

# Anemia prevention behavior in female adolescents and related factors based on Theory of Planned Behavior: A cross-sectional study

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## ABSTRACT

**Introduction:** Female adolescent is a group prone to iron deficiency anemia due to various factors such as having monthly menstruation and poor diet. Therefore, anemia prevention behavior needs to be done from an early age to avoid prolonged health problems. The purpose of this study was to analyze the factors that correlated with anemia prevention behavior in female adolescents based on the Theory of Planned Behavior.

**Methods:** This study used a descriptive correlational design with a cross-sectional approach. The population of this study is female adolescents in Madiun City. Purposive sampling was used to obtain 105 respondents. The instrument used was a questionnaire to measure the variables attitude, subjective norm, perceived behavioral control, intention, and anemia prevention behavior. Data analysis was performed using the Spearman Rho Test with a level of significance  $\leq 0.05$ .

**Results:** There is a relationship between attitudes ( $p = 0.003$ ;  $r = 0.292$ ), subjective norms ( $p = 0.006$ ;  $r = 0.266$ ), and perceived behavioral control ( $p = 0.002$ ;  $r = 0.299$ ) with the intention to prevent anemia and also perceived behavioral control ( $p = 0.003$ ;  $r = 0.292$ ) and intention ( $p = 0.000$ ;  $r = 0.392$ ) with anemia prevention behavior.

**Conclusions:** Better attitude, subjective norm, perceived behavioral control, and intention possessed by a female adolescent will make better anemia prevention behavior too. Therefore, support from various parties is needed to intensify the promotion of anemia prevention, education on early detection of anemia, especially for female adolescents, and further research to determine effective health promotion methods.

**Keywords:** adolescent; anemia; behavior; healthcare; prevention; healthy lifestyle

## Introduction

Female adolescent is a group that is prone to anemia (Andriastuti et al., 2020). Anemia is a condition of changing morphology and reducing the number of blood cells and hemoglobin so that they are not sufficient to meet the physiological needs of the body (Levy, De la Cruz Góngora and Villalpando, 2016). In female adolescents, iron deficiency anemia is the largest cause of morbidity and mortality (WHO, 2017). Several factors such as poor nutritional status, low socioeconomic status, comorbidities (malaria, thalassemia, etc.), impaired nutrient absorption, and irregular menstrual patterns will increase the chance of anemia (Abioye and Fawzi,

2020). In general, the prevalence of anemia in the world reaches 50-80% of the total population (Kassebaum et al., 2016). In Indonesia, the incidence of anemia reaches 23.7% with the prevalence of incidence in female adolescents aged 15-24 years old 32% (Ministry of Health Indonesia, 2019).

The incidence of anemia in female adolescents increases because every month they undergo menstruation, which causes an increase in iron expenditure (Swati and Sunita, 2021). In addition, many female adolescents are restricting food intake, causing an iron deficiency, and disrupting hormonal balance (Abioye and Fawzi, 2020). This is further exacerbated by the



perception of barriers such as feeling that iron tablets consumption does not provide benefits, unattractive forms of packaging and iron tablets, peers who do not consume iron tablets and dislike for the taste of iron tablets (Aprianti, Sari and Kusumaningrum, 2018).

Unsupportive behavior of female adolescents in anemia prevention efforts is influenced by knowledge levels, attitudes, perceptions, supporting environments, resources, and national policies (Roche et al., 2018). The better the support provided by the family, the more adaptive the health behaviors performed by adolescents (Annisa, Mulyono and Widyatuti, 2021). In addition, the presence of training, monitoring, availability of iron tablets, and strengthening health promotion can improve anemia prevention behavior (Gosdin et al., 2020). Some of the effects of anemia include decreased endurance, cognitive-developmental disorders, psychomotor disorders, and increased susceptibility to infection (Spezia et al., 2018). In female adolescents, the long-term impact will be more dangerous because it increases the risk of premature infant birth, bleeding, and maternal mortality (Levy, De la Cruz Góngora and Villalpando, 2016; Zekiye and Rukiye, 2021).

Based on basic health research (RISKESDAS) 2018, the prevalence of anemia in adolescents is 32%, which means that 3-4 teenagers out of 10 suffer from anemia (Ministry of Health Indonesia, 2018). According to findings, 23% of young girls and 12% of boys in East Java had anemia (Report of Office of Women's Empowerment, 2019). Through circular letter number HK.03.03/V/0595/2016 concerning the Provision of Blood Iron Tablets to Female Adolescents and Women of Childbearing Age, the government implements a program of giving one tablet per week throughout the year to female adolescents aged 12-18 years old (Ministry of Health Indonesia, 2016). In East Java Province, as many as 29.7% of female adolescents aged 10-19 years old have received iron tablets, but their consumption success rate is still low (Ministry of Health Indonesia, 2019). Handling anemia in adolescents is increasingly difficult because of behaviors such as consuming tea after eating, improper eating patterns, and consuming less iron from animal sources, causing low body mass (Mistry et al., 2017).

Implementing anemia prevention behavior from an early age is very important, especially for female adolescents to be able to prepare themselves well in facing pregnancy and childbirth. In the Theory of Planned Behavior (TPB), it is explained that the good and bad attitudes, subjective norms, and perceived behavioral control possessed by individuals will affect the amount of intention they have, resulting in differences in behavior displayed (Ajzen, 2005). The purpose of this study was to analyze factors related to anemia prevention behavior in adolescent girls based on TPB.

## Materials and Methods

## Study Design

This study used a descriptive correlational design through cross-sectional approach conducted in Madiun, East Java in February 2021.

## Respondent

The participants involved was female adolescents selected by purposive sampling techniques. A total of 105 respondents met the inclusion criteria, and all were included in this research. The study's inclusion criteria were female adolescents aged 18-22 years old, have menstruation, and can use Google Form. The exclusion criterion is married female adolescents.

## Instrument

The instrument in this study used a questionnaire prepared by the researcher, based on the TPB component and parameter, to obtain demographic data information and measure the independent variables (attitudes, subjective norms, perceptions of behavioral control, intentions) and dependent variable (anemia prevention behavior) in female adolescents. Demographic data consisted of name (initials), age, last education, age at first menstruation, menstrual pattern, knowledge about anemia, ever or not experiencing anemia, and sources of information about anemia. The number of statements on the questionnaire in each variable was attitude (n = 8), subjective norm (n = 7), perceived behavioral control (n = 7), intention (n = 6), and anemia prevention behavior (n = 7). All questions were measured using a 5-point Likert scale with answer choices on the independent variable (1 = strongly disagree; 2 = disagree; 3 = undecided; 4 = agree; 5 = strongly agree) and the dependent variable (1 = never; 2 = rarely; 3 = sometimes; 4 = often; 5 = always). The final results on the scoring were categorized into good, enough, and less. The instrument has been tested on 20 young women with an age range of 18-24 to get the results of the validity test ( $r > 0.444$ ) and reliability (Cronbach's alpha attitude = 0.733; subjective norm = 0.704; perceived behavioral control = 0.636; intention = 0.727, anemia prevention behavior = 0.617).

## Data Collection

Data collection used online questionnaire by compiling a list of prospective respondents based on criteria and large samples that have been determined from female adolescents who are members of the Madiun student organization. Furthermore, the researchers explained the research to respondents and examined the Google Form filled out by the respondent to ensure that the data submitted were appropriate and recorded in the researcher's database.

## Data Analysis

The data were analyzed using the descriptive analysis method to determine the percentage and frequency distribution of the data and bivariate analysis to

Table 1 Demographic characteristics of respondents (N = 105)

Characteristics	Parameter	n	%	Mean	SD
Age	18 years old	7	6.7	20.11	1.13
	19 years old	28	26.7		
	20 years old	29	27.6		
	21 years old	28	26.7		
	22 years old	13	12.4		
Last education	Senior High School	98	93.3	12.32	1.28
	Diploma	5	4.8		
	Bachelor	2	1.9		
Age at first menstruation	≤12 years old	62	59.1	12.32	1.28
	>12 years old	43	40.9		
Length of menstruation	3-4 days	2	1.9	NA	NA
	4-5 days	21	20		
	5-6 days	22	21		
	6-7 days	50	47.6		
	>7 days	10	9.5		
Many change of sanitary pad in a day	2 times	13	12.4	3 times	0.88
	3 times	53	50.5		
	4 times	24	22.9		
	>4 times	15	14.3		
Know anemia	Yes	103	98.1	NA	NA
	No	2	1.9		
Have anemia	No	53	50.5	NA	NA
	Yes	52	49.5		
Source of anemia information	Family	17	16.2	NA	NA
	University	12	11.4		
	Social Media	25	23.8		
	School	47	44.8		
	Book	1	1		
	Internet	2	1.9		
Know the guidelines for prevention and control of anemia	Yes	10	9.5	NA	NA
	No	95	90.5		

Table 2 Relationship between attitudes, subjective norms, and perceptions of behavioral control with the intention to prevent anemia in female adolescent (N = 105)

Variable	Category	Intention						Spearman Rho Test	
		Less		Enough		Good		p	r
		n	%	n	%	n	%		
Attitude	Positive	7	6.7	28	26.7	18	17.1	0.003	0.292
	Negative	12	11.4	36	34.3	4	3.8		
Subjective Norm	Good	3	2.9	10	9.5	12	11.4	0.006	0.266
	Enough	12	11.4	42	40.0	8	7.6		
	Less	4	3.8	12	11.4	2	1.9		
Perceived Control Behavior	Good	2	1.9	17	16.2	14	13.3	0.002	0.299
	Enough	17	16.2	40	38.1	7	6.7		
	Less	0	0	7	6.7	1	1.0		

Table 3 Relationship between perceived behavioral control and intention with anemia prevention behavior in female adolescent (N = 105)

Variable	Category	Anemia Prevention Behavior						Spearman Rho Test	
		Less		Enough		Good		p	r
		n	%	n	%	n	%		
Perceived Control Behavior	Good	4	3.8	24	22.9	5	3.8	0.003	0.292
	Enough	23	21.9	34	32.4	7	6.7		
	Less	5	4.8	3	2.9	0	0		
Intention	Good	2	1.9	16	15.2	4	3.8	<0.001	0.392
	Enough	17	16.2	39	37.1	8	7.6		
	Less	13	12.4	6	5.7	0	0		

determine the relationship between the independent and dependent variables using the Spearman Rho Test with  $\alpha \leq 0.05$ . If the value of  $p < 0.05$  then  $H_0$  was rejected. It means there is a relationship between attitude, subjective norm, and perceived control behavior with the intention to prevent anemia, also there is a relationship between perceived control behavior and intention with anemia prevention behavior.

### Ethical Consideration

This research has been reviewed and approved by the Health Research Ethics Commission, Faculty of Nursing, Universitas Airlangga with No. 2166-KEPK. The ethical components considered in this study are informed consent, anonymity, and confidentiality.

## Results

The majority of respondents in this study were 20 years old (27.6%) and the last education level was high school, namely 98 respondents (93.3%). In addition, as many as 62 respondents (59.1%) experienced their first menstruation at the age of 12 years old. Most of the young women in this study experienced menstruation for 6-7 days each month (47.6%). During menstruation they changed sanitary pad twice (12.4%), three times (50.5%), four times (22.9%), and more than four times (14.3%). Regarding knowledge about anemia, 103 respondents (98.1%) knew about anemia and 53 respondents (50.5%) said that they had anemia. Schools are the main source of information for a female adolescent to gain knowledge about anemia, as many as 47 respondents (44.8%), followed by social media ( $n = 25$ ; 27.8%), and families ( $n = 17$ ; 16.2%). In addition, 95 respondents (97.5%) said they never knew about the Guidelines for Prevention and Management of Anemia, a guide in the form of a module issued by the Ministry of Health for adolescents and women of childbearing age to deal with anemia (Table 1).

Based on Table 2, it can be seen that there is a relationship between attitudes ( $p = 0.003$ ;  $r = 0.292$ ), subjective norms ( $p = 0.006$ ;  $r = 0.266$ ), and perceived behavioral control ( $p = 0.002$ ;  $r = 0.299$ ) with intention to prevent anemia and the relationship created has a moderate degree of strength. In the attitude variable, the highest number is found in respondents with negative attitudes and having enough intention to prevent anemia, namely 36 respondents (34.3%). Furthermore, in the subjective norm variable, the highest number is found in respondents with enough subjective norms and having enough intention to prevent anemia, as many as 42 respondents (40%). Meanwhile, in the perceived behavioral control variable, the highest number was found in respondents with enough behavioral control perceptions and had sufficient intention to prevent anemia, namely 40 respondents (38.1%).

Based on Table 3, it can be seen that there is a relationship between perceptions of behavioral control ( $p = 0.003$ ;  $r = 0.292$ ) and intentions ( $p < 0.001$ ;  $r = 0.392$ ) with anemia prevention behavior and the relationship created has a moderate degree of strength. In the behavioral control perception variable, the highest number is found in respondents with enough behavioral control perceptions and realizing sufficient anemia prevention behavior as many as 34 respondents (32.4%). Furthermore, in the intention variable, the highest number is found in respondents with enough intention or intention and realizing sufficient anemia prevention behavior, as many as 39 respondents (37.1%).

## Discussions

Most female adolescents have enough behavior in preventing anemia and some are already in the good category. However, it was still found that some

respondents fall into the category of lacking in anemia prevention behavior. Behavioral differences embodied by these female adolescents can be influenced by several factors, namely, age, gender, health information received, knowledge, and income of parents to affect the level of health knowledge due to low interest in health literacy (Fleary, Joseph and Pappagianopoulos, 2018). Behavior is also influenced by repeated habits that form a cycle (Jalambo et al., 2018). A person will display adaptive behavior when they know the benefits, have sufficient pressure or social drive, and support, both internal and external. TPB relates to attitudes, subjective norms, and perceived behavioral control that affect the magnitude of the intention to realize health behavior (Ajzen, 2005). The main findings of this research show that attitudes, subjective norms, perceived behavioral control, and intention have strong relationship with anemia prevention behavior among female adolescents.

There is a significant relationship between the attitude of female adolescents to prevent anemia. Adolescents with a positive attitude will have better abilities in realizing health (Guerin and Toland, 2020). However, not all respondents with a positive attitude have good intentions in preventing anemia. Some of them still have a negative attitude but have enough and good intentions to prevent anemia. This is related to the low level of knowledge of young women about signs and symptoms and how to prevent anemia. Someone who knows is not necessarily able to realize the information they get in the form of behavior (Fleary, Joseph and Pappagianopoulos, 2018). Another factor that causes this to happen is the age of the respondent in the adolescent stage, making decisions about an action to be taken is influenced by differences in the level of psychological maturity, cognitive abilities, and symptoms of depression (Mccue et al., 2019). Health workers are an important part of being able to increase awareness and modify interventions for female adolescent so that they have knowledge, attitudes, and behaviors that support preventing anemia (Nesrin, Anwar and Abdullah, 2021).

Subjective norms are also related to the intention to prevent anemia. This result is in line with research that states that adolescents have the intention to manifest health behaviors when they have high subjective norm support, especially from parents and peers (Zhao et al., 2020). The incidence of anemia will increase two times higher if adolescents only live with one of their parents (father or mother) and 2.4 times higher if they live with their guardian (Gonete et al., 2018). Adolescents who receive emotional and instrumental support from teachers and friends will also be more concerned with their health condition because they have a positive influence (Triana et al., 2019). The attention given by the people closest to them or those who are considered important and authorized, may not necessarily change the perspective of female adolescents to influence the intention to prevent anemia. In addition, adolescents

have a high sense of ego so that they seem unruly and act selfishly, and do not think about the impact of the choices they make (Krisnani and Farakhiyah, 2017).

On the other hand, there is a relationship between perceived behavioral control and the intention to prevent anemia. Adolescents with a strong perception of behavioral control will have 3.906 times higher intention to comply with iron tablet supplement consumption (Quraini, Ningtyias and Rohmawati, 2020). Beliefs in the perception of behavioral control can be influenced by the support received and the habits that are carried out to form a recurrent value (Triana et al., 2019). Most of the respondents in this study have a perception of sufficient behavioral control and sufficient intensity of anemia prevention. This is due to the ability to meet the body's lack of nutrition to prevent anemia, especially during menstruation. In fact, during menstruation, adolescent girls will lose hemoglobin more quickly, so they need to increase their intake of nutrients, especially iron (Masoud et al., 2020). However, this will be difficult if young women have low socioeconomic conditions, because they are related to the fulfillment of nutrition from the food that can be consumed daily (Banayjeddi et al., 2019).

Perceived behavioral control is also directly related to anemia prevention behavior. Some of the female adolescents in this study already had a good level of perception of behavioral control so that they would carry out anemia prevention behavior well. However, some female adolescents have a perception of sufficient behavioral control but can perform anemia prevention behavior well or vice versa. This is influenced by family support, information, communication, and the level of emotional quality (Park and Lee, 2020). In addition, the emergence of opportunities for adaptive behavior is higher when adequate health facilities are available. If individuals are aware that the perceived ease of accessing health services is higher than the barriers, it will form a positive perception of being able and utilizing the available facilities in realizing health behaviors (Roche et al., 2018).

Intention also has a significant relationship with anemia prevention behavior. In TPB, there is a base rate term which states that individuals will tend to perform behaviors that are mostly done by others, and vice versa (Ajzen, 2005). In addition, the good or bad health behavior that will be realized is also strongly influenced by various kinds of life contexts such as the environment, skills, and existing health programs (Nagy-Pénczes, Vincze and Biro, 2020). Good intentions can arise because of health-related actions taken every day. Female adolescents who regularly consume vegetables and fruit every day will meet their vitamin and iron needs (Ahankari et al., 2017). Awareness of the consumption of vegetables and fruit will arise from the knowledge that the older you get, the more your iron needs will increase (Masoud et al., 2020). Wrong dietary habits and consumption of unhealthy food (junk food) should be

avoided (Jalambo et al., 2018). Female adolescents must also meet the necessary nutrients, not only macro but also micro (Htet et al., 2016). In addition, female adolescents who get iron tablets from school or have independent supplies tend to consume iron tablets regularly (Gosdin et al., 2020). This habit will directly or indirectly foster intention and shape anemia prevention behavior.

The limitation of this research is that it is a cross-sectional study that only emphasizes the measurement of variables at one time so that there is no follow-up on the results of observations. The parameters used in the study are few so that they have not been able to provide a more detailed description of the respondent's condition. In addition, the online data collection process made the researcher unable to see the respondent's physical condition (height, weight, signs of anemia, etc.), if they did not read the explanation, as well as the instructions for filling out the questionnaire properly.

## Conclusions

The better intention possessed by adolescent girls, the better anemia prevention behavior is carried out, while attitudes, subjective norms, and perceived behavioral control are factors that affect the quality of the intentions. The factor that most strongly influenced the quality of intention was the perceived behavioral control, while the most influential support came from the family. It is necessary to increase knowledge about anemia prevention behavior to female adolescents and their families as the main source of support for adolescents in adaptive behavior. In addition, further research is expected to be able to find effective methods in increasing knowledge and awareness for young women in realizing anemia prevention behavior from an early age.

## References

- Abioye, A. I. and Fawzi, W. W. (2020) 'Nutritional Anemias', *Present Knowledge in Nutrition (Eleventh Edition)*. Boston, 2, pp. 503–521. doi: 10.1016/B978-0-12-818460-8.00027-7.
- Ahankari, A. S. et al. (2017) 'Prevalence of Iron-deficiency Anaemia and Risk Factors in 1010 Adolescent Girls from Rural Maharashtra, India: A Cross-Sectional Survey', *Public Health*. Elsevier Ltd, 142, pp. 159–166. doi: 10.1016/j.puhe.2016.07.010.
- Ajzen, I. (2005) *Attitudes, Personality, and Behavior*. Second Edi. United Kingdom: Open University Press.
- Andriastuti, M. et al. (2020) 'Prevalence of anemia and iron profile among children and adolescent with low socio-economic status', *International Journal of Pediatrics and Adolescent Medicine*. Elsevier Ltd, 7(2), pp. 88–92. doi: 10.1016/j.ijpam.2019.11.001.
- Annisa, F., Mulyono, S. and Widayati, W. (2021) 'Family Support on Utilization of Adolescent Reproduction Health Services at The Area of Public Health Service (Puskemas) of Martapura', *Enfermeria Clinica*, 31(2), pp. S153–S138. doi: doi.org/10.1016/j.enfcli.2020.12.008.
- Aprianti, R., Sari, G. M. and Kusumaningrum, T. (2018) 'Factors Correlated with the Intention of Iron Tablet Consumption among Female Adolescents', *Jurnal Ners*, 13(1), p. 122. doi: 10.20473/jn.v13i1.8368.
- Banayjeddi, M. et al. (2019) 'Implementation evaluation of an iron supplementation programme in high-school students: The

- crosswise model', *Public Health Nutrition*, 22(14), pp. 2635–2642. doi: 10.1017/S1368980019001575.
- Fleary, S. A., Joseph, P. and Pappagianopoulos, J. E. (2018) 'Adolescent Health Literacy and Health Behaviors: A Systematic Review', *Journal of Adolescence*. Elsevier, 62(March 2017), pp. 116–127. doi: 10.1016/j.adolescence.2017.11.010.
- Gonete, K. A. et al. (2018) 'Prevalence and Associated Factors of Anemia among Adolescent Girls Attending High Schools in Dembia District, Northwest Ethiopia, 2017', *Archives of Public Health*. Archives of Public Health, 76(1), pp. 1–9. doi: 10.1186/s13690-018-0324-y.
- Gosdin, L. et al. (2020) 'Barriers to and Facilitators of Iron and Folic Acid Supplementation within a School-based Integrated Nutrition and Health Promotion Program among Ghanaian Adolescent Girls', *Current Developments in Nutrition*. Oxford University Press, 4(9), pp. 1–11. doi: 10.1093/cdn/nzaa135.
- Guerin, R. J. and Toland, M. D. (2020) 'An Application of A Modified Theory of Planned Behavior Model to Investigate Adolescents' Job Safety Knowledge, Norms, Attitude and Intention to Enact Workplace Safety and Health Skills', *Journal of Safety Research*. National Safety Council, 72(December), pp. 189–198. doi: 10.1016/j.jsr.2019.12.002.
- Htet, M. K. et al. (2016) 'Folate and Vitamin B 12 Status and Dietary Intake of Anaemic Adolescent Schoolgirls in the Delta Region of Myanmar', 116, pp. 36–41. doi: 10.1017/S0007114515001609.
- Jalambo, M. O. et al. (2018) 'Prevalence and Risk Factor Analysis of Iron Deficiency and Iron-deficiency Anaemia among Female Adolescents in the Gaza Strip , Palestine', (8), pp. 1–10. doi: 10.1017/S1368980018001568.
- Kassebaum, N. J. et al. (2016) 'The Global Burden of Anemia', *Hematology/Oncology Clinics of North America*. Elsevier Inc, 30(2), pp. 247–308. doi: 10.1016/j.hoc.2015.11.002.
- Krisnani, H. and Farakhiyah, R. (2017) 'Meningkatkan Kemampuan Pengambilan Keputusan pada Remaja Akhir dengan Menggunakan Metode Realty Therapy', *Share Social Work Jurnal*, 7(2), pp. 1–79.
- Levy, T. S., De la Cruz Góngora, V. and Villalpando, S. (2016) 'Anemia: Causes and Prevalence', *Encyclopedia of Food and Health*, pp. 156–163. doi: 10.1016/B978-0-12-384947-2.00029-5.
- Masoud, M. S. et al. (2020) 'The association between iron and Vitamin D status in Arab adolescents', *Public Health Nutrition*, 23(7), pp. 1208–1213. doi: 10.1017/S1368980019001113.
- Mccue, R. et al. (2019) 'The Future and Me : Imagining the Future and the Future Self in Adolescent Decision Making', *Cognitive Development*. Elsevier, 50(December 2018), pp. 142–156. doi: 10.1016/j.cogdev.2019.04.001.
- Ministry of Health Indonesia (2016) *Guidelines for the Prevention and Management of Anemia in Adolescent Girls and Women of Childbearing Age (WUS)*. Directorate of Community Nutrition and Directorate General of Public Health, Ministry of Health, Republic of Indonesia.
- Ministry of Health Indonesia (2018) *Report Basic Health Research 2018*. Jakarta.
- Ministry of Health Indonesia (2019) *National Report Basic Health Research 2018*. Publishing Institute for Health Research and Development Agency.
- Mistry, S. K. et al. (2017) 'An Outline of Anemia Among Adolescent Girls in Bangladesh: Findings from a Cross-sectional Study', *BMC Hematology*. BMC Hematology, 17(1), pp. 1–8. doi: 10.1186/s12878-017-0084-x.
- Nagy-p, G., Vincze, F. and B, É. (2020) 'Does Better Health-Related Knowledge Predict Favorable Health Behavior in Adolescents?', 17.
- Nesrin, N. A.-B., Anwar, M. E. and Abdullah, M. K. (2021) 'The Impact of Nutrition Education on Knowledge, Attitudes, and Practice Regarding Iron Deficiency Anemia among Female Adolescent Student in Jordan', *Heliyon*, 7(2). doi: 10.1016/j.heliyon.2021.e06348.
- Park, H. and Lee, K. S. (2020) 'The Association of Family Structure with Health Behavior, Mental Health, and Perceived Academic Achievement among Adolescents: A 2018 Korean Nationally Representative Survey', *BMC Public Health*. BMC Public Health, 20(1), pp. 1–10. doi: 10.1186/s12889-020-08655-z.
- Quraini, D. F., Ningtyias, F. W. and Rohmawati, N. (2020) 'Compliance Behavior of Iron Tablet Supplement Consumption to Adolescent Girls in Jember, Indonesia', *The Indonesian Journal of Health Promotion an Health Education*, 8(2), pp. 154–162. doi: 10.20473/jpk.V8.I2.2020.154-162.
- Report of Office of Women's Empowerment, C. P. and P. of E. J. P. (2019) *No Tit*.
- Roche, M. L. et al. (2018) 'Adolescent Girls' Nutrition and Prevention of Anaemia: A School Based Multisectoral Collaboration in Indonesia', *BMJ (Online)*, 363, pp. 1–6. doi: 10.1136/bmj.k4541.
- Spezia, J. et al. (2018) 'Prevalence of Anemia in Schools of the Metropolitan Region of Curitiba, Brazil', *Hematology, Transfusion and Cell Therapy*. Associação Brasileira de Hematologia, Hemoterapia e Terapia Celular, 40(2), pp. 151–155. doi: 10.1016/j.htct.2017.11.007.
- Swati, R. and Sunita, M. (2021) 'Menstrual Status and Obstetrical History Influencing Prevalence of Iron Deficiency Anemia among Reproductive Age Women in Rural Area', *Materials Today: Proceedings*. doi: https://doi.org/j.matpr.2020.12.966.
- Triana, R. et al. (2019) 'Understanding the protective factors (self-esteem, family relationships, social support) and adolescents' mental health in Jakarta', *Enfermeria Clinica*. Elsevier España, S.L.U., 29(Insc 2018), pp. 629–633. doi: 10.1016/j.enfcli.2019.04.096.
- WHO (2017) *Global Accelerated Action for the Health Adolescent: Guidance to Support Country Implementation*.
- Zekiye, K. and Rukiye, D. (2021) 'The Impact of Adolescent Pregnancy on Maternal an Infant Health in Turkey: Systematic Review and Meta-analysis', *Journal of Gynecology Obstetrics and Human Reprofusion*, 50(4). doi: 10.1016/j.jogoh.2021.102093.
- Zhao, X. et al. (2020) 'Intention to Drink and Alcohol Use Before 18 Years Among Australian Adolescents: An Extended Theory of Planned Behavior', *Addictive Behaviors*. Elsevier, 111(February), p. 106545. doi: 10.1016/j.addbeh.2020.106545.

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