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Prevalence of Anaemia and its Risk Factors Among Adolescent Girls

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Abstract **--Anaemia is one of health problems in Indonesia. Adolescent girls are the most vulnerable group to anaemia. Adolescent girls with anaemia are at risk of anaemia during pregnancy. It will negatively affect growth and development of the fetus in the womb as well as potential complications of pregnancy and childbirth, even causing the death of mother and child. One factor of anaemia is iron deficiency. This study aims to determine the prevalence and risk factors of anaemia in adolescent girls. This was a descriptive study with cross-sectional design. The study conducted in State Senior High School 1 (SMA N 1) Sp Padang Ogan Komering Ilir. A total of 100 students was selected as samples. The results showed the prevalence of anaemia among adolescent girls in SMA Negeri 1 Sp Padang is 16%, there was no association between nutritional status (p value = 0.594), duration of menses (p value = 0.393) and physical activity (p value = 0.754) with the incidence of anaemia in adolescent girls. The prevalence of anaemia in adolescent girls in SMA N 1 Sp. Padang including mild public health problem. There was no relationship between nutritional status, duration of menstruation and physical activity with anaemia. Based on our research, we recommend young women equipped with knowledge about the food and drink that can help as well as inhibit iron absorption so that the iron contained in foods and drinks can be absorbed perfectly.**

Keywords: anaemia, adolescent girls

I. INTRODUCTION

Anaemia is a condition in which the number and size of red blood cells, or hemoglobin concentration decrease under the cut-off value has been established, thereby disrupting the ability of blood to carry oxygen throughout the body. Anaemia and iron deficiency can decrease an individual's health, causing fatigue and lethargy, lowered productivity and performance of one's physical. Maternal anaemia associated with mortality and morbidity in the mother and baby, including risk of miscarriage, stillbirth, prematurity and low birth weight. Anaemia is an indicator of poor nutrition and poor health.[1]

Globally from 2005 to 2011, the prevalence of anaemia in non-pregnant women decreased from 33% to 29%, and in pregnant women dropped from 43% to 38%.[1] In Asia in 2011, the prevalence of anaemia in non-pregnant women was 31.6% (CI 95% = 24.1% - 40.5%) and in pregnant women was 39.3% (31.8% - 46.5 %).[2] Indonesia in 2011 estimated there were 22% (95% CI = 12% - 37%) non-pregnant women are anemic and 30% (CI 95% = 17% - 51%) of pregnant women were anemic.[2] This indicates a problem of anaemia in Indonesia including public health problem category medium.

Riskesdas 2013 showed that the prevalence of anaemia in pregnant women in Indonesia is 37.1% and continued to increase to 48.9% in Riskesdas 2018 with the proportion of anaemia in pregnant women most (84.6%) in the age group of 15-24 years.[3] Riskesdas 2013 generally indicates there is a 18.4% aged 15 to 24 years who are anemic and the proportion of women who experienced anaemia was higher than the male.[4]

Age 15 years up to 19 years still included in adolescent. A quarter of adolescent people in Indonesia are anemic. Anaemia in adolescent men during pre-puberty was higher (24.5%) compared to male puberty(12.1%). On the other hand, the risk for women continues to remain high even after they reach puberty. The results of the National Household Health Survey 2001 finds that there are 30% of young women (10-19 years) had anaemia with hemoglobin levels below 12%, and the prevalence of anaemia in the age group 10-14 years is more than 45%.[5]

Adolescent girls with anemic at risk of anaemia during pregnancy. This will negatively affect the growth and development of the fetus in the womb as well as potential complications of pregnancy and childbirth, even causing the death of mother and child. Maternal Mortality Rate (MMR) according to the Inter- Census Population Survey in 2015 amounted to 305 per 100,000 live births[6] and the greatest cause of maternal mortality from 2010 to 2013 is bleeding.[7]

The most common cause of anaemia is iron deficiency, which is caused by the lack of intake, inadequate absorption, increased need for iron during pregnancy and infancy, as well as iron losses due to menstruation and intestinal worm infections.[1] Adolescence is a period of growth, in addition to the young women menstruate and thus susceptible to anemic.

Anaemia associated with other nutritional five global targets (stunting, low birth weight, overweight in childhood, exclusive breastfeeding and wasting). Control of anaemia among women of childbearing age is very important to prevent low birth weight and maternal and

perinatal mortality, and prevalence of the disease in the future.[1] The prevalence of stunting in Ogan Komering Ilir (OKI) of 22.6% is high, so districts OKI become one locus handling of stunting.[8]

Control of anaemia is expected to impact on the control of other nutritional problems, especially stunting, the one of nutritional problems in Ogan Komering Ilir. This study is expected to dig up information on the prevalence and risk factors for anaemia in adolescent girls in Ogan Komering Ilir.

II. METHOD

This study uses cross-sectional study design. The study population of research is all adolescent girls in SMA Negeri 1 Sp Padang Ogan Ogan Ilir. Total of the are 100 students from class X, XI, and XII. 50 people from science majors and 50 of the Social Sciences. The results were analyzed using univariate and bivariate by a computer program. Hemoglobin level test conducted by lecturers with vocational education background of obstetric and anthropometric measurements assisted by nutrition student Public Health Faculty of Sriwijaya University

Measurement of physical activity using IPAQ questionnaires to adolescent classification (a) <600 MET-minutes / week of physical activity is considered low; (B) 600 sd 2999 MET-minutes / week of moderate physical activity categorized, and (c)> 3000 MET-minutes / week of physical activity categorized by weight.

III. RESULT

Hemoglobin test results indicate the range of 7.4 g/dl - 18,4gr/dl with an average of 13.8 g/dL and a standard deviation of 1.79. The result of the examination is known that 10% of respondents who experienced mild anaemia (Hb 11 - <12 g / dl), 5% had moderate anaemia (8gr / dl - <11 g / dl) and 1% had severe anaemia (<8 g / dl). The frequency distribution of research variables can be seen in Table 1.

Table 1 shows the prevalence of anaemia among adolescent girls SMA N 1 Sp. Padang is 16%, there are 5% of respondents with underweight and 2% that have overweight/obesity. The results also showed a majority of respondents have long periods of 3-7 days (95%) and the majority of respondents have a high level of physical activity (75%).

TABLE 1
Distribution of the study variable frequency

Variables	Frequency	Percentage (%)
Anaemia status		
anaemia (Hb <12 g / dl)	16	16
not anaemia (Hb> 12 g / dl)	84	84
Nutritional status		
very thin	1	1
thin	4	4
normal	93	93
overweight	1	1
obesity	1	1
Long periods		
> 7 days	3	3
3-7 days	95	95
<3 days	1	1
missing	1	1
Physical activity		
low	1	1
moderate	24	24
high	75	75
Total	**100**	**100**

The nutritional classified into two categories, normal nutritional status and abnormal. Abnormal nutritional status is a combination of malnutrition and over nutrition. Long periods also made two categories and the results of the bivariate analysis are shown in Table 2.

TABLE 2
Analysis of bivariate

	anaemia status				*P value*	PR
	Anaemia		not anaemia			
	n	%	n	%		
Nutritional status						
abnormal	0	0	7	100	0.594	-
normal	16	17.2	77	82.8		
long periods						
> 7 days	1	33.3	2	66.7	.393	2.286
≤ 7 days	14	14.6	82	85.4		(0.429 to 12.166)
physical activity						
Low-medium	3	12	22	88	0.754	0,692
high	13	17.3	62	82.7		(0.215 to 2.233)
Total						

Table 2 shows there is no association between body mass index (p value = 0.594) and the incidence of anaemia among adolescent girls in SMA Negeri 1 Sp. Padang. A total of 17.2% of young women in high school N 1 Sp Padang with normal nutritional status are anemic.

Table 2 also shows the girls who have long periods of more than 7 days more likely to have anaemia (33.3%) than girls who have long periods of less than 7 days (14.6%). Statistical analysis showed no significant relationship between long periods with the incidence of anaemia.

The results showed there was no significant relationship between physical activity with anaemia (p value = 0.754). However, Adolescents women with high physical activity more likely to have anaemia (17.3%) compared to women who have a moderate or low physical activity.

IV. DISCUSSION

The prevalence of anaemia in adolescent girls in SMA N 1 Sp. Padang Ogan Komering Ilir is 16%, it indicates that the problem of anaemia in adolescent girls in Ogan Koemring Ilir especially in SMA N 1 Sp. Padang is still included health problems with the low category. However, there is still a 5% experiencing moderate anaemia and 1% were severely anemic. Respondents with lower levels of hemoglobin <8 g/dl has confirmed not menstruating during the measurement. The prevalence of anaemia in adolescent girls in SMA N 1 Sp. Padang is still under the prevalence of anaemia in adolescent girls (ages 15-19 years). In Indonesia, prevalence of anaemia in 2005 indicates the number 26.5%[9] and the results of the National Household Health Survey 2001 (age 10-19 years) is 30%. [5]And slightly under the prevalence of anaemia in adolescent based on research of Siva, et. al in Central Kerala, India.[10]

Ogan Ogan Ilir has been established as one of the districts that became the locus of control stunting, one of the acceleration program is carried out by giving blood booster tablets for young women and women of childbearing age.[8] SMAN 1 Sp Padang has also received this program, adolescent girls in SMA N 1 Sp Padang got blood booster tablet, so the incidence of anaemia among adolescent girls in high school can be decreasing.

The results showed no association between nutritional status based on body mass index per age with anaemia among adolescent girls. These results are similar to Indartanti and Kartini stating that there was no association between nutritional status and the incidence of anaemia in adolescent girls.[11]All the adolescent girls who are anemic have normal weight. In addition to the intake of

foods containing iron, one that affects the incidence of anaemia is iron absorption has been consumed.[1]Iron contained in foods such as red meat, liver or green vegetables, will not be able to be absorbed by the body when taken with food or drinks that inhibit iron absorption, such as tea. Micronutrients that can help with iron absorption is vitamin C. The absorption of iron by the body gets better when food rich in iron are consumed together with vitamin C. Therefore, in addition to knowledge about foods that are rich in iron, adolescent girls need equipped with the knowledge about the food or beverage that can hinder and help the absorption of iron.

The results also showed no association between long periods with anaemia, consistent with research by Kirana, proportion of anaemia in the group that experienced long periods of more than 7 days higher than what has long periods of less than 7 days. These results are similar to studies Sriningrat., Et al.[12], The duration of the long periods (more than 7 days) caused a person more and more blood loss during menstruation, thus requiring more iron than the short or normal menstrual duration. In this study, the majority of respondents (95%) had normal menstrual duration (3-7 days) so statistically there is no significant association between long periods with the incidence of anaemia in adolescents.

The majority of respondents in this study had a high physical activity, and proportion of anaemia was higher in the group having high physical activity (17.3%) compared to respondents who have a low or moderate physical activity (12%). The results are consistent with research Sriningrat, et.al[12], The higher physical activity, the more nutritional needed, including the iron. If it is not covered by the food intake, it can leads to anaemia.[12]In addition strenuous exercise can increase iron needs up to 1-2 mg/day. This can be caused by if someone has heavy exercise, they will lose their iron through sweat, blood loss from the gastrointestinal system, and hemolysis[13][14].

V. CONCLUSION

The prevalence of anaemia in adolescent girls in SMA N 1 Sp. Padang including mild public health problem. There was no relationship between nutritional status, duration of menstruation and physical activity with anaemia. Based on our research, we recommend young women equipped with knowledge about the food and drink that can help as well as inhibit iron absorption so that the iron contained in foods and drinks can be absorbed perfectly.

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