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# RELATIONSHIP BETWEEN KNOWLEDGE AND SIZE OF MUAC WITH ANEMIA IN FEMALE ADOLESCENTS

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**ABSTRAK : HUBUNGAN ANTARA TINGKAT PENGETAHUAN DAN UKURAN LILA TERHADAP ANEMIA PADA REMAJA PURI**

Latar Belakang: Remaja putri merupakan kelompok yang memiliki risiko tinggi untuk mengalami anemia. Anemia mempengaruhi 27% remaja putri di negara-negara miskin dan 6% remaja putri di negara-negara kaya, dan di Indonesia prevalensi anemia pada remaja umur 13-18 tahun sekitar 23%. Banyak faktor yang berhubungan dengan kejadian anemia diantaranya adalah tingkat pengetahuan dan ukuran LILA.

Tujuan: Mengetahui hubungan antara tingkat pengetahuan dan ukuran LILA dengan kejadian anemia pada remaja putri di Desa Dawungsari Wilayah Kerja Puskesmas Cilawu Garut Tahun 2023.

Metode: Penelitian menggunakan desain case control, di mana kelompok kasus adalah remaja putri yang mengalami anemia dan kelompok kontrol adalah remaja putri yang tidak anemia. populasi penelitian adalah remaja putri di desa Dawungsari Wilayah Kerja Puskesmas Cilawu Garut. Sampel masing-masing sejumlah 50 responden untuk kelompok kasus dan kelompok kontrol yang dipilih dengan menggunakan purposive sampling. Pengumpulan data menggunakan kuesioner untuk pengetahuan, pita LILA untuk ukuran LILA, dan stik Hb untuk kejadian anemia. Analisis data digunakan Chi square.

Hasil: Ada hubungan tingkat pengetahuan dengan kejadian anemia pada remaja putri di Desa Dawungsari Wilayah Kerja Puskesmas Cilawu Garut Tahun 2023, dengan p-value sebesar 0,043 (p < 0,05). remaja putri dengan tingkat pengetahuan yang rendah mempunyai peluang untuk mengalami anemia sebesar 2,496 kali lebih tinggi dibandingkan dengan remaja putri dengan tingkat pengetahuan yang tinggi. Ada hubungan ukuran LILA dengan kejadian anemia pada remaja putri di Desa Dawungsari Wilayah Kerja Puskesmas Cilawu Garut Tahun 2023, dengan p-value sebesar 0,045 (p < 0,05).Remaja putri dengan ukurang LILA kategori kurang mempunyai peluang untuk mengalami anemia sebesar 2,447 kali lebih tinggi dibandingkan dengan remaja putri dengan ukuran LILA kategori normal..

Kesimpulan: Ada hubungan tingkat pengetahuan dan ukuran LILA terhadap kejadian anemia pada remaja putri di Desa Dawungsari Wilayah Kerja Puskesmas Cilawu Garut Tahun 2023.

Saran: Puskesmas Cilawu Garut dapat melaksanakan promosi kesehatan tentang anemia terhadap remaja putri dengan bekerja sama dengan kader kesehatan di wilayahnya.

Kata Kunci : Anemia, Pengetahuan, ukuran LILA

**ABSTRACT**

Background: Adolescent girls are a group at high risk of experiencing anemia. Anemia affects 27% of adolescent girls in poor countries and 6% of adolescent girls in rich countries, and in Indonesia the prevalence of anemia in adolescents aged 13-18 years is around 23%. Many factors are associated with anemia, including knowledge levels and mid-upper arm circumference (MUAC) size.

Objective: To determine the relationship between knowledge levels and MUAC size with anemia among adolescent girls in Dawungsari Village, Cilawu Sub-district, Garut District, in the year 2023.

Method: This study used a case-control design, where the case group consisted of adolescent girls with anemia and the control group consisted of adolescent girls without anemia. The study population included adolescent girls in Dawungsari Village within the working area of Cilawu Sub-district Health Center. A sample of 50 respondents was selected for each case and control group using purposive sampling. Data collection involved using a questionnaire for knowledge levels, MUAC tape for MUAC size, and Hb test strips for anemia. Data analysis was performed using the Chi-square test.

Results: There is a relationship between knowledge levels with anemia among adolescent girls in Dawungsari Village, Cilawu Sub-district, Garut District, in the year 2023, with a p-value of 0.043 (p < 0.05).

Adolescent girls with low knowledge levels have a 2.496 times higher chance of experiencing anemia compared to those with high knowledge levels. There is a relationship between MUAC size with anemia among adolescent girls in Dawungsari Village, Cilawu Sub-district, Garut District, in the year 2023, with a p-value of 0.045 (p < 0.05). Adolescent girls with insufficient MUAC size have a 2.447 times higher chance of experiencing anemia compared to those with normal MUAC size.

Conclusions: There is a relationship between knowledge levels and MUAC size with anemia among adolescent girls in Dawungsari Village, Cilawu Sub-district, Garut District, in the year 2023.

Suggestions: Cilawu Sub-district Health Center can carry out health promotion activities about anemia targeting female adolescents in collaboration with health volunteers in the area.

Keywords: Anemia, Knowledge, MUAC size,

## INTRODUCTION

Adolescence is a transitional period between childhood and adulthood (Tandoh et al., 2021). *The World Health Organization* (WHO) states that adolescents are individuals aged between 10 and 19 years. Adolescence is an important phase in which optimal growth and development occurs. During this period, adolescents have very crucial physical and psychological needs. Anemia is one of the problems that often arises in adolescence due to lack of nutritional intake (Sari et al., 2022). Anemia is a global public health problem that affects half of preschool children, adolescent girls and pregnant women. WHO states that anemia is the second leading cause of disability and estimates that the number of anemia cases worldwide is close to two billion (Ahankari et al., 2020) . Iron deficiency anemia is the most common type of anemia in adolescents (Tura et al., 2020), and is the biggest cause of morbidity and mortality in adolescents (Puspitasari et al., 2022).

Female adolescent are a group that has a greater risk of developing anemia than male adolescent. This is because the need for nutrients, including iron, increases with menstruation. Menstruation every month experienced by female adolescent allows large amounts of blood to be released (Ekasanti et al., 2020). Anemia affects 27% of female adolescent in poor countries and 6% of female adolescent in rich countries (Madestria et al., 2021) . Based on the 2017 Indonesian Demographic and Health Survey (IDHS), the prevalence of anemia among adolescents aged 13-18 years is 23% for female adolescents and 17% for male adolescents (Khobibah et al., 2021).

Based on the 2018 Basic Health Research (Riskesdas) data, the prevalence of anemia in adolescents in Indonesia reaches 32%, which means that around 3-4 out of 10 adolescents experience anemia. Factors that influence this include sub-optimal eating patterns and lack of physical activity (Widyawati, 2021) . Anemia in adolescence is a nutritional problem that has an irreversible negative impact on growth, cognitive abilities, performance, and has a serious impact throughout the reproductive years and beyond (Vaira et al., 2022).

Many factors are associated with the incidence of anemia in adolescents. The research results of Nainggolan et al. (2022) showed that anemia is still a public health problem in Indonesia among non-pregnant women of childbearing age (19–49 years). Nutritional status, medical history, and health behavior have a significant relationship with the incidence of anemia. Satriani Research (2018) get the result that family income, number of family members, menstrual cycle, and Body Mass Index (BMI), are factors associated with the incidence of anemia in adolescents. As for father's education, mother's education, menstrual volume, physical activity, dental caries, exposure to cigarette smoke, nutritional intake, stunting, and MUAC, are not related to the incidence of anemia in adolescents. The absence of a relationship between MUAC and the incidence of anemia is also supported by research by Utami et al. (2021); and Windari et al. (2018); performed on pregnant women. The opposite result was shown by the research of Ina et al. (2018); Sari et al. (2022); and Vaira et al. (2022); who got the result that there is a relationship between MUAC and the incidence of anemia. In addition, research (Ahankari et al., 2020) shows that there is a relationship between MUAC and hemoglobin levels.

MUAC is a guide that can estimate nutritional conditions in the past by describing the condition of the muscles and layers of fat under the skin (Wirawanti, 2022). Upper Arm Circumference (MUAC) is one of the risk parameters for Chronic Energy Deficiency (CED ) in pregnant women, women of childbearing age and in this case including female adolescent (Mutmainnah et al., 2021). A person is said to have CED if the size of MUAC is <23.5 cm (Lipoeto et al., 2020) . Female adolescent who experience CED have the potential to

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experience iron deficits, and increase the risk of anemia (Mutmainnah et al., 2021) .

research (2021) with a literature study found that knowledge about anemia has a relationship with the incidence of anemia in female adolescent . The results of this study are also supported by the results of Warlenda et al. (2019) ; Hasana et al. (2023) . Research Nurhayati et al. (2023) found that knowledge is a predisposing factor that influences adolescents' susceptibility to anemia. Knowledge about anemia will affect adolescent eating behavior (Oktariana et al., 2021) . Adolescents' knowledge of the signs and symptoms, complications, and prevention of anemia is lacking, causing adolescents to be unable to maintain consumption of foods that contain lots of iron, so that the need for iron is not fulfilled, which will ultimately increase the risk of anemia (Mulianingsih et al., 2021).

Meanwhile, Verma & Baniya (2022) in his research on factors related to the incidence of anemia in adolescents, divided knowledge into several variables according to the type of knowledge. The results of his research showed that knowledge about the causes of anemia, knowledge about anemia symptoms, knowledge about anemia treatment, knowledge about iron-rich foods, and sources of knowledge about anemia, had no relationship with the incidence of anemia. The absence of a relationship between knowledge and the incidence of anemia is also supported by research results (Isati & Hastono (2017); and Handayani & Sugiarsih (2021).

If you look at the results of the previous studies described above, it can be seen that there are inconsistencies in the results of research on the factors associated with the incidence of anemia, especially on the knowledge factor and the size of MUAC. Based on this, research on the relationship between knowledge and size of MUAC with the incidence of anemia is interesting to do.

## RESEARCH METHODS

This research is a case control study, where the measurement of the independent and dependent variables is not carried out at the same time, where the researcher measures the dependent variable or effect, and then the independent variables are measured retrospectively (Alatas et al., 2018). The case group is female adolescents who suffer from anemia and the control group is female adolescents who do not suffer from anemia. The population in this study were female adolescent in Dawungsari Village, the working area of the Cilawu Garut Health Center. The samples in this study were 50 respondents each for the case group and the control group, with the sampling technique used *purposive sampling* . Data collection on knowledge about anemia was carried out using a questionnaire adopted from Utomo's research (2019). The size of MUAC data was collected using the MUAC tape, and the incidence of anemia was seen from the Hb level values measured using the Hb stick.

Univariate analysis in this study was carried out by describing the data using a frequency distribution table. Knowledge data about anemia is categorized by T-Score, which is categorized as low if T-Score <50 is categorized as high if T-Score ≥ 50. MUAC size data is categorized as low if MUAC size is <23.5 and normal if MUAC size. The data on the incidence of anemia is categorized as anemia if the Hb level is <12.0 g/dl in women and <13.0 g/dl in men and is categorized as not anemia if the Hb level is ≥12.0 g/dl in women and ≥13. 0 g/dl in males. Bivariate analysis in this study was carried out using Chi square with continuity correction, because the contingency table is 2 x 2 and N = 40 (Smoller & Smoller, 2015).

## RESEARCH RESULTS

### Univariate analysis

Level of Knowledge about Anemia

Table 1 shows that among female adolescent who are anemic, most of them have knowledge about anemia in the low category, namely 34 respondents (68.0%). For female adolescents who were not anemic, most of them had knowledge about anemia in the high category, namely 27 respondents (54.0%).

**Table 1**
**Frequency Distribution of Knowledge Levels about Anemia in Young Girls in Dawungsari Village Working Area of Cilawu Garut Health Center in 2023**

| Knowledge level | Incidence of Anemia in Female Adolescent | | | |
|---|---|---|---|---|
| | Yes | | No | |
| | N | % | N | % |
| Low | 34 | 68.0 | 23 | 46.0 |
| Tall | 16 | 32.0 | 27 | 54.0 |

**MUAC size**

**Table 2**
**Frequency Distribution of MUAC Size for Female Women in Dawungsari Village Working Area of Cilawu Garut Health Center in 2023**

| MUAC size | Incidence of Anemia in Female Adolescent | | | |
|---|---|---|---|---|
| | Yes | | No | |
| | N | % | N | % |
| Not enough | 30 | 60.0 | 19 | 38.0 |
| Normal | 20 | 40.0 | 31 | 62.0 |

Table 2 shows that in female adolescents who are anemic, most of them have MUAC size in the less category, namely 30 respondents (60.0%). In female adolescent who are not anemic, most of them have normal MUAC sizes, namely 31 respondents (62.0%).

**Bivariate Analysis**

**Relationship Between Level of Knowledge about Anemia with Anemia Incidence**

Table 3 shows that 57 female adolescent who have knowledge about anemia are in the low category, 34 people (59.6%) have anemia, and 23 people (40.4%) are not anemic. As for 43 female adolescent who had knowledge about anemia in the high category, 16 people (37.2%) had anemia, and 27 people (62.8%) were not anemic.

**Table 3**
**The Relationship Between Knowledge of Anemia and the Incidence of Anemia in Young Girls in Dawungsari Village, Working Area of the Cilawu Garut Health Center in 2023**

| Knowledge level | Incidence of Anemia in Female Adolescent | | | | Total | | p-values | OR (95% CI) |
|---|---|---|---|---|---|---|---|---|
| | Yes | | No | | | | | |
| | n | % | n | % | N | % | | |
| Low | 34 | 59,6 | 23 | 40,4 | 57 | 100.0 | 0.043 | 2,496 (1.105-5.629) |
| Tall | 16 | 37,2 | 27 | 62,8 | 43 | 100.0 | | |

**Relationship Between MUAC Size and Anemia Incidence**

**Table 4**
**Relationship Between MUAC Size and Incidence of Anemia in Young Girls in Dawungsari Village Working Area of Cilawu Garut Health Center in 2023**

| MUAC size | Incidence of Anemia in Female Adolescent | | | | Total | | p-values | OR (95% CI) |
|---|---|---|---|---|---|---|---|---|
| | Yes | | No | | | | | |
| | n | % | n | % | N | % | | |
| Not enough | 30 | 61,2 | 19 | 38,8 | 49 | 100.0 | 0.045 | 2,447 (1.095-5.468) |
| Normal | 20 | 39,2 | 31 | 60,8 | 51 | 100.0 | | |

Table 4 shows that 49 female adolescent who have MUAC sizes are in the less category, 30 people (61.2%) have anemia, and 19 people (38.8%) are not anemic. As for 51 female adolescent who had normal MUAC size, 20 people (39.2%) had anemia, and 31 people (60.8%) were not anemic.

**DISCUSSION**

Based on the results of the Chi square test described in table 3, a p-value of 0.043 was obtained (p-value <0.05), so it was concluded that there was a significant relationship between the level of knowledge and the incidence of anemia in female adolescent in Dawungsari Village, Cilawu Health Center Working Area Garut in 2023. The results of this study support the results of Warlenda et al.

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(2019); Kusnadi (2021); and Hasana et al. (2023). The Odds Ratio (OR) value was 2.496, which means that female adolescent with a low level of knowledge have a 2.496 times higher chance of experiencing anemia compared to female adolescent with a high level of knowledge.

Knowledge about anemia will affect adolescent eating behavior (Oktariana et al., 2021). In the PRECEDE model, predisposing factors occur at the cognitive level and one of them includes knowledge. This behavioral antecedent provides motivation to perform the behavior (Snelling, 2014). Knowledge about the causes, signs and symptoms, treatment of anemia, and foods that contain lots of iron, will motivate adolescents to consume lots of foods that contain iron. Adequate iron intake will increase the level of Hb in adolescents so that it will reduce the incidence of anemia.

If you look at the results of the research described in table 1, most of the female adolescent who are anemic have knowledge about anemia in the low category, namely 34 respondents (68.0%). For female adolescents who were not anemic, most of them had knowledge about anemia in the high category, namely 27 respondents (54.0%). There are still many female adolescent who have knowledge about anemia in the low category, it should be taken into consideration for the Cilawu Garut Health Center to carry out health promotion about anemia to adolescents. The program to prevent anemia in adolescents is to carry out a school-based supplementation program for blood-added tablets in junior high schools in the Cilawu Health Center area.

Based on the results of the Chi square test described in table 4, a p-value of 0.045 was obtained (p-value <0.05), so it was concluded that there was a significant relationship between MUAC size and the incidence of anemia in female adolescent in Dawungsari Village, Cilawu Health Center Working Area Garut in 2023. The results of this study support the results of the study Ina et al. (2018); Sari et al. (2022); and Vaira et al. (2022). The Odds Ratio (OR) value was 2.447, which means that female adolescent with the MUAC size category have less chance of experiencing anemia by 2.447 times higher than girls with the normal category of MUAC size.

Previous studies have shown that the MUAC size is related to BMI. This means that MUAC size can be a parameter of malnutrition (Laghari et al., 2017). The low MUAC size is a risk parameter for CED (Mutmainnah et al., 2021). A young girl with a low MUAC size indicates that the nutritional content including iron in the body is not sufficient or not sufficient for the body's needs. Adolescent girls need a lot of iron, especially during menstruation. If the need for iron is insufficient, female adolescent will be at risk of developing anemia.

## CONCLUSION

There is a relationship between the level of knowledge and the size of MUAC with the incidence of anemia in female adolescent in Dawungsari Village, the Working Area of the Cilawu Garut Health Center in 2023.

## SUGGESTION

It is hoped that the Cilawu Garut Health Center can carry out health promotion on anemia for adolescents by working with health cadres in their area.

## DAFTAR PUSTAKA

Ahankari, A. S., Tata, L. J., & Fogarty, A. W. (2020). Weight, Height, and Midupper Arm Circumference are Associated with Haemoglobin Levels in Adolescent Girls Living in Rural India: A Cross-sectional Study. *Maternal and Child Nutrition*, *16*(2), 1–5. https://doi.org/10.1111/mcn.12908

Alatas, H., Karyomanggolo, W., Musa, D. A., Boediarso, A., & Usman, I. N. (2018). Desain Penelitian. In S. Sastroasmoro & S. Ismael (Eds.), *Dasar-dasar Metodologi Penelitian Klinis*. Sagung Seto.

Ekasanti, I., Adi, A. C., Yono, M., Nirmala G, F., & Isfandiari, M. A. (2020). Determinants of Anemia among Early Adolescent Girls in Kendari City. *Amerta Nutrition*, *4*(4), 271–278. https://doi.org/10.20473/amnt.v4i4.2020.271-279

Handayani, I. F., & Sugiarsih, U. (2021). Kejadian Anemia Pada Remaja Putri di SMP Budi Mulia Kabupaten Karawang Tahun 2018. *Muhammadiyah Journal of Midwifery*, *2*(2), 76–89. https://doi.org/10.24853/myjm.2.2.76-89

Hasanah, R., Aisyah, S., & Sukarni, D. (2023). Factors Associated with Anemia in Female Adolescents. *JKM: Jurnal Kebidanan Malahayati*, *9*(3), 358–362. https://doi.org/10.33024/jkm.v9i3.11032

Ina, A. S., Yulifah, R., & Susmini. (2018). Hubungan Ukuran Lingkar Lengan Atas dengan Kejadian Anemia pada Mahasiswa Di Asrama Putri Universitas Tribhuwana Tunggadewi Malang. *Nursing News*, *3*(3), 748–757.

Isati, & Hastono, S. P. (2017). Determinan Kejadian Anemia Remaja Putri di SMP Negeri 22 Kota Jambi. *Jurnal Kesmas Jambi (JKMJ)*, *1*(1), 1–

10. https://doi.org/10.22437/jkmj.v1i1.3685

Khobibah, Nurhidayati, T., Ruspita, M., & Astyandini, B. (2021). Anemia Remaja dan Kesehatan Reproduksi. *Jurnal Pengabdian Masyarakat Kebidanan*, *3*(2), 11–17. https://doi.org/10.26714/jpmk.v3i2.7855

Kusnadi, F. N. (2021). Hubungan Tingkat Pengetahuan Tentang Anemia dengan Kejadian Anemia pada Remaja Putri. *JMH: Jurnal Medika Hutama*, *03*(01), 1293–1298.

Laghari, Z. A., Baig, N. M., Memon, F., Panhwar, F., Qambarani, M. R., & Palh, Z. A. (2017). Correlation of BMI and MUAC with Anemia among Sindh University Students, Jamshoro, Pakistan. *Sindh University Research Journal -Science Series*, *49*(3), 553--556. https://doi.org/10.26692/surj/2017.09.15

Lipoeto, N. I., Masrul, & Nindrea, R. D. (2020). Nutritional Contributors to Maternal Anemia in Indonesia: Chronic Energy Deficiency and Micronutrients. *Asia Pacific Journal of Clinical Nutrition*, *29*(1), S9–S17. https://doi.org/10.6133/APJCN.202012_29(S1).02

Madestria, N. P. O., Moedjiono, A. I., Suriah, Tahir, M., Masni, Suarayasa, K., Nur, R., & Syam, A. (2021). Effect of Education Through Video and Packaging Modifications of Iron Tablets on Female Adolescent Behavior in The Iron Supplementation Intake in SMPN 2 And SMPN 1 Parigi. *Gaceta Sanitaria*, *35*(S2), S127–S130. https://doi.org/10.1016/j.gaceta.2021.10.011

Mulianingsih, M., Nurmayani, W., Oktaviani, E., Ilham, Hayana, & Pertiwi, A. N. (2021). Factors Affecting Anemia Status in Adolescent Girls. *Journal of Health Education*, *6*(1), 27–33. https://doi.org/10.15294/jhe.v6i1.43758

Mutmainnah, Patimah, S., & Septiyanti. (2021). Hubungan KEK dan Wasting dengan Kejadian Anemia Pada Remaja Putri di Kabupaten Majene. *Window of Public Health Journal*, *1*(5), 561–569. https://doi.org/10.33096/woph.v1i5.184

Nainggolan, O., Hapsari, D., Titaley, C. R., Indrawati, L., Dharmayanti, I., & Kristanto, A. Y. (2022). The Relationship of Body Mass Index znd Midupper Arm Circumference with Anemia in Nonpregnant Women Aged 19-49 Years in Indonesia: Analysis of 2018 Basic Health Research data. *PLoS ONE*, *17*(3), 1–13. https://doi.org/10.1371/journal.pone.0264685

Nurhayati, Lestari, A. A., & Rizki, A. A. (2023). Factors Associated with Anemia Risk Behaviour in Teenage Girls: Literature Review. *International Archives of Medical Sciences and Public Health*, *4*(1), 1–7.

Oktariana, D., Lusiana, E., Tamzil, N. S., & Prasasty, G. D. (2021). Level of Haemoglobin and Knowledge Regarding Anemia and Its Prevention Among Adolescent. *Sriwijaya Journal of Medicine*, *4*(2), 117–122. https://doi.org/10.32539/sjm.v4i2.108

Puspitasari, H. Z. G., Armini, N. K. A., Pradanie, R., & Triharini, M. (2022). Anemia Prevention Behavior in Female Adolescents and Related Factors Based on Theory of Planned Behavior: A Cross-Sectional Study. *Jurnal Ners*, *17*(1), 25–30. https://doi.org/10.20473/jn.v17i1.27744

Sari, P., Herawati, D. M. D., Dhamayanti, M., & Hilmanto, D. (2022). Anemia among Adolescent Girls in West Java, Indonesia: Related Factors and Consequences on the Quality of Life. *Nutrients*, *14*(18), 1–13. https://doi.org/10.3390/nu14183777

Satriani. (2018). *Analisis Determinan Anemia pada Remaja Putri (15-18 Tahun) di Kecamatan Tamalate Kabupaten Jeneponto*. Universitas Hasanuddin.

Smoller, S. W., & Smoller, J. (2015). *Biostatistics and Epidemiology*. Springer Science+Business Media.

Snelling, A. (2014). *Introduction to Health Promotion*. Jossey-Bass.

Tandoh, M. A., Appiah, A. O., & Edusei, A. K. (2021). Prevalence of Anemia and Undernutrition of Adolescent Females in Selected Schools in Ghana. *Journal of Nutrition and Metabolism*, *2021*, 1–5. https://doi.org/10.1155/2021/6684839

Tura, M. R., Egata, G., Fage, S. G., & Roba, K. T. (2020). Prevalence of Anemia and its Associated Factors among Female Adolescents in Ambo Town, West Shewa, Ethiopia. *Journal of Blood Medicine*, *11*, 279–287. https://doi.org/10.2147/JBM.S263327

Utami, D. M. A., Sutiari, N. K., Adhi, N. K. T., & Sawitri, A. A. S. (2021). Faktor Risiko yang Berhubungan dengan Anemia Ibu Hamil di Desa Dajan Peken dan Desa Delod Peken Kecamatan Tabanan Tahun 2019. *Jurnal Penelitian Dan Kajian Ilmiah Kesehatan*, *7*(1), 1–9.

Utomo, E. T. R. (2019). *Faktor-faktor yang Berhubungan dengan Konsumsi Tablet Tambah Darah (TTD) Pada Remaja Putri di SMP Negeri 9 Jember*. Universitas Jember.

Vaira, R., Merlin Karinda, & Muflihah. (2022). Factors

Related of Anemia in Adolescence Girl. *Science Midwifery*, *10*(4), 2490–2495. https://doi.org/10.35335/midwifery.v10i4.696

Verma, K., & Baniya, G. C. (2022). Prevalence, Knowledge, and Related Factor of Anemia among School‐Going Adolescent Girls in a Remote Area of Western Rajasthan. *Journal of Family Medicine and Primary Care*, *11*, 1474–1481. https://doi.org/10.4103/jfmpc.jfmpc

Warlenda, S. V., Widodo, M. D., Candra, L., & Rialita, F. (2019). Determinan Kejadian Anemia Pada Remaja Putri di SMA Negeri 1 Reteh Kecamatan Reteh Kabupaten Indragiri Hilir Tahun 2019. *Photon: Jurnal Sain Dan Kesehatan*, *9*(2), 88–98. https://doi.org/10.37859/jp.v9i2.1265

Widyawati. (2021). *Remaja Sehat Komponen Utama Pembangunan SDM Indonesia*.

Windari, L., Lisnawati, N., & Herutomo, T. (2018). Faktor-Faktor yang Mempengaruhi Kejadian Anemia pada Ibu Hamil di Kecamatan Jatiluhur Kabupaten Purwakarta. *Journal of Holistic and Health Sciences*, *2*(1), 44–48. https://doi.org/10.51873/jhhs.v2i1.24

Wirawanti, I. W. (2022). Kurang Energi Kronik (KEK) Berhubungan dengan Kejadian Anemia Remaja Putri. *Svasta Harena: JUrnal Ilmiah Gizi*, *3*(1), 1–6.