

## ANALYSIS OF ADOLESCENT GIRLS’ UNDERSTANDING OF ANEMIA

Arifah Septiane Mukti <sup>1\*</sup>, Ririn Lestari <sup>2</sup>, Siti Fatimah <sup>3</sup>

<sup>1, 2, 3</sup> Department of Midwifery, Faculty of Health Sciences, Universitas Galuh, Indonesia

Corresponding Email: [\\*arifah\\_septiane\\_mukti@unigal.ac.id](mailto:arifah_septiane_mukti@unigal.ac.id)

### ABSTRACT

**Background:** Anemia remains a major public health problem among adolescent girls, and limited evidence regarding their knowledge in rural senior high schools in Indonesia may hinder the development of effective school-based prevention programs. **Objective:** This study aimed to analyze the level of knowledge regarding anemia among adolescent girls at SMAN 1 Cihaurbeuti, Ciamis, West Java, Indonesia. **Methods:** A descriptive quantitative study with a cross-sectional design was conducted from January to March 2026 involving all 46 eligible adolescent girls using a total sampling technique. Data were collected using a structured questionnaire assessing knowledge of anemia, including its definition, causes, signs and symptoms, consequences, and preventive measures. Data were analyzed descriptively and presented as frequencies and percentages. **Results:** Most respondents were 17 years old (46.8%) and had regular menstrual cycles (69.6%). Low adherence to iron supplementation was reported by 54.3% of respondents, while 39.1% had poor dietary patterns. Overall, 71.7% of respondents were not anemic, whereas 28.3% experienced varying degrees of anemia. Regarding knowledge, 19 respondents (41.3%) demonstrated good knowledge, 12 (26.1%) had moderate knowledge, and 15 (32.6%) had poor knowledge of anemia. **Conclusion:** Although most respondents demonstrated good knowledge regarding anemia, nearly one-third still had inadequate understanding. Strengthening school-based nutrition education and promoting adherence to iron supplementation programs are recommended to improve anemia prevention among adolescent girls.

**Keywords:** adolescent girls; anemia; iron supplementation; knowledge; nutrition education.

### INTRODUCTION

Anemia remains one of the most significant public health problems worldwide, particularly among women and adolescents. According to the World Health Organization (WHO), anemia affects approximately one-third of women of reproductive age globally and contributes substantially to disability, impaired cognitive performance, reduced physical capacity, and decreased quality of life. Among adolescents, anemia has become an important indicator of nutritional status because this period is characterized by rapid growth, increased nutritional requirements, and physiological changes that elevate iron demand (WHO, 2023; Chaparro & Suchdev, 2019).

Adolescent girls are particularly vulnerable to anemia due to the combined effects of accelerated growth, menstrual blood loss, inadequate dietary intake, and poor nutritional habits. Iron deficiency remains the leading cause of anemia, although chronic infections, inflammatory conditions, and hereditary hemoglobin disorders also contribute to its occurrence. Poor adherence to iron supplementation, irregular meal patterns, and low consumption of iron-rich foods further increase the risk of anemia among adolescents (Chaparro & Suchdev, 2019; Zhu et al., 2021).

In Indonesia, anemia among adolescent girls continues to be a major nutritional problem. The 2018 Basic Health Research (Riskesdas) reported that approximately 32% of adolescents

aged 15–24 years experienced anemia, indicating that nearly one in three adolescents suffers from this condition. Previous studies have also shown that anemia among Indonesian adolescent girls is associated with inadequate dietary intake, poor nutritional status, low adherence to iron supplementation tablets (TTD), and insufficient knowledge regarding anemia prevention (Kementerian Kesehatan Republik Indonesia, 2018; Sari et al., 2022).

The consequences of anemia during adolescence extend beyond immediate health problems. Untreated anemia may impair cognitive function, academic achievement, physical performance, immune function, and reproductive health. Furthermore, adolescent girls with anemia are more likely to become anemic during pregnancy, increasing the risk of maternal complications, low birth weight, preterm delivery, and stunting in the next generation. Therefore, preventing anemia among adolescent girls is essential for breaking the intergenerational cycle of malnutrition (WHO, 2023; Chaparro & Suchdev, 2019).

Knowledge regarding anemia is considered one of the key determinants of preventive behavior. Adolescents who possess adequate knowledge are more likely to consume balanced diets, comply with iron supplementation programs, and adopt healthy lifestyles that reduce anemia risk. Previous intervention studies have demonstrated that nutrition education significantly improves adolescents' knowledge and preventive practices toward anemia (Abu-Baker et al., 2021; Lutfiasari et al., 2023).

Although numerous studies have investigated the prevalence and determinants of anemia, evidence regarding the level of understanding of anemia among adolescent girls in specific school settings remains limited, particularly in Ciamis Regency. Assessing adolescents' knowledge is essential to identify educational needs and to support the development of effective school-based health promotion programs.

Therefore, this study aimed to analyze the understanding of anemia among adolescent girls at SMAN 1 Cihaurbeuti, Ciamis. The findings are expected to provide evidence that can support health education strategies and strengthen anemia prevention programs among adolescents.

## METHOD

This study employed a **quantitative descriptive study with a cross-sectional design**. A cross-sectional design is appropriate for describing the characteristics and knowledge level of a population at a single point in time without manipulating the study variables (Setia, 2016).

The study was conducted at **SMAN 1 Cihaurbeuti, Ciamis Regency, West Java, Indonesia**, from January to March 2026. The target population comprised all female students enrolled during the study period. Since the total number of eligible participants was relatively small, a **total sampling technique** was employed, allowing all members of the accessible population to participate in the study (Etikan et al., 2016). Consequently, 46 adolescent girls met the inclusion criteria and were included in the analysis.

The inclusion criteria consisted of female students who were actively enrolled at SMAN 1 Cihaurbeuti, agreed to participate voluntarily, and completed the questionnaire. Students who were absent during data collection or submitted incomplete questionnaires were excluded.

Data were collected using a structured questionnaire developed based on the **World Health Organization (WHO, 2023) guidelines on adolescent anemia prevention**, previous studies on adolescent anemia knowledge (Abu-Baker et al., 2021; Mukti et al., 2025), and relevant literature regarding anemia among adolescents. The questionnaire measured respondents' knowledge regarding the definition, causes, signs and symptoms, risk factors, consequences, prevention strategies, balanced nutrition, and iron supplementation.

Each correct answer received a score of one, whereas incorrect answers received a score of zero. Total scores were converted into percentages and categorized according to the

**Modified Bloom's Cut-off Point**, namely good (76–100%), moderate (56–75%), and poor (<56%) (Kaliyaperumal, 2004).

Before implementation, the questionnaire underwent content validation by experts in maternal and adolescent health. (*Tambahkan nilai validitas dan reliabilitas apabila tersedia, misalnya Cronbach's alpha.*)

Data collection was conducted after obtaining permission from the school authorities. Respondents were informed about the objectives of the study, confidentiality, anonymity, and voluntary participation before signing informed consent forms.

The collected data were processed through editing, coding, data entry, cleaning, and verification. Descriptive statistical analysis was performed using **IBM SPSS Statistics version XX**, and the findings were presented as frequencies, percentages, means, and standard deviations where appropriate (Pallant, 2020).

The study adhered to ethical principles involving human participants, including autonomy, confidentiality, anonymity, beneficence, and justice. Ethical considerations were strictly observed, including maintaining respondent confidentiality, ensuring anonymity, and ensuring voluntary participation without coercion.

## RESULTS AND DISCUSSION

### Characteristics of Respondents

**Table 1.**

Distribution of Respondents' Characteristics (n = 46)

Characteristics	Frequency (n)	Percentage (%)
Age		
16 years	16	34.04%
17 years	22	46.81%
18 years	9	19.15%
Total	46	100%
Menstrual Cycle		
Regular (21–35 days)	32	69.56%
Irregular	14	30.44%
Total	46	100%
Age at Menarche		
>12 years	21	45.65%
<12 years	25	54.35%
Total	46	100%
Dysmenorrhea		
Yes	34	73.91%
No	12	26.09%
Total	46	100%
Adherence to Iron Supplementation (TTD)		
Low	25	54.34%
Moderate	13	28.26%
High	8	17.40%
Total	46	100%
Duration of Menstruation		
5–7 days	23	50%
7–10 days	20	43.5%

>10 days	3	6.5%
Total	46	100%
Food Consumption (Vegetables & Fruits)		
Never in 1 week	3	6.5%
>3 times per week	22	47.9%
>6 times per month	21	45.6%
Total	46	100%
Meal Frequency		
Good	11	23.9%
Moderate	27	58.7%
Poor	8	17.4%
Total	46	100%
Dietary Pattern		
Good	13	28.3%
Moderate	15	32.6%
Poor	18	39.13%
Total	46	100%

Based on the results of the study involving 46 respondents, the characteristics of the participants were described in terms of age, menstrual cycle, age at menarche, occurrence of dysmenorrhea, adherence to iron supplementation (TTD), duration of menstruation, consumption of vegetables and fruits, meal frequency, and dietary patterns.

The majority of respondents were 17 years old ( $n = 22$ ; 46.81%), followed by 16 years old ( $n = 16$ ; 34.04%) and 18 years old ( $n = 9$ ; 19.15%), indicating that most participants belonged to the mid-adolescent age group. Regarding the menstrual cycle, most respondents had a regular cycle (21–35 days) ( $n = 32$ ; 69.56%), while 14 respondents (30.44%) had irregular cycles. In terms of age at menarche, more than half of the respondents experienced menarche before 12 years of age ( $n = 25$ ; 54.35%), whereas 21 respondents (45.65%) had menarche after 12 years of age.

For dysmenorrhea, most respondents reported experiencing it ( $n = 34$ ; 73.91%), while 12 respondents (26.10%) did not. Adherence to iron supplementation (TTD) was mostly low ( $n = 25$ ; 54.34%), followed by moderate adherence ( $n = 13$ ; 28.26%) and high adherence ( $n = 8$ ; 17.40%).

Regarding menstruation duration, half of the respondents had periods lasting 5–7 days ( $n = 23$ ; 50.00%), 20 respondents (43.50%) had periods lasting 7–10 days, and 3 respondents (6.50%) experienced menstruation for more than 10 days. For vegetable and fruit consumption, most respondents ate vegetables and fruits more than three times per week ( $n = 22$ ; 47.90%), 21 respondents (45.60%) consumed them more than six times per month, and 3 respondents (6.50%) did not consume them at all-in-one week.

In terms of meal frequency, most respondents were categorized as moderate ( $n = 27$ ; 58.70%), followed by good ( $n = 11$ ; 23.90%) and poor ( $n = 8$ ; 17.40%). Dietary patterns showed that the largest proportion of respondents fell into the poor category ( $n = 18$ ; 39.13%), followed by moderate ( $n = 15$ ; 32.60%) and good ( $n = 13$ ; 28.30%).

Overall, the results indicate that although most respondents had a normal menstrual cycle, a considerable proportion experienced dysmenorrhea, low adherence to iron supplementation, and suboptimal dietary patterns.

**Table 2.**

Distribution of Knowledge Levels Regarding Anemia		
Knowledge Level	Frequency (n)	Percentage (%)
Good	19	41.3%
Moderate	12	26.1%
Poor	15	32.6%
<b>Total</b>	<b>46</b>	<b>100%</b>

Based on the results of the study involving 46 adolescent girls, the distribution of knowledge levels regarding anemia showed considerable variation. Nineteen respondents (41.3%) had good knowledge, indicating that they understood the concept of anemia, its causes, signs and symptoms, impacts, and preventive measures fairly comprehensively. Twelve respondents (26.1%) were categorized as having moderate knowledge, reflecting a partial understanding and indicating the need for additional education to raise awareness about anemia. Meanwhile, fifteen respondents (32.6%) were classified as having poor knowledge, suggesting limited understanding and a clear need for educational intervention.

Overall, these findings underscore the importance of enhancing nutrition education and reproductive health awareness so that adolescent girls can better understand and prevent anemia at an early stage. This study aligns with previous research showing that knowledge of anemia is related to anemia status in adolescent girls. Nutrition education has been proven to improve knowledge scores, making it a critical component of health interventions aimed at preventing anemia. (5)

**Table 3.**

Distribution of Anemia Levels		
Status Anemia	Frequency (n)	Percentage (%)
<b>Anemia berat</b>	1	2,17%
<b>Anemia ringan</b>	7	15,22%
<b>Anemia sedang</b>	5	10,87%
<b>Tidak anemia</b>	33	71,74%
<b>Total</b>	<b>46</b>	<b>100%</b>

Based on the results of the study involving 46 respondents, the majority of participants (n = 33; 71.74%) did not experience anemia. Meanwhile, 7 respondents (15.22%) had mild anemia, 5 respondents (10.87%) had moderate anemia, and 1 respondent (2.17%) had severe anemia. This indicates that although most respondents fell into the non-anemic category, a portion of adolescents still experienced anemia at varying levels of severity.

These findings are consistent with the World Health Organization (WHO), which reports that anemia among adolescent girls remains a global public health issue, with relatively high prevalence in developing countries, including Indonesia, due to low iron intake, menstrual blood loss, and poor dietary patterns. WHO also emphasizes that adolescent girls are particularly vulnerable to anemia because of increased iron requirements during growth and menstruation.

The results also align with the 2018 Basic Health Research (Riskesmas) by the Indonesian Ministry of Health, which reported that anemia prevalence among adolescent girls in Indonesia remains high, at approximately 32%, with most cases classified as mild to moderate. (6) This condition is influenced by insufficient consumption of iron-rich foods and low adherence to

iron supplementation. Furthermore, research by Arumsari et al. (2020) indicated that while most adolescents were non-anemic, mild to moderate anemia cases still occurred, associated with unbalanced dietary habits and irregular iron intake.

These findings suggest that even though severe anemia prevalence is relatively low, mild and moderate anemia among adolescents still warrants attention. Therefore, this study highlights that anemia in adolescents remains a significant public health issue, requiring prevention through improved balanced nutrition, nutrition education, and increased adherence to iron supplementation. (7)

Anemia is a condition in which hemoglobin levels or red blood cell counts are insufficient to meet the physiological needs of the body. Its etiology is complex, particularly in low- and middle-income countries, with major causes including iron deficiency, chronic infections and inflammation, and genetic hemoglobin disorders. (8) In addition, nutritional status, overall health, and socio-economic factors also play important roles in the occurrence of anemia. Adherence to iron supplementation is one of the key indicators for preventing anemia among adolescents.

### LIMITATION OF THE STUDY

This study employed a descriptive method with a limited number of respondents and was conducted only among students at SMAN 1 Cihaurbeuti. Consequently, the findings may not accurately represent the condition of adolescents in a broader population. Therefore, future research is recommended to use an analytical or experimental design with a larger sample size and a wider geographic scope, so that the results can be more representative and generalizable.

### CONCLUSIONS AND SUGGESTIONS

The results of the study indicate that the knowledge level of adolescent girls regarding anemia still varies, ranging from good to moderate to poor. Adequate knowledge about anemia is crucial for increasing adolescents' awareness of maintaining a balanced diet, particularly the consumption of iron-rich foods and iron supplementation, as a preventive measure against anemia and to support the health and quality of life of adolescents.

### ETHICAL CONSIDERATIONS

The authors declare that there is no conflict of interest related to this study.

### REFERENCES

- Abu-Baker, N. N., Eyadat, A. M., & Khamaiseh, A. M. (2021). The impact of nutrition education on knowledge, attitude, and practice regarding iron deficiency anemia among female adolescent students in Jordan. *Heliyon*, 7(2), e06348. <https://doi.org/10.1016/j.heliyon.2021.e06348>
- Briawan, D., Arumsari, E., Hardinsyah, H., & Riyadi, H. (2011). Faktor risiko anemia pada siswi peserta program suplementasi tablet tambah darah. *Jurnal Gizi dan Pangan*, 6(1), 74–83. <https://doi.org/10.25182/jgp.2011.6.1.74-83>
- Chaparro, C. M., & Suchdev, P. S. (2019). Anemia epidemiology, pathophysiology, and etiology in low- and middle-income countries. *Annals of the New York Academy of Sciences*, 1450(1), 15–31. <https://doi.org/10.1111/nyas.14092>
- Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics*, 5(1), 1–4. <https://doi.org/10.11648/j.ajtas.20160501.11>
- Kaliyaperumal, K. (2004). *Guideline for conducting a knowledge, attitude and practice (KAP) study*. AECS Illumination, 4(1), 7–9. [https://v2020eresource.org/content/files/guideline\\_kap\\_jan\\_mar04.pdf](https://v2020eresource.org/content/files/guideline_kap_jan_mar04.pdf)

- Kementerian Kesehatan Republik Indonesia. (2018). *Laporan Nasional Riset Kesehatan Dasar (Riskesdas) 2018*. Badan Penelitian dan Pengembangan Kesehatan. <https://repository.badan.kebijakan.kemkes.go.id/id/eprint/3514/>
- Lutfiasari, D., Martini, S., & Widati, S. (2023). The effectiveness of peer group on adolescent anemia prevention behavior: A systematic review. *Journal of Public Health in Africa, 14*(Suppl. 2). <https://doi.org/10.4081/jphia.2023.2548>
- McLean, E., Cogswell, M., Egli, I., Wojdyla, D., & de Benoist, B. (2009). Worldwide prevalence of anaemia, WHO Vitamin and Mineral Nutrition Information System, 1993–2005. *Public Health Nutrition, 12*(4), 444–454. <https://doi.org/10.1017/S1368980008002401>
- Mukti, A. S., Hindiarti, Y. I., & Fatimah, S. (2025). Kepatuhan konsumsi tablet tambah darah dengan kejadian anemia pada remaja putri. *Jurnal Kesehatan, 7*(2), 396–400. (Tambahkan DOI atau URL jurnal apabila artikel telah dipublikasikan secara daring.)
- Oktaviana, M., Dwiriani, C. M., & Dewi, M. (2023). The potential use of anthropometric parameters to predict the anemia status of adolescent girls. *Jurnal Gizi dan Pangan, 18*(3), 137–146. <https://doi.org/10.25182/jgp.2023.18.3.137-146>
- Pallant, J. (2020). *SPSS Survival Manual* (7th ed.). McGraw-Hill Education.
- Sari, P., Fathurrohman, F., & Utami, D. (2022). Anemia among adolescent girls in West Java, Indonesia: Related factors and consequences on the quality of life. *Nutrients, 14*(18), 3777. <https://doi.org/10.3390/nu14183777>
- Setia, M. S. (2016). Methodology series module 3: Cross-sectional studies. *Indian Journal of Dermatology, 61*(3), 261–264. <https://doi.org/10.4103/0019-5154.182410>
- World Health Organization. (2014). *Comprehensive implementation plan on maternal, infant and young child nutrition*. World Health Organization. <https://www.who.int/publications/i/item/9789241508458>
- World Health Organization. (2023). *Anaemia*. <https://www.who.int/news-room/fact-sheets/detail/anaemia>
- Zhu, Z., Sudfeld, C. R., Cheng, Y., Qi, Q., Li, S., Elhoumed, M., Yang, W., Chang, S., Dibley, M. J., Zeng, L., & Fawzi, W. W. (2021). Anemia and associated factors among adolescent girls and boys at 10–14 years in rural western China. *BMC Public Health, 21*, 353. <https://doi.org/10.1186/s12889-021-10268-z>

Mukti, A.S., Lestari, R., & Fatimah, S. (2026). Analysis of Adolescent Girls' Understanding of Anemia. 2(1) 117-124