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## The Effect of Leaflet-Based Health Education on Adolescent Girls Knowledge of Anemia Prevention

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### ABSTRACT

Anemia is a condition characterized by hemoglobin (Hb) levels below the normal range. It remains a prevalent public health problem among adolescent girls in developing countries. This study aimed to analyze the effect of health education using leaflets on adolescent girls' knowledge of anemia prevention. The method use is a quasi-experimental one-group pretest-posttest design was conducted among 69 female students at SMAN 1 Polewali Mandar using a validated questionnaire. Data were analyzed using the Wilcoxon Signed Rank Test. Results showed a significant increase in knowledge scores from 39.13 to 91.74 ( $p<0.001$ ). The study concludes that leaflet-based health education effectively improves anemia prevention knowledge among adolescent girls

## INTRODUCTION

Anemia is defined as a condition in which hemoglobin (Hb) levels fall below the normal range (Ernawati et al., 2021). Anemia in adolescent girls is a very common health problem in developing countries. According to the 2023 Indonesian Health Survey, the prevalence of anemia in Indonesia is 16.2%, with the prevalence in women being 18% higher than in men (Kemenkes.RI, 2023). Based on data from the Polewali Mandar District Health Office, in 2023 the rate of anemia in adolescent girls reached 45.8% of 5,919 female students and in 2024 it reached 32.9% of a total of 6,454 female students. The main factor causing anemia in adolescent girls is iron deficiency in the body which occurs due to monthly menstrual bleeding which reduces iron reserves in the body and hemoglobin production (Anggorodiputro et al., 2025).

Poor dietary habits often result in insufficient nutrient intake (Angelina et al., 2025). Because anemia is often caused by iron deficiency due to inadequate nutritional intake, health education from adolescence is very important to develop healthy eating habits and awareness of the importance of iron for the body (Maulina et al., 2025).

Lack of knowledge about how to prevent anemia and the importance of iron in the body often prevents them from participating in anemia prevention programs such as taking iron tablets (Fe), counseling at school and regular health checks (Sari, 2024).

Therefore, providing health education through appropriate media, such as leaflets, is considered an effective strategy (Nurfadila et al., 2024). Leaflets

have the advantage of being able to present information concisely, clearly, and easily understood by adolescent girls. They can be reread at any time, thus strengthening understanding and recalling the material presented (Rahmi, 2023). Education related to anemia prevention is needed to increase knowledge, especially among adolescent girls, and to increase awareness of the need to frequently consume iron-rich foods (Maulina et al., 2025). However, limited studies have examined the effectiveness of leaflet-based health education specifically among senior high school students in Polewali Mandar District, creating a gap that this study aims to address.

The results of the study indicate that providing health education on anemia prevention not only increases knowledge but also impacts healthy lifestyles in adolescent girls (Sari, 2024). Several previous studies have primarily used lecture methods, while print media such as leaflets have shown varying results, such as their potential to promote health in sustainable anemia prevention efforts. Therefore, this study aims to analyze the effect of health education using leaflets on the level of knowledge about anemia prevention in adolescent girls. This research is expected to contribute to reducing the prevalence of anemia at SMAN 1 Polewali Mandar.

## METHODS

The research method used is quantitative with a quasi-experimental research design with a one-group pretest-posttest design. This research was conducted at SMAN 1 Polewali Mandar from July to September 2025. The population of this study was 109 female students in grade XI with a sample size of 69 people. The sampling technique used

purposive sampling. This research was conducted by providing health education using leaflets regarding the definition of anemia, the impact and prevention of anemia during menstruation, and the dangers of nutritional deficiencies. Before the health education was provided, the researcher conducted a pretest to determine the level of knowledge of the respondents. After that, health education was provided on anemia prevention, after the material and leaflets were given to the respondents, a posttest was conducted to determine the level of knowledge.

The instrument used in this study was a questionnaire on anemia prevention knowledge that had been tested for validity and reliability. Completing the questionnaire, namely, correct answer are the worth point and wrong answer are worth zero points, and the maximum total score is 10 with a total 10 knowledge questions in the knowledge categories is 5 to 10 is good and <5 is less. The questionnaire was administered before and after the health education intervention using leaflets. Data

were analyzed using the Wilcoxon Signed Rank Test.

## RESULTS AND DISCUSSION

### Results

Table 1. Respondent Characteristics Based on Age in Adolescent Girls

Characteristics	Frequency (f)	Percentage (%)
<b>Age</b>		
17 years	4	5.79
16 years	62	89.8
15 years	3	4.3
<b>Total</b>	<b>69</b>	<b>100</b>

Source: Primary Data (2025)

Based on table 1. The results obtained show that the characteristics of the respondents include the age category of 17 years as many as 4 people (5.79%), age 16 years as many as 62 people (89.8%), and age 15 years as many as 3 people (4.3%).

Table 2. Analysis of Knowledge Level Before and After Providing Health Education Using Leaflets

Variables	Mean ( SD)	Median (Min-Max)	P-Value
Pre-test	39.13 (5.62)	30 (60)	0,001
Post test	91.74 (8.03)	70 (100)	

Based on Table 2, the knowledge score or mean pretest was 39.13, while the posttest score was 91.74, with a *P-Value* of 0.001 ( $p<0.05$ ). This indicates a significant difference between respondents' knowledge levels before and after receiving health education using leaflets.

### Discussion

#### Level of Knowledge Before Health Education Intervention with Leaflet Media

The results of the study showed that adolescent girls' knowledge of anemia prevention before the health education intervention averaged 39.13% out of 100%, indicating low levels of knowledge. This low level of knowledge before the

intervention may be due to a lack of exposure to specific health information about anemia among adolescent girls.

Although anemia is a common health problem among adolescent girls, the health information they receive is often general and poorly communicated (Rosidah, 2024). Many adolescent girls consider symptoms such as fatigue, dizziness, or weakness to be normal, without realizing that these can be signs of

anemia. If adolescent girls do not receive specific education about anemia from schools or health professionals, their knowledge tends to be limited (Angelina et al., 2025).

This aligns with research (Sari, 2024) that states that health education about anemia is crucial because it provides adolescent girls with additional information on how to prevent anemia. Educational media is essentially any tool that can be used to effectively convey messages or information to recipients (Lestari et al., 2024).

#### Level of Knowledge After Health Education Intervention with Leaflet Media

The results of the study showed that the average level of knowledge of adolescent girls regarding anemia prevention after the health education intervention was 91.74% out of 100%, indicating an increase in knowledge compared to before the intervention. This increase indicates that health education using leaflets is effective in conveying information about anemia prevention.

Simple, easy-to-understand, and reread information in leaflets strengthens adolescent girls' understanding. This improvement can be influenced by repeated exposure to information, the girls' interest in learning, engaging delivery methods, and support from the school environment that encourages students to understand the material (Anggorodiputro et al., 2025). Practically, these results demonstrate that health education using leaflets can be an effective promotional strategy in anemia prevention programs for adolescent girls. Increasing knowledge is an important first step in developing sustainable attitudes and behaviors for anemia prevention.

#### Analysis of the Influence of Health Education with Leaflets on the Level of Knowledge of Anemia Prevention

The results of the study show that there is a significant influence health education using leaflets to increase knowledge of adolescent girls regarding anemia prevention. Before the intervention, most respondents had low to moderate levels of knowledge, but after being given health education through leaflets, there was a significant increase in knowledge. This is evidenced by the results of the Wilcoxon test which showed a p value of 0.001 ( $p < 0.05$ ), so it can be concluded that there is a significant difference between knowledge scores before and after the intervention.

The increase in knowledge scores after health education indicates that leaflets are an effective educational medium in improving adolescent girls' understanding of anemia. Leaflets present information concisely, systematically, and are equipped with attractive images, making it easier for respondents to understand the material. In addition, leaflets can be read repeatedly, thus helping to strengthen memory and understanding of the information provided by (Mulansari et al., 2024). The results of this study are in line with research (Hadina et al., 2022) which shows the effect of education using leaflets on increasing adolescent girls' knowledge about preventing anemia during menstruation at SMPN 19 Palu. Study (Soraya et al., 2025) showed that educational interventions using leaflets and posters for adolescent girls at adolescent with good knowledge category from 22% to 65% after education ( $p < 0.01$ ). However, the absence of a control group limits causal inference, and future studies should employ randomized controlled designs.

Adolescent girls are a vulnerable group for anemia due to blood loss during menstruation, increased iron requirements during growth, and often unbalanced diets.

Lack of knowledge about the importance of consuming iron-rich foods and iron-fortified tablets can increase the risk of anemia. Therefore, health education interventions are a crucial step in increasing awareness and understanding of anemia prevention among adolescent girls (Rosidah, 2024). The significant increase in knowledge after the intervention indicates that leaflets contribute positively to efforts to improve adolescent health literacy.

## CONCLUSION AND RECOMMENDATIONS

This study proves that health education using leaflets significantly influences the level of knowledge of anemia prevention in adolescent girls. The intervention provided was able to overcome the information gap that was previously still found in the majority of respondents, especially regarding understanding the causes of anemia, long-term impacts, iron needs during menstruation, and the importance of consuming iron tablets.

More than just cognitive enhancement, this activity builds awareness and readiness of adolescents to implement anemia prevention behavior independently, thus contributing to promotive and preventive efforts in improving the health quality of adolescent girls as future generations of mothers.

### Suggestion

Future research is recommended strengthening the School Health Program (UKS) Anemia prevention materials can be included in the routine health education agenda in the UKS, including monitoring iron supplement tablet (TTD) consumption and providing anemia information corners in schools.

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