Nutritional Knowledge, Social Support, and the Incidence of Anemia in Adolescent Girls in Junior High School Alam Lampung

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Abstract: Anemia is a condition of hemoglobin levels less than normal, which is prone to occur in adolescent girls due to the menstrual cycle that occurs every month. In addition, dietary habits also affect hemoglobin levels of adolescent girls. Dietary habits are also influenced by nutritional knowledge and social support from their peers. This study aims to determine the association between nutritional knowledge and social support on the incidence of anemia in adolescent girls. This study is an observational analytical study using *the cross-sectional* method, with 12 respondents (total sampling) grade 7, 8, and 9 at Junior High School Alam Lampung. Data collection of nutrition knowledge and social support was carried out by filling out questionnaires by respondents, while blood capillaries sampling for hemoglobin measurement were done by researchers using hemoglobin meters. The results of the study found that the average Hb respondents were 13.5mg / dl, there were 2 respondents (16.7%) who had anemia, as many as 6 respondents had good nutritional knowledge (50%), and as many as 7 people (58.3%) had good social support. There was no significant association between the incidence of anemia and nutritional knowledge *(p value: 0.12) or social support (*p value*: 0.79).*

1 INTRODUCTION

Anemia is a condition where the levels of red blood cells or hemoglobin in the body are below normal levels according to age and physiological state of the body. Adolescent girls have high risk of anemia because of their rapid growth and development, menstruation, poor dietary habits, peer pressure and dieting. Based on the PRECEDE behavioral theory by Lawrence Green, there are 3 factors that influence health behavior, including *predisposing, enabling* and *reinforcing*. Health behavior will affect the incidence of anemia, p*redisposing* factors that affect the incidence of anemia one of them is iron consumption (Junengsih dan Yuliasari, 2017), knowledge (Yunita *et al*., 2020) and attitude (Listiana, 2016). Meanwhile the enabling factors that influence the incidence of anemia is the availability of family iron sources, and the strengthening factors are maternal nutrition knowledge, maternal nutritional attitudes, maternal nutritional behavior (Zuraida, 2020) as well as social support (Sri Raharjo dan Indrayanti, 2021). In this study, researchers will look for a relationship between adolescent girls' knowledge and social support on the incidence of anemia in junior high school Alam Lampung.

2 METHODS

This research is an observational analytical research with cross sectional method. The population in this study is 12 adolescent girls in grades VII, VIII and IX (age 12-14 years old) at Junior High School Alam Lampung, all population are taken as research sample (total sampling method). Data was collected by filling out questionnaires by respondents [18 points nutritional knowledge questionnaire modified from Zuraida (2020) and 7 points social support questionnaire Duke-UNC FSSQ].

Figure 1: Questionnaire filling by the respondent

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Blood sampling taken directly by researchers, conducted from distal blood capillaries with digital measurement. This research has received ethical approval from the Health Research Ethics Commission of the Faculty of Medicine, University of Lampung No. 1754/UN26.18/PP.05.02.00/2023.

Figure 2. Blood sampling

3 RESULTS AND DISCUSSION

3.1 Anemic Status of Adolescent Girls

The results of hemoglobin (Hb) levels of adolescent girls of JHS Alam Lampung students were obtained on average 13.5 mg / dl with the lowest level of 9.3 mg / dl and the highest 20.4 mg / dl/. Hb levels that exceed 20mg / dl can be caused by several things such as dehydration, chronic hypoxia, or other conditions that produce excess erythropoietin, so a physical examination and further support are needed to determine the cause of the excess Hb levels. Based on the examination from the 12 respondents, 10 adolescent girls who did not have anemia and 2 adolescent girls who had anemia (Table 1).

Table 1. Adolescent Girls' Anemia Status

Status	n	%
Non Anemic	10	83,3
Anemic	2	16,7
Total	12	100,0

The results of this examination showed good things, because adolescent girls who did not have anemia reached 83.3%. Normal haemoglobin levels indicate a good level of health, because it is assumed that oxygen transport and tissue oxygenation occur optimally, so that energy production and other body functions occur optimally (Ahmed *et al*., 2020). Normal haemoglobin levels can be maintained by ensuring a diet that contains balanced nutrition in accordance with the portion of "isi piringku" for adolescents (Kemenkes, 2023) shown in Figure 3.

Figure 3. Balanced Nutrition in Adolescents (Kemenkes, 2023)

The fulfilments of iron needs during adolescence not only improves the reproductive health of adolescent girls but will also have an impact until the adolescent is an adult, especially during pregnancy and childbirth (UNICEF, 2020). Adequate iron reserves will minimize the occurrence of anemia in pregnant women, so that the growth of the fetus conceived will occur optimally and reduce the risk of low birth weight and the incidence of stunting in the child itself (Das *et al*., 2018). At the time of labor, the risk of bleeding will be more minimal and postpartum recovery will occur more optimally (Camaschella, 2019).

In addition to a diet that is in accordance with balanced nutrition, haemoglobin levels can also be maintained with the addition of iron supplements. Based on information provided by JHS Alam Lampung, students of junior and senior high school Alam Lampung and Senior High School are routinely given the iron supplements by the local Healthcare Facility (Puskesmas Karang Anyar, Lampung Selatan). However, no further attention has been paid to the compliance of female students in consuming the iron supplements itself.

3.2 Nutritional Knowledge of Adolescent Girls

The results of research on nutritional knowledge of adolescent girls obtained through filling out questionnaires with 18 questions found that adolescent girls who had good and less nutritional knowledge each amounted to 6 people per category (Table 2). The question items answered correctly in the modified questionnaire from the Zuraida (2020)

questionnaire that contained questions regarding nutrition slogans, balanced nutrition messages, menus with balanced nutrition according to the contents of my plate, animal protein sources, energy adequacy for young women, menus with high iron content, and foods that help or inhibit iron absorption.

Table 2. Results of Adolescent Girls' Nutritional Knowledge

Nutritional Knowledge	n	%
Great	6	50
Less	6	50
Total	12	100,0

These results show that adolescent girls who have good nutrition knowledge have reached 50%, this achievement level is quite good, considering the characteristics of respondents, namely the age of adolescent girls as respondents to this study ranged from 12-14 years. Great nutritional knowledge will support adolescents to have a more nutritious diet and food selection, know the daily energy needs of adolescents in order to balance between food intake and physical activity needed so that ideal body weight is maintained, manage reproductive health and mental (emotional) which will have an impact on good health behaviour (Hamulka et al., 2018).

However, nutrition knowledge alone will not have a significant impact if it is not done in conjunction with good eating practices (Chung & Fong, 2018). Adolescent Girls with this age range still depend on caregivers (mothers) in the process of preparing daily meals, but it is hoped that with good nutritional knowledge, adolescent Girls can independently choose healthier foods, for example when buying food in the school cafeteria.

3.3 Social Support of Adolescent Girls

Based on the results of research on adolescent girls' social support, it was found that as many as 7 adolescent girls had great social support and 5 adolescent girls had less social support (Table 3). The results of this examination showed good things, because adolescent girls who had great social support reached 58.3%.

Table 3. Results of Adolescent Girls' Social Support

Social Support	n	%
Great	7	58,3
Less	5	41, 7
Total	12	100,0

Social support can be interpreted as verbal or actional assistance and attention. Some forms of social support are emotional support (listening to complaints, providing encouragement and moral support), instrumental support (can be in the form of services, financial assistance or transportation), or information support (explanation of a matter or giving advice). Social support can be provided by family, peers, or teachers at school.

Adolescence is the age of transition from child to adult, adolescents are easily influenced by something or someone who is considered to play an important role in adolescent profit. The role of support from family, peers and teachers is very influential on the behaviour of a teenager, including health behaviour. Adolescents tend to worry about physical changes along with the puberty phase they experience, with sufficient support for adolescents will have better health behaviours, such as peer support to take iron supplementation tablets (Raharjo & Indrayanti, 2021).

3.4 The Relation of Nutritional Knowledge, Social Support, and Anemia Status of Adolescent Girls

Bivariate analysis in this study was conducted to see the relationship between anemia status and nutritional knowledge as well as anemia status and social support. The statistical analysis test used is *chi square* and obtained the results as listed in Table 4. The results of bivariate analysis between anemia status and nutritional knowledge showed that all adolescent girls who had great knowledge did not have anemia or had normal hemoglobin levels, while there were 4 adolescent girls who had less nutritional knowledge and did not have anemia (66.7%), with a *p value* obtained of 0.12, which means that nutritional knowledge did not have a significant relationship with anemia status.

Table 4. Results of Bivariate Analysis

	Anemic Status				*p value*
	Non-Anemic		Anemic		
	n	%	n	%	
Nutritional Knowledge					
Great	6	100	0	0	0,12
Less	4	66,7	2	33,3	
Total	10		2		
Social Support					
Great	6	85,7	1	14,3	0,79
Less	4	80	1	20	
Total	10		2		

These results show that although adolescent girls have less nutritional knowledge, not necessarily these adolescents have low haemoglobin levels, because haemoglobin levels not only depend on good nutritional knowledge, but are also influenced by daily food intake containing balanced nutrition (Kemenkes, 2014), iron supplements consumption (Rahmiati, 2019), as well as the illness experienced by a teenager (Camaschella, 2019).

The results of bivariate analysis between anemia status and social support showed that of 7 adolescent girls who had great social support, there were 6 (85.7%) adolescent girls who did not have anemia or had normal haemoglobin levels and 1 person (14.3%) who had anemia, while of 5 adolescent girls who had less social support there were 4 people (80%) who did not have anemia or had normal haemoglobin levels, and 1 person (20%) who had anemia, with *a p value* of 0.79 which means there was no significant relationship between social support and anemia status.

4 CONCLUSION

Based on research that has been conducted on adolescent girls of Junior High School Alam Lampung, the following conclusions were obtained:

1. The results of anemia status found that as many as 10 people (83.3%) are non anemic and 2 people (16.7%) are anemic.
2. The results of nutritional knowledge found that as many as 6 people (50%) had great nutritional knowledge and 6 people (50%) had less nutritional knowledge.
3. The results of social support found that as many as 7 people (58.3%) had great social support and 5 people (41.7%) had less social support.
4. There was no significant association between anemia and nutritional knowledge with p value: 0.12.
5 There was no significant association between the incidence of anemia and social support with p value: 0.79.

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