 6 months, 106 female students in the intervention group received iron supplementation and health education, while 104 female students in the control group received only iron supplementation. **C: -** **O:** The effect of iron tablet supplementation with and without health education on the anemia status of female students	A total of 77 female students from the control group and 41 female students from the intervention group were diagnosed with anemia following the intervention. The results showed a greater reduction in anemia prevalence in the intervention group compared to the control group, with a p-value of 0.001. This indicates that the combination of iron supplementation and health education can effectively lower the prevalence of anemia by 54.7%.
Tiara Rinta Sari, Tuti Surtimanah, Ejeb Ruhyat. 2022. Indonesia	*Perbandingan Kadar Hemoglobin Santriwati Sesudah Konsumsi Tablet Tambah Darah Ditambah Edukasi Video Singkat Dengan Hanya Konsumsi Tablet Tambah Darah* (Comparison of Hemoglobin Levels of Female Students in the Islamic boarding school After	**Design:** Quasi experiment **Sample:** 37 Female students in Islamic boarding school **Method of collecting data:** Hb measurements using the Fora 6 Plus digital Hb check tool were carried out before and after the intervention **Analysis:** T Test	**P:** Female students of AWL Islamic Boarding Svhool **E:** For 4 weeks, 18 female students in the control group were given 1 tablet of iron supplementation 1 week, while 19 female students in the intervention group were given iron supplementation accompanied by short video education.	Following the intervention, there were changes in Hb levels in both groups. However, the results of the analysis showed no statistically significant difference in the change in Hb levels before and after the intervention between the two groups, with a p-value of 0.588. After the intervention, the mean Hb level in the intervention group increased by 0.3 mg/dL, while the mean Hb level in the control group increased by 0.8

	Consuming Iron Suplementatiton Accompanied by Short Video Education with Only Consuming Blood Enhancing Tablets)		**C: -** **O:** Differences in female students Hb levels after giving iron suplementation with and without video education.	mg/dL. The possible reason for the lack of a significant change in Hb levels is that the duration of iron supplementation was insufficient.
Article on Providing Iron Supplementation with Health Counseling				
Sisri Novrita, Ika Puspitasari, Nanang Munif Yasin, Chrisna Wardhani. 2020. Indonesia	*Pengaruh Konseling Apoteker Terhadap Outcome Anemia pada Siswi SMA yang Menerima Program Suplementasi Zat Besi* (The Effect of Pharmacist Counseling on Anemia Outcomes in Female High School Students Who Receive the Iron Supplementation Program)	**Design:** Pretest Posttest with Control Group Design **Sample:** 68 female students. **Method of collecting data:** Measurement of Hb levels using a Hemoglobinometer. Compliance measurement use a questionnaire **Analisis:** T Test dan Paired T Test	**P:** Female students with Hb levels below normal **E:** 33 female students in the control group did not receive counseling and 35 female students in the treatment group received counseling for 7 months. Both groups received iron supplementation **C: -** **O:** The effect of counseling on compliance with iron supplement consumption and anemia status	The results indicate that the counseling intervention had a significant impact on both compliance and Hb levels. Following the intervention, compliance rates increased significantly ($p = 0.020$), while Hb levels also showed an improvement ($p = 0.042$). Student compliance increased by 18%, and the percentage of anemia cases decreased by 54%.

Based on Table 1, the five reviewed articles had mixed results. Most articles suggest that iron supplementation for adolescents can be an effective strategy to address anemia by increasing hemoglobin levels in female adolescents. A study conducted at SMAK Tunas Gloria and SMAS Beringin found a significant association between iron supplementation and anemia incidence, with a PR value of 6.66. This indicates that female students who did not consume iron supplements were six times more likely to develop anemia compared to those who did (Wio, *et al.*, 2022). Another study by Rahmadi, (2018) also showed a 44% reduction in the risk of anemia among female students who received iron supplementation.

Apart from providing iron supplementation, it was found that additional school support was carried out simultaneously with iron supplementation, such as providing health education can further enhance the effectiveness of iron supplementation in improving hemoglobin levels and reducing anemia risk in female adolescents. A study conducted in India found a 54.7% reduction in anemia prevalence among female adolescents after receiving health education and iron supplementation for six months. The health education provided included presentations using PowerPoint, pamphlets, and visual displays of examples of iron-rich foods and vitamin C (Singh, Rajoura and Honnakamble, 2020). In this Indian study, participants were also encouraged to consume iron-rich foods. Similarly a study conducted on female students at AWL Islamic Boarding School found a 0.3 mg/dL increase in hemoglobin levels after four weeks of iron supplementation combined with health education (Sari, Surtimanah and Ruhyat, 2022).

However, a study conducted at AWL Islamic Boarding School on the effectiveness of iron tablets and health education using short videos showed inconclusive results. While the study found an increase in hemoglobin levels among the female students, the levels remained below the normal range of 12 mg/dL, indicating a persistent state of anemia. The average hemoglobin level among the students increased from 10.4 mg/dL to 10.7 mg/dL after receiving health education through short videos and iron tablets, representing a mere 0.3 mg/dL increase. There was no statistically significant difference in hemoglobin levels before and after the intervention. (Sari, Surtimanah and Ruhyat, 2022). These findings contrast with the

results of the Indian study, which showed an average increase in hemoglobin levels of 2.3 mg/dL and a 54.7% reduction in anemia prevalence among female adolescents who received iron supplementation and health education. Following iron supplementation combined with health education, no female adolescents were found to have severe anemia or hemoglobin levels below 7 mg/dL (Singh, Rajoura and Honnakamble, 2020).

The differences between the two studies could be attributed to several factors, including sample size, the form of education provided, and the duration of the intervention. The Indian study had a larger sample size of 210 female adolescents compared to the 37 female students in the study on the Islamic boarding school. The form of education in the Indian study involved presentations using PowerPoint and pamphlets. Additionally, the female students were encouraged to consume iron-rich foods, and visual displays of examples of iron-rich foods and vitamin C were provided. In contrast, the study on the Islamic boarding school students only utilized short videos as the medium for health education. The duration of the intervention was also shorter in the Islamic boarding school study. The Indian study implemented the intervention for six months, while the Islamic boarding school study lasted only one month. Iron supplementation for adolescents can effectively increase hemoglobin levels if administered regularly over a specific period (Rahmadi, 2018).

In addition to health education, schools can provide further support to enhance the effectiveness of iron supplementation by offering counseling on anemia and iron tablets. This counseling aims to improve female students' adherence to iron supplementation. A study conducted in Yogyakarta found a 28.6% increase in iron tablet consumption adherence following counseling (Novrita *et al.*, 2020).

Comparing the results from the five articles, the combined approach of iron supplementation with health education and health counseling shows a greater reduction in anemia risk compared to iron supplementation alone. Iron supplementation alone was found to reduce anemia risk by 44% (Rahmadi, 2018). Additional support through health education and counseling can further reduce the risk of anemia among adolescent girls by 16% to 48% more than iron

supplementation alone (Singh, Rajoura and Honnakamble, 2020; Sari, Surtimanah and Ruhyat, 2022; Novrita *et al.*, 2020). Consuming iron supplements regularly can effectively elevate hemoglobin (Hb) levels in the blood and reduce the risk of anemia by addressing iron deficiencies that may not be adequately met through dietary intake (Rahmadi, 2018; Wio *et al*., 2022). However, combining health education and counseling with iron supplementation can further reduce the risk of anemia even more. Health education and counseling for adolescents can enhance their knowledge and compliance to iron supplementation, leading to improved outcomes (Mulyadi, Warjiman. and Chrisnawati, 2018; (Novrita *et al.*, 2020).

Research of school-based interventions for anemia prevention among adolescents has not yet been carried out using the literature review method. No one has conducted an extensive review so that this literature can help to prove the most effective school-based support strategies to address anemia in adolescents. However, the results of this review cannot be generalized to all settings due to limitations in the scope of the literature review. The included studies were restricted to Indonesia and India, and the review period was limited, resulting in a lack of diversity in the literature and coverage of only a few regions. Additionally, none of the studies included in this review employed a randomized controlled trial design, raising the possibility of selection bias.

CONCLUSION AND SUGGESTION

The systematic literature review of the five articles revealed that providing iron tablets combined with health education and counseling in schools is more effective in reducing anemia among adolescent girls compared to iron supplementation alone. This comprehensive support can enhance hemoglobin levels and reduce anemia prevalence among school aged adolescents. Implementing iron supplementation alongside health education and counseling in schools is crucial to improve adolescents' knowledge about iron tablets and promote compliance to iron supplementation. The Health Office can collaborate with the Educational Office to expand the coverage of the iron supplementation program alongside health education and counseling to schools that have not yet implemented the program.

DECLARATION

Conflict of Interest

The authors declare that they have no competing interest.

Authors' Contribution

First author: conseptualized the study, designed the methodology, collected data, analyzed data, wrote the manuscript, and revised the manuscript.

Second author: contribute to the design and methodology of the study, verified research findings, review, and revised the manuscript.

Ethical Approval

This study employs systematic literature review method and thus, does not require ethical approval.

Funding Source

There is no funding source.

Data Availability

The publication reviewed in this research are available and accessible through Google Scholar and PubMed databases.

Acknowledgements

We would like to gratefully acknowledge all those who have contributed to the completion of this research. Hopefully the result of this research will be useful for readers.

REFERENCE

Amir, N. and Djokosujono, K. (2019) 'Faktor-faktor yang berhubungan dengan konsumsi tablet tambah darah (TTD) pada remaja putri di Indonesia: Literatur review', *Jurnal Kedokteran dan Kesehatan*, 15(2), pp. 119–129. Available at: https://jurnal.umj.ac.id/index.php/JKK/article/view/3865 (Accessed: 22 May 2023).

Eni Elawati, N. *et al.* (2023) 'Edukasi dan Pemeriksaan Hemoglobin Sebagai Gerakan Sehat tanpa Anemia pada Siswa SMK Nurul Islami Semarang Info Articles', *Jurnal Pengabdian dan Pemberdayaan Masyarakat*, 3, pp. 132–145. Available at: http://e-journal.ivet.ac.id/index.php/manggali.

Falkingham, M. *et al.* (2010) 'The effects of oral iron supplementation on cognition in older children and adults: a systematic review and meta-analysis.', *Nutrition journal*, 9, p. 4. doi: 10.1186/1475-2891-9-4.

Fitranti, D. Y. *et al.* (2022) 'Pencegahan Anemia Pada Remaja Putri dengan Metode Focus Group Discussion di SMA Negeri 3 Pekalongan', *Jurnal Proactive*, 1(1), pp. 46–54. Available at: https://ejournal2.undip.ac.id/index.php/proactive/article/view/13764 (Accessed: 22 May 2023).

Gosdin, L. *et al.* (2021) 'A School-Based Weekly Iron and Folic Acid Supplementation Program Effectively Reduces Anemia in a Prospective Cohort of Ghanaian Adolescent Girls.', *The Journal of nutrition*, 151(6), pp. 1646–1655. doi: 10.1093/jn/nxab024.

Kaimudin, N. I., Lestari, H. and Afa, J. R. (2017) 'Skrining Dan Determinan Kejadian Anemia Pada Remaja Putri Sma Negeri 3 Kendari Tahun 2017', *Jurnal Ilmiah Mahasiswa Kesehatan Masyarakat*, 2(6), pp. 1–10.

Mulyadi, M. I., Warjiman. and Chrisnawati (2018) 'Efektivitas pendidikan kesehatan dengan media video terhadap tingkat pengetahuan perilaku hidup bersih dan sehat', *Jurnal Keperawatan STIKES Suaka Insan*, 3(2), pp. 1–9. Available at: http://journal.stikessuakainsan.ac.id/index.php/jksi/article/view/111.

Novrita, S. *et al.* (2020) 'Pengaruh Konseling Apoteker Terhadap Outcome Anemia Pada Siswi SMA Yang Menerima Program Suplementasi Zat Besi', *Majalah Farmaseutik*, 18(2). Available at: https://journal.ugm.ac.id/majalahfarmaseutik/article/view/60555 (Accessed: 23 May 2023).

Nuradhiani, A., Briawan, D. and Dwiriani, C. M. (2017) 'DUKUNGAN GURU MENINGKATKAN KEPATUHAN KONSUMSI TABLET TAMBAH DARAH PADA REMAJA PUTRI DI KOTA BOGOR', 12(November), pp. 153–160. doi: 10.25182/jgp.2017.12.3.153-160.

Nurhayati, J. and Susilowati, S. T. (2022) *Literature Review: Efektivitas Suplementasi Zat Besi Terhadap Kadar Hemoglobin Pada Remaja Putri*. Universitas Muhammadiyah Surakarta. Available at: http://eprints.ums.ac.id/id/eprint/104471 (Accessed: 22 May 2023).

Rahmadi, A. (2018) 'Perbedaan Status Anemia Gizi Besi Remaja Putri yang Bersekolah di SMA Program dan Non-Program Suplementasi Tablet Tambah Darah', *Borneo Journal of Medical Laboratory Technology*, 1(1). Available at: https://journal.umpr.ac.id/index.php/bjmlt/article/view/462 (Accessed: 23 May 2023).

Samson, K. L. I., Fischer, J. A. J. and Roche, M. L. (2022) 'Iron Status, Anemia, and Iron Interventions and Their Associations with Cognitive and Academic Performance in Adolescents: A Systematic Review.', *Nutrients*, 14(1). doi: 10.3390/nu14010224.

Sari, P. *et al.* (2022) 'Anemia among Adolescent Girls in West Java, Indonesia: Related Factors and Consequences on the Quality of Life', *Nutrients*, 14(18), pp. 1–13. doi: 10.3390/nu14183777.

Sari, T. R., Surtimanah, T. and Ruhyat, E. (2022) 'Perbandingan Kadar Hemoglobin Santriwati Sesudah Konsumsi Tablet Tambah Darah Ditambah Edukasi Video Singkat Dengan Hanya Konsumsi Tablet Tambah Darah',

Perilaku dan Promosi Kesehatan: Indonesian Journal of Health Promotion and Behavior, 4(1), p. 39. doi: 10.47034/ppk.v4i1.5973.

Singh, M., Rajoura, O. P. and Honnakamble, R. A. (2020) 'Assessment of Weekly Iron-Folic Acid Supplementation with and without Health Education on Anemia in Adolescent Girls: A Comparative Study.', *International Journal of Preventive Medicine*, 11, pp. 1–4. doi: 10.4103/ijpvm.IJPVM_552_18.

Wio, A., Jutomo, L. and Boeky, D. L. A. (2022) 'Relationship of Fe Supplement Consumption With Anemia In Students of SMAK Tunas Gloria and SMAS Beringin, Kupang City', *Media Kesehatan Masyarakat*, 4(1), pp. 9–17. Available at: https://doi.org/10.35508/mkmhttps://ejurnal.undana.ac.id/MKM.