# THE KNOWLEDGE LEVEL OF EDUCATION STUDENTS AT THE UNIVERSITY OF MATARAM REGARDING ANEMIA

**Baiq Hawarikatun[1*], Candra Eka Puspitasari[2]**
*Pharmacy, Faculty of Medicine and Health Sciences, University of* Mataram[1], Apotek Pendidikan, *University of* Mataram[2]
**Corresponding Author* : hawarika06@gmail.com

## ABSTRAK
Anemia ialah suatu kondisi ketika kadar hemoglobin atau eritrosit dalam darah kurang dari normal. Kurangnya kadar hemoglobin dalam darah menyebabkan penurunan fungsi sel dalam mensuplai oksigen dan nutrisi ke otak serta jaringan, sehingga menyebabkan penurunan fungsi fisiologis tubuh. Data Riskesdas 2018 menunjukkan prevalensi anemia di Indonesia berkisar 23,7%, dengan angka kejadian pada remaja usia 15-24 tahun mencapai 32,0%. Kurangnya pengetahuan serta pemahaman mengenai anemia meliputi gejala, penyebab serta penangannnya menjadi salah satu faktor yang berkontribusi terhadap kejadian anemia pada setiap individu. Penelitian ini bertujuan untuk mengetahui tingkat pengetahuan mahasiswa pendidikan Universitas Mataram mengenai anemia. Penelitian ini merupakan penelitian observasional dengan desain *cross-sectional*. Instrumen yang digunakan adalah kuesioner *online* yang dibagikan kepada mahasiswa/i dan kemudian dianalisis secara deskriptif dan inferensial. Responden yang terlibat dalam penelitian ini sebanyak 220 mahasiswa, dimana 103 mahasiswa (46,8%) memiliki pengetahuan tinggi, 112 mahasiswa (50,9%) memiliki pengetahuan cukup, dan 5 siswa (2,27%) memiliki pengetahuan rendah mengenai anemia. Analisis statistik yang telah dilakukan dengan menggunakan uji *Kruskal Wallis* dan uji *Man-Whitney* didapatkan tidak ada perbedaan yang signifikan (CI 90%, p>0,05) antara jenis kelamin (p=0,317) dan usia (p=0,911), serta terdapat perbedaan yang signifikan antara program studi (p=0,043) dengan tingkat pengetahuan responden. Sebagian besar mahasiswa/i pendidikan Universitas Mataram memiliki pengetahuan yang cukup mengenai anemia (50,9%).

**Kata kunci** : anemia, mahasiswa pendidikan, pengetahuan

## *ABSTRACT*
*Anemia is a condition when the level of hemoglobin or erythrocytes in the blood is less than normal. Lack of hemoglobin in the blood causes a decrease in cell function in supplying oxygen and nutrients to the brain and tissues, decreasing the body's physiological functions. The 2018 Riskesdas data shows the prevalence of anemia in Indonesia is around 23.7%, with the incidence rate in adolescents aged 15-24 years reaching 32.0%. Lack of knowledge and understanding of anemia, including symptoms, causes, and treatments, is one factor contributing to the incidence of anemia in each individual. This study aims to asses the level of knowledge of education students at the University of Mataram regarding anemia. This study was an observational with a cross-sectional design. The instrument was an online questionnaire distributed to students and then will be analyzed descriptively and inferentially. The respondents involved in this study were 220 students, of which 103 students (46.8%) had high knowledge, 112 students (50.9%) had sufficient knowledge, and 5 students (2.27%) had low knowledge of anemia. Statistical analysis that has been done using the Kruskal Wallis test and the Man-Whitney test obtained no significant difference (CI 90%, p>0.05) between gender (p=0.317) and age (p=0.911), and there was a significant difference between the program of study (p=0.043) and the level of knowledge of the respondents. Most education students at the University of Mataram have sufficient knowledge about anemia (50.9%).*

***Keywords*** *: anemia, education student, knowlegde*

## INTRODUCTION
Anemia is a condition when the level of hemoglobin (Hb) or erythrocytes in the blood is less than the normal range (Sungkawa & Wahdaniah, 2020). Low hemoglobin levels in red

blood cells cause a decrease in cell function in supplying oxygen and nutrients to the brain and body tissues, so the physiological and biochemical processes that occur in body tissues will be disrupted (Dieniyah et al., 2019). There is a difference in normal hemoglobin levels in men and women. In anemia, hemoglobin levels are below 13 g/dl for men and less than 12 g/dl for women (Anriani et al., 2022). Riskesdas in 2013 showed that the prevalence of anemia in Indonesia reached 21.7%. Based on age, the prevalence of anemia among adolescents aged ≥ 15 years was 16.6% in males and 22.7% in females (Riskesdas, 2013). Riskesdas in 2018 showed that the prevalence of anemia in Indonesia increased to 23.7%, with the incidence rate in adolescents aged 15-24 years reaching 32.0%. Adolescent girls are the most vulnerable group, with a prevalence of anemia in women of 27.2% compared to 20.3% in males (Riskesdas, 2018).

The risk of anemia in adolescent girls is higher than in men because teenage girls experience a menstrual cycle every month, leading to iron loss that is twice as high as in males (Izzara et al., 2023). Adolescence is a growth phase, so iron intake is needed in greater quantities during this period (Simanungkalit & Simarmata, 2019). Iron deficiency anemia is a type of anemia that is often encountered in developing countries such as Indonesia. Iron deficiency anemia arises due to a lack of iron intake in the body, which inhibits the body's ability to produce hemoglobin during erythropoiesis (Harahap, 2018). Anemia can have several negative effects on adolescents, including impaired immunity, making the body susceptible to disease, interfering with study concentration, decreased academic performance, and lower productivity. In addition, adolescents in their fertile period who suffer from anemia may experience growth disorders, leading to below-average height and weight (Harahap, 2018). Anemia can also cause complications related to menstruation and pregnancy in adolescents who are in their fertile years (Dambal & Panneerselvam, 2018).

One of the factors that can lead anemia in each individual is a lack of knowledge about the disease. The knowledge about anemia affects a person's behavior and attitude in satisfying nutritional needs to the condition (Kusnadi, 2021). In addition, the lack of understanding regarding to the symptoms of anemia, such as fatigue, weakness, pale skin, and dizziness, leads to delayed diagnosis and treatment of the condition (Astuti, 2023). Delays in the diagnosis and treatment of anemia can lead to an increase in the severity of the condition, resulting in a decline in quality of life. Untreated symptoms of anemia, such as fatigue and weakness, can interfere with daily activities and affect both physical and mental well-being. Additionally, untreated anemia can worsen other existing medical conditions, as the body has to work harder to meet its oxygen demand, placing strain on the body's organs overall (Elisa et al., 2023).

Therefore, this study was conducted to determine the level of knowledge about anemia among education students at the University of Mataram, with the goal of preventing an increase in anemia cases in Indonesia. This research was conducted on education students at the University of Mataram, and it was aimed at educating, so they were expected to have good knowledge about anemia. This study aims to asses the level of knowledge of education students at the University of Mataram regarding anemia.

## METHOD

This study is an observational study with a cross-sectional design. The research was conducted at the Faculty of Teacher Training and Education, University of Mataram, from 22 December 2022 to 22 January 2023. Ethical approval for the study was obtained from the Ethics Commission of the Faculty of Medicine and Health Sciences, University of Mataram, with ethics code number 211/UN18.F7/ETIK/2022. The research instrument was a questionnaire adapted from Noviazahra's research in 2017, which consisted of 18 questions (Noviazahra *et al.*, 2017). Before being distributed, the questionnaire was retested with the help of 6 *experts*

through a content validity test, with a CVI value of 0.96. Additionally, a reliability test was conducted on 30 respondents who were different from the research object but had the same characteristics, and obtained a reliability value of 0.608.

Questionnaires that have met the rules of validity and reliability were then distributed online to education students at the University of Mataram. The total population of education students at the University of Mataram is 8,090 people. The sample size was calculated using the Slovin formula, resulting in 220 respondents. The collected data were analyzed both descriptively and inferentially. Descriptive analysis was conducted to determine the average knowledge level of respondents. Meanwhile, inferential analysis was conducted to determine the relationship between the characteristics of respondents and their level of knowledge through the Kruskhal-Wallis and the Man-Whitney test

## RESULT

The respondents in this study consisted of 220 education students from the University of Mataram. According to the data collected, most respondents were female, with 200 individuals (90.91%), significantly higher than the number of male respondents, who totaled 20 individuals (9.09%). The participants ages ranged from 17 to 28 years, where most of the respondents were aged 19 to 20 years with 120 individuals (54.55%), followed by 17 to 18 years with 48 individuals (21.82%) and 21 to 22 years with 46 individuals (20.91%). Respondents involved in the study were students who were divided into five different groups of majors (table 1).

**Table 1. Characteristics of Research Respondents**

| Characteristics of the Respondents | Frequency (n=220) | Persentage ( % ) |
|---|---|---|
| **Gender** | | |
| Male | 20 | 9,09 |
| Female | 200 | 90,91 |
| **Age** | | |
| 17-18 | 48 | 21,82 |
| 19-20 | 120 | 54,55 |
| 21-22 | 46 | 20,91 |
| 23-24 | 3 | 1,36 |
| 25-26 | 2 | 0,91 |
| 27-28 | 1 | 0,45 |
| **Program of Study (Bachelor)** | | |
| Primary Education | 52 | 23,64 |
| Early Childhood Education | 29 | 13,18 |
| Science Education | 65 | 29,55 |
| Language Education | 45 | 20,45 |
| Social Science Education | 29 | 13,28 |

According to the study's findings, the questions with the highest percentage of correct answers were those concerning the definition, prevention methods, and symptoms of anemia, with correct answer rates of 94,54%; 93,63%; 93,63%; and 89.54%, respectively. However, for the questions related to the causes and management of anemia, the percentage of correct answers was only 19,54% and 20,00%, respectively, indicating that respondents had insufficient knowledge of these aspects.

A statistical test was conducted to determine the relationship between characteristics and respondents' knowledge level. The results of the Man-Whitney test showed that the gender variable had a p-value of $0.317>\alpha=0.05$, indicating no significant relationship between gender and knowledge of anemia. The results of the non-parametric test with the Kruskal-Wallis test showed that the age variable had a p-value of $0.911>0.05$, indicating no significant relationship between age and the level of knowledge about anemia. However, for the program of study

variable, the p-value was 0.043<0.05, showing a significant difference between the student's program of study and their knowledge about anemia (table 2).

**Table 2. The Knowledge Level of Education Students at the University of Mataram Regarding Anemia**

| Characteristic | Average Level of Knowledge | p |
|---|---|---|
| **Gender** | | |
| Male | 62,5±19,3 | 0,317[α*] |
| Female | 62,9±12,8 | |
| **Age** | | |
| 17-18 | 62,6±14,89 | |
| 19-20 | 63,3±13,34 | |
| 21-22 | 62,5±13,50 | 0,911[b*] |
| 23-24 | 59,2±3,23 | |
| 25-26 | 55,6±7,84 | |
| 27-28 | 66,7±0,0 | |
| **Program of Study (Bachelor)** | | |
| Primary Education | 63,0±13,66 | |
| Early Childhood Education | 62,1±12,17 | |
| Science Education | 65,1±14,56 | 0,043[b*] |
| Language Education | 63,7±12,41 | |
| Social Science Education | 57,3±13,05 | |

[*]) Significantly Different (p<0,05)
[α]) Man-Whitney Test
[b]) Kruskal-Wallis Test

**Table 3. Distribution of Knowledge Levels of Education Students at the University of Mataram Regarding Anemia**

| No. | Knowlegde Level | Frequency (n) | Persentage (%) |
|---|---|---|---|
| I | Low | 5 | 2,27 |
| II | Suffient | 112 | 50,9 |
| III | High | 103 | 46,8 |
| **Total** | | **220** | **100** |

The results of the study showed that 103 students (46.8%) had high knowledge of anemia, 112 students (50.9%) had sufficient knowledge, and as many as five students (2.27%) had low knowledge (Table 3). So, it can be concluded that education students at the University of Mataram generally have a sufficient level of knowledge about anemia.

## DISCUSSION

Knowledge is associated with a person's understanding of specific concepts, where all forms of attitudes and actions are influenced by the knowledge they possess. Various factors, both internal and external, influence a person's knowledge. As an internal factor, age affects a person's comprehension and mindset. A person with mature thinking will tend to receive information more quickly leading to better knowledge acquisition (Agus et al., 2019). According to the study results, respondents aged 27 to 28 demonstrated high knowledge of anemia. As age increases, a person's ability to manage information improves. However, after conducting the Kruskal-Wallis test, no significant difference was found between age and an individual's level of knowledge about anemia (p-value = 0.911, p > 0.05). This contrasts with Anifah's research (2020), which indicates a relationship between age and knowledge, suggesting that greater maturity enhances a person's ability to focus on and process information. Education is one of the external factors that can influence a person's level of knowledge (Sukesih et al., 2020). The higher a person's education level, the more

comprehensive their knowledge tends to be (Purnamasari & Raharyani, 2020). Research by Patimah et al., (2021) indicates that education level influences the knowledge possessed by each individual. A person with higher education is likely to have an easier time obtaining, processing, and managing the information they receive. The knowledge possessed by individuals affects their attitudes and behaviours in maintaining and improving their quality of life (Sudarman et al., 2020).

Based on the program of study characteristics, science education students have higher knowledge levels than students from another program of study, although the difference is not statistically significant. The results of the Kruskal-Wallis test between the program of study and students' knowledge of anemia showed a p-value > 0.047, indicating a significant difference. However, regarding gender characteristics, the knowledge levels between males and females did not differ significantly, as the Mann-Whitney test results showed no significant difference between gender and knowledge level.

The distribution of knowledge levels indicated that education students at the University of Mataram had sufficient knowledge about anemia (50.9%). A lack of knowledge about anemia increases the risk of developing it by 2-3 times compared to those with good knowledge (Anifah, 2020). Efforts to improve knowledge can be made in various ways. Improving health services through effective socialization can increase students' knowledge and understanding of health, especially anemia. By conducting seminars, workshops, or health campaigns on campus, students can be more aware of the importance of early detection, prevention, and treatment of anemia. This socialization provides basic information about anemia and can introduce various ways to maintain a healthy body, such as a balanced diet and adequate iron consumption (Mariana et al., 2021). In addition, current technological advances also make it easy for anyone to access information about anemia quickly and easily (Mulyani & Haliza, 2021). Various digital platforms, such as social media and health applications, provide direct access to the public, including students, to get articles, videos, and other educational content that discusses the causes, symptoms, treatment, and prevention of anemia. The use of online media in health promotion efforts has proven effective in increasing adolescents' understanding of health issues and supporting them to adopt healthy behaviors (Sembada et al., 2022).

## CONCLUSION

The results showed that most education students at the University of Mataram had a sufficient understanding of anemia (50.9%). Therefore, improving health services, such as socialization efforts, is essential to enhance student awareness and reduce the incidence of anemia in Indonesia.

## ACKNOWLEDGMENT

Thanks to the academic community of the Faculty of Teacher Training and Education at the University of Mataram for granting permission and supporting the research process. Sincere gratitude also goes to the Research Team on the Level of Knowledge from the Department of Clinical Pharmacy at the Pharmacy Study Program, Faculty of Medicine and Health Sciences, University of Mataram, for their cooperation in implementing this research

## REFERENCES

Agus Cahyono, E., Studi Ilmu Keperawatan, P., Tinggi Ilmu Kesehatan Husada Jombang, S., Korespondensi, A., Veteran Mancar, J., Peterongan, K., Jombang, K., & Timur, J. (2019). Pengetahuan ; Artikel Review. In *Jurnal Keperawatan* (Vol. 12, Issue 1).

Anifah, F. (2020). Pengaruh Pendidikan Kesehatan Melalui Media Vidio Terhadap Pengetahuan Tentang Anemia Pada Remaja Putri. *Jurnal Keperawatan Muhammadiyah*, *5*(1), 296–300. https://doi.org/10.30651/jkm.v5i1.6335

Anriani, L. S., Candra Eka Puspitasari, & Ima Arum Lestarini. (2022). Sosialisasi Terkait Anemia Pada Santriwati Di Pondok Pesantren Nurul Hakim Kecamatan Kediri Kabupaten Lombok Barat. *Jurnal Pengabdian Magister Pendidikan IPA*, *5*(4), 270–273. https://doi.org/10.29303/jpmpi.v5i4.2212

Astuti, E. R. (2023). Literature Review: Faktor-Faktor Penyebab Anemia Pada Remaja Putri. *Jambura Journal of Health Science and Research*, *5*(2), 550–561. https://ejurnal.ung.ac.id/index.php/jjhsr/index

Dambal, S., & Panneerselvam, S. (2018). Anemia in Adolescent Girl. *Asian Pacific Journal of Nursing*, *5*(1), 7–8. https://doi.org/10.1017/S1368980012005587

Dieniyah, P., Maeta Sari, M., Avianti, I., Kesehatan Reproduksi dan Kesehatan Ibu Anak, K., Studi Kesehatan Masyarakat Fakultas Ilmu Kesehatan, P., & Ibn Khaldun Bogor, U. (2019). Hubungan Tingkat Pengetahuan Tentang Anemia Dengan Kejadian Anemia Pada Remaja Putri Di Smk Analisis Kimia Nusa Bangsa Kota Bogor Tahun 2018. In *PROMOTOR Jurnal Mahasiswa Kesehatan Masyarakat* (Vol. 2, Issue 2).

Elisa, S., Oktafany, & Oktarlina, R. Z. (2023). Faktor Penyebab Kejadian Anemia pada Remaja Putri. *Agromedicine*, 145–148. https://doi.org/10.36053/mesencephal

Harahap, N. R. (2018). Faktor- Faktor Yang Berhubungan Dengan Kejadian Anemia Pada Remaja Putri. *36 Nursing Arts*, *XII*(Desember), 78–90.

Izzara, W. A., Yulastri, A., Erianti, Z., Putri, M. Y., & Yuliana, Y. (2023). Penyebab, Pencegahan dan Penanggulangan Anemia pada Remaja Putri (Studi Literatur). *Jurnal Multidisiplin West Science*, *2*(12), 1051–1064. https://doi.org/10.58812/jmws.v2i12.817

Kusnadi, F. N. (2021). Hubungan Tingkat Pengetahuan Tentang Anemia dengan Kejadian Anemia Pada Remaja Putri. *Jurnal Medika Hutama*, *03*(01), 1293–1298. https://doi.org/http://www.jurnalmedikahutama.com/index.php/JMH/article/view/266

Mariana, Novita, E., & Pariyana. (2021). Sosialisasi anemia dan gizi serta pelatihan pemeriksaan hemoglobin pada guru dan orang tua anak usia sekolah dasar. *Jurnal Pengabdian Masyarakat: Humanity and Medicine*, *2*(1), 56–65. https://doi.org/10.32539/hummed.v2i1.15

Mulyani, F., & Haliza, N. (2021). Research & Learning in Faculty of Education Analisis Perkembangan Ilmu Pengetahuan dan Teknologi ( Iptek ) Dalam Pendidikan. *PENDIDIKAN Dan KONSELING*, *3*, 101–109.

Patimah, I., Yekti, S. W., Alfiansyah, R., Taobah, H., Ratnasari, D., Nugraha, A., Studi Sarjana Keperawatan, P., Karsa Husada Garut, Stik., & Studi Profesi Ners, P. (2021). Hubungan Tingkat Pengetahuan dengan Perilaku Pencegahan Penularan Covid-19 pada Masyarakat Relationship between Knowledge Level and Behavior to Prevent Covid-19 Transmission in the Community. In *Jurnal Kesehatan* (Vol. 12, Issue 1). Online. http://ejurnal.poltekkes-tjk.ac.id/index.php/JK52

Purnamasari, I., & Raharyani, A. E. (2020). Tingkat Pengetahuan Dan Perilaku Masyarakat Kabupaten Wonosobo Tentang COVID -19. *Jurnal Ilmu Kesehatan*, *3*(1), 33–42. https://doi.org/10.14421/lijid.v3i1.2224

Riskesdas. (2013). Laporan_riskesdas_2013_final. In *Badan Penelitian dan Pengembangan Kesehatan Kementrian Kesehatan RI*. https://repository.badankebijakan.kemkes.go.id/id/eprint/4467/

Riskesdas. (2018). *Hasil Utama Riskesdas 2018*. https://repository.badankebijakan.kemkes.go.id/id/eprint/3514/

Sembada, S. D., Pratomo, H., Fauziah, I., Amani, S. A., Nazhofah, Q., & Kurniawati, R. (2022). Pemanfaatan Media Online Sebagai Sarana Edukasi Kesehatan Pada Remaja : Tinjauan

Literatur. *PREPOTIF : Jurnal Kesehatan Masyarakat*, *6*(1), 564–574. https://doi.org/10.31004/prepotif.v6i1.3110

Simanungkalit, S. F., & Simarmata, O. S. (2019). Pengetahuan dan Perilaku Konsumsi Remaja Putri yang Berhubungan dengan Status Anemia. *Buletin Penelitian Kesehatan*, *47*(3), 175–182. https://doi.org/10.22435/bpk.v47i3.1269

Sudarman, S., Hadi, A. J., Manggabarani, S., & Ishak, S. (2020). Pengaruh Intervensi Perilaku Jajan Sehat terhadap Pencegahan Anemia Gizi pada Anak Usia Sekolah Dasar di Kota Makassar. *Promotif: Jurnal Kesehatan Masyarakat*, *10*(1), 67–72.

Sukesih, S., Usman, U., Budi, S., & Sari, D. N. A. (2020). Pengetahuan Dan Sikap Mahasiswa Kesehatan Tentang Pencegahan Covid-19 Di Indonesia. *Jurnal Ilmu Keperawatan Dan Kebidanan*, *11*(2), 258. https://doi.org/10.26751/jikk.v11i2.835

Sungkawa, H. B., & Wahdaniah. (2020). Penentuan Nilai Rujukan Hemoglobin Pada Masyarakat Kalbar. *Jurnal Vokasi Kesehatan*, *6*(1), 13. https://doi.org/10.30602/jvk.v6i1.441