



THE EFFECT OF ANEMIA EDUCATION ON INCREASING HAEMOGLOBIN LEVELS IN ADOLESCENT GIRLS

Silva Millenia*, Rahmadyanti

STIKES Abdi Nusantara, Jl. Swadaya No.7, Jatibening, Pd. Gede, Bekasi, West Java 17412, Indonesia

*silvamillenia10jan@gmail.com

ABSTRACT

The high incidence of anemia in adolescent girls can affect various impacts of growth and development. So that learning achievement decreases, physical endurance is low so easily tired, physical activity decreases, easily sick due to low body resistance, one of the prevention that can be made in reducing the incidence of anemia in adolescent girls is to give the education for increasing knowledge about anemia. The purpose of the study was to analyze the effect of education about anemia and nutrition on increasing haemoglobin levels in female students. This study was an experimental quasy design. at SMPN 1 Jasinga, Pamegarsari village, Jasinga District, Bogor Regency, West Java Province from September to January 2024. The sample was 146 female students, sampling was done by simple random sampling technique. Data was collected by direct hemoglobin examination. Bivariate analysis is with the Mann Whitney U test. The results of the Mann-Whitney test where in pairs before the intervention and after the intervention obtained Sig.2-tailed values of $0.004 < 0.05$, it can be concluded that there is a difference in average haemoglobin levels before and after education.

Keywords: adolescence; anemia; education; haemoglobin

First Received 12 December 2023	Revised 18 December 2023	Accepted 30 December 2023
Final Proof Received 08 January 2024		Published 29 January 2024
How to cite (in APA style) Millenia, S., & Rahmadyanti, R. (2024). Analysis of Stakeholder Behavior on the Successful Development of Active Alert Villages in Grobogan District. <i>Indonesian Journal of Global Health Research</i> , 6(1), 111-116. https://doi.org/10.37287/ijghr.v6i1.2673 .		

INTRODUCTION

Anemia is one of the health problems around the world, especially developing countries, where an estimated 30% of the world's population suffers from anemia. Anemia occurs in many communities, especially in adolescent girls. Iron deficiency anemia is prone to occur in adolescent girls due to the increased need for iron during the growth period. The body needs a large amount of nutrients, including iron, which is mainly used by the blood to transport oxygen. Insufficient iron will trigger anemia. Plus, blood loss during menstruation also increases the risk of anemia. According to WHO, in 2018 the incidence of anemia in adolescent girls in developing countries was around 53.7% of all adolescent girls. The prevalence of anemia in Indonesia according to Basic Health Research (RISKESDAS) in 2018 based on female sex is 27.2% and anemia often attacks adolescent girls caused by stress, menstruation, or low intake food (Habtegiorgis, 2022) (Wahyuningsih, 2019)(Juffrie, 2020)(Agustina, 2021)(Laksmi, 2018)

The high incidence of anemia in adolescent girls can affect various impacts of change and adolescent growth and development, one of which is the lack of growth in adolescent girls. Deficient hemoglobin levels can be used as an indicator of iron deficiency anemia. In terms of public health, nutritional anemia is associated with iron deficiency anemia. The prevalence of

iron deficiency in developing countries is much higher than in developed countries, at 36% and 8%, respectively, the prevalence of iron deficiency anemia in adolescent girls in several countries: 82.5% in Bangladesh, 23% in China and 42.2% in the Philippines. India found 74.7% of adolescent girls (12-19 years). (Deivita, 2021)(Putri, 2018).

In Indonesia, the prevalence of iron deficiency anemia in adolescent girls ranges from 28% to 57.1%. One in three adolescent girls in Indonesia suffers from anemia. This is understandable because adolescence is a period of growth that requires higher nutrients including iron. In addition, adolescent girls menstruate every month so they need higher iron, while the amount of food they consume is also lower than men because of the factor of wanting to slim. Iron deficiency can cause interference or obstacles to growth, both body cells and brain cells as a result can reduce learning achievement, exercise and work productivity, besides that people with iron deficiency will reduce body resistance, resulting in easy infection (Safitri, 2019)

Anemia causes blood to not adequately bind and transport oxygen from the lungs to the rest of the body. If the necessary oxygen is not enough, it will result in difficulty concentrating, so that learning achievement decreases, low physical endurance so easily tired, decreased physical activity, easily sick due to low body resistance, as a result rarely enter school or work. As a result of this anemia if not given intervention for a long time will cause several diseases such as congestive heart failure, germ infectious diseases, thalassemia, immune system disorders, and meningitis.(Izdihar, 2022)(Safitri, 2019) Young women are also one of the groups at risk of suffering from anemia are future leaders, prospective workers who will be the backbone of national productivity, and as prospective mothers who will give birth to the next generation and are the key to child care in the future. Therefore, the quality of young women deserves special attention. Adolescent girls have a high risk for anemia because at this age there is an increase in iron needs due to growth, menstruation, often limiting food consumption, and consumption patterns often violate the rules of nutrition.(Larasati, 2022)(Putri, 2018)

Previous research has reported that one of the efforts that can be made in reducing the incidence of anemia in adolescent girls is to provide knowledge and education about the dangers of anemia and ways to overcome it. Research conducted reports that there is a significant relationship between knowledge and the incidence of anemia p-value (0.000). The purpose of the study was to analyze the effect of education about anemia and nutrition on increasing haemoglobin levels in female students at SMPN 1 Jasinga. (Arifah, 2022)(Putri, 2018).

METHOD

This study used quantitative research methods with experimental quasy design. This research was conducted at SMPN 1 Jasinga, Pamegarsari village, Jasinga District, Bogor Regency, West Java Province from September to January 2024. The population in this study was adolescent girls recorded at SMPN (Junior high school) 1 Jasinga. The young women population is 230 female students. The sample was 146 female students, sampling was done by simple random sampling technique. The intervention provided is an education or counseling program provided by health workers about anemia in adolescent girls as much as 1 time and the outcome measured is hemeoglobin levels in the blood which are assessed by taking a small blood sample and tested through a test kit (hb stick). The bivariate analysis used in this study was to determine whether there was a relationship between the level of knowledge of adolescents before and after being given anemia education, namely with the Mann Whitney U test.

RESULTS

Table 1.
Frequency Distribution of Haemoglobin Levels Before and After Education

	Before Education	After Education
Average (mean)	11.04 g/dL	11.28 g/dL
Standard Deviation	0.68	0.83
Minimum	9.7 g/dL	9.7 g/dL
Maximum	12.4 g/dL	13.4 g/dL

Education in adolescent girls can increase the average haemoglobin levels and also the maximum value of haemoglobin. It can be seen in the table that after education, the average haemoglobin level was 11.28 g/dL, up 0.24 g/dL from before education, which was 11.04 g/dL. The maximum value of haemoglobin levels after education increased quite significantly, namely after maximum education haemoglobin levels reached 13.4 g / dL while before education only 12.4 g / dL different 1 g / dL.

Table 2.
Cross-tabulation of anemia categories before and after education

Education Time	Categories Anemia				Total	
	Anemia		No Anemia		f	%
	f	%	f	%		
Before	126	43.2	20	6.8	146	50
After	106	36.3	40	13.7	146	50

Tabel 2 regarding the category of haemoglobin levels, it can be seen that 126 adolescent girls experience anemia either in menstrual conditions or not. After education about anemia, there was an increase in the number of female students who were not anemic by 2 times, namely before education there were only 20 adolescent girls who were not anemic and after education there were 40 female students who were no longer anemic.

Table 3.
Normality Test Results

Result	Test Of Normality					
	Kolmogrov-Smirnova			Shapiro - Wilk		
	Statistics	Df	Sig	Statistics	Df	Sig
Before education	,517	146	,000	,402	146	,000
After education	,456	146	,000	,557	146	,000

Table 3 shows that the resulting value in the Sig value is 0.040 in the Pretest value which means that the data is not normally distributed because the Sig value is < 0.05 and in the Posttest the Sig value is 0.000 which means that the data is also not normally distributed because the Sig value is < 0.05, since the values of the two variables above are not normally distributed, the next step is the *Mann Whitney U-Test*.

Table 4.
Effectiveness of Anemia Education on Increased Haemoglobin Levels

Result	Mann-Whitney Test						
	Mean Rank before	Z	Mean Rank after	95 Confidence Interval		Df	Sig (2-tailed)
				Lower	Upper		
Before - after	13.6	2.89	15.6	0.04	0.44	146	.004

Table 4 of the Mann-Whitney test results where in pairs before the intervention and after the intervention obtained Sig.2-tailed values of 0.004 < 0.05, it can be concluded that there is a difference in average haemoglobin levels before and after education. Based on the results of

the table above, it can be concluded that providing education about anemia is effective in increasing haemoglobin levels of adolescent girls at SMPN 1 Jasinga.

DISCUSSION

The results showed that after education, the average haemoglobin level was 11.28 g / dL, up 0.24 g / dL from before education, which was 11.04 g / dL. In addition, after education about anemia, there was an increase in the number of female students who were not anemic by 2 times, before education there were only 20 adolescent girls who were not anemic and after education there were 40 female students who were no longer anemic. The results of the analysis also showed that the p value was $0.004 < 0.05$, so it can be concluded that the provision of education is effective in increasing students' haemoglobin levels. This result is in line with research conducted by that the provision of education about anemia was able to increase the average haemoglobin levels from before the intervention the average Hb levels were 10.65 ± 0.69 g / dL and after the intervention increased to 12.40 ± 0.59 g / dL, with an average increase of 1.75 g / dL. In the control group before the intervention the average Hb level was 11.18 ± 0.51 g / dL and after the intervention increased to 11.90 ± 0.42 g / dL with an average increase of 0.72 g / dL.(Indriani, 2019)

This result relates to the increase in knowledge obtained as a result of information absorption. Providing education can increase one's knowledge, this is supported by those who state that providing counseling can increase adolescent knowledge. Audio-visual anemia education without or with leaflets in increasing anemia knowledge in adolescent girls so that they pay more attention to intake and lifestyle.(Arifarahmi, 2021)(Sopiyandi, 2023) Another study from (Dwistika, 2023) also reported that in the intervention group, a p-value of 0.000 ($p < 0.05$) was obtained, which showed that there was an effect of providing anemia education on Hb levels in the intervention group. This can also be seen from the descriptive test carried out, namely there was an increase in the average hemoglobin level before the intervention was carried out, which was $11,378 \pm 1.1860$ and increased to $14,244 \pm 1.3129$ after the intervention. Education is closely related to knowledge and aims to increase knowledge, Knowledge is the result of human curiosity about anything through certain ways and with certain tools. Knowledge is very closely related to education, where it is expected that with higher education, the person will be more knowledge-widespread, so it is expected to affect behavior and attitudes and healthy food choices. However, it should be emphasized, it does not mean that someone with low education is absolutely low knowledge (Darsini et al. 2019).(Az-zahra, 2020)(Kusuma, 2022)

The provision of education in addition to increasing knowledge, is also able to change behavior, especially in the context of health psychology, referring to behavior that is in line with recommendations from information sources. Behavior is influenced by knowledge and attitudes, so to improve knowledge and attitudes health promotion is needed . Health promotion aims to educate individuals about the importance of good behavior to prevent disease. School is an important environment for health promotion because a large part of the population is students, and school is a place where health knowledge, attitudes and behaviors are learned early . In addition, young women often forget or even do not take blood-added tablets. The absence of an introduction program through the provision of information and counseling of Fe tablets as nutritional supplementation for adolescents in the school may be a factor in the lack of knowledge about Fe tablets (Ghasemi, 2019) (Kusuma N. I., 2021)(Nurhayati, 2019)(Riyanto, 2021)(Dwiningrum, 2022).

CONCLUSION

The results of this research showed that the p value was $0.004 < 0.05$, so it can be concluded that the provision of education is effective in increasing students' haemoglobin levels. It is

hoped that this research can be used as input for educational practices and health promotion efforts as a preventive measure to overcome anemia in adolescents in the educational environment, because schools must be able to provide various knowledge for efforts to improve the quality of human resources.

REFERENCES

- Laksmita, S. &. (2018). Hubungan Pengetahuan Remaja Putri Tentang Anemia dengan Kejadian Anemia di Kabupaten. *Jurnal Ilmiah Keperawatan Sai Betik*, 14(1), 104-107.
- Putri, K. M. (2018). Hubungan pengetahuan dengan kejadian anemia pada remaja putri di wilayah kerja puskesmas Paal Merah I Kota Jambi tahun 2018. *Scientia Journal*, 7(1), 132-141.
- Safitri, S. &. (2019). Hubungan Pengetahuan Gizi Terhadap Kejadian anemia Pada Remaja Putri Di SMP Negeri 13 Kota Jambi. *Jurnal Akademika Baiturrahim Jambi*, 8(2), 261-266.
- Izdihar, M. S. (2022). Hubungan Pengetahuan dan Sikap tentang Anemia dengan Perilaku Pencegahan Anemia pada Remaja Puteri di SMAIT Ukhuwah Banjarmasin. *Homeostasis*, 5(2), 333-342.
- Larasati, D. K. (2022). Hubungan pengetahuan dan kepatuhan mengkonsumsi tablet tambah darah dengan kejadian anemia defisiensi besi: Literature review. *Media Gizi Kesmas*, 10(2), 298-306.
- Wahyuningsih, A. &. (2019). Hubungan pengetahuan tentang anemia dengan kepatuhan mengkonsumsi tablet tambah darah remaja putri di SMA Negeri 1 Karanganom. *INVOLUSI: Jurnal Ilmu Kebidanan*, 9(1), 1-12.
- Arifah, N. A. (2022). Penyuluhan Kesehatan tentang Anemia Pada Siswa di SMPN2 Galesong Selatan Kabupaten Takalar. *Jurnal Altifani Penelitian dan Pengabdian kepada Masyarakat*, 2(2), 176-182.
- Indriani, L. Z. (2019). Pengaruh pemberian edukasi gizi dan kapsul serbuk daun kelor (*Moringa oleifera* L.) terhadap kenaikan kadar hemoglobin remaja putri di universitas pakuan. *MPI (Media Pharmaceutica Indonesiana)*, 2(4), 200-207.
- Arifarahmi, A. (2021). Pengetahuan tentang Anemia dengan Kadar Hemoglobin Remaja Putri. *Jurnal Akademika Baiturrahim Jambi*, 10(2), 463-468.
- Sopiyandi, S. S. (2023). Edukasi Pedoman Gizi Seimbang (Pgs) Melalui Media Sosial Dapat Meningkatkan Kadar Hemoglobin Dan Pengetahuan Pada Remaja Putri. *Pontianak Nutrition Journal (PNJ)*, 6(2).
- Dwistika, W. F. (2023). Pengaruh Edukasi Anemia Dengan Video Animasi Terhadap Kepatuhan Konsumsi Tablet Tambah Darah dan Kadar Hemoglobin Remaja Putri di SMPN 17 Samarinda. *Advanced In Social Humanities Research*, 1(8), 112-124.
- Riyanto, A. (2021). Promosi kesehatan menggunakan aplikasi WhatsApp untuk meningkatkan kepatuhan minum tablet tambah darah pada remaja putri di masa pandemi COVID-19. *Jurnal Kesehatan Kartika*, 16(2), 66-74.

- Az-zahra, K. &. (2020). Efektivitas pemberian media edukasi gizi yang menarik dan inovatif terhadap pencegahan anemia kepada remaja putri: literature review. *Media Publikasi Promosi Kesehatan Indonesia (MPPKI)*, 5(6), 618-627.
- Kusuma, T. U. (2022). Peran Edukasi Gizi Dalam Pencegahan Anemia Pada Remaja Di Indonesia: Literature Review. *Jurnal Surya Muda*, 4(1), 61-78.
- Dwiningrum, Y. &. (2022). Efektivitas Video Edukasi Anemia Gizi Besi Terhadap Pengetahuan Remaja Putri Di Bantul. *Jurnal Medika Indonesia*, 3(2), 33-40.
- Nurhayati, N. P. (2019). Iron deficiency anemia and current state of knowledge among adolescent girls, Lampung-Indonesia. *Malahayati Int J Nurs Heal Sci*, 2(1), 20-4.
- Ghasemi, V. S. (2019). The effect of peer education on health promotion of Iranian adolescents: A systematic review. *International Journal of Pediatrics*, 7(3), 9139-9157.
- Kusuma, N. I. (2021). Changes in Knowledge and Attitudes in Preventing Anemia in Female Adolescents: A Comparative Study. *Women Midwives and Midwifery*, 1(2), 46-54.
- Juffrie, M. H. (2020). Nutritional anemia in Indonesia children and adolescents: Diagnostic reliability for appropriate management. *Asia Pacific Journal of Clinical Nutrition*, 29.
- Agustina, R. W. (2021). Associations of knowledge, attitude, and practices toward anemia with anemia prevalence and height-for-Age Z-Score among Indonesian adolescent girls. *Food and nutrition bulletin*, 42(1_suppl), S92-S108.
- Deivita, Y. S. (2021). Overview of Anemia; risk factors and solution offering. *Gaceta Sanitaria*, 35, S235-S241.
- Habtegiorgis, S. D. (2022). Prevalence and associated factors of anemia among adolescent girls in Ethiopia: A systematic review and meta-analysis. *Plos One*, 17(3), e0264063.