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Analysis of Factors Associated with The Occurrence of Anemia in Adolescent Girls in Indonesia

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ABSTRACT
The main causes of anemia are a lack of knowledge about anemia, lack of iron, vitamin 12, vitamin A, and folic acid. The aim of this research was to find out what factors are associated with the incidence of anemia in adolescent girls in Indonesia. This research is an analytical survey using a cross-sectional design. The population in this study was women aged 19-25 years. Data was collected using secondary data from the 2017 Indonesian Demographic Health Survey (SDKI) and analyzed using the SPSS Paired T-Test. The results of this research are the occurrence of anemia in women in Indonesia, which is related to age, gender, education level, occupation, case criteria, drug consumption, and distance from home.
Keywords*: Anemia; Factor; Woman*

ABSTRAK
Anemia adalah kondisi dimana kadar sel darah merah atau hemoglobin dalam tubuh rendah. Penyebab utama anemia meliputi kurangnya pengetahuan tentang anemia, serta kekurangan zat besi, vitamin B12, vitamin A, dan asam folat. Penelitian ini bertujuan untuk mengidentifikasi faktor-faktor yang berkaitan dengan terjadinya anemia pada remaja perempuan di Indonesia. Penelitian ini adalah survey analitik yang menggunakan desain *Cross Sectional*. Populasi dalam penelitian ini yaitu perempuan dengan usia 19-25 tahun. Pengumpulan data menggunakan data sekunder Survei Demografi Kesehatan Indonesia (SDKI) tahun 2017 dan dianalisis dengan uji *Paired T-Test* SPSS. Hasil dari penelitian ini adalah terjadinya anemia pada perempuan di Indonesia berhubungan dengan usia, jenis kelamin, tingkat pendidikan, pekerjaan, kriteria kasus, kepatuhan mengkonsumsi obat dan jarak rumah.

Kata Kunci: Anemia; Faktor; Perempuan

INTRODUCTION

Anemia is a common health problem worldwide, both in developed and developing countries.(Sri Wulandari Rahman et al., 2023). It is characterized by low levels of red blood cells or hemoglobin in the body. The main causes of anemia are lack of awareness or knowledge about the condition and deficiencies in iron, vitamin B12, vitamin A, and folate.(Aulya et al., 2022).

Anemia can be classified into mild, moderate, and severe anemia based on hemoglobin levels. For non-pregnant women, the hemoglobin levels used for classification are as follows: no anemia >12 grams/dL, mild anemia 11.0 – 11.9 grams/dL, moderate anemia 8.0 grams/dL (P. Sari et al., 2022).

In the World Health Statistics 2021 report, the World Health Organization (WHO) reported that 2019 around 29.9% of women of reproductive age (15-49 years) worldwide experienced anemia. Meanwhile, anemia was recorded at 29.6% in women aged 15 to 49 who were not pregnant, with adolescents included in this category. In Indonesia, 23% of women aged 15 years and over experience anemia. According to Riskesdas, in 2018, the prevalence of anemia in adolescents reached 32%, which means 3-4 out of 10 adolescents experience anemia, and the prevalence of anemia in East Java Province was 5.8%.

Anemia is often experienced by women of childbearing age, especially because of their monthly menstrual cycle. Lack of iron causes a lack of endurance, resulting in decreased productivity.(Nur Fauziah et al., 2022). Anemia in adolescent girls can result in fatigue, decreased concentration, and decreased immunity, making them susceptible to disease or infection, so additional iron supplements, such as blood-boosting tablets, are needed.(Aulya et al., 2022).

Prevention of anemia can be done by consuming foods containing iron, folate, vitamin A, vitamin C, zinc, and TTD. The government provides TTD to young women with the aim of minimizing the incidence of anemia, namely by giving 1 tablet per week (Julaecha, 2020). This study aimed to determine the factors associated with the incidence of anemia in adolescent girls in Indonesia.

Research conducted by

Indrawatiningsih et al., (2021)examined the factors that can influence the occurrence of anemia in adolescent girls. The results of the study concluded that there was a significant relationship between the level of education of adolescents and the incidence of anemia in adolescent girls in Sidomakmur Village, Gumawang Health Center area, East OKU Regency in 2020.

Previous research conductedZuiatna, (2020)to evaluate the determining factors for anemia in adolescent girls, namely due to the menstrual cycle and lack of habits of consuming foods containing iron.

METHOD

This research is included in the analytical survey using Cross Sectional design. Cross Sectional is a study that examines risk factors with an approach method, observation or collecting data.(Abduh et al., 2023). The dependent variable is anemia and the independent variable is the influencing factor.

This study involved women aged 19-25 years. Data were collected through secondary data from the 2017 Indonesian Demographic and Health Survey (SDKI) andanalyzed using the SPSS Paired T-Test.

RESULTS AND DISCUSSION

Respondent Characteristics

The independent variables used were age, education level, distance from home, case criteria, gender, occupation, and medication compliance.

This study's respondents were teenagers in three age categories: 16-25, 26-45, and 46-65.

Table 1. One-Way Anova Test Age

Age	N	Mean ± SD	P
16 – 25 years	3	2.00 ±1.00	0.866
26 – 45 years	22	1.81 ±0.90	
46 – 65 years	47	1.74 ±0.89	

Description: *statistical significance (sig. <0.05)
Source: Secondary Data

The results of the difference test shown in Table 1 using the One Way ANOVA method show a significance value of 0.866 (p>0.05), which means there is no significant difference between the three age categories of respondents.

I was using the criteria of male and female gender to be used respondents. Female gender numbered 15 respondents, and male gender numbered 57 respondents.

Table 2. One Way Anova Test for Gender

Gender	N	Mean ± SD	P
Man	57	1.82 ± 0.90	0.389
Woman	15	1.60 ± 0.82	

Description: *statistical significance (sig. <0.05)
Source: Secondary Data

Using the One Way ANOVA method to test gender differences, table 2 shows a significance value of 0.389 (p>0.05). This indicates that there is no significant difference between female and male gender.

The level of education used as respondents consists of four levels: elementary school, with 10 respondents, junior high school, with 11 respondents, high school, with 41 respondents, and bachelor's degree, with 10 respondents.

Table 3. One Way Anova Test of Education Level

Level of education	N	Mean ± SD	P
SD	10	1.60 ± 0.84	0.232
JUNIOR HIGH SCHOOL	11	1.90 ± 0.94	
SENIOR HIGH SCHOOL	41	1.90 ± 0.91	
Bachelor	10	1.30 ± 0.67	

Description: *statistical significance (sig. <0.05)
Source: Secondary Data

The One Way Anova test results on the respondents' education level showed a significance value of 0.232 (p>0.05), indicating no significant difference in the respondents' education level.

Employment status is one factor in respondent characteristics in this study. 57 respondents are working, and 15 are not working.

Table 4. One-Way Anova Test of Jobs

Work	N	Mean ± SD	P
Work	57	1.77 ± 0.90	0.915
Does not work	15	1.80 ± 0.86	

Description: *statistical significance (sig. <0.05)
Source: Secondary Data

The difference test in Table 4 regarding employment status using One Way Anova produced a significance value of 0.915 (p>0.05), which indicates that the respondents' employment status did not show a significant difference.

In this study, the case criteria used consisted of two categories: primary, with 41 respondents, and secondary, with 31 respondents.

Table 5. One-Way Anova Test Case Criteria

Case Criteria	N	Mean ± SD	P
Primary	41	1.92 ± 0.90	0.103
Secondary	31	1.58 ± 0.84	

Description: *statistical significance (sig. <0.05)
Source: Secondary Data

According to the One Way Anova difference test in Table 5, there is no significant difference between the primary and secondary case criteria, which produces a significance value of 0.103 (p>0.05).

This study uses drug consumption as a characteristic of respondents in the study. There are two categories of drug consumption, namely compliant with 50 respondents and non-compliant with 22 respondents.

Table 6. One-Way Anova Test of Drug Consumption

Drug Consumption	N	Mean ± SD	P
Obedient	50	1.94 ± 0.91	0.019*
Not obey	22	1.40 ± 0.73	

Description: *statistical significance (sig. <0.05)
Source: Secondary Data

The test of differences in drug consumption in Table 6 using One Way Anova shows a significance value of 0.019 (p<0.05), which means there is a significant difference between compliant and non-compliant respondents in taking medication. This difference is because more than 50% of

respondents follow the pattern of drug consumption obediently.

The distance of the house is also included in the characteristics of the respondents. There are three categories of home distance: close as many as 15 respondents, medium 26 respondents and far 31 respondents.

Table 7. One-Way Anova Test of House Distance

Distance from Home	N	Mean ± SD	P
Near	15	1.66 ± 0.81	0.432
Currently	26	1.65 ± 0.89	
Far	31	1.93 ± 0.92	

Description: *statistical significance (sig. <0.05)
Source: Secondary Data

The difference test in Table 7 regarding house distances using One Way Anova produced a significance value of 0.432 (p>0.05), which shows that there is no significant difference between the categories of close, medium, and far house distances.

Factors Affecting Anemia

Anemia is the occurrence of iron deficiency, which means that there is a problem of nutrient deficiency often experienced by developing countries such as Indonesia.(Fitriany and Saputri, 2018).

Hemoglobin, hematocrit, and red blood cell counts below normal limits are signs of anemia caused by a decrease in red blood cells, so the cells cannot transport enough oxygen to peripheral tissues.(Maulana et al., 2022).

Classification of anemia, namely mild anemia, moderate anemia, and severe anemia based on hemoglobin levels. Hemoglobin levels are non-anemia ≥12 grams/dL, mild 11.0-11.9 dram/dL, moderate 8.0-10.9 grams/dL, and severe <8 grams/dL(P. Sari et al., 2022).

Table 8. Analysis of Anemia Categories

Anemia	N	Cumulative Percent (%)
Light	38	52.7%
Currently	12	16.6%
Heavy	22	30.5%

Source: Secondary Data

Table 8 shows that there are three categories of anemia: mild, moderate, and severe. 52.7% of respondents suffer from the mild category, 16.6% from moderate, and 30.5% from severe.

Table 9. Results of Paired T-Test Analysis of Factors with Anemia

Factor	Mean ± SD	P
Age	0.83 ± 1.08	0,000
Gender	-0.56 ± 1.01	0,000
Level of education	0.93 ± 1.28	0,000
Work	-0.56 ± 0.97	0,000
Case Criteria	-0.34 ± 1.10	0.009
Medication Compliance	-0.47 ± 1.11	0.001
Distance from Home	0.44 ± 1.09	0.001

Source: Secondary Data

Based on Table 9 of the Paired T-Test, it can be seen that the factors of age, gender, education level, occupation, particular criteria, compliance with taking medication, and distance from home are statistically significant ($p<0.05$), which means that all these factors are related to the occurrence of anemia.

Age is one of the factors that often causes anemia.(MD Sari et al., 2022).Increasing age can improve a person's ability to understand and think more maturely and make decisions to improve the knowledge gained.(Umur et al., 2018).

Anemia often occurs in someone who is female. Women are more likely to experience anemia due to menstruation. Menstruation is a normal life cycle that women must pass through(Fatmawati et al., 2023). During menstruation, a person will experience menstrual disorders either during pre-menstruation or during menstruation. During menstruation, a person will release red blood cells so that if a person is not diligent in consuming Fe tablets, anemia can occur.

Education is a learning process; growth and development can occur. The level of education can affect the level of knowledge, which in turn can affect the

ability to accept or understand something. A person with secondary or higher education is less likely to get anemia(Wasono et al., 2021).

Work can make muscles move, which requires energy and more oxygen. The body lacks iron, which can hinder physical work and affect work.(Isaini et al., 2021).

Lack of respondent compliance in consuming Fe tablets can cause iron deficiency. Compliance is the knowledge that is owned. Knowledge is a predisposing factor that influences behavior in consuming TTD(Putra et al., 2020). Hemoglobin contains iron-like heme protein and globulin. Iron deficiency during menstruation causes excess iron requirements.(Permata et al., 2023).

The limitation of this study is the lack of information on diet, which can affect the occurrence of anemia. Diet is an important factor in this process because a good diet with balanced nutrition can help prevent anemia.

CONCLUSION

It can be concluded that the occurrence of anemia in women in Indonesia is related to age, gender, education level, occupation, case criteria, compliance with taking medication, and distance from home. The most influential factors are age and compliance with taking medication compared to other factors.

In further research, it is better to analyze the relationship between factors that influence the occurrence of anemia in order to determine the relationship between factors. In addition, it is better for further research to include diet as a factor that can influence or be related to the occurrence of anemia.

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