

The Relationship Between Age and Anemia Status Among Adolescent Girls at the Salafiyah Syafi'iyah Islamic Boarding School in Sukorejo, Situbondo

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ARTICLE INFORMATION

Article history

Received (30 June 2025)

Revised (9 June 2026)

Accepted (19 June 2026)

Keywords

Anemia status, Adolescent Girls

ABSTRACT

Introduction: adolescent girls are among the age groups most vulnerable to iron-deficiency anemia. During this period, they experience rapid growth and development, requiring a balanced nutritional intake. One of the essential nutrients needed by the body is iron. In addition, adolescent girls undergo menstruation, which may contribute to the incidence of anemia.

Objective: The purpose of this study was to determine the relationship between respondents' age and their anemia status.

Methods: This study employed a quantitative analysis method with a cross-sectional research design, in which variables were measured simultaneously at a specific point in time. The dependent variable was anemia status, and the independent variable is the respondent's age. The sampling technique used was purposive sampling. The study was conducted at the Salafiyah Syafi'iyah Islamic Boarding School in Sukorejo, Situbondo, with a total of 75 respondents.

Univariate analysis presents a frequency distribution of each variable, and bivariate analysis uses the chi-square test because the variables are categorical.

Results: The study results show that the majority of participants were early adolescents, totaling 70 individuals (93.3%).

The anemia status in this study showed that most respondents did not have anemia, with 58 individuals (77.3%). The results of the chi-square test indicate that age is not associated with anemia status.

Conclusions: Age does not have a significant association with anemia status.

Nevertheless, it is important to conduct research on this topic, given that anemia status in adolescents is key to improving health outcomes throughout a woman's life cycle.

Introduction

Anemia is a condition which can occur across all age groups. It is particularly prevalent among adolescent girls and pregnant women. Anemia is characterized by a red blood cell or hemoglobin count that is below normal levels. The normal hemoglobin level for adolescent girls is 12 g/dL. However, the hemoglobin levels of most adolescents are below normal. This is due to iron deficiency. This is evident in the data cited regarding adolescents who still suffer from this condition.

Data from the Indonesian Health Survey show that 18% of adolescent girls aged 15–24 suffer from anemia (SKI, 2023). This means that 4 out of 10 adolescents have a lower-than-normal red blood cell count.

Adolescents are an age group that undergoes rapid growth and development, requiring adequate daily nutritional intake, and one of the essential nutrient is iron. A common issue faced by adolescents is an unhealthy lifestyle, which affects their ability to meet daily iron requirements, therefor resulting in anemia.



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Adolescent girls are more likely to experience anemia. This is due to monthly blood loss through menstruation, which leads to a decrease in the number of red blood cells in the body. In addition, age also influence the incidence of anemia, particularly among adolescent girls. Several studies have shown that a person's age is closely linked to their knowledge. Someone with a good understanding of the issue will take steps to increase their hemoglobin levels to prevent anemia, and vice versa.

The information in question pertains to the regular intake of iron, especially during monthly menstruation. Since the body cannot produce iron on its own, it is necessary to consume iron-rich nutrients daily, which can be obtained from food or supplements. Iron helps adolescents improve their health earlier on, so that it does not affect their reproductive health later in life, even after they get married.

The high number of anemia cases among adolescents has significantly influenced the government in implementing comprehensive intervention efforts. The government has initiated several prevention programs, including the distribution of iron supplement tablets to adolescent girls (Ernawati, 2021).

This study aims to determine the relationship between respondents' age and the prevalence of anemia among adolescent girls at the Salafiyah Syafi'iyah Islamic Boarding School in Sukorejo, Situbondo. This research is important because anemia in adolescents is often perceived as a condition that will resolve on its own, and therefore does not require immediate attention. In reality, if left untreated, anemia in adolescents can affect both their physical and psychological health, leading to disruptions in their academic activities.

Methods

Study Design

This study employed a quantitative research design with a cross-sectional approach, in which data collection for the variables (risk factors and their effects) was observed or measured simultaneously at a single specific point in time (Ratna, Nyoman Khuta, 2012).

Setting

This study was conducted from September 2024 to February 2025 at the Salafiyah Syafi'iyah Sukorejo Situbondo Islamic Boarding School. The first step taken by the researcher was to draft a cover letter requesting permission from the boarding school's leadership to use the students as respondents in this study. Subsequently, discussions were held with the relevant boarding school staff regarding the research site and location.

Research Subject

The sample consisted of 75 adolescent girls, and the sampling technique used was purposive sampling. The inclusion criteria for selecting respondents were adolescent girls residing at the Salafiyah Syafi'iyah Sukorejo Situbondo Islamic boarding school, aged 12–14 years, and willing to participate as research respondents. The exclusion criteria were adolescent girls not residing at the boarding school and those unwilling to participate. The dependent variable in this study was anemia status, and the independent variable is age. The measurement scale for age is ordinal, using a questionnaire divided into two groups: early adolescents aged 12–13 years and middle adolescents aged 14 years. Anemia status is measured on a nominal scale (anemic and non-anemic) using a standard operating procedure (SOP) for Hb level testing with the Easy Touch Hb device.

Instrument

The research instruments used were a questionnaire and an observation sheet for measuring Hb levels.

Data analysis



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Data analysis consisted of univariate and bivariate analyses using the chi-square test, as the data scales for both variables were categorical.

Results

This study was conducted on adolescent girls aged 12–14 years at the Salafiyah Syafi'iyah Islamic Boarding School in Sukorejo, Situbondo. The purpose of the study was to describe the incidence of iron-deficiency anemia among adolescent girls. This study was conducted to determine the relationship between respondent's age and anemia status among adolescent girls at the Salafiyah Syafi'iyah Islamic Boarding School in Sukorejo, Situbondo. The research was carried out from September 2024 to February 2025, involving a total of 75 respondents. The statistical analyses used in this study included univariate analysis, which presented frequency distributions of age and anemia status, as well as bivariate analysis aimed at determining the relationship between respondent's age and anemia status using the chi-square test. The table below presents the results of the univariate and bivariate analyses.

Table 1. Frequency Distribution of Age, Education, and Anemia Status

Research Variables	Frequency (N)	Percentage (%)	Mean	Median
Age				
a Early adolescent (12-13 years old)	70	93.3	12.83	13.00
b Middle adolescent (14 years old)	5	6.7		
Total	75	100		
Anemia Status				
a Not Anemic	58	77.3	13.10	13.10
b Anemic	17	22.7		
Total	75	100		

Table 1 shows that the majority of respondents were aged 12–13 years, accounting for 93.3%, while the anemia status in the table above indicates that the majority of respondents did not have anemia, accounting for 77.3% (58 people).

Table 2. The relationship between age and anemia status

Variable (Age)	Anemia status		P Value
	Anemia	Not Anemic	
a. Early adolescent (12-13 years old)	16	54	0.883
b. Middle adolescent (14 years old)	1	4	
Total	17	58	

Tabel 2. the results indicate that age and education level are not associated with anemia status among adolescent girls. It appears that more girls aged 12–13 were not anemic than were anemic,



with 54 and 16 cases, respectively. Among respondents with a higher level of education, more were not anemic, totaling 58 individuals.

Discussion

Univariate Analysis

Age

Age is the length of a person's life from birth to the present. According to the WHO in 2018, adolescence ranges from 10 to 19 years of age. This age group falls within early adolescence, a period characterized by various physical and psychosocial changes as part of the growth and development process. These changes include rapid physical growth, the development of reproductive organs, and emotional and behavioral changes that influence thought patterns and decision-making. In this study, the respondents' ages ranged from 12 to 14 years (WHO, 2018). This age range is a critical period in the formation of health behaviors and habits because, during this phase, adolescents begin to develop the ability to think more abstractly and start building independence in making choices related to health and lifestyle. As shown in Table 1, the proportion of respondents aged 12–13 years (93.3%) was higher than that of 14-year-olds. This age group is particularly vulnerable to various diseases, one of which is anemia. The incidence of this disease increases among early adolescents due to rising iron requirements. Therefore, the 12–14 age group is a critical period for preventing anemia, as health status during this time significantly impacts their growth and development.

Anemia Status

Anemia is a condition in which a person's hemoglobin (Hb) level is below normal. The normal range for hemoglobin or red blood cell levels in adolescent girls is 12.0 mg/dL (WHO, 2018). The most common status among respondents was non-anemia, at 77.3%. Several studies suggest that anemia is more common among early adolescents. However, not all adolescents in this age group have anemia. This is likely due to a balanced daily nutrient intake, the adoption of a healthy lifestyle, and balanced physiological processes (Proverawati. A and Misaroh, 2009).

Bivariate Analysis

The relationship between age and anemia status

The results of the chi-square test indicate that age is not associated with anemia status in adolescent girls, with a p-value of 0.883. These findings are supported by Erdianti, N, et al., 2024, who reported similar results. The respondents in this study were adolescent girls living in Islamic boarding schools, where daily meals are provided and are sufficiently nutritious. This is likely why a higher proportion of respondents were not anemic. In addition, the absence of such a relationship may be due to the relatively homogeneous age range of the respondents, meaning that differences in iron requirements among age groups are not particularly evident.

Conclusion

Based on the results of the study, it can be concluded that the majority of respondents were aged 12–13 years, accounting for 93.3%. The majority of respondents were not anemic, accounting for 77.3%. The results of the chi-square test indicate that there is no association between age and anemia status.

Acknowledgments

I would like to express my sincere gratitude to the Institute for Research and Community Service (LPPM) of Ibrahimy University for facilitating and supporting the implementation of this research



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