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Factors Associated with Anemia Among Adolescence Girls at SMAN 1 Telukjambe Kabupaten Karawang in 2015

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Abstract

This study aimed to determine factors related to anemia among adolescent girls at the SMAN 1 Telukjambe Kabupaten Karawang in December 2015. A cross-sectional study is conducted to determine the hemoglobin, food intake, physical examination. A total of 92 girls selected in random. An interviewer-administered questionnaire was used to collect information on their characteristics and food consumption, knowledge of anemia, infections, and other, other relevant factors. The prevalence was a measured percentage and the association between anemia and identified factors explored through bivariate analyses. The results showed that the prevalence of anemia was 44.6%; consumption of protein, fruit, and knowledge significant associated with anemia but not other factors.

Keywords: Anemia, Adolescence girls.

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1. Introduction

Anemia is a multi-factorial disorder that requires approaches from different branches of science for prevention and treatment. Iron deficiency and infection are the most common etiologic factors, yet other conditions may have a role. They include nutritional deficiencies from vitamin A, vitamin B12, folic acid and riboflavin, and thalassemia and hemoglobinopathy [1].

The government for more than 30 years has made efforts to improve the nutrition of the community, but until now the problem of nutrition is still a problem in Indonesia. Nutrition anemia is a major nutritional problem suffered by pregnant women and women in general [2].

Women often go on a weight-loss diet because they want to slim down, whereas iron requirement in women is three times greater than men's requirement, this exacerbates the occurrence of anemia in women so that often women enter pregnancy with conditions where the iron reserves in the body are less or limited. This situation will be more aggravated when pregnant at a young age (<20 years) because the young mother requires more iron for the growth of the fetus it contains. Given the problem of anemia

and its effects that can degrade the quality of human resources, anemia prevention is needed as early as possible before the woman becomes pregnant [2].

Data on hemoglobin examination results in 200 high school students in Karawang regency in 2010 showed as many as 63.65% of adolescent girls experienced anemia. In 2011, there were 23.15%, in 2012 as much as 46.62% and in 2013 the survey that conducted on five high schools in Karawang got students who experienced anemia of 65.27%. (Health Office Karawang (2013) in Latifa (2014)) [3].

2. Methods

This research is quantitative research using cross-sectional study design. The research conducted at SMAN 1 Telukjambe, District of Telukjambe Timur, Kabupaten Karawang in August - December 2015. The research was done by a laboratory test (check hemoglobin level) and fill the questionnaire. The selection of survey location was done by a purposive method by considering various things. The samplewas obtained by simple random sampling. By using the calculation of 475 population, it's obtained samples of 74 female teenagers. Samples decreased because of the drop out of the sample plus 25% to 92 people. Data collection for feeding consumption in female adolescents was used 1x24 hours of food recall method, questionnaire filling, physical examination (blood pressure check and clinical examination of anemia), and blood sampling and testing performed by laboratory personnel from the private clinic. The analysis was done univariate and bivariate using chi-square statistic test.

3. Results

In table 1, it can be seen that the prevalence of anemia in adolescent girls in SMAN 1 Telukjambe was 44.6%. After examination of the hemoglobin level, the lowest hemoglobin level was 8.6 gr/dl and the highest hemoglobin level was 14 g / dl. The mean hemoglobin level in adolescent girls was 11,889 gr/dl, median for hemoglobin level in adolescent girls was 12,100 with standard deviation 1.0498.

Table 1: Prevalence of Anemia on Adolescent at SMAN 1 Telukjambe Kab.Karawang 2015.

Anemia	N	%	Minimum	Maximum	Mean	Median	SD
No	51	55.4					
Yes	41	44.6	8.6	14	11.889	12.100	1.0498
Total	92	100					

Analysis of the relationship between carbohydrate consumption with anemia was found that adolescent girls who consumed carbohydrate <3 times per day (51.2%) more than those who consumed carbohydrate ≥ 3 times per day (38.8%) who experienced anemia, p = 0.326, it can be concluded that there is no relationship between the number of carbohydrate consumption and anemia. According to Lubis [4], there was a tendency for teenagers disobedient to their parents; they were more than happy to go along with his friends rather than staying at home.

The food consumed by adolescents was greatly influenced by peers and consumption of energy derived from carbohydrates was reduced because of snack habits in adolescents. Women often go on a weight-loss diet because they want to slim down, whereas iron requirement in women is three times greater than men's requirement, this exacerbates the occurrence of anemia in women [2].

Analysis of the relationship between consumption of animal protein source and anemia found that adolescent girls who did not consume protein source every day (87.5%) were more likely to suffer from anemia compared to teenage girls who consumed animal protein source every day (30.3%). The statistical test obtained value of p = 0.000 that could be concluded that there was a significant relationship between the consumption of animal protein sources every day and anemia, OR = 16.800, showing that adolescent girls who did not consume protein every day were at risk of anemia of 16.800 times than those who consumed.

Protein is associated with anemia because the measured hemoglobin to determine an anemia status of a person is a red blood pigment functioning as an oxygen transporter and carbon dioxide is a protein bond [5].

Analysis of relationship between consumption of vegetables and anemia found that adolescent girls who did not consume vegetables every day (47.8%) were more likely to suffer from anemia than teenagers who consumed vegetables every day (41.3%), p = 0.675, showing that it could be concluded that there was no relationship between the number of vegetable consumption and anemia. Many non-heme iron sources come from a plant. The proportion of low non-heme iron absorption is influenced by promoting or inhibiting materials so that its bioavailability is low [6].

Analysis of the relationship between fruit consumption and anemia found that teenagers who did not eat any fruit (52.6%) were more like to have anemia than those who consumed fruits daily (0%), the result of statistical test obtained p = 0.001. It could be concluded that there was a significant relationship between daily consumption of fruits and anemia. Vitamin C can increase the absorption of non-heme iron up to fourfold. If there is vitamin C between 25 and 30 mg of diet, it can increase the iron absorption of the food by 85% [7].

The result of analysis of the relationship between tea consumption with anemia found that adolescent girls who did not consume tea every day were less suffering from anemia (39.4%) than adolescent girls who consumed tea every day (57.7%), the result of statistical test obtained p-value = 0.175. It can be concluded that there was no relationship between daily consumption of tea and anemia. Tanin which is a polyphenol and found in tea, coffee, and some vegetables and fruits also inhibits iron absorption by binding it [5]. In this study, tea consumption by adolescent girls was not asked more about the time of tea (whether drinking tea at the same time as eating), and the concentration of tea consumed by adolescents). So it could cause bias in the analysis of data incidence of anemia.

The result of the analysis of the relationship between knowledge and anemia found that girls who had less knowledge about anemia (64.9%) were more likely to have anemia than adolescent girls who had good knowledge about anemia (11.4%), the result of the statistical test is p = 0.000. It could be concluded that there was a significant relationship between the knowledge of adolescent girls about anemia and the incidence of

Table 2: Food Consumption in One Day Relations with Anemia in Adolescent at SMAN 1 Telukjambe Kab.Karawang 2015.

Consumption of Nutrition	Hb level				Total		OR	p-value
	Anemia		No Anemia					
	N	%	N	%	N	%		
Carbohydrate								
<3 times a day	22	51.2	21	48.8	43	100	1.654	0.326
≥ Three times a Day	19	38.8	30	61.2	49	100		
Animal protein								
Not everyday	21	87.5	3	13.3	24	100	16.800	0,000
Every day	20	30.3	48	37.7	68	100		
Vegetable								
Not everyday	22	47.8	24	52.2	46	100	1.303	0.675
Every day	19	41.3	27	58.7	46	100		
Fruit								
No	41	52.6	37	47.4	78	100		0.001
Yes	0	0	14	100	14	100		
Tea								
No	26	39.4	40	60.6	66	100	2.098	0.175
Yes	15	57.7	11	42.3	26	100		
Amount	41	44.6	51	55.4	92	100		

anemia. From the analysis results also obtained that the value OR = 14.338, meaning that adolescent girls who had less knowledge about anemia had 14.338 times to suffer anemia than adolescent girls who had good knowledge about anemia. Knowledge of cognitive is a very important domain in shaping one's actions. From experience and research, it is evident that behavior based on knowledge is more lasting than behavior that is not based on knowledge [8].

Table 3: Knowledge Relationships with Anemia in Adolescent at SMAN 1 Telukjambe Kab.Karawang 2015.

Knowledge	Hb level				Total		OR	p-value
	Anemia		No Anemia					
	N	%	N	%	N	%		
Less	37	64.9	20	35.1	57	100	14.338	0.000
Good	4	11.4	31	88.6	35	100		
Amount	41	44.6	51	55.4	92	100		

The result of analysis of correlation between history of worms and anemia found that adolescent girls who did not have worms history (41.8%) were more likely less to suffer from anemia than those who had history of worm infection (61.5%), statistic result obtained p-value = 0.304, showing that there was no correlation between the history of worm infection and anemia. The result of analysis of correlation between drinking worm medicine in the last 6 months and anemia was found that adolescent girls who did not

take worm medication in the previous 6 months (46.8%) were more likely to have anemia than adolescent girls who took worm medicine in the last 6 months (30.8%), the results of statistical tests obtained value p = 0.436, showing that there was no relationship between the history of worms and anemia. The results of the analysis of the relationship between wearing footwear and anemia found that adolescent girls who did not use footwear when playing outside of the house (46.2%) fewer anemic than teenagers who wore footwear when playing outdoors (61.5%), the results of statistical tests obtained p = 1.000. It could be concluded that there was no relationship between the history of worms and anemia. Iron nutritional anemia leads to decrease learning ability and work productivity, as well as lowering antibodies so that someone is susceptible to infections [9]. Some types of worms can also cause hemoglobin levels as a result of blood and iron loss [10].

TABLE 4: Relationship of History of Worms with Anemia in Adolescent At SMAN 1 Telukjambe Kab.Karawang 2015.

Worms	Hb level				Total		OR	P Value
	Anemia		No Anemia					
	N	%	N	%	N	%		
History of Worms								
Yes	8	61.5	5	38.5	13	100	2.230	0.304
No	33	41.8	46	58.2	79	100		
Drinking Worm Medicines								
No	37	46.8	42	53.2	79	100	1.982	0.436
Yes	4	30.8	9	69.2	13	100		
Wear Footwear								
No	6	46.2	7	53.8	13	100	1.078	1,000
Yes	35	44.3	44	55.7	79	100		
Amount	41	44.6	51	55.4	92	100		

The result of analysis of the relationship between menstrual period and anemia found that adolescent girls who menstruation > 7 days (55.6%) were more likely suffering from anemia than adolescent girls having menstrual period 0-7 days (43.4%), statistic test result obtained value p = 0.730, showing that there was no relationship between menstrual period and anemia. The number of dressing pads in one day during menstruation with anemia is found that adolescent girls who changed her pads ≤ 2 times a day (42.9%). This was less to have anemia than adolescent girls who changed her pads> 2 times (45.3%), result statistical test obtained p = 1.000, showing it could be concluded that there was no relationship between the number of dressing in one day during menstruation and anemia. The result of the analysis of the relationship between menstrual cycle and anemia found that adolescent girls who had menstrual cycle <21 days (50%) had more anemia than adolescent girls who had menstrual cycle between 21-35 days (44.4%), statistic test result obtained p = 1.000, showing that it could be concluded that there was no relationship between menstrual cycle and anemia. Sexual maturation in adolescents leads to increase iron requirement. The iron female adolescent requirement

is higher than the male adolescent, because it is needed to replace iron lost during menstruation. Adolescent girls who have menstrual periods lose iron about 0.8 mg/day [11].

TABLE 5: Menstrual Patterns Relationships with Anemia in Adolescent at SMAN 1 Telukjambe Kab.Karawang 2015.

Menstrual Patterns	Hb level				Total		OR	P Value
	Anemia		No Anemia					
	N	%	N	%	N	%		
Long Menstruation								
> 7 Days	5	55.6	4	44.4	9	100	1.632	0.730
0-7 Days	36	43.4	47	56.6	83	100		
Replace Bandages								
≤ 2 Times	12	42.9	16	57.1	28	100	1.105	1,000
> 2 Times	29	45.3	35	54.7	64	100		
Menstrual Cycle								
<21 Days	1	50	1	50	2	100	1.250	1,000
21-35 Days	40	44.4	50	55.6	90	100		
Amount	**41**	**44.6**	**51**	**55.4**	**92**	**100**		

4. Conclucions

The result with chi-square analysis found prevalens of anemia in SMAN 1 Telukjambe is 44.6%. Correlations analysis between protein consumption (p=0.000) and anemia, fruit consumption (p=0.001) and anemia, and knowledge of anemia (p=0.000) and anemia. No correlations between carbohidrate consumption (p=0.326) aand anemia, vegetables consumptions (p=0.675) and anemia, daily tea consumptions (p=0.175) with anemia, worm infestation (history (p=0.304), wearing footwear (p=1.000), anthelmintic (p=0.436)) and anemia, and menstrual factor (duration (p=0.730), volume (p=1.000), and cycles (p=1.000) with anemia.

References

[1] WHO: WHO *Global Database of Anaemia: Worldwide Prevalence of Anaemia* 1993-2005. Geneva: WHO. 2009.
[2] Depkes: Anemia Gizi pada WUS. Jakarta: Depkes. 2003.
[3] Latifa, Yanti Kamayanti: Hubungan Status Gizi Dengan Kejadian Anemia Pada Remaja Puteri di 5 SLTA Kab. Karawang Tahun 2013. 2014.
[4] Lubis, Namora Lumongga: Psikologi Kespro: Wanita dan Perkembangan Reproduksinya. Jakarta: Kencana. 2013.
[5] Almatsier, Sunita: Prinsip Dasar Ilmu Gizi. Jakarta: Gramedia. 2015.
[6] Bakta, I Made: Hematologi Klinik Ringkas. Jakarta: EGC. 2007.
[7] Fauziyah, RR.Nur: Faktor Determinan Kejadian Anemia Siswa SMP di Kabupaten Administrasi Kepulauan Seribu. Depok: FKMUI. 2005.
[8] Notoatmodjo, Soekidjo: Kesehatan Masyarakat: Ilmu dan Seni. Jakarta: Rineka Cipta. 2007.
[9] Almatsier, Sunita., Soetardjo, Susirah., & Soekatri Moesijanti: Gizi Seimbang dalam Daur Kehidupan. Jakarta: Gramedia. 2011.

[10] UNICEF: *Preventing Iron Deficiency in Women and Children: Technical Consensus on Key Issues*. A UNICEF/UNU/WHO/MI Technical Workshop. 1999.

[11] Hallberg, B. Sandstrom, and P.J. Agget L: *Iron, zinc and other trace elements*. Churchill Livingstone: Human Nutrition and Dietetics. 1994.