E-ISSN: 2987-209X
International Journal of Midwifery and Health Sciences
Vol. 1, Issue 2 (2023), July

Factors Related to Anemia in Adolescents of SMK Bina Am Makmur in Tangerang Regency 2022

Siti Komariyah[1], Rukmaini[1*] , Putri Azzahroh[1],

[1]Faculty of Health Sciences, Universitas Nasional, Jakarta

Submission date: 15-02-2023; Date of received: 26-05-2023; Publication date: 31-07-2023

Abstract

Background: There was still a lot of anemia in adolescent girls, which is suspected to be 64% of adolescent girls experiencing anemia related to knowledge about anemia, diet, and activities of adolescent girls at SMK BINA AM MAKMUR in Tangerang Regency.
Purpose: To determine the factors related to anemia in adolescents at SMK BINA AM MAKMUR in Tangerang Regency in 2022.
Methods: This research design used quantitative methods, non-experimental approaches, and *cross-sectional* approaches. The study sample amounted to 62 adolescents. The sampling technique used *was simple random sampling.* The research instrument consisted of questionnaires on anemia, knowledge, diet, and activity. Data analysis used descriptive statistics and kai squared with *chi-square formulation* to determine the relationship between knowledge, diet, and activity and the incidence of anemia in adolescents.
Result: Of the 62 adolescent girls, 48 (77.4%) had anemia. There was a relationship between knowledge (p value = 0.000), diet (p value = 0.007), and activity (p value = 0.004) with the incidence of anemia in adolescents at SMK BINA AM MAKMUR, Tangerang Regency, Banten in 2022.
Conclusions: The incidence of anemia in adolescents at SMK BINA AM MAKMUR Tangerang Regency in 2022 is quite high at 77.4%. It is expected that there will be strengthened coordination with all sectors, especially with the Tangerang Regency Health Office regarding the program for handling anemia in adolescents.

Keywords: Activity, Adolescents, Anemia, Diet, Knowlegde

Introduction

Adolescence is the stage where a person experiences a transition period to adulthood. Adolescence is an age stage that comes after childhood ends and is characterized by rapid physical growth. Adolescents in society are known by various terms that denote age groups that do not include children but are not adults. In general, anemia is more common in women and adolescent girls compared to men. What is very unfortunate is that most sufferers do not know or do not realize it. Even when you know, you still consider anemia a trivial problem.[1] Young women are prone to suffering from

*Corresponding Author: Rukmaini, Faculty of Health Sciences, Universitas Nasional, Jakarta, Indonesia, email: rukmaini@civitas.unas.ac.id

anemia because adolescent girls are growing up and experiencing menstruation every month, which causes iron loss.[2]

Anemia is a condition when the number of red blood cells or the concentration of oxygen carriers in the blood (Hb) is insufficient for the physiological needs of the body. According to WHO and Ministry of Health guidelines from 1999*, anemia cut-off points* vary between age groups as well as individuals. Certain age groups or groups of individuals were considered more susceptible to anemia than other groups. The reference *cut-off point* for anemia in toddlers aged 12-59 months is Hb levels below 11.0 g/dL. Schoolchildren aged 6–12 years were considered anemic if the Hb level is <12.0 g/dL. Pregnant women were considered anemic if their Hb levels are below 11.0 g/ddL. Meanwhile, men aged 15 years were considered to have anemia if Hb levels are <13.0 g/ddL and women of childbearing age 15–49 years experience anemia if Hb levels are <12.0 g/dL.[10]

Anemia is a nutritional problem around the world, especially in developing countries like Indonesia. The rate of iron deficiency anemia in Indonesia was 72.3%. As many as 60.2% of these anemias are hypochrome microcytic anemia (small cells with a small amount of hemoglobin in the cells), which is mostly caused by iron deficiency anemia. Meanwhile, based on Basic Health Research in 2010, more than 10% of school-age children in Indonesia have anemia.[10]

The impact of anemia on adolescent girls includes declining reproductive health, inhibiting motor, mental, and intelligence development, reducing learning ability and concentration, disrupting growth so that height does not reach optimal, reducing physical exercise and fitness levels, and causing pale faces.[8]

One of the causes of low levels of hemoglobin in the blood is insufficient intake. Daily nutrient intake is strongly influenced by eating habits. One of the factors influencing adolescent eating habits is knowledge.[6]

Lack of knowledge causes teenagers to choose to eat out or only consume snacks. Another cause is a lack of adequate eating and consuming food sources containing iron; besides that, consumption eats enough, but the food consumed has low iron bioaccessibility, so the amount of iron absorbed by the body is less.[13]

The results of the previous study showed that factors associated with anemia were the length of menstruation (p = 0.003), the length of the menstrual cycle (p = 0.004),

the level of education of parents (mother) (p = 0.000), and the level of income of parents (p = 0.000). A factor not associated with anemia was nutritional status (p = 0.064).[5]

Young women who received blood-added tablets were 76.2%, received TTD at school as much as 80.9%, and adolescent girls who took blood-added tablets (52 grains) as much as 98.6%. Blood Add Tablets (TTD) is a blood-enhancing nutritional supplement in the form of tablets, caplets, or capsules that can be obtained from the Program or independently.[10]

Based on a preliminary study conducted on adolescent girls at SMK Bina Am Makmur, Tangerang Regency, in November 2022 by measuring Hb levels using the Microlab-300 brand Hemoglobinometer, it is known that the prevalence of anemia in grade X adolescent girls is 64% (35 out of 55 adolescent girls). At the same time, a brief interview with 55 young women about anemia was conducted, and it was found that 42 young women did not know about anemia. While 13 other adolescent girls know about anemia only in terms of symptoms such as weakness, fatigue, lethargy, fatigue, and paleness, if symptoms of anemia occur in adolescence, it will also have an impact on when she will give birth and cause low birth. They also do not know that anemia is caused by iron deficiency due to a lack of intake, and they say they do not have time to eat breakfast because of the rush, and during school break they prefer to consume fast food such as meatballs, chicken noodles, grilled meatballs, fried foods, instant noodles, and other snacks. SMK Bina Am Makmur Tangerang Regency is one of the Private Vocational Schools in Banten Province, Tangerang Regency, and has never been used as a place for scientific research on health.

Based on the background above, the researchers conducted a study on factors associated with anemia in adolescents of SMK Bina Am Makmur in Tangerang Regency in 2022.

Method

1. *Research design*

   This study was used quantitative methods*, cross-sectional design.*

2. *Setting and samples*

   The location of the research was conducted at SMK Bina Am Makmur in Tangerang Regency. The study was conducted in December 2022. The population in this study was

all students of classes X, XI, and XII, totaling 165 students at SMK BINA AM MAKMUR in Tangerang Regency. The sample size calculated with the Slovin formula was 62 respondents. The sampling method uses *Simple Random Sampling.*

a. Inclusion Criteria

1) Class X, XI, and XII Students of SMK Bina AM Makmur in Tangerang Regency in 2022
2) Students who are not undergoing menstruation
3) Willing to follow research, as evidenced by the signing of approval sheets.

b. Exclusion Criteria

1) Students who were not present at the time of the study
2) Female student who is menstruating
3) Student was sick

3. *Measurement and data collection*

The instruments used in this study were questionnaires and interviews.

4. *Data analysis*

Data analysis using the *chi-squared statistical test.*

Results

Univariate Analysis

Table 1.
Distribution of Anemia Frequency in Adolescents at SMK BINAAM MAKMUR, Tangerang Regency, Banten in 2022

Anemia in adolescents	Frequency (f)	Percent (%)
Anemia	48	77,4
No Anemia	14	22,6
Sum	**62**	**100**

Table 2 .
Distribution of Knowledge Frequency to Adolescents at SMK BINA AM MAKMUR, Tangerang Regency, Banten in 2022

Knowledge	Frequency (f)	Percent (%)
Less	44	71
Good	18	29
Sum	**62**	**100**

Table 3.
Distribution of Dietary Frequency in Adolescents at SMK BINAAM MAKMUR, Tangerang Regency, Banten in 2022

Diet	Frequency (f)	Percent (%)
Less	46	74,2
Enough	16	25,8
Sum	**62**	**100**

Table 4.
Distribution of Activity Frequency in Adolescents at SMK BINAAM MAKMUR, Tangerang Regency, Banten in 2022

Activity	Frequency (f)	Percent (%)
Light	50	80,6
Keep	12	19,4
Sum	**62**	**100**

Results of Bivariate Analysis

Table 5.
The Relationship between Knowledge and Anemia in Adolescents at SMK BINA AM MAKMUR, Tangerang Regency, Banten in 2022

Knowledge	Anemia in adolescents				Total		P *Value*	OR (95% CI)
	Anemia		No Anemia					
	(f)	(%)	(f)	(%)	(f)	(%)		
Less	40	90,9	4	9,1	44	100	0,000	12,500 (3,126-49,980)
Good	8	44,4	10	55,6	18	100		
Sum	**48**	**77,4**	**14**	**22,6**	**62**	**100**		

Table 6.
The Relationship between Diet and Anemia in Adolescents at SMK BINAAM MAKMUR, Tangerang Regency, Banten in 2022

Diet	Anemia in adolescents				Total		P *Value*	OR (95% CI)
	Anemia		No Anemia					
	(f)	(%)	(f)	(%)	(f)	(%)		
Less	40	87	6	13	46	100	0,007	6,667 (1,812-24,525)
Enough	8	50	8	50	16	100		
Sum	**48**	**77,4**	**14**	**22,6**	**62**	**100**		

Table 7.
The Relationship between Activities and Anemia in Adolescents at SMK BINA AM MAKMUR, Tangerang Regency, Banten in 2022

Activity	Anemia in adolescents				Total		P *Value*	OR (95% CI)
	Anemia		No Anemia					
	(f)	(%)	(f)	(%)	(f)	(%)		
Light	43	86	7	14	50	100	0,004	8,600 (2.124-34,815)
Keep	5	41,7	7	58,3	12	100		
Sum	**48**	**77,4**	**14**	**22,6**	**62**	**100**		

Discussion

1. The relationship between adolescent knowledge and the incidence of anemia at SMK Bina Am Makmur in Tangerang Regency in 2022.

The results of the analysis found that adolescents who had less knowledge were less likely to experience anemia, which was as much as 40 (90.9%), while adolescents who had good knowledge tended not to experience anemia, which was as much as 10 (55.6%). The results of the *chi-square* analysis obtained a p value of 0.000, which means that there is a meaningful relationship between knowledge and anemia in adolescents at SMK Bina Am Makmur, Tangerang Regency, Banten in 2023. The OR (Odd Ratio) value is 12,500, so it can be stated that adolescents who have less knowledge tend to experience anemia 12 times more than adolescents who have good knowledge.

The results of research by Budianto show that there is a relationship between knowledge about Anemia and the incidence of Anemia in adolescent girls in Massachusetts. Mathla'ul Anwar Gisting with pvalue = 0.002 < α (0.05), while the results of research by Umriaty and Qudriani M. (2018) found that most female students have good knowledge (51.8%), have a positive perception of vulnerability (55.4%), and have a negative perception of seriousness (56.6%). The number of female students who experience anemia is 13.3%. The results of the analysis showed no significant relationship between knowledge (p value 0.399), perception of vulnerability (p value 0.215), and perception of seriousness (p value 0.145).[3]

Knowledge is the result of knowing, which occurs after someone senses a certain object. This sensing occurs through all five human senses, such as sight, hearing, smell, taste, and touch. Most of human knowledge comes from sight and hearing.[9]

Researchers assume that adolescents who have less knowledge are caused by a lack of understanding of anemia, its signs and symptoms, causes, effects, and efforts to prevent it. This is due to the eating habits of adolescents, who choose food outside or only consume snacks, and the lack of information obtained by young women about anemia. So it is very necessary for policymakers in schools to include the topic of anemia in the school curriculum.

2. The relationship between adolescent diet and the incidence of anemia at SMK Bina Am Makmur in Tangerang Regency in 2022

The results of the analysis found that adolescents who had a lower diet tended to experience anemia, which was as high as 40 (87%), while adolescents who had a sufficient diet tended not to experience anemia, which was as high as 8 (50%). The results of the *chi-square* analysis obtained *a p value* of 0.007, which means that there is a significant relationship between diet and anemia in adolescents at SMK Bina Am Makmur, Tangerang Regency, Banten in 2023. The OR (Odd Ratio) value is 6.667, so it can be stated that adolescents who have a lower diet tend to experience anemia 6.6 times more than adolescents who have an adequate diet.

The results of previous research explain that the factors associated with anemia in adolescent girls are: knowledge factor P = 0.611; age factor P = 0.851; diet factor P = 1.144; nutritional status factor P = 0.041; menstrual pattern factor P = 1.000; disease factor accompanied by P = 0.169; and income factor P = 0.169.[7]

The results of research in 2018 showed that most of the 39 (82.1%) respondents whose food intake was not enough experienced anemia, and less than a third, namely as many as 23 (26.1%) respondents, had anemia. The results of statistical analysis showed that there was an association between food intake and the incidence of anemia in adolescent girls (nilan p = 0.000), and respondents with insufficient food intake had a 12 times higher chance of anemia compared to respondents with adequate food intake (OR = 12.65).[12]

Modern patterns and lifestyles make teenagers tend to prefer eating outside the home with their groups. Young women often practice dieting in ways that are not right, such as abstinence or limiting or reducing the frequency of eating to prevent obesity. In general, adolescents have poor eating habits. Some adolescents, especially adolescent girls, often consume food in an unbalanced amount compared to their needs for fear of obesity and call eating not only in the context of consuming staple foods but snacks are also categorized as eating.[2]

The quantity and quality of food and beverages consumed will affect nutritional intake, which will affect the health of individuals and society as a whole. Optimal nutrition is essential for normal growth as well as the physical development and intelligence of infants, children, and all age groups. Good nutrition makes normal or healthy weight possible; the body is not susceptible to infectious diseases; work productivity increases; and the body is protected from chronic diseases and premature death. A good state of nutrition can improve individual and community health.

Balanced Nutrition for adolescents aged 10–19 years (Pre-pubertal and Puberty) This group is the transitional age group from children to young adolescents to adults. Important conditions that affect the nutritional needs of this group are rapid growth entering puberty, snacking habits, menstruation, and attention to physical appearance and body image in adolescent girls. Thus, the calculation of nutritional needs for this group must pay attention to these conditions. Especially for adolescent girls, more attention should be paid to their preparation before marriage.

According to the researchers' assumptions, the average teenager consumes food in the school cafeteria, which only provides food such as rice cakes, fried rice, boiled noodles, fried noodles, fried chicken, fried foods (bakwan, tofu, tempeh), meatballs, mini martabak, and snacks. And based on questionnaires given to adolescents in general, adolescents like to eat fast food such as boiled noodles and fried chicken, and some teenagers like snacks or consume snacks that are easy to consume without paying attention to the nutritional content contained in food. So, the lower the level of food intake, the more susceptible adolescents are to becoming anemic. The majority of respondents have a bad diet. The wrong diet can cause weight loss, which results in decreased brain ability, decreased enthusiasm for adolescents in learning, and adolescent anemia.

3. The relationship between adolescent activities and the incidence of anemia at SMK Bina Am Makmur in Tangerang Regency in 2022

The results of the analysis found that adolescents who had light physical activity tended to experience anemia as much as 43 (86%) while adolescents who had moderate activity tended not to experience anemia, which was as much as 7 (58.3%). The results of the *chi-square* analysis obtained *a p value* of 0.004, which means that there is a significant relationship between physical activity and anemia in adolescents at SMK Bina Am Makmur, Tangerang Regency, Banten in 2023. The OR (Odd Ratio) value is 8,600, so it can be stated that adolescents who have light physical activity tend to experience anemia 8.6 times greater than adolescents who have moderate physical activity.

Physical activity includes all movements of the human body, such as daily activities, hobbies, and competitive sports.[14] Physical activity is a complex behavior. There are two classifications of physical activity, namely active and inactive. It is said to be active if a person does one of the strenuous or moderate activities or a combination of the two. While it is said to be inactive if a person does not do one of the strenuous or moderate activities, explained that there are three classifications of physical activity, namely: a. Light Physical Activity: Light physical activity is an activity carried out in daily life such as resting (sleeping) for 8 hours or doing housework such as sweeping, mopping, cooking, washing dishes, and ironing. Sit and work at the computer, reading or writing. Take a leisurely walk around the house, park, or shopping center. Play video games, paint, draw, or play music. b. Moderate Physical Activity: Moderate physical activity includes the equivalent of resting (sleeping) for 8 hours. Household activities such as moving light items, planting trees or gardening activities, and washing cars. Fast walking (speed 5 km/hh) on a flat surface indoors or outdoors to get somewhere Badminton, playing table tennis, cycling on a flat track, skateboarding c. Strenuous Physical Activity: Strenuous physical activity includes 8 hours of sleep. Household activities such as moving heavy items, playing, or carrying a younger sibling. Walking very fast (speed more than 5 km/hh), carrying heavy weight on the back, climbing mountains, jogging (speed 8 km/hh), running, cycling more than 15 km/hh with a climbing track, competitive badminton, volleyball.[4]

According to the researchers' assumptions, this is influenced by non-optimal nutritional intake habits and a lack of physical activity. Food is one of the factors that affect activity because if the amount and portions of food are too large, the body will feel easily tired and not want to do activities such as sports or carry out other activities. The content of fatty foods also affects the body a lot. To carry out daily activities or exercise, the food to be consumed should be considered for its nutritional content so that the body does not experience excess energy that cannot be released optimally.

Conclusion

There is a relationship between knowledge, diet, and activity with the incidence of anemia in adolescents at SMK BINA AM MAKMUR Tangerang Regency in 2022. Knowledge variables have a high probability of anemia incidence in adolescents (p value = 0.000, OR = 12.500).

References

1. Yusuf, Syamsu dkk. 2017. *Perkembangan Peserta Didik*. Jakarta: Grafindo Persada.
2. Arisman. 2019. *Gizi Dalam Daur Kehidupan*: Buku Ajar Ilmu Gizi. Buku Kedokteran EGC. Jakarta.
3. Budianto, A & Fadhilah, N. 2015. *Anemia Pada Remaja Putri Dipengaruhi Oleh Tingkat Pengetahuan Tentang Anemia* Jurnal Ilmiah Kesehatan_Vol 5, No.9 Januari 2016
4. Erwinanto, D. (2017). Hubungan Antara Tingkat Aktivitas Fisik Dengan Kebugaran Jasmani Siswa Smk Muhammadiyah 1 Wates. Pendidikan Jasmani Kesehatan dan Rekreasi, 5(5).
5. Indrawatiningsih Y, Hamid ST A., Puspita Sari E, Listiono H, (2020), *Faktor-Faktor yang Mempengaruhi Terjadinya Anemia pada Remaja Putri*. Jurnal Ilmiah Universitas Batanghari Jambi, 21(1), Februari 2021, 331-337. Lembaga Penelitian dan Pengabdian kepada Masyarakat universitas Batanghari Jambi.
6. Khomsan Ali. 2015. *Pangan dan Gizi untuk Kesehatan*. Jakarta: PT. Rajagrafindo Persada.
7. Melyani & Alexander. 2018. *Faktor-Faktor Yang Berhubungan Dengan Kejadian Anemia Pada Remaja Putri Di Sekolah Smpn 09 Pontianak Tahun 2019.* Jurnal

Kebidanan-ISSN 2252-8121 Volume 9 Nomor 2 Tahun 2019.

8. Merryana jp. 2012. Anemia pada Remaja Putri. Dikutip dari http://monikajp.blogspot.com/2012/12/anemia- pada-remaja-putri.html
9. Notoatmodjo Soekidjo. 2017. *Pendidikan dan Perilaku Kesehatan*. Jakarta Pusat : Rineka Cipta
10. Riskesdas. 2018. *Laporan Hasil Riset Kesehatan Dasar Indonesia Tahun 2018*, Departemen Kesehatan Republik Indonesia, Jakarta.
11. Riskesdas. 2010. *Laporan Hasil Riset Kesehatan Dasar Indonesia Tahun 2010*, Departemen Kesehatan Republik Indonesia, Jakarta.
12. Sari, WN. 2018. *Faktor Kejadian Anemia Pada Remaja Putri Di MTSN Talawi Kota Sawah Lunto.* MENARA Ilmu Vol. XIII No.4 April 2019. ISSN 1693-2617 LPPM UMSB. E-ISSN 2528-7613
13. Soetjiningsih, 2017. *Tumbuh Kembang Anak.* Jakarta : EGC.
14. Syam, Y. (2017). Hubungan Aktivitas Fisik Dengan Kejadian Obesitas Pada Anak Usia Sekolah di SD Negeri Mangkura 1 Makassar. Skripsi. Universitas Hasanuddin: Makassar.
15. Umriaty & Qudriani M. 2018. *Hubungan Pengetahuan Dan Persepsi Remaja Putri Tentang Anemia Remaja Terhadap Status Anemia Pada Siswi SMK Negeri 2 Kota Tegal.* Jurnal SIKLUS Volume 08 Nomor 02, Juni 2019 p-ISSN: 2089-6778. e-ISSN: 2549-5054