

The Effectiveness of Booklet Media on Knowledge About Anemia Among Adolescent Girls at Junior High School in Bandar Lampung

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Abstract

Anemia is a common health problem among adolescent girls, often caused by a lack of knowledge regarding its causes, symptoms, and prevention methods. Therefore, appropriate educational efforts are needed to improve awareness and understanding of anemia among teenagers. Booklets are considered an effective and accessible educational medium, particularly for adolescent groups. This study aimed to determine the effectiveness of booklet media in increasing knowledge about anemia among female students at SMP Negeri 14 Bandar Lampung. This study used a quantitative approach with a one-group pretest–posttest design. A total of 230 students were selected using Slovin’s formula. Data were collected using a 25-item questionnaire administered before and after the booklet intervention. Because the data were not normally distributed, analysis was conducted using the Wilcoxon Signed Rank Test. The mean pretest score was 42.52 and increased significantly to 98.99 in the posttest. The Wilcoxon test showed a significance value of $p < 0.05$ ($p = 0.000$), indicating a statistically significant difference in knowledge before and after the booklet intervention. In conclusion, booklet media is proven to be effective in improving adolescent girls’ knowledge about anemia. It serves as an easily understood educational tool and can be utilized to support school-based health education programs.

Keywords: anemia, adolescent girls, health education, booklet media, knowledge

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Abstrak

Anemia merupakan masalah kesehatan yang umum terjadi pada remaja putri, yang sering disebabkan oleh kurangnya pengetahuan mengenai penyebab, gejala, dan cara pencegahannya. Oleh karena itu, diperlukan upaya edukasi yang tepat untuk meningkatkan kesadaran dan pemahaman remaja tentang anemia. Media booklet dinilai sebagai sarana edukasi yang efektif dan mudah diakses, khususnya bagi kelompok usia remaja. Penelitian ini bertujuan untuk mengetahui efektivitas media booklet dalam meningkatkan pengetahuan tentang anemia pada siswi SMP Negeri 14 Bandar Lampung. Penelitian ini menggunakan pendekatan kuantitatif dengan desain one-group pretest–posttest. Sampel berjumlah 230 siswi yang dipilih menggunakan rumus Slovin. Data dikumpulkan melalui kuesioner berisi 25 pertanyaan yang diberikan sebelum dan sesudah intervensi booklet. Karena data tidak berdistribusi normal, analisis dilakukan menggunakan uji Wilcoxon Signed Rank Test. Hasil menunjukkan nilai rata-rata pretest sebesar 42,52 yang meningkat secara signifikan menjadi 98,99 pada posttest. Uji Wilcoxon menunjukkan nilai signifikansi $p = 0,000$ ($< 0,05$), yang menandakan adanya perbedaan bermakna antara pengetahuan sebelum dan sesudah pemberian booklet. Disimpulkan bahwa media booklet terbukti efektif dalam meningkatkan pengetahuan remaja putri tentang anemia. Media ini dapat digunakan sebagai sarana edukasi yang mudah dipahami dan mendukung program kesehatan berbasis sekolah.

Kata kunci: anemia, remaja putri, edukasi kesehatan, media booklet, pengetahuan

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INTRODUCTION

Anemia is a global health issue that demands serious attention, particularly in Indonesia. It is a condition in which the number of red blood cells or the hemoglobin level falls below the normal threshold. Women and children are the primary populations affected. Factors contributing to anemia include iron deficiency, poor nutrition, infections,

chronic illnesses, heavy menstruation, pregnancy complications, and genetic predisposition (WHO, 2023). In 2019, anemia affected 30% (539 million) of non-pregnant women and 37% (32 million) of pregnant women aged 15–49 years. Africa and Southeast Asia are the most affected regions, with approximately 106 million women and 103 million children in Africa, and 244 million women and 83 million

children in Southeast Asia suffering from anemia (WHO, 2023).

The prevalence of anemia in Indonesia is also considerably high. According to the Indonesian Ministry of Health (2018), the prevalence among adolescents aged 15–24 years reached 32%, meaning that an estimated 3–4 out of every 10 adolescents suffer from anemia. Among adolescent girls, the prevalence is higher at 27.2% compared to 20.3% in boys, making them one of the most vulnerable groups to this condition (Astuti, 2023).

If left untreated, the high prevalence of anemia among adolescents can persist into adulthood and contribute significantly to maternal mortality, premature births, and low birth weight infants. Adolescent girls (locally referred to as *rematri*) are particularly vulnerable due to substantial blood loss during menstruation. This condition can pose serious risks during future pregnancies, potentially affecting fetal growth and development, and increasing the likelihood of complications during pregnancy and childbirth, including maternal and infant mortality (Dinkes Provinsi Lampung, 2022).

According to the Global School Health Survey (2015), 93.6% of adolescents consume insufficient amounts of fruits and vegetables and instead prefer instant foods. If this behavior continues, it may lead to long-term or degenerative diseases, including anemia. Research has identified menstruation-induced blood loss as a primary cause of anemia in adolescent girls due to reduced iron levels. Other contributing factors include limited

knowledge about anemia and unhealthy lifestyle habits, particularly those related to reproductive health (Risky Amalia et al., 2023).

Anemia among adolescents can be prevented through appropriate nutrition education using targeted educational media. This is essential for developing and implementing effective nutrition and health education programs in schools, such as integrating nutrition education into extracurricular activities and school health programs (UKS) (Khotimah et al., 2024). In health education, booklet media can serve as an informative tool that presents key issues and provides reference materials on anemia prevention, iron supplementation, and maternal–child health (MMR/NMR) (Yulianingsih et al., 2023). Booklets are particularly suitable for adolescent learners due to their concise language, ease of understanding, and visually engaging format, which make the content accessible and well received (Fajriyah, 2016).

Based on this background, it is essential to understand the factors associated with anemia, especially in relation to adolescents' knowledge. Therefore, this study aims to examine the effectiveness of booklet media in improving the knowledge of adolescent girls about anemia at SMP Negeri 14 Bandar Lampung, Kemiling District, Bandar Lampung City, Lampung Province.

METHODOLOGY

This study employed a quantitative approach using a pre-experimental design, specifically a one-group pretest–posttest model. This design was applied to measure

changes in respondents' knowledge levels before and after receiving an educational intervention in the form of booklet media. The study population consisted of all female students at SMP Negeri 14 Bandar Lampung, with a total sample of 230 respondents determined using Slovin's formula.

The research instrument was a questionnaire comprising 25 multiple-choice items that assessed basic knowledge about anemia, including its causes, symptoms, prevention, and management. The questionnaire was subjected to validity and reliability testing prior to data collection. Each respondent completed the questionnaire twice: once before and once after receiving the booklet intervention.

Data were analyzed using the Wilcoxon Signed Rank Test because the data were not normally distributed based on the Kolmogorov–Smirnov test. This analysis was conducted to determine differences in the average knowledge scores before and after the intervention.

RESULTS AND DISCUSSION

To describe the demographic characteristics of the respondents, their age distribution is presented in Table 1.

Table 1. Distribution of Respondents Based on Age

Age (years)	N	%
12	42	18.3
13	36	15.2
14	40	17.4
15	37	16.5
16	43	18.7
17	32	13.9
Total	230	100

As shown in Table 1, a total of 230 female students aged 12–17 years participated in this study. The largest proportion of respondents were 16 years old (18.7%), representing middle adolescence, a stage in which the risk of anemia increases due to the onset of regular menstruation. To further describe the academic background of the respondents, their class-level distribution is presented in Table 2.

Table 2. Distribution of Respondents Based on Class Level

Grade	N	%
7	78	34
8	77	33
9	75	33

As presented in Table 2, respondents were evenly distributed across grades 7 to 9, with the largest proportion from grade 7 (34%), indicating a balanced representation of all junior high school levels.

To evaluate the effect of the booklet intervention on students' knowledge levels, the comparison of pre-test and post-test scores is presented in Table 3.

Table 3. Effectiveness of Booklet Media on Knowledge About Anemia

Knowledge Level	Mean	Min–Max	p-value
Pre-test	42.52	16–72	0.000
Post-test	98.99	76–100	

The impact of anemia on adolescents is substantial and may reduce quality of life by decreasing concentration, causing fatigue, lowering immunity, and ultimately reducing academic performance and productivity. In the long term, anemia may impair reproductive health and increase the

risk of complications during future pregnancies. Other contributing factors include poor dietary habits, limited nutrition education, and low awareness of iron supplementation, particularly among adolescent girls.

As shown in Table 3, a substantial increase in knowledge scores was observed after the booklet intervention. The mean pre-test score was 42.52 (range: 16–72), indicating a low level of knowledge. After the intervention, the mean score increased markedly to 98.99 (range: 76–100), reflecting near-complete understanding. The Wilcoxon Signed Rank Test yielded a p-value of 0.000 (< 0.05), indicating a statistically significant difference in knowledge before and after the intervention.

Anemia is a common problem among adolescent girls, primarily due to iron deficiency. Adolescence is characterized by rapid physical development, which increases the body's demand for nutrients, especially iron. In addition, routine menstruation leads to regular blood and iron loss, thereby increasing the risk of anemia when dietary iron intake is insufficient. Therefore, anemia prevention efforts must involve education, improved balanced dietary intake, and support from schools and the broader community.

This study aimed to evaluate the effectiveness of booklet media in increasing anemia-related knowledge among female students at SMP Negeri 14 Bandar Lampung. The pre-intervention average score of 42.52 indicated that most students

had limited understanding. This was reflected in the low proportion of correct answers during the pretest, including identification of anemia symptoms (37.8%), recognition of high-risk groups (47.8%), and appropriate iron tablet consumption methods (30.9%). These findings suggest that anemia-related information had not been effectively communicated to adolescents, despite their vulnerability during puberty and menstruation.

Following the booklet intervention, post-test results demonstrated a marked improvement, with a mean score of 98.99 and more than 95% of respondents correctly answering all items. Even questions that had been poorly answered in the pretest showed dramatic improvement. This indicates that the booklet content was well understood. The improvement was evident not only in the mean scores but also in the overall distribution, confirming a general increase in knowledge among all respondents. The booklet was effective in delivering information in a clear, structured, and accessible manner for adolescents.

To statistically validate these findings, the Wilcoxon Signed Rank Test was applied because of the non-normal distribution of the data. The analysis produced a p-value of 0.000, confirming a significant difference in knowledge scores before and after the booklet intervention. Thus, it can be concluded that booklet media is effective in increasing knowledge about anemia among adolescents.

These results are consistent with the findings of Hutasoit (2023), who also

reported significant improvements in anemia knowledge among adolescent girls using booklet-based education ($p = 0.000$). The selection of appropriate educational media plays an important role in motivating student engagement. Effective and engaging media encourages students to actively participate in learning (Suzana & Haris, 2018). Booklets offer several advantages, including concise and systematic content, attractive design, portability, and reusability.

This study is further supported by research from Hutasoit et al. (2023), which found a significant improvement in knowledge after the use of booklets. Similar results were reported by Muwakhidah et al. (2021), who demonstrated that booklets were more effective than posters, leaflets, or counseling without media. The booklet used in this study was developed by the researcher and reviewed by experts from the midwifery department.

Several factors may have contributed to the effectiveness of the booklet in this study, including a supportive school environment (such as the presence of school health programs/UKS), the natural curiosity of adolescents, and the active involvement of students throughout the learning process through pretests, booklet-based learning, and post-tests, which maximized information retention.

However, this study has several limitations. It only measured short-term improvements in knowledge, and it remains unclear whether these improvements will be sustained over time or translated into behavioral change. Future

studies are recommended to examine the long-term effects of booklet interventions on attitudes and behaviors and to explore additional influencing factors, such as family support and nutritional status.

CONCLUSION

This study demonstrated a statistically significant difference in anemia-related knowledge among adolescent girls between the pre-test and post-test scores, with a p -value of 0.000. The findings indicate that booklet-based educational media is effective in improving students' understanding of anemia. Therefore, booklet media can be considered a practical and accessible health education tool to support school-based anemia prevention programs.

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