Indonesian Journal of Global Health Research
Volume 7 Number 4, August 2025
e-ISSN 2715-1972; p-ISSN 2714-9749
http://jurnal.globalhealthsciencegroup.com/index.php/IJGHR

RELATIONSHIP BETWEEN NUTRITIONAL STATUS OF ADOLESCENT GIRLS AND THE INCIDENCE OF ADOLESCENT GIRLS' ANEMIA IN SEVEN VILLAGES

Louisa Ariantje Langi[1]*, Ida Bagus Eka Utama Wija[2]
[1]Department of Medical Community, Faculty of Medicine, Universitas Kristen Indonesia, Jl. Mayor Jendral Sutoyo No.2, Cawang, Jakarta Timur, Jakarta 13630 Indonesia
[2]Department of Pediactric, Faculty of Medicine, Universitas Kristen Indonesia, Jl. Mayor Jendral Sutoyo No.2, Cawang, Jakarta Timur, Jakarta 13630 Indonesia
*louisa.langi@uki.ac.id

ABSTRACT
Anemia in adolescent girls is a significant public health problem, especially in rural areas. One of the main risk factors for anemia is poor nutritional status. Adolescent girls with unbalanced nutritional status have a higher risk of iron deficiency, leading to anemia. This study aims to determine the relationship between nutritional status and the incidence of anemia in adolescent girls in seven villages in the Rancakalong Health Center working area in 2023. Aims: to determine whether there is a relationship between nutritional status and the incidence of anemia in adolescent girls in seven villages in Rancakalong sub-district. Methods: This study used an observational analytical design with a cross-sectional approach. The subjects were adolescent girls aged 13–18 years who lived in seven villages in the Rancakalong Health Center working area. Nutritional status was measured based on Body Mass Index (BMI) according to age, while the Sahli method determined anemia based on hemoglobin levels. Data analysis was carried out using the chi-square test to see the relationship between nutritional status and the incidence of anemia. Results: Of the 140 adolescent girls studied, 23 (16.4%) had anemia. One person (4.3%) with anemia had poor nutritional status. The results of the analysis showed no significant relationship between nutritional status and the incidence of anemia ($p > 0.05$) with the results of the chi-square p-value analysis of 0.443. Conclusion: There is a significant relationship between nutritional status and the incidence of anemia in adolescent girls in the Rancakalong Health Center working area. Sustainable nutritional intervention and health promotion are needed to improve nutritional status and reduce the incidence of anemia in adolescent girls.

Keywords: adolescent girls; anemia; nutritional status; rancakalong health center

How to cite (in APA style)
Langi, L. A., & Wija, I. B. E. U. (2025). Relationship between Nutritional Status of Adolescent Girls and the Incidence of Adolescent Girls' Anemia in Seven Villages. Indonesian Journal of Global Health Research, 7(4), 717-722. https://doi.org/10.37287/ijghr.v7i4.6406.

INTRODUCTION

Based on the Regulation of the Minister of Health of the Republic of Indonesia Number 25 of 2014, it defines adolescents as residents aged between 10 and 18 years, where this age is an important moment for physical development, thinking skills, morals, and creativity in humans, so special attention needs to be given to someone when they reach adolescence (Unicef, 2021). According to data from the World Health Organization (WHO), adolescents make up around 18% of the world's population or around 1.2 billion people. The population of Indonesia is around 270,203,917 and 2/3 of the population is recorded as being of productive age. With a prevalence of 52% of male adolescents and 48% of female adolescents. Based on the prevalence of the distribution of the adolescent population in Indonesia, West Java Province ranks first as the province with the largest number of adolescents, namely 18% (Indonesia, 2021) (Sompie et al., 2015) Nutritional status is a condition caused by the balance between nutrient intake from food and the nutritional needs required for body metabolism (Kemenkes, 2017). Each individual requires different nutrient intakes between individuals, this depends on age, gender, activity, weight, and others. The National Basic Health Research Survey (2018) shows

that the burden of malnutrition in Indonesia is quite large, with more than a quarter of the adolescent population aged 13-15 years experiencing shortness or stunting (around 26 percent) and 9 percent underweight (thin). Among adolescents aged 16-18 years, 27 percent experienced stunting and 8 percent were thin, while 2013 data showed the prevalence of anemia in adolescents aged 13-18 years was 12.4 percent for male adolescents and 22.7 percent for female adolescents (Sompie et al., 2015)

Hemoglobin is an erythrocyte protein that contains oxygen. Decreased hemoglobin levels are parameters that indicate a condition of iron anemia, bleeding, chronic kidney disease, or low levels of folate, vitamins B12 and B6 (Farid et al., 2019). A person is said to be anemic if the Hb level is <12 mg/dl in adult women. In this state of anemia, the number of circulating erythrocytes decreases so that there is a decrease in oxygen transport from the lungs to peripheral tissues (Harewood & Azevedo, 2017). One of the main risk factors for anemia is inadequate nutrient intake. Nutritional intake is also an indicator of nutritional status as measured by anthropometry. Based on data from Riskesdas 2018, the prevalence of anemia in adolescent girls is 32%, in other words, 3-4 out of 10 adolescents suffer from anemia. This figure has increased from the prevalence of anemia in Riskesdas 2013, which was 22.7%, and is a national health problem because it is >15%. Anemia is characterized by symptoms of weakness, fatigue, lethargy, tiredness, no enthusiasm, and decreased ability to concentrate (Deivita et al., 2021). The importance of paying more attention to adolescent girls about anemia because this group is at risk of 10 times greater decrease in hemoglobin than adolescent boys. This occurs due to menstruation, which coincides with the growth phase, which will require twice as much nutrition (Sompie et al., 2015).

Nutritional status is one of the factors that affect Hb levels in the blood. This is because inadequate intake of nutrients in the body causes nutritional needs in the body not to be met, especially nutritional needs such as iron. Iron is one of the most important components in the formation of hemoglobin (Sabngatun & Sari, 2018; Sanjaya & Sari, 2020). Decreased hemoglobin levels in adolescent girls will have an impact on decreased immunity which makes adolescents susceptible to infection, decreased fitness and agility in thinking and working, and learning achievement. Long-term aspects of anemia since adolescence include the risk of postpartum hemorrhage, inhibited fetal growth, abortion, and premature birth, thereby increasing morbidity and maternal mortality (MMR) (Chiabrando et al., 2014). Therefore, it is important to meet nutritional intake in adolescent girls to prevent anemia from an early age. This is what will be explored in this study, whether there is a relationship between the nutritional status of adolescent girls and hemoglobin levels in 7 villages in the Rancakalong Health Center work area. The purpose of this study was to determine the relationship between the nutritional status of adolescent girls and the incidence of anemia in adolescent girls in seven villages in the Rancakalong Health Center working area in 2023.

METHOD

This study used an analytical quantitative design with a cross-sectional approach implemented in 2023. The population in this study were all female adolescents aged 13–18 years who lived in 7 villages in the Rancakalong Health Center working area. The sampling technique was stratified random sampling, with a sample size of 140 respondents. Measurement of nutritional status was carried out by assessing the Body Mass Index (BMI) based on age using WHO standards. Meanwhile, the incidence of anemia was determined based on hemoglobin levels measured using the Sahli method, with a normal limit of <12 g/dL as an indicator of anemia. Data were analyzed using the chi-square test to determine the relationship between nutritional status and the incidence of anemia, with a significance level of 5% ($p < 0.05$).

RESULT

The number of adolescent girls who met the inclusion and exclusion criteria was 140, because 1 adolescent had passed the maximum age.

Table 1.
Frequency Distribution of Respondents Based on Age

Age	f	%
13-15 years	100	71.4
16-18 year	40	28.6

Table 1 shows the distribution data of respondents based on age, the number of female teenagers who became respondents was 140 female teenagers. The largest age distribution of teenagers was in the 13-15 age group, with 100 respondents (71.4%), while the smallest age distribution was in the 16-18 age group, with 40 respondents (28.6%). Table 2 shows data on the prevalence of nutritional status, where the nutritional status of adolescent girls is highest in the good nutritional status age group, namely 113 respondents (80.7%)

Table 2.
Prevalence of Respondents' Nutritional Status

Nutritional Status	f	%
Malnutrition	1	0.7
Undernutrition	3	2.1
Good Nutrition	113	80.7
Overnutrition	18	12.9
Obesity	5	3.6

Table 3 shows data on the prevalence of anemia in adolescent girls, where the number of adolescent girls who experienced anemia was 23 (16.4%) respondents, while the number of adolescent girls who did not experience anemia was 117 (83.6%) respondents.

Table 3.
Prevalence of Anemia in Adolescent Girls

Anemia Occurrence	f	%
Anemia	23	16.4
No Anemia	117	83.6

Table 4.
Relationship between Nutritional Status of Adolescent Girls and the incidence of anemia

Nutritional Status Variables	Anemia Occurrence				Total		P-Value
	Anemia		No Anemia				
	f	%	f	%	f	%	
Malnutrition	0	0	1	0.9	1	0.7	
Undernutrition	1	4.3	2	1.7	3	2.1	
Good Nutrition	21	91.4	92	78.6	113	80.7	0.443
Overnutrition	1	4.3	17	14.5	18	12.9	
Obesity	0	0	5	4.3	5	3.6	

Based on the table, anemia was most common among adolescent girls with good nutritional status (91.4%), with no cases in the poor or obese groups (0%). Only 1 case each was found in the undernourished and overnourished groups (4.3% each). Among those without anemia, most had good nutritional status (78.6%), followed by overnourished (14.5%), obese (4.3%), undernourished (1.7%), and poor nutritional status (0.9%). The Chi-Square test showed no significant relationship between nutritional status and anemia ($p = 0.443$).

DISCUSSION

Frequency Distribution of Respondents Based on Respondent Age

Based on the results of a study conducted on 140 female adolescents in seven villages in Rancakalong District, Sumedang Regency, it was found that the largest number of adolescents was in the 10-15 year age group, with 100 respondents (71.4%), while the smallest age distribution was in the 16-18 year age group, with 40 respondents (28.6%). These results are by the targets set by the government, especially in the Rancakalong Health Center area, which

targets the eradication of anemia in female adolescents to prevent stunting early in the Zero Stunting program (Jaelani et al., 2017; Li et al., 2019). According to WHO, the age limits for adolescents based on age consist of early adolescence (10-13 years), middle adolescence (14-16 years), and late adolescence (17-19 years). Based on the Minister of Health Regulation Number 25 of 2014, adolescents are the age group of 10 to 18 years (Sompie et al., 2015). Age itself is defined as the age of an individual calculated from birth to the present. The older the person is, the more mature the level of comprehension and mindset of a person will be in thinking so that the knowledge they gain will improve. Several other factors also influence the incidence of anemia, namely basic factors (socioeconomic status, knowledge, education, and culture), and direct factors (Fe tablet consumption patterns, infectious diseases, and bleeding) (Jaelani et al., 2017).

Prevalence of Respondents' Nutritional Status

Based on the results of a study conducted on 140 female adolescents in seven villages in Rancakalong District, Sumedang Regency, it was found that 1 adolescent had poor nutrition (0.7%), 3 had undernutrition (2.1%), 113 had good nutrition (80.7%), 18 had overnutrition (12.9%), and 5 had obesity (3.6%). In general, respondents had an average of good nutrition, reaching 80.7%. Nur Widianti's 2012 study stated that there was a significant relationship between eating behavior and nutritional status in female adolescents ($p = 0.001$), and Laus et al's 2009 study in Brazil stated that there was a relationship between body image and nutritional status ($p < 0.01$, $r = 0.37$). Nutritional status in female adolescents is often influenced by eating behavior and body image. Many teenagers feel dissatisfied with their own appearance, especially regarding body image or perception of their body, where a tall and thin body shape is something that is desired by teenage girls (PRAMESWARI, 2023). This sometimes has a bad influence, many teenagers apply unhealthy eating patterns to get an ideal body. Wrong eating patterns can also increase the risk of poor nutritional status. Malnutrition or excess nutrition in teenagers occurs due to food consumption patterns that do not pay attention to nutritional and health rules, so that nutritional intake in terms of quantity and quality does not match the recommended Nutritional Adequacy Rate (AKG) (Deivita et al., 2021; Li et al., 2019).

Prevalence of Anemia in Adolescent Girls in Rancakalong District

Based on the results of a study conducted on 140 adolescent girls in seven villages in Rancakalong District, Sumedang Regency, it was found that the number of adolescent girls who experienced anemia was 23 (16.4%), while adolescent girls who did not experience anemia were 117 (83.6%). Anemia is a condition where the hemoglobin level in the blood is below the normal limit. In adolescent girls, the hemoglobin level limit for anemia is 12 g/dL. Adolescent girls are one of the groups that are susceptible to anemia. Many factors can cause anemia, one of the most contributing factors is iron deficiency. This occurs due to nutritional intake that does not consider a balanced menu that includes elements of carbohydrates, fat, protein, iron, vitamins, minerals, and others. Food consumption patterns also have a major role in the occurrence of anemia (Gandhi et al., 2017). Research data shows that in adolescents aged 13-19 years in West Java, the prevalence of anemia reached 42.4%, which was obtained from several factors, namely energy intake, protein, iron, vitamin C, tea and coffee drinking habits, and menstrual patterns. In the study, Raditya Atmaka et al. stated that among 189 female students, 69 were newly diagnosed with iron deficiency anemia (incidence = 36.5 percent), but 7 students refused to participate in the study. Based on the screening results, the average hemoglobin of the subjects was 10,365 g / dL and the average serum ferritin was 8,885 µg / L (Atmaka et al., 2020).

Relationship of Nutritional Status of Adolescent Girls with the incidence of anemia

Based on the results of a study conducted on 140 adolescent girls in seven villages in Rancakalong District, Sumedang Regency, it was found that in the group of poor nutritional

status and obesity who experienced anemia 0%, adolescent girls who experienced anemia in the undernutrition group were 1 person (4.3%), adolescent girls who experienced anemia in the good nutrition group were 21 people (91.4%), and adolescent girls who experienced anemia in the overnutrition status group were 1 person (4.3%). Adolescent girls with poor nutritional status who did not experience anemia were 1 person (0.9%), adolescent girls with undernutrition status who did not experience anemia were 2 people (1.7%), adolescent girls with good nutritional status who did not experience anemia were 92 people (78.6%), adolescent girls with overnutrition status who did not experience anemia were 17 people (14.5%), adolescent girls with obesity nutritional status who did not experience anemia were 5 people (4.3%). Based on the results of the Chi-Square test, a P Value of > 0.05 was obtained, namely 0.443, which means that there is no relationship between the nutritional status of adolescent girls and the incidence of anemia in 7 villages in the Rancakalong Health Center working area. Research by Indarti (2014) showed no significant relationship between nutritional status and the incidence of anemia (p> 0.05) because most young women are classified as having normal nutritional status. Nutritional status based on BMI/U indicators is more influenced by macronutrient intake (carbohydrates, fats, proteins). Carbohydrates, proteins, and fats are the nutrients that supply the most energy to the body (Indonesia, 2021; Killeen & Tambe, 2024). A decrease in nutritional status can occur if energy intake is less than the needs within a certain period of time, a balance of nutritional intake will help maintain normal nutritional status and will potentially cause obesity if there is excessive energy intake or lack of energy expenditure (Herwandar & Soviyati, 2020).

Nutritional status based on BMI/U is not influenced by micronutrient intake because of the small energy content it has, and if there is a deficiency, it has probably been going on for a long time. Micronutrient deficiencies such as: iron, iodine, and vitamin A will cause anemia. Especially iron which is one of the nutritional elements as a component of red blood cell formation (Ayudia, 2020). The incidence of anemia in young women is likely caused by other factors that were not studied and controlled in this study such as problems with bone marrow, the immune system, and chronic diseases. In addition, this study only looked at the category of nutritional status in adolescents without looking at what factors influence this (Abdel-Razeq & Hashem, 2020). Iron is very important for teenagers because rapid growth causes blood volume to increase, as well as muscle mass and enzymes. Especially for women, menstruation experienced every month will also increase the need for iron minerals. Iron deficiency, in principle, can be overcome by, among others, changing eating habits, because anemia is basically caused by a lack of iron intake from food and low bioavailability of iron consumed, so improving the quality of the food menu is one alternative for a long-term program (Harewood & Azevedo, 2017)

CONCLUSION

Based on the results and discussion of the data, it can be concluded that: 1) The highest age is in the age group of 10 to 15 years in adolescent girls in 7 villages in the Rancakalong health center work area; 2) The nutritional status of adolescent girls is highest in the good nutritional status group; 3) More adolescent girls do not experience anemia in 7 villages in the Rancakalong health center work area; 4) There is no relationship between the nutritional status of adolescent girls and hemoglobin levels in 7 villages in the Rancakalong health center work area

REFERENCES

Abdel-Razeq, H., & Hashem, H. (2020). Recent update in the pathogenesis and treatment of chemotherapy and cancer induced anemia. Critical Reviews in Oncology/Hematology, 145, 102837. https://www.sciencedirect.com/science/article/pii/S1040842819302239

Atmaka, D. R., Ningsih, W. I. F., & Maghribi, R. (2020). Dietary intake changes in adolescent girl after iron deficiency anemia diagnosis. Health Science Journal of

Indonesia, 11(1), 27–31. http://61.8.75.226/itblog/attachments/article/2815/Dietary intake changes in adolescent girl after iron deficiency anemia diagnosis.pdf

Ayudia, F. (2020). Pengaruh Status Gizi Dengan Kadar Hemoglobin Remaja Putri. Jurnal Kesehatan Saintika Meditory, 2(2), 40–43. https://jurnal.syedzasaintika.ac.id/index.php/meditory/article/viewFile/508/289

Chiabrando, D., Mercurio, S., & Tolosano, E. (2014). Heme and erythropoieis: more than a structural role. Haematologica, 99(6), 973. https://pmc.ncbi.nlm.nih.gov/articles/PMC4040894/

Deivita, Y., Syafruddin, S., Nilawati, U. A., Aminuddin, A., Burhanuddin, B., & Zahir, Z. (2021). Overview of Anemia; risk factors and solution offering. Gaceta Sanitaria, 35, S235–S241. https://www.sciencedirect.com/science/article/pii/S0213911121003113

Farid, Y., Bowman, N. S., & Lecat, P. (2019). Biochemistry, hemoglobin synthesis. https://europepmc.org/article/nbk/nbk536912

Gandhi, S. J., Hagans, I., Nathan, K., Hunter, K., & Roy, S. (2017). Prevalence, comorbidity and investigation of anemia in the primary care office. Journal of Clinical Medicine Research, 9(12), 970. https://pmc.ncbi.nlm.nih.gov/articles/PMC5687900/

Harewood, J., & Azevedo, A. M. (2017). Alpha thalassemia. https://europepmc.org/article/nbk/nbk441826

Herwandar, F. R., & Soviyati, E. (2020). Perbandingan Kadar Hemoglobin Pada Remaja Premenarche Dan Postmenarche Di Desa Ragawacana Kecamatan Kramatmulya Kabupaten Kuningan Tahun 2018. Jurnal Ilmu Kesehatan Bhakti Husada: Health Sciences Journal, 11(1), 71–82. https://pdfs.semanticscholar.org/91ce/43a573e324de9df8a21053ce29e2c3d7596e.pdf/1000

Indonesia, U. (2021). Strategi Komunikasi Perubahan Sosial Dan Perilaku: Meningkatkan Gizi Remaja Di Indonesia. Jakarta: UNICEF Indonesia.

Jaelani, M., Simanjuntak, B. Y., & Yuliantini, E. (2017). Faktor risiko yang berhubungan dengan kejadian anemia pada remaja putri. Jurnal Kesehatan, 8(3), 358–368. http://repository.poltekkesbengkulu.ac.id/2854/

Kemenkes, R. I. (2017). Bahan Ajar Gizi Penilaian Statuz Gizi. Cetakan Pertama. Jakarta. Kemenkes RI.

Killeen, R. B., & Tambe, A. (2024). Acute Anemia. In StatPearls [Internet]. StatPearls Publishing. https://www.ncbi.nlm.nih.gov/books/NBK537232/

Li, Q., Liang, F., Liang, W., Shi, W., & Han, Y. (2019). Prevalence of anemia and its associated risk factors among 6-months-old infants in Beijing. Frontiers in Pediatrics, 7, 286. https://www.frontiersin.org/articles/10.3389/fped.2019.00286/full

PRAMESWARI, T. (2023). Hubungan Konsumsi Fast Food Dengan Status Gizi Pada Remaja Kelas X Di Smk Muhammadiyah 2 Klaten Utara [Universitas Muhammadiyah Klaten]. http://repository.umkla.ac.id/id/eprint/3195

Sabngatun, S., & Sari, A. N. (2018). Hubungan Antara Status Gizi dengan Kadar Hemoglobin pada Ibu Hamil Trimester III. Avicenna: Journal of Health Research, 1(1). http://jurnal.stikesmus.ac.id/index.php/avicenna/article/view/196

Sanjaya, R., & Sari, S. (2020). Hubungan status gizi dengan kadar hemoglobin pada remaja putri di Madrasah Aliyah Darul Ulum Panaragan Jaya Tulang Bawang Barat tahun 2019. Jurnal Maternitas Aisyah (JAMAN AISYAH), 1(1), 1–8. http://journal.aisyahuniversity.ac.id/index.php/Jaman/article/view/rionaimtx

Sompie, K. A., Mantik, M. F. J., & Rompis, J. (2015). Hubungan antara status gizi dengan kadar hemoglobin pada remaja usia 12-14 tahun. E-CliniC, 3(1). https://ejournal.unsrat.ac.id/index.php/eclinic/article/view/6756

Unicef. (2021). Strategi Komunikasi Perubahan Sosial dan Perilaku: Meningkatkan Gizi Remaja di Indonesia. UNICEF Indonesia, 1–66.