

Effect of Leaflet-Based Counseling on Knowledge and Attitudes Toward Iron Tablet Use Among Pregnant Women in West Aceh, Indonesia

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Abstract

The Indonesian government has implemented various efforts to reduce anemia among pregnant women, including the provision of 90 iron supplement tablets (Tablet Tambah Darah, TTD) during pregnancy. Counseling is one of the strategies used to improve maternal knowledge and awareness regarding the importance of iron tablet consumption. This study aimed to determine the effect of leaflet-based counseling on pregnant women's knowledge and attitudes toward iron tablet consumption at the Seuneubok Village Health Center, Johan Pahlawan Subdistrict, West Aceh Regency. This quantitative study employed a quasi-experimental design. A total sample of 23 pregnant women was selected using purposive sampling. The study was conducted in Seuneubok Village in October 2023. Knowledge and attitude data were collected using questionnaires, and data analysis was performed using a paired t-test. The average knowledge score increased by 9.0 points from pretest to posttest, while the average attitude score increased by 7.26 points. The results showed a significant difference in both knowledge and attitudes before and after the intervention ($p = 0.000$ for both outcomes). These findings indicate that counseling using leaflets effectively improves knowledge and attitudes regarding iron supplement tablet (TTD) consumption among pregnant women at the Seuneubok Village Health Center.

Keywords: attitude, counseling, iron supplement tablets (TTD), knowledge

Introduction

The nutritional status of pregnant women is an essential indicator of a community's overall health. When dietary intake during pregnancy does not meet physiological needs, nutritional deficiencies may occur, potentially leading to adverse health outcomes and even maternal mortality if left untreated (Aisyah et al., 2013). The Maternal Mortality Rate (MMR) is a key indicator of public health status. According to the World Health Organization (WHO), maternal mortality refers to the death of a woman during pregnancy or within 42 days after the termination of pregnancy, irrespective of its duration or location, from causes related to or aggravated by pregnancy but not from accidental or incidental causes. These deaths can result from direct or indirect obstetric causes, one of which is anemia. Anemia remains a major public health problem worldwide, particularly in developing countries (Nur Dewi Kartikasari, 2010).

Anemia is characterized by low hemoglobin (Hb) levels, impairing the blood's ability to transport oxygen. In pregnant women, anemia is defined as Hb levels below 11 g/dL. The prevalence of anemia among pregnant women in Indonesia remains high. Nationally, the 2013 Basic Health Research (Riskesdas) reported a prevalence of 37.1%, with similar rates in urban (36.4%) and rural (37.8%) areas. In Aceh, the 2018 provincial Riskesdas reported a prevalence of 12.84%, with the highest prevalence (36.93%) observed among women aged 15–19 years.

According to the 2023 Indonesian Health Survey, the highest prevalence of anemia among pregnant women (39.6%) was found in the 35–44 age group, indicating that approximately one-third of pregnant women continue to experience anemia.

Risk factors for anemia during pregnancy include inadequate iron intake, poor iron absorption due to the consumption of phytate- and phenol-rich foods, and low adherence to iron supplement consumption (Aditianti et al., 2020). The Indonesian government has introduced various anemia prevention programs, including the provision of 90 iron tablets (Tablet Tambah Darah, TTD) for pregnant women through community health centers and integrated health posts. However, compliance remains suboptimal, and many pregnant women fail to consume the recommended number of tablets (Ika, 2010).

Improving maternal knowledge, awareness, and attitudes regarding the importance of iron tablet consumption can be achieved through health education interventions such as counseling. Health counseling aims to increase awareness, understanding, and willingness to adopt recommended health behaviors (Puspitasari, 2013). The effectiveness of counseling is strongly influenced by the use of appropriate educational media. Visual media such as leaflets can enhance understanding by presenting information concisely, simply, and attractively. Leaflets can also be taken home and reread, allowing respondents to reinforce the information received (Ulfa, 2013).

Previous research by Purbowati (2016) found that counseling using flip charts and leaflets significantly increased compliance with iron tablet consumption, with compliance rates reaching 89.7% in the intervention group compared to 25.9% in the control group. In West Aceh, maternal and child mortality remains a concern. In 2024, two maternal deaths were recorded, one of which occurred in the Johan Pahlawan Subdistrict. This subdistrict also reported the highest number of child deaths ($n = 8$) (West Aceh Health Office, 2024). Within the Johan Pahlawan Community Health Center area, the Seuneubok Village integrated health post (Posyandu) continues to record cases of anemia among pregnant women. Although iron tablets are distributed monthly at the Posyandu, initial interviews revealed that no structured counseling is provided during distribution—pregnant women receive tablets but lack adequate information regarding dosage, benefits, and consequences of non-adherence. Given these conditions, this study aims to investigate the effect of leaflet-based counseling on the knowledge and attitudes of pregnant women toward iron tablet consumption at the Seuneubok Village Health Center, Johan Pahlawan District, West Aceh Regency.

Methods

This study employed a quasi-experimental design using a one-group pretest–posttest approach to assess the effect of leaflet-based counseling on pregnant women’s knowledge and attitudes regarding iron supplement consumption. The study was conducted at the Seuneubok Village Health Center in Johan Pahlawan District, West Aceh Regency, Aceh Province, over one month. A total of 23 pregnant women were selected using purposive sampling. Counseling sessions were delivered by health center nutritionists using leaflets as the primary educational medium, along with a question-and-answer method. Knowledge and attitude data were collected using structured questionnaires.

Pre-intervention knowledge was measured through interviews using a questionnaire

administered before counseling. Post-intervention knowledge was assessed using the same questionnaire after counseling and leaflet distribution. Similarly, pre-intervention attitudes were measured using a structured attitude questionnaire, and post-intervention attitudes were assessed after the counseling sessions.

The study was conducted in three stages:

1. **Preparation Stage:** Identification and recruitment of eligible pregnant women within the health center's service area who agreed to participate.
2. **Intervention Stage:** Counseling was provided twice—on Day 1 and Day 8—using leaflets that contained information on iron supplements.
3. **Posttest Stage:** On Day 12, posttest interviews were conducted using the same knowledge and attitude questionnaires to assess changes following the intervention.

Results

Sample Characteristics

Table 1. Characteristics of respondents by age, occupation, and education

Characteristics	n	%
Age		
19–29 years	10	43.5
30–49 years	13	56.5
Occupation		
Housewife	20	87.0
Entrepreneur	1	4.3
Civil servant	2	8.7
Education		
High school	21	91.3
Bachelor's degree	2	8.7

Table 1 describes the demographic characteristics of the 23 pregnant women who participated in the study. The majority of respondents were in the 30–49-year age group (56.5%), indicating that most participants were in the mature reproductive age range. In terms of occupation, a large proportion of the respondents were housewives (87%), suggesting that they were likely to have more time available for counseling sessions compared to those who were employed. Regarding educational background, most respondents had completed high school (91.3%), which may suggest a relatively adequate level of literacy for understanding health information delivered through leaflets. Only a small proportion (8.7%) held a bachelor's degree. These characteristics provide an overview of the population to whom the counseling intervention was delivered.

Average Knowledge Before and After Counseling

Table 2 shows a notable increase in the respondents' knowledge regarding iron supplement tablets following the counseling intervention. Before counseling, the mean knowledge score was 8.3 (SD = 2.79), indicating limited understanding of iron supplementation among the participants. After counseling using leaflets, the mean score increased substantially

to 17.3 (SD = 1.84), with a mean difference of 9.0 points. This substantial improvement demonstrates that the counseling intervention, supported by leaflet media, was effective in improving participants' cognitive understanding related to iron supplement benefits, dosage, and importance during pregnancy. The reduction in standard deviation after the intervention also suggests more uniform understanding among respondents.

Table 2. Mean knowledge scores before and after counseling

Knowledge about Iron Supplement Tablets	n	Mean	SD	Difference
Before counselling	23	8.3	2.79	9.0
After counselling	23	17.3	1.84	

Average Attitudes Before and After Counseling

Table 3 illustrates changes in the respondents' attitudes toward iron tablet consumption. Before receiving counseling, the mean attitude score was 73.17 (SD = 5.2), indicating a moderate level of positive attitude toward iron supplementation. After counseling and the distribution of leaflets, the mean attitude score increased to 80.43 (SD = 4.1), with a mean difference of 7.26 points. This improvement suggests that the counseling intervention not only enhanced knowledge but also contributed to shaping more favorable attitudes toward the importance of adhering to iron supplementation during pregnancy. Although the increase in attitude scores was smaller compared to knowledge scores, it still reflects meaningful behavioral impact toward compliance.

Table 3. Mean attitude scores before and after counseling

Attitudes about Iron Supplement Tablets	n	Mean	SD	Difference
Before counselling	23	73.17	5.2	7.26
After counselling	23	80.43	4.1	

Effect of Counseling Using Leaflets on Knowledge

A paired *t*-test was performed to assess the effect of counseling on knowledge. The mean knowledge score increased significantly from 8.39 (SD = 2.79) before counseling to 17.3 (SD = 1.84) after counseling. The *p*-value of 0.000 indicates a statistically significant difference in knowledge before and after the intervention. This demonstrates that counseling using leaflets had a strong and positive effect on improving pregnant women's understanding of iron supplement tablets. The significant increase corresponds to the educational content delivered during the sessions and the effectiveness of leaflet media in reinforcing information.

Table 4. Effect of counseling on knowledge about iron tablets in pregnant women

Knowledge about Iron Supplement Tablets	n	Mean	SD	Difference	p-value	Statistical test
Before counseling	23	8.39	2.79	44.7	0.000	<i>t</i> -test
After counselling	23	17.3	1.84			

Effect of Counseling Using Leaflets on Attitudes

The Wilcoxon test was used to measure differences in attitude scores before and after counseling. Table 5 shows the results of the Wilcoxon test conducted to evaluate the effect of the counseling intervention on participants' attitudes. The mean attitude score increased from 73.17 (SD = 5.2) before counseling to 80.43 (SD = 4.1) after counseling, with a statistically significant p-value of 0.000. These findings indicate that counseling using leaflets had a meaningful impact on improving attitudes toward iron supplement consumption. While attitudes are generally more resistant to change compared to knowledge, the observed improvement highlights that the counseling sessions successfully influenced participants' perceptions, beliefs, and motivation to consume iron tablets as recommended.

Table 5. Effect of counseling on attitudes toward iron tablets in pregnant women

Attitudes about Iron Supplement Tablets	n	Mean	SD	Difference	P-value	Statistical test
Before counseling	23	73.17	5.2	7.26	0.000	Wilcoxon test
After counseling	23	80.43	4.1			

Discussion

The Effect of Counseling Using Leaflets on Knowledge About Iron Tablets Among Pregnant Women

Knowledge is formed through a learning process in which individuals acquire information through sensory experiences, particularly sight and hearing, which play dominant roles in shaping behavior. Health education interventions that utilize visual media have been shown to significantly improve knowledge by enhancing comprehension and information retention (World Health Organization [WHO], 2016; Glanz et al., 2015). Visual aids such as leaflets help translate complex health messages into easily understood information, making them effective tools in maternal nutrition education.

The findings of this study are consistent with these principles. Statistical analysis using a paired *t*-test showed a significant increase in pregnant women's knowledge before and after counseling ($p < 0.05$), indicating that leaflet-based counseling effectively improved understanding of iron tablet supplementation among pregnant women at the Seuneubok Village Health Center. Similar results were reported in a quasi-experimental study in Indonesia, which found that nutrition education using printed media significantly increased knowledge about iron supplementation among women of reproductive age (Nurhayati et al., 2020).

Several previous studies support these findings. A study by Risonar et al. (2019) demonstrated that health education using leaflets significantly improved adolescent girls' knowledge of iron deficiency anemia prevention. Likewise, a study conducted by Gebremedhin et al. (2018) reported that nutrition counseling significantly increased pregnant women's awareness and correct use of iron-folic acid tablets.

Before counseling, many pregnant women lacked knowledge regarding the recommended dosage of iron tablets and dietary sources of iron. After counseling sessions on days 1 and 8, followed by a post-test on day 12, a significant improvement in knowledge was

observed. Educational background played an important role, as individuals with higher educational attainment tend to process and apply health information more effectively (Ministry of Health of the Republic of Indonesia [MoH RI], 2018). Employment status may also influence knowledge acquisition, as socially active individuals are more likely to be exposed to health information through interpersonal communication and media (Glanz et al., 2015).

Health counseling remains a key strategy for improving nutrition-related knowledge among pregnant women. Evidence shows that structured educational interventions can increase awareness and motivation to follow nutrition recommendations (WHO, 2016). Leaflets, as simple visual media, enhance learning by combining concise text with illustrations that can be reviewed repeatedly, thereby reinforcing understanding (Kemenkes RI, 2020; McKenzie et al., 2017). Therefore, counseling using leaflets is a relevant, effective, and practical approach to increasing pregnant women's knowledge about iron tablet supplementation.

The Effect of Counseling Using Leaflets on Attitudes Toward Iron Supplements Among Pregnant Women

The results of this study showed a significant improvement in attitudes toward iron tablet consumption before and after leaflet-based counseling ($p < 0.05$, Wilcoxon test). This indicates that counseling interventions using visual media are effective in shaping positive attitudes among pregnant women. According to behavioral health theory, attitude change is closely linked to increased knowledge and understanding, as described in the Knowledge–Attitude–Practice (KAP) framework (Glanz et al., 2015).

These findings align with previous studies demonstrating that nutrition education using leaflets significantly improves pregnant women's attitudes toward iron supplementation adherence (Titaley et al., 2019; Nurhayati et al., 2020). Adequate knowledge enables individuals to perceive health risks more accurately and develop favorable attitudes toward preventive behaviors, including regular iron tablet consumption (WHO, 2016).

Prior to counseling, many pregnant women underestimated the importance of iron tablets and reported consuming tea, coffee, or milk close to tablet intake—practices known to inhibit iron absorption. Following counseling sessions on days 1 and 8, and evaluation on day 12, improvements in attitudes were evident. This highlights the importance of continuous nutrition education at the primary healthcare level, particularly in rural settings where misconceptions remain common.

Visual media such as leaflets help address these gaps by providing clear, consistent messages that can be read repeatedly at home. Research shows that visual educational materials significantly improve message retention and support attitude change in maternal health programs (McKenzie et al., 2017; Kemenkes RI, 2020). Leaflets are especially suitable for pregnant women because they are portable, concise, and easy to understand.

Recent evidence further confirms that printed visual media contribute to positive behavioral intentions and improved compliance with daily iron supplementation (Titaley et al., 2019; WHO, 2016). Therefore, counseling using leaflets is an effective intervention not only for improving knowledge but also for fostering positive attitudes toward iron tablet consumption among pregnant women.

Conclusion

The average knowledge score regarding iron supplement tablets (TTD) increased from 8.39 before counseling to 17.30 after counseling, with an improvement of 9.0 points. The average attitude score also increased from 73.17 before counseling to 80.43 after counseling, showing a difference of 7.26 points. Statistical analysis demonstrated a significant effect of counseling using leaflets on both knowledge and attitudes of pregnant women toward iron supplement tablets, with p-values of 0.000 for both outcomes. These findings indicate that counseling supported by leaflet media is effective in improving pregnant women's understanding and attitudes toward iron supplementation at the Seuneubok Village Health Center, Johan Pahlawan District, West Aceh Regency.

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