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The Effect of Multifaceted Intervention on Iron Intake and Hemoglobin (Hb) Levels in Teenage Girl with Mild Moderate Anemia at The Vocational School State of Tanjung Sari in South Lampung Regency

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A B S T R A C T

Introduction: The prevalence of anemia in teenage girls in Lampung Province is still quite high. In preventing and overcoming anemia in teenage girls, it is possible to increase the intake of iron-rich foods and supplementation with blood-added tablets (TTD). It is necessary to develop innovative multifaceted interventions in improving dietary intake behavior, especially iron. This study was conducted to analyze the effect of multifaceted intervention on iron intake and hemoglobin (Hb) levels in teenage girls with mild moderate anemia at the Vocational High School in Tanjung Sari, South Lampung Regency. **Methodology:** Quasy experimental research with one group pretest and posttest design. The study was conducted from January to May 2022 with a sampling technique that is consecutive sampling on anemic teenage girls at the vocational high school state in Tanjung Sari and the number of research samples was 41 respondents. The respondents carried out a multifaceted intervention in the form of nutrition education, food supervision for parents and teachers and the provision of iron supplementation for six weeks. The analysis test used paired t-test with the SPSS program and it was considered to have a significant effect if $p<0.05$. **Result:** There was an increase in the average iron intake (increase 7.60 mg) and an increase in the average hemoglobin level (increase 1.06 g/dL). The results is showed a significant effect of multifaceted intervention on iron intake ($p = 0.000$) and a significant effect on hemoglobin (Hb) levels ($p = 0.000$). **Discussion**: Based on the results of the analysis showed that there was a significant effect of multifaceted intervention on iron intake and hemoglobin (Hb) levels in anemic teenage girls at the vocational high school in Tanjung Sari.

Kata kunci:

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A B S T R A K

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respondents. The respondents carried out a multifaceted intervention in the form of nutrition education, food supervision for parents and teachers and the provision of iron supplementation for six weeks. The analysis test used paired t-test with the SPSS program and it was considered to have a significant effect if p<0.05. **Result:** There was an increase in the average iron intake (increase 7.60 mg) and an increase in the average hemoglobin level (increase 1.06 g/dL). The results is showed a significant effect of multifaceted intervention on iron intake (p = 0.000) and a significant effect on hemoglobin (Hb) levels (p = 0.000). **Discussion**: Based on the results of the analysis showed that there was a significant effect of multifaceted intervention on iron intake and hemoglobin (Hb) levels in anemic teenage girls at the vocational high school in Tanjung Sari.

INTRODUCTION

One of the health problems in teenagers is anemia (Kalsum and Halim, 2016). Teenage girls have a greater risk of suffering from anemia compared to teenage boys due to physiological processes such as menstruation. Globally, the prevalence of anemia in women aged 15-49 years is 29.9% (WHO, 2019). In Indonesia, according to the World Health Organization (WHO) in 2019, the prevalence of anemia in non-pregnant women (aged 15-49 years) was 31.2% (WHO, 2019). Based on several studies conducted in Lampung Province, it shows that the prevalence of anemia in adolescent girls is still high, such as at MAN 1 Metro by 40%, at SMA N 1 Purbolinggo in East Lampung Regency by 80.9%, at SMAN 1 Talang Padang, Tanggamus Regency by 62.8%, at SMK N 1 Terbanggi Besar in Central Lampung Regency by 60.8% and in several SMA Bandar Lampung by 49.3% (Martini, 2015; Astuti and Trisna, 2016; Laksmita and Yenie, 2018; Listiana, 2016; Zuraida, 2020).

In preventing and overcoming anemia in teenage girls, several things can be done, such as increasing the intake of iron-rich foods and giving blood-added tablets (TTD) (Ministry of Health, 2018). Research on teenage girls in Banyumas Regency was found from 92.9% of anemic teenage girls in urban areas. The factors associated with the genesis of iron deficiency anemia in that area were lack of protein intake (60%) and less iron intake (95.7%) (Sari et al, 2016).

In order to improve eating behavior, especially iron intake, it can be done by conducting nutrition education and involving school support such as teachers and family/parents as one of the reinforcing factors and enabling factors that are expected to increase iron intake.

Based on the above considerations, an innovative approach or the development of a multifaceted intervention (multifaceted/multidimensional intervention) is needed to overcome this. Therefore, this objective of the study to analyze the effect of multifaceted intervention on iron intake and hemoglobin (Hb) levels in teenage girls with mild moderate anemia at the vocational high school state in Tanjung Sari of South Lampung Regency.

RESEARCH METHOD

Research Design and Research Sample

The researcher did a quasy experiment with a one group pretest and posttest design. The study was carried out on January-May 2022 with consecutive sampling technique for teenage girls in grades X and XI at the vocational school state in Tanjung Sari, South Lampung Regency and it obtained a total sample of 41 respondents. The inclusion criteria in the study were teenage girls who were already menstruating, no diseases that could interfere with the study (suffering from thalassemia, tuberculosis, HIV/AIDS, Chronic Malaria), not having excessive menstruation, not being pregnant, not taking multivitamins and supplements regularly and not experiencing severe anemia.

Operational Definition

The independent variable (free) is multifaceted intervention in the form of nutrition education, food supervision by teachers and parents and supplementation of blood-added tablets (TTD). While the dependent variable (bound) is iron intake and Hb levels in teenage girls with mild moderate anemia.

Data Collecting Technique

Based on Figure 1. Presented about the stages of data collection in research. In this study, informed consent was carried out to protect respondents and researchers when conducting research. This study was approved by the Ethics Commission of the Faculty of Medicine, University of Lampung with No: 771/ UN26.18/ PP.05.02.00/2022.

In the multifaceted intervention, nutrition education is given one (1) time every week, food supervision by teachers and parents who have been given briefing/training as well as giving blood-added tablets (TTD) 1 tablet every week and every day during menstruation for 6 weeks. Before carrying out food supervision by teachers and parents, parents and teachers are trained so that they can play a role in preventing anemia and monitoring the nutritional intake of adolescent girls. Parents were given information about preparing good foods containing iron, food companions and monitoring the consumption of TTD (blood supplement tablets). The teacher is prepared as a facilitator in motivating young women to eat and supervising the consumption of blood-added tablets (TTD). Prior to intervention, respondents were examined for Hb levels and assessment of iron intake using the SQ FFQ questionnaire. After 6 weeks, at the end of the intervention, Hb levels were checked again and iron intake was assessed.

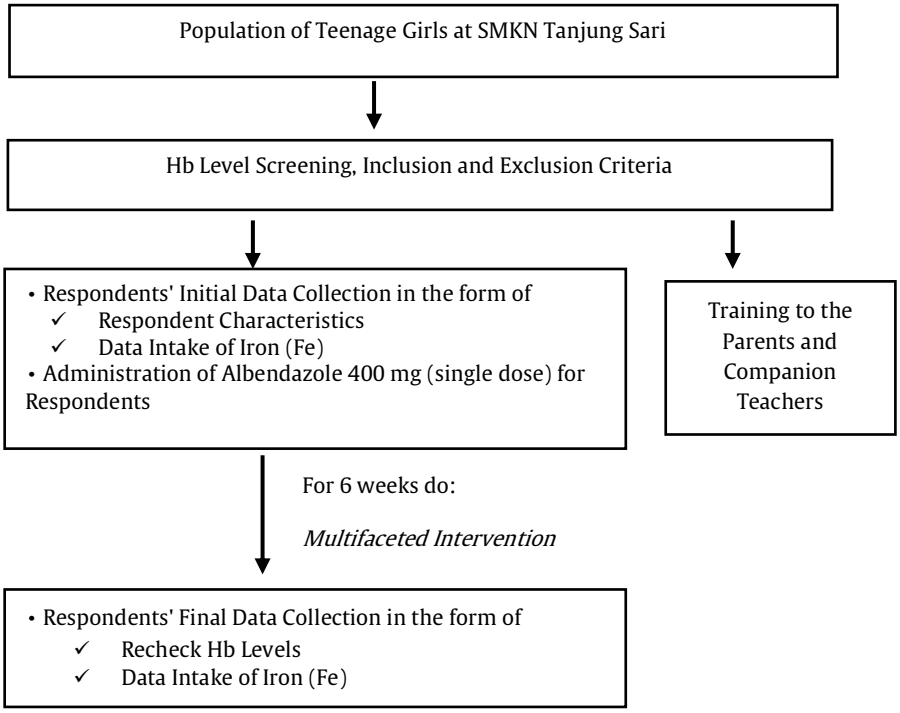

Figure 1. Data Collection Stage

Data analysis

The analysis used comparative numerical analysis in pairs with repeated measurements of two measurements. Paired t-test if the data distribution is normal, Wilcoxon test if the distribution is not normal. Data were collected and it analyzed with the SPSS program, considered to have a significant effect if $p<0.05$.

RESULTS

Based on Table 1.1. The general characteristics and nutritional status of the research respondents were obtained. Most of the research respondents came from teenage girls in class X as many as 22 people (53.66%) with an average menstrual period of 6.63 days. For the nutritional status of the research respondents, most of them were normal, namely 32 people (78%) but most of the research respondents suffers CED (Chronic Energy Deficiency) as much as 65.9%. For pocket money, 61% of research respondents brought pocket money of Rp.> 5,000 - 10,000. In addition, most of the respondents did not bring lunch for school, 95.1%.

Table 1.1. The characteristics of research respondents

No	Variables	Characteristics	n	%
1	Grade	X	22	53,66
		XI	19	46,34
2	Nutritional Status	Thin	7	17.1
		Normal	32	78.0
		Risk Overweight	2	4.9
3	Menstruation	Average (6,63 hari)		
4	MUAC Mid Upper Arm Circumference	Average (22,57 cm)		
5	Status of Chronic Energy Deficiency (CED)	CED (MUAC<23,5 cm)	27	65.9
		NOT CED (MUAC ≥ 23,5)	14	34.1
6	Pocket Money	Rp. 0 - 5000	2	4.9
		Rp.>5000-10000	25	61.0
		Rp.>10000-15000	7	17.1
		Rp.>15000-20000	6	14.6
		Rp.>20000	1	2.4
7	Habit for bringing lunch box	Bringing lunch box	2	4,9
		Not bringing lunch box	39	95,1

Based on Table 1.2, it was found that the family characteristics of the research respondents were mostly Muslim as many as 38 families (92.7%), most of the ethnic groups of young women's families were the Javanese as

many as 33 families (80.5%). For parental education, both father and mother education are evenly distributed among graduates in Elementary School, Junior High School and Senior High School. Most of the father's work is non-farm labor (31.7%) and most of the mother's work is housewife (80.5%). For parents' monthly income, most of them are still below the Minimum Work Wage of South Lampung Regency < Rp.2,650,000, which is 25% with an average income per capita of Rp.709.857.68. All respondents live with their mother and their mother also takes care of their meals.

Table 1.2. the characteristic of family research respondents

No	Variables	Characteristics	N	%
1	**Religious**	Islam	38	92.7
		Kristen Protestan	1	2.4
		Hindu	1	2.4
		Budha	1	2.4
2	**Tribes**	Lampungnese	3	7.3
		Javanese	33	80.5
		Sundanese	1	2.4
		Palembangnese	1	2.4
		Balinese	1	2.4
		Lainnya	2	4.9
3	**Parents Education**			
	Fathers Education	Not graduated	2	4.9
		Elementary School	12	29.3
		Junior High School	15	36.6
		Senior High School	12	29.3
	Mothers Education	Not graduated	2	4.9
		Elementary School	16	39.0
		Junior High School	12	29.3
		Senior High School	11	26.8
4	**Parents Job**			
	Fathers Job	Farmer	7	17.1
		Seller	6	14.6
		Farm workers	8	19.5
		Non-farm workers	13	31.7
		Service	1	2.4
		Contract Worker	1	2.4
		Others	5	12.2
	Mothers Job	Farmer	2	4.9
		Seller	2	4.9
		Farm workers	3	7.3
		Non-farm workers	1	2.4
		Housewife	33	80.5
5	**Parents income**	Under minimum wage (< Rp. 2.650.000)	25	61.0
		Above minimum wage (≥ Rp.2.650.000)	16	39.0
6	**Income per capita**	Average (Rp. 709.857,68)		
7	**Takes care of eating**	Mother	41	100
		Other people	0	0
8	**Living together**	Mother	41	100
		Other people	0	0

Based on Table 1.3. The iron (Fe) intake of respondents before the intervention was found to be mostly in the poor category, namely 37 teenage girls (90.2%) with an average iron (Fe) intake of 9.74 mg but after multifaceted intervention most of the iron intake was carried out. (Fe) respondents in the category of good enough, namely 30 people (73.2%). The average intake of iron (Fe) is 17.34 mg.

Table 1.3. Respondents' Iron Intake Category

No	Iron Intake Category	Characteristic	n	%
	Before Multifaceted Intervention			
1	Less (< RDA value of iron)	< 15 mg	37	90,2
2	Enough or Good (>RDA value of iron)	> 15 mg	4	9,8
3	Average Iron Intake	9,74 mg		
	After Multifaceted Intervention			
1	Less (< RDA of iron)	< 15 mg	11	26,80
2	Enough or Good (>RDA value of iron)	> 15 mg	30	73,20
3	Average Iron Intake	17,34 mg		

Based on table 1.4. The respondent's hemoglobin (Hb) level before the intervention was obtained an average Hb level of 11.02 g/dL with a minimum value of 8.90 g/dL of Hb level and a maximum value of 11.90 g/dL of Hb level. After multifaceted intervention, the average Hb level for anemic teenage girls was 12.08 g/dL with a minimum value of 10.10 g/dL and a maximum value of 13.20 g/dL.

Table 1.4. Characteristics of Respondents' Hemoglobin (Hb) Levels

No	Characteristics of Hemoglobin (Hb) Levels	Hemoglobin (Hb) Levels (g/dL)
	Before Multifaceted Intervention	
1	Average	11,02
2	Minimum	8,90
3	Maximum	11,90
	After Multifaceted Intervention	
1	Average	12,08
2	Minimum	10,10
3	Maximum	13,20

BIVARIATE ANALYSIS

In table 1.5. The results obtained after multifaceted intervention were significantly different in iron intake (p = 0.000) and significantly different levels of hemoglobin (Hb) (p = 0.000) in research respondents.

Tabel 1.5. Effect of multifaceted intervention on iron intake and hemoglobin (Hb) levels in teenage girls with mild moderate anemia at the vocational high school in Tanjung Sari of South Lampung Regency

Variabel	*Multifaceted Intervention*			pValue
	Begining	End	Different	
Iron Intake				
Average	9,74	17,34	7,60	0,000
Minimum	3,50	10,50		
Maximum	18,10	27,50		
Hb Levels				
Average	11,02	12,08	1,06	0,000
Minimum	8,90	10,10		
Maximum	11,90	13,20		

DISCUSSIONS

In this study, it was found that there were significant differences in iron intake and Hb levels after multifaceted intervention. Another study that has similarities in nutrition education has an effect on iron intake, namely the research conducted by Marfuah et al. (2016) which states that providing nutrition education is effective in increasing the average iron intake in class X SMA N 1 Simo Boyolali by 15.5 mg (p value < 0.000) (Marfuah and Dyah Kusudaryati, 2016). The results of this study were strengthened by the results of research conducted by Zuraida on teenage girls in senior high school at Bandar Lampung with CBA model nutritional education which stated that there was a significant correlation in teenage girls at the senior high school who were given an intervention on iron intake (p = 0.000) (Zuraida et al, 2020).

In addition to the nutritional education, in the multifaceted intervention, teenage girls with mild anemia were given blood-supplementing tablets (TTD) and food supervision by teachers and parents. Provision of TTD is intended in the prevention and control of anemia in teenage girls. TTD supplementation was given containing 60 mg ferrous fumarate and 400 mcg folic acid with the mechanism of giving once a week and every day during menstruation ((Taufiqa et al, 2020). Meanwhile, the role of parents and teachers in this study is one of reinforcing. factors and enabling factors in the prevention and control of anemia in teenage girls.

The results of the study that are in line with the correlation between nutritional education and giving iron tablets to increase Hb levels are in the research conducted by Ahmady et al. (2016) who provided nutrition counseling interventions and giving blood supplement tablets (TTD) to Senior High School State students in Mamuju showed that students who received these interventions had an average increase in Hb levels of 0.93 g/dL (p value <0.001) (Ahmady et al, 2016). The results of this study are strengthened by the results of research conducted by Zuraida in teenage girls at the senior high school in Bandar Lampung from the results of the Chi-Square test which showed a statistically significant effect on the implementation of nutritional education with the CBA model on the increase in hemoglobin levels of rematry blood in the intervention group (p = 0.004) (Zuraida et al, 2020). However, the results of this study are not in line with the research conducted by Yusoff et al. (2012) which stated that there was no significant difference in hemoglobin levels recorded between the 4 groups, either the control group or the intervention group who were given nutrition education or given blood-supplementing tablets (TTD) in anemic students aged 16-17 in senior high school of 4 schools in Tenah Merah, Malaysia (p = 0.06) (Yusoff et al, 2012).

As for the role of teachers and parents in this study, it can help in monitoring and increasing iron intake as well as in compliance with the consumption of blood-added tablets (TTD). This line with the research conducted by Apriningsih et al. (2019) which states that the role of parents is closely related to the adherence to drinking iron tablets in female students in Depok City (Apriningsih et al., 2019) and can change the behavior of adolescent girls in food intake patterns in the context of preventing anemia in the Public Health Center in Ngemplak Simongan (Setyowati). et al, 2017). This is reinforced by research conducted by Nuradhiani et al. (2017) stated that the teacher's role was a determining factor in adherence to TTD drinking in junior high school state students in Bogor City (Nuradhiani et al, 2017).

CONCLUSIONS AND SUGGESTIONS

Based on the results of the research and discussion, it can be concluded that there is an effect of multifaceted intervention on iron intake (p value = 0.000) and hemoglobin (Hb) levels (p value = 0.000) in anemia of teenage girls at the vocational school state in Tanjung Sari.

Based on the results of the study, the researchers proposed suggestions for policy makers such as public health centers to carry out routine and periodic Hb checks for teenage girls who are physically seen as having symptoms of anemia in collaboration with the School Health Unit so that they can detect anemia early. The role of other health centers includes providing briefing for accompanying teachers and peer counselors for adolescent girls in terms of preventing and overcoming anemia in anemia for teenage girls in schools so that they can become companions or motivators for anemic teenage girls. Schools can carry out additional learning in the form of anemia education and fulfilling intake nutrition, especially iron intake for teenage girls, forming peer counselors in schools who are trained to become companions for teenage girls at the school so that they are motivated to become healthy teenagers free of anemia.

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REFERENCES

Ahmady, A., Hapzah, H. and Mariana, D. (2016). *Penyuluhan Gizi Dan*

Pemberian Tablet Besi Terhadap Pengetahuan Dan Kadar Hemoglobin Siswi Sekolah Menengah Atas Negeri Di Mamuju. dalam Jurnal Kesehatan Manarang. Mamuju: Poltekkes Kemenkes Mamuju diakses melalui, 2(1), p. 15. doi: 10.33490/jkm.v2i1.8.

Apriningsih, Madanijah, S. Meti, C. and Kolopaking, R. (2019). *Peranan Orang-Tua Dalam*

*Meningkatkan Kepatuhan Siswi Minum Tablet Zat Besi Folat Di Kota-Depok. d*alam Jurnal Gizi Indonesia: Jakarta. diakses melalui Doi: 10.36457/gizindo.v42i2.459 www.persagi.org/ejournal/ index.php/Gizi_Indon

Astuti, S. and. Trisna, E. (2016). F*aktor-Faktor yang Berhubungan dengan*

Kejadian Anemia pada Remaja Putri Wilayah Lampung Timur dalam Jurnal Keperawatan volume XII(2), pp. 277–251: Bandar Lampung. diakses melalui https://ejurnal.poltekkes-tjk.ac.id/index.php/JKEP/article/view/611.

Basith, A Agustina, R. and Diani, N.(2017). *Faktor-Faktor Yang Berhubungan Dengan*

Kejadian Anemia Pada Remaja Putri. dalam Jurnal Keperawatan dan Kesehatan. Universitas Lambung Mangkurat diakses melalui https://ppjp.ulm.ac.id/journal/index.php /JDK/article/view/3634

Handayani E and Rumiati, Z. (2019). *Hubungan Status Gizi Remaja terhadap*

*Kejadian Anemia Pada Remaja Putri Di SMPN 02 Rambah Hilir Kabupaten Rokan Hul*u, Universitas Pasir Pengaraian. diakses melalui http://e-journal.upp.ac.id/index.php/akbd/article/view/1987.

Kalsum, U. and Halim, R. (2016). *Kebiasaan Sarapan Pagi Berhubungan Dengan*

Kejadian Anemia Pada Remaja dalam Jurnal Penelitian Universitas Jambi Seri Sains, 18(1), pp. 09–19. diakses melalui https://adoc.pub/kebiasaan-sarapan-pagi-berhubungan-dengan-kejadian-anemia-pa.html.

Kemenkes RI. (2018) *Pedoman Pencegahan dan Penanggulangan Anemia Pada*

Remaja Putri dan Wanita Usia Subur (WUS). Jakarta: Dirjaen Kesmas Kemenkes RI. diakses melalui https://promkes.kemkes.go.id/buku-pedoman-pencegahan-dan-penanggulangan-anemia-pada-remaja-putri-dan-wanita-usia-subur.

Laksmita, S. and Yenie, H. (2018). *Hubungan Pengetahuan Remaja Putri*

*Tentang Anemia dengan Kejadian Anemia di Kabupaten Tanggamus, d*alam Jurnal Ilmiah Keperawatan Sai Betik,. 14(1), p. 104. diakses melalui doi: 10.26630/jkep.v14i1. 1016.

Listiana, A. (2016). *Analisis Faktor-Faktor yang Berhubungan Dengan Kejadian*

*Anemia Gizi Besi pada Remaja Putri di SMKN 1 Terbanggi Besar Lampung Tengah', d*alam Jurnal Kesehatan. 7(3), p. 455. diakses melalui doi: 10.26630/jk.v7i3.230.

Marfuah, D. and Dyah Kusudaryati, D. P. (2016). *Efektifitas Edukasi Gizi*

Terhadap Perbaikan Asupan Zat Besi Pada Remaja Putri. Profesi (Profesional Islam) dalam Media Publikasi Penelitian, 14(1), p. 5. diakses melalui doi: 10.26576/profesi.129.

Martini, (2015). *Faktor - Faktor yang Berhubungan dengan Kejadian Anemia*

pada Remaja Putri di MAN 1 Metro dalam Jurnal Kesehatan Metro Sai Wawa*i*, VIII(1) , pp. 1–7. diakses melalui https://ejurnal.poltekkes-tjk.ac.id/index.php/JKM/article/view/ 162.

Nuradhiani, A., Briawan, D. and Dwiriani, C. M. (2017). *Dukungan Guru*

*Meningkatkan Kepatuhan Konsumsi Tablet Tambah Darah Pada Remaja Putri di Kota Bogor', d*alam Jurnal Gizi dan Pangan. Bogor: IPB. 12(3), pp. 153–160. diakses melalui doi: 10.25182/jgp.2017.12.3.153-160.

Sari, P.H., Dardjito, E. Anandari, D. (2016). A*nemia Gizi Besi pada Remaja Putri*

di Wilayah Kabupaten Banyumas. dalam Jurnal Kesmas Indonesia. Semarang: Unsoed. 8(1), pp. 16–31. diakses melalui http://jos.unsoed.ac.id/index.php/kesmasindo/article/view/138/127.

Setyowati, N. Riyanti, E. Indraswari, R. (2017). *Faktor-Faktor Yang*

*Berhubungan Dengan Perilaku Makan Remaja Putri Dalam Pencegahan Anemia Di Wilayah Kerja Puskesmas Ngemplak Simongan d*alam Jurnal Kesehatan Masyarakat (e-Journal). Semarang: UNDIP. 5(5), pp. 1042–1053. diakses melalui https://ejournal3.undip.ac.id/index.php/ jkm/article/view/19233/18259.

Silalahi, V., Aritonang, E. and Ashar, T. (2016). *Potensi Pendidikan Gizi Dalam*

Meningkatkan Asupan Gizi Pada Remaja Putri Yang Anemia Di Kota Medan. dalam Jurnal Kesehatan Masyarakat. Medan: FKM USU. 11(2), p. 295. diakses melalui doi: 10.15294/kemas.v11i2.4113.

Taufiqa, Z., Ekawidyani, K. R. and Sari, T. P. (2020) *Aku Sehat Tanpa Anemia*,

CV. Wonderful Publisher. Jakarta: Doktoral Gizi FK UI. diakses melalui https://books.google.co.id/books?id=W6ggEAAAQBAJ&pg=PT1&lpg=PT1&dq=aku+sehat+tanpa+anemia&source=bl&ots=XqE4yXX7GJ&sig=ACfU3U2wusRCRll062O8xv38fs3zR95A6Q&hl=id&sa=X&ved=2ahUKEwjI1smU_cD1AhVZTWwGHVQFA2IQ6AF6BAgyEAM#v=onepage&q=aku sehat tanpa anemia&f=fals.

WHO (2017) *Global Accelerated Action for the Health of Adolescents (AA-HA!)*

Guidance to Support Country Implementation Geneva: World Health Organization. diakses melalui http://www.who.int/maternal_child_adolescent/documents/global-aa-ha-annexes.pdf?ua=1.

WHO. (2019). *Prevalence of anaemia in women of reproductive age(age 15-49)(%)*. diakses melalui https://www.who.int/data/gho/data/indicators/indicator-details/GHO/prevalence-of-anaemia-in-women-of-reproductive-age-(-)

Yusoff, H., Daud, W. N. W. and Ahmad, Z. (2012). *Nutrition Education And*

Knowledge, Attidude And Hemoglobin Status Of Malaysian Adolescent', Southeast Asian J trop Med public health, (Nhms Iii). diakses melalui https://pubmed.ncbi.nlm.nih.gov/23082570/.

Zuraida, R. (2020) *Model Promosi Kesehatan Promosi CBA (Club Bebas Anemia)*

Sebagai Model Intervensi Penanggulanagan Anemia Gizi Besi Berbasisi Sekolah Pada Remaja Putri. Padang: Universitas Andalas.

Zuraida, R. Indrawati, N. Masrul, M. Februbartanty, J. 2020 . *The Effect of Anemia Free Club*

Interventions to Improve Adolescent Dietary Intakes in Bandar Lampung City, Indonesia dalam http://repository.lppm.unila.ac.id/23961/

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