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MENSTRUAL CYCLE AND HISTORY OF INFECTIOUS DISEASES RELATED TO ANEMIA IN ADOLESCENT WOMEN

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Abstract

The purpose of the study is known factors associated with anemia in adolescent women. The research method was a cross sectional survey. The sampling technique used in this study is the total sampling. The number of respondents were 115 people, consisting of 61 eighth grade women junior Boarding School Bantul Binbaz Piyungan and 54 women high school class XI PIRI 2 Yogyakarta. Data were collected through questionnaires and measurements charging anemia with Cyanmethemoglobine method. Data analysis was performed by means of univariate, bivariate and multivariate analyzes. The results showed the majority of respondents women suffer mild anemia (46%) and moderate anemia (11%). Factors associated with anemia in adolescent women based bivariate test is mother's education (p: 0.013), nutritional status (p: 0.000), duration of menstruation (p: 0.000), the menstrual cycle (p: 0.000), a history of infectious diseases or chronic (p: 0.000). There is no employment relationship with the maternal anemia in adolescent women. Based on the multivariate test, the factors associated with anemia in adolescent women is the menstrual cycle (p: 0.001; beta: 0.308) and a history of infectious disease (p: 0.023; beta: -0.212).

Keywords: anemia, adolescent women, menstruation, illness

INTRODUCTION

Anemia is a condition characterized by a deficiency of the body upon the size and number of erythrocytes or hemoglobin levels are not sufficient for the function of O2 and CO2 exchange between the blood system. Anemia is still a major health problem in Indonesia in addition to the problem of protein energy malnutrition, vitamin A deficiency and iodine deficiency disorder (GAKI). The prevalence of anemia is used as an alternative indicator for iron deficiency in public health order value measured by hemoglobin levels. Anemia is a global public health problem because of its prevalence is higher in women and adolescents, particularly in the developing countries including Indonesia (Anita, 2007).

WHO (2008) stated that the prevalence of anemia in the world as much as 24.8% of the total population in the world (nearly 2 billion people in the world). Household Health Survey in 2007, the prevalence of nutritional anemia in adolescent girls are between 10-19 years of age reached 26.5%. There are about 370 million women who suffer from anemia due to iron deficiency. In America, there are 12% of women of childbearing age (WUS) 15-49 years, 11% of pregnant women of childbearing age are anemic (Department of Health, RI 2009)

Department of Health (2009) reported that the prevalence of anemia in the province is 20.9% in adult women, 11.6% in adult men and, in children less than 14 years was 8.7%. Based

on the results of nutrition surveys conducted June 19, 2012 by the Directorate of Nutrition with UNICEF and the European Union held at the University Yoyakarta magnitude of the problem of micronutrient deficiencies in children and pregnant women in Yogyakarta also fall into the category of "high" (58.6% of anemia in children and women pregnant 45%). According to research conducted on February 28, 2013 by the City Health Office Yogyakarta teenage daughter who claimed that positive anemia after conducting a survey for 1 more month and found as many as 37% of the 300 respondents who were all high school students in several schools in the city of Yogyakarta.

Approximately 34 percent of young women in the city of Yogyakarta anemia as revealed in the results of research conducted Yogyakarta City Health Office (PHO KY) with the Faculty of Medicine, University of Gadjah Mada (UGM) to 280 female students in the city. That percentage is quite surprising because the number is high. The high rates of anemia in adolescent girls in Yogyakarta must be taken seriously by all parties because when the girls became pregnant mothers later, will put in a high-risk pregnancy (Tribun Jogja, 2013).

Anemia in adolescents is less impact on the healthy body condition, decreased learning ability and concentration, inhibited the growth that did not reach the optimum height, resulting in pallor, lowered physical abilities sportswomen and increases the risk of infection because of decreased immune system (Junita, 2008).

The cause of anemia in adolescents is low socioeconomic factors that adequate and nutritious food are not met. Ignorance about nutritional needs increase with growth, wrong diet eg no breakfast because rush off to school. Another thing that can cause anemia that is the complication of certain diseases such as malaria, worms and other infections as well as teens now too concerned about his appearance, fear of fat, want to be thin, limiting in choosing foods that contain a lot of energy. On the other hand the weight gain is an absolute must occur where a teenager experiencing a period of rapid growth (growth spurt) both height and weight she started at age 12 and reached its peak at the age of 17 years (Savitri, 2008).

Based on the background of the problem, the formulation of the problem in this study is "What are some of the factors associated with anemia in adolescent girls?" The purpose of this study is known factors associated with anemia in adolescent girls, the mother's occupation, mother's education, nutritional status, duration of menstruation, menstrual cycle and history of infectious diseases.

This study is expected to add information to develop knowledge related to the epidemiology of anemia based on age and its determinant variables. The results of this research can be important information for more attention to health, especially in adolescent women.

RESEARCH METHOD

This type of research is survey research with cross sectional approach to study the dynamics of the correlation between the factors and the effect (can be either a specific disease or health status) model with time-point approach (Sulistyaningsih, 2011).

The population was eighth grade girls at Boarding School Bantul Binbaz Piyungan and girls high school class XI PIRI 2 Yogyakarta. Sampling technique in this study with a total sampling (Sulistyaningsih, 2011) that 61 teenage girls in the eighth grade Binbaz Piyungan Boarding School Bantul, 54 high school girls in class XI PIRI 2 Yogyakarta.

Data collection instrument used in this study was a questionnaire. The collection of data by the method of filling the questionnaire. Anemia data obtained by measuring hemoglobin levels using methods Cyanmethemoglobin.

Bivariate analyzes to determine the relationship of maternal employment variables, long menstruation, history of infectious disease / chronic anemia in adolescent girls using Chi Square test is the 95% confidence level. Bivariate statistical tests to examine the association of maternal

education, nutritional status, menstrual cycle with anemia in adolescent girls using Kendall Tau test with a confidence level of 95%. Multivariate analysis used is multiple linear regression with 95% confidence level (Sugiyono, 2011).

RESULT AND DISCUSSION

Tabel 1. Cases Anemia In Adolescents Women class VIII in Binbaz of Boarding School Piyungan Bantul and class XI SMA PIRI 2 Yogyakarta 2013

No	Anemia	Frequency	Percentage
1	No anemia (>= 12 gr%)	49	42.61
2	Mild anemia (10 - < 12 gr%)	53	46.09
3	Moderate anemia (8 - < 10 gr%)	13	11.3
4	Severe anemia (< 8 gr%)	0	0
	Jumlah	115	100

Table 1 shows that the majority of adolescent girls suffer from mild anemia (46%) and moderate anemia (11%). The high rates of anemia in adolescents is in line with research conducted Yogyakarta City Health Office (PHO KY) with the Faculty of Medicine, University of Gadjah Mada (UGM) to 280 female students, that about 34 percent of teenage girls in the city of Yogyakarta anemia. The high rates of anemia in adolescent girls in Yogyakarta must be taken seriously by all parties as a teenager when the woman becomes pregnant mothers later, will put in a high-risk pregnancy (Tribun Jogja, 2013).

Impact caused by anemia in adolescent girls is physical and psychological development were impaired, decreased physical work and power revenues, decreased resistance to fatigue, increased morbidity and mortality. Anemia suffered by female adolescents can lead to decreased performance study, immune deficiencies are susceptible to infectious diseases. Kebugarannyapun level will drop that result in low productivity and achievement (Department of Health, 2009).

1. Mother's Education

Table 2. shows that adolescent girls who are not anemic or mildly anemic and was showing most of the mother's education: moderate (high school graduation). Educational level affect healthy behavior. Higher education easier for a person to absorb information and implement the behavior and everyday lifestyle, particularly in terms of health and nutrition. Level of education, especially female education affect health status (Almatsier, 2004). According Junita (2008) which states that the mother's education is the main capital in supporting family economy, also play a role in preparing food and child care.

Kendal Tau test results on the relationship of maternal education with anemia showed the value of sign: 0.013 (less than 0.05) means that there is a relationship with the mother's education anemia in adolescent women. The results are consistent with research Yelly (2010), entitled "Factors Associated with Anemia in Adolescent women Genesis in the District State High School Jatibarang Brebes Year 2010" that there is a relationship with the mother's education level of anemia in adolescent girls (p = 0.040).

The results of multiple linear regression test showed the value of sign: 0,448; beta: -0.061 meaning that the mother's education was not significantly associated with anemia in adolescent girls, but showed a negative relationship (the higher the education level, the less the risk of anemia in adolescent girls). The results of the study according to the study Sobarullah (2011), entitled Factors associated with Genesis Anemia In Teen Age 14-16 in high school girls Yaspen Body Mother Depok, ie there is no significant relationship between parental education

(p = 0.163).

Table 2 Factors Associated with Anemia in Adolescent Women

Factor2	Not Anemia		Mild Anemia		Moderate Anemia		Severe Anemia		Total	Bivariat	Multivariat	
	F	%	F	%	F	%	F	%		Sign	Sign	Beta
1. Mother Education										0.013	0.448	-0.061
Elementary	0	0	4	7.55	2	15.38	0	0	6			
High school	27	55.10	29	54.72	10	76.92	0	0	66			
College	22	44.90	20	37.74	1	7.69	0	0	43			
Total	49	100	53	100	13	100	0	0	115			
2. Occupation Mother										0.237	0.306	0.079
Housewife	14	28.57	8	15.09	5	38.46	0	0	27			
Government employee	10	20.41	12	22.64	1	7.69	0	0	23			
Private employee	10	20.41	19	35.85	2	15.38	0	0	31			
Entrepreneur	14	28.57	10	18.87	4	30.77	0	0	28			
Farmer, porter	1	2.04	4	7.55	1	7.69	0	0	6			
Total	49	100	53	100	13	100	0	0	115			
3. Status Gizi										0.000	0.065	-0.155
Thin (IMT < 18.5)	4	8.16	18	33.96	9	69.23	0	0	31			
Normal (IMT: 18.5-22.5)	43	87.76	34	64.15	3	23.08	0	0	80			
Fat (IMT > 22.5)	2	4.08	1	1.89	1	7.69	0	0	4			
Total	49	100	53	100	13	100	0	0	115			
4. Menstrual Lenghty										0.000	0.07	0.154
Normal (< 7 days)	42	85.71	31	58.49	1	7.69	0	0	74			
Long (>= 7 days)	7	14.29	22	41.51	12	92.31	0	0	41			
Total	49	100	53	100	13	100	0	0	115			
5. Menstrual cycle										0.000	0.001	0.308
Short (< 21 days)	25	51.02	7	13.21	0	0	0	0	32			
Long (> 30 days)	0	0.00	0	0.00	0	0	0	0	0			
Normal (21-30 days)	16	32.65	15	28.30	0	0	0	0	31			
Irreguler	8	16.33	31	58.49	13	100	0	0	52			
Total	49	100	53	100	13	100	0	0	115			
10. History of infectious diseases										0.000	0.023	-0.212
Yes	2	4.08	18	33.96	13	100	0	0	33			
No	47	95.92	35	66.04	0	0	0	0	82			
Total	49	100	53	100	13	100	0	0	115			

2. Mother's Occupation

Based on Table 2, that the work of teenage mothers who are not anemic women mostly housewives and self-employed (28.57% each), the mother of teenage employment of women with mild anemia is mostly private employees (35.85%), the work of teenage girls who suffer from anemia were mostly housewives (38.46%). Income affect a person's job, but it is also the length of time that a person's mother used to work inside or outside the home, the workplace can affect the distance the food in the family. According Kunanto that older people with livelihoods remain, though low in number but at least provide a social security families safer when compared with non-permanent employment with no fixed income.

The results of the Chi Square test on maternal employment relationship with anemia showed the value of sign: 0.237 (greater than 0.05) means that there is no employment relationship with the maternal anemia in adolescent girls. Based on multivariate linear regression test that there was no significant association with maternal employment anemia in adolescent girls (sign: 0.306; beta: 0.079). This suggests that maternal employment has no direct influence, but the mother will affect the work of the family income. According to the research Yelly (2010), entitled "Factors Associated with Anemia in Adolescent women Genesis in the District State High School Jatibarang Brebes Year 2010" that there is a relationship with a family income level of anemia in adolescent women (p = 0.035).

3. Adolescent Nutritional Status of Adolescent Women

Adolescent women who are not anemic showed mostly normal nutritional status (87.76%), adolescent girls who suffer from mild anemia also largely normal nutritional status

(64.15%), but the teenage girls who suffer from anemia were mostly skinny nutritional status (69.23%). Nutritional status of students also affected by education, occupation and income of the parents. All Binbaz Boarding School Bantul junior high school student living in a dorm which has been providing food menu for students. The food provided is homogeneous for each individual with meals 3 times daily schedule. In fact a lot of the girls do not comply with a set feeding schedule like eating only 2 meals a day, in one portion with a double dose of that night did not eat. Eat regular and nutritious food is needed by young people to grow and develop processes. Factors can influence disease experienced by adolescents for nutritional status because many teenagers are recovering from illness or being sick lazy to eat.

Most high school students PIRI 2 Yogyakarta lives with his parents, where the set menu daily diet is the mother. What is provided by the mother who is consumed by teenagers, if the pattern menu provided mother does not meet the balanced nutrition it will affect the nutritional status of girls as well so that the effect on student BMI. There is also a student away from their parents and live with their mothers boarding house, not infrequently that a boarding student breakfast. Girls who live with their mothers tend boarding no attention to the daily diet, they just eat out of pocket diwarung and often eat fast food nutritional content is not good.

Nutritional status in adolescents is influenced by the amount of food consumed, frekuesi meal per day and consumed the menu. High school age teens are still in puberty with the average age is 16-18 years of age. Adolescent girls with irregular meal frequency 3x a day with regular eating habits with a menu of vegetables and side dishes that are quite likely not have anemia. Conversely teens irregular meal frequency especially for adolescents who consume a diet drug that is not qualified and teens who often walks to the mall with her friends tend to eat food carelessly by always choosing fast food available in the mall as well as the nutritional content is not appropriate high in fat will also affect BMI among girls.

Kendal Tau test results on the nutritional status of the relationship with anemia showed the value of sign: 0.000 (less than 0.05) means that there is a relationship with the nutritional status of anemia in adolescent girls. This result is consistent with the results of the study Gunatmaningsih (2007) which shows the relationship between nutritional status and incidence of anemia among adolescent girls in SMA 1 Jatibarang District of Bradford District. Adolescent women with abnormal nutritional status have tended to experience anemia. Based on research Arumsari (2008) Nutritional status has a positive correlation with hemoglobin concentration, meaning that the worse the nutritional status of a person, the lower the hemoglobin her. Conversely, the better the higher the nutritional status of her hemoglobin concentration.

Nutritional needs reach their highest point when adolescence and when deficiencies of macro and micro nutrients can interfere with the growth and inhibit sexual maturation. Incidence of poor nutritional status not only due to less food intake but also disease. Children who get enough food but often suffer from pain, it will eventually suffer from malnutrition as well as children are not getting enough to eat, the body resistance will be weakened and susceptible to disease (Supariasa, 2001).

The results of multiple linear regression that there is no significant relationship with the nutritional status of anemia in adolescent girls (sign: 0.065), but there is a negative relationship between nutritional status and anemia in adolescent girls (beta: -0.155) means that the better the nutritional status of the smaller the risk of anemia in adolescent girls.

4. Menstrual Lenghty

Long periods are not anemic girls showed mostly normal (85.71%), long menstruation in young women who suffer from mild anemia also largely normal (58.49%), longer menstrual

teenage girls who suffer from anemia were mostly long (92.31%). Adolescent girls with menstrual cycle length is more than 30 days will have anemia due to blood loss during menstruation is very much the cause of iron deficiency. Factors that affect the student experience long cycles include the consumption of nutritional factors, hormonal imbalance and is influenced by thoughts and emotions.

Remaja perempuan yang sudah mengalami menarche, jika darah yang keluar selama menstruasi sangat banyak akan terjadi anemia defisiensi zat besi, karena jumlah darah yang hilang selama satu periode haid berkisar 20-25 cc, jumlah ini menyiratkan kehilangan zat besi berkisar 12,5-15 mg/bulan, atau kira-kira sama dengan 0,4-0,5 mg/hari. Jika jumlah tersebut ditambah dengan kehilangan basal, jumlah total zat besi yang hilang sebesar 1,25 mg/hari.

Adolescent girls who had experienced menarche, if blood comes out during menstruation very much will happen to iron deficiency anemia, due to the amount of blood lost during a menstrual period ranges from 20-25 cc, this number implies loss ranged from 12.5 to 15 mg of iron / month, or roughly equal to 0.4-0.5 mg/day. If the amount is added to the basal loss, the total amount of iron lost by 1.25 mg/day.

The results of multiple linear regression that there is no significant association with long periods of anemia in adolescent girls (sign: 0.07), but there is a positive relationship between long periods and anemia in adolescent girls (beta: 0.154) means longer periods get longer the more substantial risk of anemia in adolescent girls. The longer the longer period, then the blood out of the body more and more, so that a greater risk of anemia.

5. Menstrual Cycle

Most of the menstrual cycle of women who are not anemic teenagers mostly short cycles (51.02%), but the adolescent menstrual cycles of women who suffer from mild anemia mostly irregular (58.49%), menstrual cycles in young women with anemia was partially also large irregular (100%). The cause of the irregularity of the cycle that is the hormonal influences experienced by the adolescents themselves. At the age of adolescence to childbearing age hormonal disorders can arise by several factors such as frequent fatigue, and stress of work or activity. Load experienced by teenagers in mind the cottage so much because of the demands of their obligations as hours of solid learning, Quran recitation targets, understand verse bald and other core activities, due to the burden of the mind can affect the hormones estrogen and progesterone which impacted on their menstrual cycle such as menstruation messy schedule, because of hormonal factors are the main causes of irregular menstruation.

Any woman experiencing monthly menstrual iron loss ranges from 0.5-1.4 mg / day. Hormonal factors are the main cause irregular menstruation can cause anemia because the hormonal balance is the result of a collaboration between the brain, ovary, gland in the brain, the thyroid gland in the event of an interruption in the circulation of these hormones cause a woman's menstrual cycle is interrupted.

The more frequent menstruation lasts, the more blood expenditure. This resulted in increased iron expenditure and the balance of iron in the body is interrupted. Iron deficiency can cause anemia and fatigue in which teenagers need more iron to replace the iron lost with menstrual blood. Several studies have shown that the amount of blood lost in the menstrual period ranged between 20-25 cc and considered abnormal if menstrual blood loss of more than 80 ml. The number of 20-25 cc implies iron loss of 12.5 to 15 mg/month or approximately equal to 0.5-1.4 mg/day (Arisman, 2010).

Kendal Tau test results on the relationship of the menstrual cycle with anemia showed the value of sign: 0.000 (less than 0.05) means that there is a relationship with the menstrual cycle of anemia in adolescent girls. Based on linear regression test things 38 that there is a significant relationship to the menstrual cycle of anemia in adolescent girls (sign: 0.001), and

there is a positive relationship between the menstrual cycle and anemia in adolescent girls (beta: 0.308) means that the regular cycle menstruation, the smaller the risk of anemia in adolescent girls. This research was supported by the results of research conducted by Adriana (2010) entitled "Factors Associated with Anemia Genesis Teenage girls in Madrasah Aliyah Negeri 2 Bogor Year 2010" by the results of the study there was a significant association between bleeding (menstrual pattern) and Genesis anemia Teenage girls in Madrasah Aliyah Negeri 2 Bogor in 2010. Research was also supported by the results of research Dilla (2010) that 8 of 15 respondents experiencing abnormal menstrual cycle most of the abnormal and abnormal menstruation is one of the determinants of anemia.

6. History of Infectious Disease / Chronic

Adolescent women who are not anemic most had no history of infectious disease / chronic (95.92%), as well as teenage girls who suffer from mild anemia most also do not have a history of infectious disease/chronic (66.04%) and young women who suffer anemia was also no history of infectious disease/chronic (100%). History of childhood teens who often play ground in the field, traveling barefoot, snack at random on the edge of the road and less hygienic hand washing habits are not good. When children play ground, if the contaminated soil helminth eggs, the egg would enter kepencernaan children. Worm eggs are in contact with the ground, it took 2 weeks, the eggs have been filled larvae. Of several thousand eggs will be carried by the wind and landed in food and then the food consumed by the children and there was an infection. Worm infections will lead to malnutrition and can lead to iron deficiency anemia. Students who have a history of malaria is dominated by poor environmental hygiene. Acute phase of malaria decreased iron absorption, heptoglobin low levels, as a result of intravascular hemolysis, will lower the hemoglobin complex formation heptablobin removed from circulation by the liver, resulting in a decrease in the availability of iron.

Chi Square test results on the relationship history of infectious disease/chronic anemia showed the value of sign: 0.000 (less than 0.05) means that there is a relationship history of infectious diseases/chronic anemia in adolescent girls. Based on multivariate linear regression test that there is a significant relationship history of infectious disease/chronic anemia in adolescent girls (sign: 0.023), but there is a negative relationship between a history of infectious disease/chronic anemia in adolescent girls (beta: -0.212) meaning that when have a history of infectious disease/chronic, the greater the risk of anemia in adolescent girls. This result is consistent with the results of the study Proverawati (2009) describes the presence of hookworm infections cause bleeding in the gut wall although slightly but continuously so may result in loss of blood and iron. Worm infection is a major contributor to the occurrence of iron deficiency anemia. Hookworms can cause intestinal bleeding that trigger blood loss due to intestinal worm burden. Hookworms that cause blood loss is greatest A. duodenale. This study agrees with the results of research conducted by Wijianto (2002). Infectious diseases such as worms or malaria can cause low levels of hemoglobin which occurs as a result of intravascular hemolysis.

The results of this study are supported by research conducted Arumsari (2008) entitled "Risk Factors Anemia In Teen female participants Prevention and Control Program Nutritional Anemia Iron (PPAGB) in Bekasi Year 2008" with the existing research results significant association between infections with anemia PPAGB 2008.

CONCLUSION AND SUGGESTION

Most respondents adolescent girls suffer from mild anemia. No adolescent girls and pregnant women who suffer from severe anemia. Factors associated with anemia in adolescent girls is the menstrual cycle and history of infectious diseases. Factors not associated with

anemia in adolescent girls is the mother's education, mother's occupation, nutritional status and long periods.

For teenage girls who suffer from anemia so seriously handle, especially because anemia improves nutritional status would adversely impact on girls. For those who are not anemic, are expected to maintain the condition by improving nutritional status. For researchers who want to continue this study is expected to look for other factors that influence anemia and can increase the sample with a wider area.

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