



**The Relationship of Mother's Behavior and Attitude to Iron Intake in Anemia
Adolescent Girls in High School of South Lampung Regency**

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Abstract

Adolescent girls are one of the groups that are prone to anemia, not only because they are prone to malnutrition but also because they are menstruating so that they need nutritional intake, especially iron to meet the needs of Fe intake in the body. Riskesdas 2018 data recorded the proportion of anemia in non-pregnant women aged 15 years was 22.7%. This situation is the result of the intake of iron from food that only meets 40% of the adequacy. The purpose of this study was to analyze the behavior and attitudes of mothers towards the consumption of iron intake in adolescent girls who had anemia in Senior High School in South Lampung Regency. This type of research is

quantitative with a cross-sectional approach. The study population was all 41 adolescent girls with anemia with a sample of 41 samples, using a non-probability sampling technique. The research has been carried out at SMKN Tanjung Sari from January to June 2022. Data collection used observation sheets. Data analysis was univariate and bivariate. The results show that 56.1% of respondents with positive maternal attitudes and 25 (61.0%) respondents with good maternal behavior. There is a relationship between maternal attitudes (*p*-value 0.012) and maternal behavior (*p*-value 0.030) on the consumption of iron intake in adolescent girls who have anemia in Senior High Schools in South Lampung Regency. Thus, suggestions for health workers are to increase knowledge to mothers and adolescent girls about the need for iron intake and can provide interventions related to iron intake to families who have family members that have anemia

Keywords: Anemia, Adolescents Girls, Behavior Intake of Iron Sources

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Introduction

Adolescent girls are one of the groups that are prone to anemia, not only because they are prone to malnutrition but also because they are menstruating so they need nutritional intake, especially iron to meet the needs of Fe intake in the body (Mone Robertus, 2019). The high prevalence of anemia in adolescent girls is caused by chronic blood loss, inadequate iron intake, inadequate absorption, and an increased need for iron for the formation of red blood cells which commonly occurs during the period of baby growth, puberty, pregnancy, and breastfeeding (Andriani *et al.*, 2021).

Adolescent girls are at a higher risk of anemia than young men, this is supported by data from the Basic Health Research (Riskesdas) in 2018, that the proportion of anemia in women (27.2%) is higher than in men (20.3%). Riskesdas 2018 data also noted that the proportion of anemia in non-pregnant women aged 15 years was 22.7%. This situation is the result of the intake of iron from food that has only met 40% of the adequacy (Kemenkes, 2019). The prevalence of anemia in adolescent girls in Lampung Province based on the latest data in 2010 was 25.9% (Lampung Provincial Health Office, 2013).

WHO states that 50% of the causes of anemia are caused by iron deficiency (WHO, 2020). Malnutrition, especially iron deficiency, is a common cause of anemia in addition to a deficiency of folate, vitamin B12, and vitamin A as well as the presence of hemoglobinopathies, and infectious diseases, such as malaria, tuberculosis, HIV and parasitic infections (Alami *et al.*, 2019). The Indonesian Ministry of Health, (2018) also mentions that the cause of anemia is due to a nutritional deficiency. The low intake of nutrients, namely iron intake, is a contributing factor to the incidence of anemia (Kemenkes RI, 2016; Wiafe *et al.*, 2020).

Iron has an important role in the body, some of which are playing a role in the formation of hemoglobin, helping metabolic processes by helping various enzymes by binding oxygen (Ni'matush Sholihah *et al.*, 2019). There are 2 kinds of iron, namely heme iron and non-heme iron. The absorption of iron from plant foods (non-heme) is usually much lower than iron from animal foods (heme). The presence of inhibiting and supporting factors of iron absorption greatly affects



the absorption of non-heme iron, while heme iron is less affected. (Warda, 2021). This nutritional deficiency in several studies is caused by the consumption pattern of the Indonesian people who are still lacking and use vegetables as the main source of iron (Abbaspour *et al.*, 2014). Most vegetables, such as spinach, are high in oxalic acid, low in iron, and difficult to absorb. Meanwhile, meat and animal protein, such as chicken and fish have high iron content, but these foods are rarely consumed by the community, especially in rural communities, causing low absorption of iron in the body (Rohmatika *et al.*, 2020).

In adolescent girls, inadequate intake is often caused by adolescent girls maintaining their body appearance by reducing food consumption and following an unhealthy diet. An unhealthy and unbalanced diet will cause the body to experience nutritional deficiencies (Sarni, 2020). The behavior of eating a source of iron in adolescent girls can be seen from several previous studies, almost all female students of nutritional adequacy of iron are still classified as lacking (97%). In addition, consumption of vegetables and fruit sources of vitamin C as enhancers is also still relatively low (33.7%) (Permatasari *et al.*, 2020). Although the government has made several efforts to reduce the incidence of anemia in adolescents, including fortification of Fe in foodstuffs and the provision of blood-added tablets and has been going well, there are still many cases of anemia in adolescent girls in various regions. Based on the explanation above, the behavior of intake of iron sources is the biggest cause of anemia in adolescent girls. Based on the PRECEDE behavioral theory by Lawrence Green, the behavior itself is influenced by three factors, including predisposing, enabling and reinforcing (Notoatmodjo, 2014).

The efforts to promote behavior change are through targeting subjective norms, attitudes, and knowledge (Arida *et al.*, 2015). Research by Knez *et al.*, (2017) explains in detail that adolescent anemia is significantly related to iron consumption behavior, as well as the influence of perception and parental involvement also makes a significant contribution. Intake of energy, protein, fat, zinc, vitamin B12, copper, fiber, tannin, and oxalate against iron deficiency anemia. Mothers have an important role in preparing children's nutrition. In fulfilling the nutrition of family members, the mother plays a very important role. Mother is the person closest to the child, the first



person who has contact with the child, and who allocates more time in child care and the first person to choose the type of food that will be consumed by household members (Setyaningsih, *et al*, 2014).

The results of a survey conducted at Tanjung Sari High School, South Lampung Regency in January 2022, of 80 adolescent girls who were examined for Hb levels, it was found that 50% of adolescent girls had anemia. From the results of unstructured interviews, it is known that adolescent girls have a habit of consuming unbalanced nutritious foods, often consume drinks that interfere with iron absorption and most of them do diet foods to maintain weight and have the habit of consuming fast food but do not pay attention to nutritional intake properly. Based on the background, the researchers were interested in examining how the relationship between attitudes and behavior of mothers with the behavior of consuming iron sources in adolescent girls who experienced anemia in high school in South Lampung Regency.

Methods

This type of research is quantitative with a cross-sectional approach. The study population was all 41 adolescent girls in school who had anemia with a sample of 41 samples, using a non-probability sampling technique. The research has been carried out at Vocational High School (SMKN) Tanjung Sari, South Lampung Regency from January to June 2022. Data collection used observation sheets. Data analysis was univariate and bivariate.

The independent variable in this study was the attitude and behavior of the mother and the dependent variable was the behavior of iron intake for anemic adolescent girls. The mother's attitude variable was measured by analyzing 15 statements related to the mother's attitude in the fulfillment and preparation of nutrition for adolescent girls using the Likert scale. The accumulation of attitude answer scores is grouped into two categories, namely: negative, if the respondent's T-score is <50 and good if the respondent's T-score ≥ 50 (Azwar, 2013).



The mother's behavior variable was analyzed from 18 questions about the mother's behavior in preparing food and supervising the food of adolescent girls, using a Likert measurement scale, with the accumulation of the mother's behavioral answer scores grouped into two categories, namely: negative if the respondent's T-score score <50 and good if the respondent's T-score ≥ 50 (Azwar, 2013).

The behavioral variable of iron intake for anemic adolescent girls was measured by assessing the iron intake of anemic adolescent girls respondents from the semi-quantitative food frequency questionnaire (SQ-FFQ). Nutritional assessment by calculating food intake scores by calculating the Fe content for each food that has been consumed (Sirajuddin et al., 2018). The accumulated average daily consumption of iron intake is grouped into two categories: adequate, if the score is $\geq 77\%$ of the Nutrition Adequacy Rate (NAR) and less if the respondent's score is $< 77\%$ of the NAR (Gibson, 2005). To find out the relationship between mother's attitude and behavior towards iron intake for anemic adolescent girls, a statistical test was conducted using the Chi-Square test.

Results and Discussion

Subjects as respondents in this study were 41 adolescent girls who experienced anemia, namely class X (22 students) and class XI (as many as 19 students) at SMKN Tanjung Sari for the academic year 2021/2022. The subjects selected as respondents were adolescent girls who suffered from anemia at school who were netted through an examination of the student's hemoglobin levels conducted by the Tanjung Sari Health Center using a hematology analyzer. The following are the characteristics of the respondents in this study.



Tabel 1. Characteristics of Anemic Adolescent Girl Respondents in Senior High School, South Lampung Regency

Variabel	Kategori	n	Persen
Father's education	Elementary school	14	34,1
	Junior High School	15	36.6
	Senior High School	12	29.3
Mother's education	Elementary school	18	43,9
	Junior High School	12	29.3
	Senior High School	11	26.8
Mother's Work	Farmer	2	4.9
	Merchant	2	4.9
	Farm Worker	3	7.3
	non-farm worker	1	2.4
	Housewife	33	80.5
Parental Income	≥ Minimum Wage Work	13	31.7
	< Minimum Wage Work	28	68.3
Haemoglobin level	8 – 9,9	2	4,9
	10 – 10,9	11	26,8
	11 – 11,9	28	68,3
BMI	Thin	7	17.1
	Normal	32	78.0
	Obese	2	4.9
Length of the menstrual period	5-7	38	92,7
	8-10	3	7,3
Total		41	100

Based on the table of respondent characteristics above, it is known that the father's education is 36.6% junior high school education, while the mother's education is 43.9% elementary school education. On the characteristics of the father's type of work, there are 31.7% working as non-farm workers and 80.5% of the mothers work as housewives. On the characteristics of parents' income, there are 68.3% of respondents' parental income below the Minimum Wage Work in South Lampung Regency where the minimum wage in South Lampung is Rp. 2,659,000,-.

Afterward, on the characteristics of the respondent's haemoglobin (Hb) level, it is known that as much as 68.3% with the Hb level of 11-11.9 g/dl. On the characteristics of body mass index (BMI), there are 78.0% of adolescent girls who have anemia with normal BMI and on the length of the menstrual period 92.7% of adolescent girls with a menstrual period of 5-7 days.



Univariate Analysis

The description of the mother's attitude in fulfilling and preparing nutrition, the mother's behavior in preparing food and supervising food and the behavior of iron intake for anemic adolescent girls can be seen in the table below.

Table 2. An Overview of Maternal Attitudes and behavior of iron intake for anemic adolescent girls in Senior High School, South Lampung Regency

Variable	Category	N	%
Mother's attitude	Negative	18	43.9
	Positive	23	56.1
Mother behavior	Not Good	16	39.0
	Good	25	61.0
Behavior of iron intake for anemic adolescent girls	Insufficient	31	75.6
	Sufficient	10	24.4
Total		41	100.0

Based on table 2, it is known that respondents with a positive mother's attitude were 56.1%, good mother behavior was 61.0%, peer social support was not good as 39.0%, and good mother behavior was 61.0%. In the behavior of iron intake for anemic adolescent girls in Senior High School, South Lampung Regency, it is known that the intake of iron from food is mostly 75.6%.

In the mother's attitude variable, it is known that none of the mothers who answered strongly agreed regarding the question that teenagers should eat 3 times a day by paying attention to the amount and portion of food as they should also eat food sources of animal protein (fish, chicken, eggs and others) 3 servings per day and should eat 3 servings of vegetables per day and should eat 4 servings of fruit per day. The mother's view related to the quantity of eating 3-4 times a day was not found in the respondents in this study, this can happen because adolescent girls go to school and sometimes go home or arrive home in the late afternoon so they are not controlled



by the mother related to the quantity of eating young women who ultimately change mother's view related to the quantity of eating of adolescent girls.

Based on the results of the analysis of the mother's attitude questions, it is known that as many as 68.3% of respondents answered agree that green vegetables can be replaced with supplements, meaning that mothers choose to use supplements as a substitute for vegetables in adolescent girls. The fiber contained in green vegetables has many functions in helping the body's digestive process besides the vitamins and minerals contained in green vegetables are needed by the body which cannot be replaced by supplements that are consumed, this is a wrong view that occurs in the respondent's mother regarding with nutrition for adolescent girls. Mother's practical thoughts, by taking supplements as a substitute for green vegetables, may be found from the many multivitamin advertisements that have the slogan as a complete multivitamin and a substitute for fiber so that it is good for the body, from these advertisements use attractive models that change the attitude or views of mothers regarding with green vegetables. Attitudes are not necessarily directly manifested in an action, supporting factors such as family are needed so that they can realize an action. Attitudes require three components that can shape behavior and are influenced by knowledge, thoughts, beliefs and emotions.

Based on the results of the analysis of the answers to the mother's behavioral questions, it was also concluded that in preparing food and food supervision for adolescent girls carried out by mothers, there still tended to be less good due to a lack of understanding in consumption patterns, and nutritional needs for adolescents. Health workers have an important role as communicators in delivering health information to the public, one of which is parents. Counseling on health, including material on efforts to prevent anemia, is given periodically by public health center officers, both by public health extension officers and nutrition officers.

Counseling on understanding the mother's knowledge about adolescent nutrition was given at the parents' meeting at the new student admissions/receiving report cards. The obstacle faced by the school was that at the time of the meeting, not all parents could attend and follow the counseling. In addition to counseling to parents, counseling is also given to school children where



there are already elementary school-age children who are included in the youth group (12-18 years). By providing nutrition education to school-age children, it is hoped that they can prevent anemia in themselves. The age of 12-14 years is included in the transition period from early adolescence to late adolescence which is a period of searching for identity and adolescents are quickly influenced by the environment. Anxiety about body shape makes teenagers intentionally not eat or choose to eat out. Nutrition education is one way that can be done for the prevention and control of anemia. Nutrition education is needed with the aim that adolescents have nutritional knowledge so that deviations in food consumption can be prevented.

Bivariate Analysis

The relationship between maternal attitude factors regarding the source of iron in adolescent girls with the behavior of intake of iron sources in anemic adolescent girls

The analysis of statistical test results on the relationship between maternal attitude factors in the fulfillment and preparation of nutrition for adolescent girls with the behavior of iron intake for anemic adolescent girls is described in the following table:

Table 3. The relationship between maternal attitude factors regarding the source of iron in adolescent girls with the behavior of intake of iron sources in anemic adolescent girls

Mother's attitude	Behavior of iron source intake				Total	%	p-value	OR 95% CI
	Insufficient		Sufficient					
	n	%	n	%				
Negative	10	55,6	8	44,4	18	100,0	0.012	0.119 (0.021-0,667)
Positive	21	91,3	2	8,7	23	100,0		

Based on Table 3, it is known that from the 18 respondents with negative maternal attitudes, there were 10 (55.6%) respondents with insufficient intake of iron and 8 (44.4%) respondents with sufficient intake of iron. From 23 respondents with positive maternal attitudes, there were 21 (91.3%) respondents with insufficient intake of iron and 2 (8.7%) respondents with sufficient



intake of iron. Based on the results of statistical tests obtained $p\text{-value} = 0.012$ which is significant $p < \alpha = 0.05$ (H_0 is rejected and H_a is accepted), this shows that there is a relationship between maternal attitudes about the source of iron in adolescent girls with the behavior of intake of iron sources in adolescents. anemic adolescent girls in Senior High School of South Lampung Regency.

Attitude is how the opinion or assessment of people or respondents on matters related to health, illness and health risk factors. Attitude is a syndrome or collection of symptoms in response to a stimulus or object so that the attitude involves thoughts, feelings, concerns and other psychiatric symptoms (Notoatmodjo, 2014).

In fulfilling the nutrition of family members, the mother plays a very important role. Mother is the person closest to the child, the first person who has contact with the child, and who allocates more time in child care and the first person to choose the type of food that will be consumed by household members (Setyaningsih, et al, 2014).

Based on the results of the study, it was found that 55.6% of mothers with negative attitudes and behavior of iron intake in adolescents were not sufficient. In the opinion of the researcher, this negative attitude is due to the mother's poor knowledge. This is in line with the theory that reveals that a person's attitude is influenced by knowledge and experience that has been experienced, in addition to the influence of others. So in this study it was found that the mother's attitude was negative but from this study it was known that there were respondents with a negative attitude but sufficient iron intake in adolescent girls, namely 44.4% of respondents, this is because young women still consume snacks outside the home such as consuming meatballs, so that iron intake can be met.

Based on the results of the study, it was known that 91.3% of respondents had a positive attitude but the behavior of iron intake was not enough, this was because even though the mother's attitude was positive, the mother could not control the high iron intake in adolescents because young women had chosen foods they liked or not, such as when the respondent likes certain foods such as instant noodles, it is likely that the respondent will continue to consume the instant noodles.



The relationship between mother's behavior and the behavior of iron intake in anemic adolescent girls in Senior High School, South Lampung Regency

Analysis of statistical test results of the relationship between maternal behavioral factors in preparing food and supervising the diet of adolescent girls with the behavior of iron intake for anemic adolescent girls is described in the following table:

Table 4. The Relationship of Maternal Behavior Factors with Behavior of Iron Source Intake in Adolescent Girls with Anemia in Senior High School, South Lampung Regency

Mother's behavior	Behavior of Iron Source Intake				n	%	<i>p-value</i>	OR 95% CI
	Insufficient		Sufficient					
	n	%	n	%				
Not Good	9	56,3	7	43,8	16	100,0	0.030	0.175
Good	22	88,8	3	12,0	25	100,0		(0.037-0,834)

Based on Table 4, it is known that from 16 respondents with poor maternal behavior, there were 9 (56.3%) respondents with insufficient intake of iron and 7 (43.8%) respondents with sufficient intake of iron. Then, from 25 respondents with good maternal behavior, there were 22 (88.0%) respondents with insufficient intake of iron and 3 (12.0%) respondents with sufficient intake of iron. Based on the results of statistical tests obtained $p\text{-value} = 0.030$ which is significant $p < \alpha = 0.05$ (H_0 is rejected and H_a is accepted), this indicates that there is a relationship between maternal behavioral factors and the behavior of iron intake in anemic adolescent girls in high school of South Lampung Regency.

In fulfilling the nutrition of family members, the mother plays a very important role. Mother is the person closest to the child, the first person who has contact with the child, and who allocates more time in child care and the first person to choose the type of food that will be consumed by household members (Setyaningsih, et al, 2014).



Based on the results of the study, it was found that as many as 56.3% of respondents with poor behavior and poor iron intake behavior, but as many as 43.8% with sufficient iron intake behavior this is because adolescent girls know good intake for themselves so that change behavior to consume iron. Although adolescent girls have mothers who prepare food ingredients and serve food that is not good, but because the knowledge of the adolescent girls is good, the behavior for iron intake is sufficient, such as adolescent girls who do not consume tea or consume chocolate, eating meatballs from these foods are seen. behavior of adequate iron intake. Based on the results of the study, it is known that as many as 88.0% of respondents with good behavior but adolescent girls are not sufficient in consuming iron intake, this can happen because young women who do not like certain foods such as not liking vegetables, do not want to consume eggs because it is fishy, resulting in less iron intake.

A person's behavior is not only influenced by knowledge but also influenced by the environment. The environment can affect changes in one's eating behavior and physical activity. In adolescents, the family environment affects food consumption as well as in the selection of favorite foods and physical activity in adolescents, which will ultimately have an impact on adolescent food intake, and lead to their nutritional status. The food intake of many students has not reached the Nutritional Adequacy Rate (NAR). This is caused by external factors that affect the nutritional knowledge of students, such as the absence of media to increase nutritional knowledge specifically from the school, there are no facilities and infrastructure that support increasing nutritional knowledge. Counseling about health was only obtained by students from outreach activities from the public health center. These results are in accordance with Maheswar's research that the media as health communication can influence the behavior of choosing healthy foods in adolescents.



Conclusion and Recommendation

Based on the results of the study above, it was found that there was a relationship between maternal nutritional attitudes and behavior with the behavior of iron intake in anemic adolescent girls in High School of South Lampung Regency. Suggestions for the involvement of the health office, public health center, schools and other related parties to work together more intensively in increasing knowledge by providing education and counseling to adolescents and parents in preventing anemia or consuming adequate iron intake so as to prevent anemia.



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References

- Abbaspour, N., Hurrell, R., & Kelishadi, R. (2014). Review on iron and its importance for human health. *Journal of Research in Medical Sciences*, 19(2), 164–174.
- Alami, A., Tavakoly Sany, S. B., Lael-Monfared, E., Ferns, G. A., Tatari, M., Hosseini, Z., & Jafari, A. (2019). Factors that influence dietary behavior toward iron and vitamin D consumption based on the theory of planned behavior in Iranian adolescent girls. *Nutrition Journal*, 18(1), 1–9. <https://doi.org/10.1186/s12937-019-0433-7>
- Andriani, L., Nugrahmi, M. A., Amalia, M., & Yunura, I. (2021). Health Education on Nutrition and the Effect of Anemia on Adolescents at SMK Muhammadiyah, Bukit Tinggi City. *Journal of Salingka Abdimas*, 1(1), 19–22.
- Atmaka, D. R., Ningsih, W. I. F., & Maghribi, R. (2020). Dietary intake changes in adolescent girl after iron deficiency anemia diagnosis. *Health Science Journal of Indonesia*, 11(1), 27–31. <https://doi.org/10.22435/hsji.v11i1.3143>
- Gibson, R. S. *Principle of Nutritional Assessment*. (Oxford University Press, 2005).
- South Lampung Health Office. (2020). *Health Profile of South Lampung Regency*. 06, 100. <https://dinkes.lampungselatankab.go.id/wp-content/uploads/2021/10/Health-Profile-Kab.-Lamsel-2020.pdf>
- Dubik, S. D., Amegah, K. E., Alhassan, A., Mornah, L. N., & Fiagbe, L. (2019). Compliance with Weekly Iron and Folic Acid Supplementation and Its Associated Factors among Adolescent Girls in Tamale Metropolis of Ghana. *Journal of Nutrition and Metabolism*, 2019 <https://doi.org/10.1155/2019/8242896>
- Gupta, A., Parashar, A., Thakur, A., Sharma, D., Bhardwaj, P., & Jaswal, S. (2014). Combating Iron deficiency anemia among school going adolescent girls in a Hilly State of North India: Effectiveness of intermittent versus daily administration of iron folic acid tablets. *International Journal of Preventive Medicine*, 5(11), 1475–1479.
- Indrawatiningsih, Y., Hamid, S. A., Sari, E. P., & Listiono, H. (2021). Factors Affecting the Occurrence of Anemia in Young Women. *Scientific Journal of Batanghari Jambi University*, 21(1), 331. <https://doi.org/10.33087/jiubj.v21i1.1116>
- Ministry of Health, Republic of Indonesia. (2018). *Guidelines for the Prevention and Control of Anemia in Young Women and Women of Childbearing Age*. Ministry of Health.
- Melyani, & Alexander. (2019). Factors Related to the Incidence of Anemia in Young Women at SMPN 09 Pontianak School in 2019. *Journal of Obstetrics*, 9, 394–403.
- Mone Robertus. (2019). *Iron and Protein Intake In Young Women is Short and Very Short in Kupang City*. 3, 1–9.
- Ni'matush Sholihah, Sri Andari, & Bambang Wirjatmadi. (2019). Relationship of Protein, Vitamin C, Iron and Folic Acid Intake Levels with the Incidence of Anemia in Young Women of Senior High School 4 Surabaya. *Amerta Nutrition Journal*, 3(3), 135–141. <https://doi.org/10.2473/amnt.v3i3.2019.135-141>
- Notoatmodjo, S. (2014a). *Public Health Sciences Basic Principles* (Print To). Rineka Cipta.



- Notoatmodjo, S. (2014b). Health promotion. Salemba Medika. Rohmatika, D., Widyastutik, D., & Wijayanti. (2020). Factors Related to the Incidence of Anemia in Young Women in Stikes Kusuma Husada Surakarta. *Journal of Advanced Nursing and Health Sciences*, 1, 47–52.
- Sarni, A. (2020). Factors Affecting the Incidence of Anemia in High School Students. *Scientific Journal of Permas : Scientific Journal of STIKES Kendal*, 10(3), 341–350.
- Setyaningsih, Rachmawati, S., & Agustini, N. (2014). Maternal Knowledge, Attitudes, and Behaviors in The Fulfillment of Toddler Nutrition: A Survey. *Indonesian Journal of Nursing*, 17(3), 88–94.
- <https://doi.org/10.7454/jki.v17i3.451> Warda, Y., & Fayasari, A. (2021). Food intake and iron bioavailability are related to the anemic status of young women in East Jakarta. *Nutrition Science Indonesia*, 4(2), 135. <https://doi.org/10.35842/ilgi.v4i2.198>
- WHO. (2012). *Anaemia Policy Brief*. 6, 1–7. http://www.who.int/iris/bitstream/10665/148556/1/WHO_NMH_NHD_14.4_eng.pdf
- WHO. (2020a). *Global anaemia reduction efforts among women of reproductive age: impact, achievement of targets and the way forward for optimizing efforts*. WHO.
- WHO. (2020b). *Global anaemia reproductive age: among women of reduction efforts of targets and the impact, achievement way forward for optimizing efforts*. In World Health Organization.
- WHO. (2020c). *WHO guideline on use of ferritin concentrations to assess iron status in individuals and populations*. Geneva: WHO
- Yunita, F. A., Parwatiningsih, S. A., Hardiningsih, M., Nurma Yuneta, A. E., Kartikasari, M. N. D., & Ropitasari, M. (2020). The Relationship between Young Women 's Knowledge About Iron Consumption and The Incidence of Anemia in Junior High School 18 Surakarta. *PLACENTUM: Scientific Journal of Health And Its Applications*, 8(1), 36.
- Zuraida, R. (2020). The CBA (Anemia-Free Club) Health Promotion Model as an Intervention Model for School-Based Iron Nutrition Anemia Management in Adolescent Girls (Dissertation). Andalas University. Padang