



The Effect of Leaflet Education on Pregnant Women's Compliance in Consuming Blood Influence Tablets at Pujon Batu Public Health Center

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Abstract. Iron deficiency anemia is a significant public health problem in pregnant women, because it can cause maternal and fetal complications. Compliance with iron tablet consumption is often low due to limited knowledge, side effects, and cultural misconceptions. Leaflet-based education is a low-cost intervention that has the potential to improve understanding and compliance. This study aims to analyze the effect of leaflet education on the adherence of iron tablet consumption in pregnant women at the Pujon Health Center, Batu. The research design used a quasi-experiment with a pretest-posttest control group design. A total of 40 pregnant women were divided into an intervention group (n = 20) that received leaflet education and a control group (n = 20) that received standard counseling. Compliance was measured over four weeks through self-consumption records and tablet count calculations, while knowledge was assessed with a structured questionnaire. Data analysis used the Chi-square test with a significance level of $p < 0.05$. Results showed a significant improvement in adherence in the intervention group, with 70% of pregnant women complying compared to 15% in the control group ($p = 0.001$). Leaflet education also increased knowledge scores and consistency of iron tablet consumption. The conclusion of this study confirms that leaflet education is effective in increasing iron supplementation adherence, so it is recommended to be integrated into routine antenatal services to prevent anemia and support maternal and fetal health.

Keywords: Iron Supplementation; Leaflet Education; Maternal Compliance; Pregnant Women; Public Health

1. INTRODUCTION

Iron deficiency anemia is one of the most common nutritional disorders affecting pregnant women worldwide. It can have serious consequences for both maternal and fetal health, including increased risk of maternal mortality, preterm birth, and low birth weight (WHO, 2021).

In Indonesia, anemia remains a significant public health problem among pregnant women, despite the implementation of national iron supplementation programs. The Ministry of Health reported that the prevalence of anemia in pregnant women reached 37.1% in 2022, indicating persistent challenges in achieving optimal maternal nutrition (Ministry of Health of Indonesia, 2023).

Iron supplementation through Tablet Tambah Darah (TTD) or iron tablets is a proven intervention to prevent and treat anemia during pregnancy. However, compliance with daily or routine consumption of iron tablets remains suboptimal in many communities (Haider et al., 2013).

Pregnant women often fail to adhere to iron supplementation due to factors such as lack of knowledge about anemia, side effects of tablets, forgetfulness, and cultural misconceptions regarding supplementation (Balarajan et al., 2011).

Knowledge about anemia and the benefits of iron intake is crucial to improving compliance. Pregnant women with sufficient understanding of the importance of iron supplementation are more likely to take the tablets regularly and consistently (Kavle & Landry, 2018).

Health education has been recognized as an effective strategy to enhance maternal knowledge and adherence to recommended health behaviors. Educational interventions delivered during antenatal care can influence perceptions, attitudes, and practices related to iron tablet consumption (Finkelstein et al., 2017).

Among educational tools, leaflets are commonly used to convey structured, concise, and visually engaging health messages. Leaflets can reinforce verbal counseling and serve as a reference that pregnant women can revisit at home (Houts et al., 2006).

Despite the widespread distribution of leaflets in health facilities, the actual impact of these materials on pregnant women's adherence to iron supplementation varies and depends on clarity, readability, and relevance of content (Nutbeam, 2000).

At Pujon Public Health Center, preliminary observations indicate that many pregnant women still do not consume iron tablets as recommended, despite routine counseling during antenatal visits. This phenomenon suggests a gap between health education delivery and actual behavioral change.

The persistence of low compliance may be attributed to insufficient understanding of anemia, the benefits of iron tablets, and the consequences of non-adherence. Pregnant women may not fully comprehend or retain verbal instructions provided by health workers.

Previous studies on iron supplementation in Indonesia have often focused on distribution coverage, biochemical indicators, or general compliance rates, with limited emphasis on the effectiveness of specific educational tools, such as leaflets, in influencing maternal behavior.

This lack of targeted research constitutes a critical gap. Evaluating the role of leaflets in improving compliance can provide evidence to refine educational strategies and enhance the effectiveness of anemia prevention programs.

Furthermore, most studies on health education interventions have been conducted in urban or high-resource settings. There is limited evidence regarding the utility of leaflets in semi-rural areas like Pujon, where literacy levels, cultural practices, and health-seeking behaviors may differ.

Addressing this research gap is essential to identify practical and low-cost strategies that can be implemented in community health centers to improve adherence to iron supplementation among pregnant women.

Integrating leaflet-based education into routine antenatal care at Pujon Public Health Center has the potential to increase maternal knowledge, correct misconceptions, and encourage consistent consumption of iron tablets, ultimately reducing the prevalence of maternal anemia.

Therefore, this study aims to examine the effect of leaflet education on pregnant women's compliance with iron tablet consumption at Pujon Public Health Center, providing evidence to guide community-based educational interventions and support maternal and fetal health.

2. RESEARCH METHOD

This study employed a quantitative approach with an analytical observational design using a quasi-experimental pretest-posttest control group method. The study aimed to examine the effect of leaflet education on pregnant women's adherence to iron tablet consumption. Data collection was conducted at Pujon Public Health Center, Batu, during the designated study period.

The study population included all pregnant women attending antenatal care at Pujon Public Health Center. A total of 40 respondents were selected using a purposive sampling technique, with 20 mothers in the intervention group (receiving leaflet education) and 20 in the control group (receiving standard counseling only). Inclusion criteria required respondents to be pregnant, willing to participate, and without chronic illnesses that could interfere with iron supplementation. Mothers with severe anemia or complications were excluded.

Leaflet education was provided as a structured intervention, containing concise information on anemia, benefits of iron tablet consumption, potential side effects, and recommended daily intake. Health workers delivered the leaflets during antenatal visits, accompanied by brief verbal explanations to reinforce comprehension. The control group received routine verbal counseling without the leaflet.

Compliance with iron tablet consumption was assessed over a four-week period using self-reported intake records and tablet count verification at follow-up visits. Compliance was classified as "compliant" if $\geq 90\%$ of the prescribed tablets were consumed, and "non-compliant" if $< 90\%$ were consumed. Mothers' knowledge about iron supplementation was also measured using a validated structured questionnaire.

Data analysis was performed using SPSS statistical software. Descriptive statistics summarized respondents' characteristics and compliance rates, while inferential analysis was conducted using the chi-square test to examine the relationship between leaflet education and adherence. A significance level of $p < 0.05$ was applied. Ethical approval was obtained from the relevant ethics committee, and informed consent was obtained from all participants before data collection.

3. RESULTS AND DISCUSSION

Table 1. Distribution of Respondents' Characteristics (General Data).

Variable	Category	Frequency (n)	Percentage (%)
Mother's Age	< 25 years	15	37.5
	25–35 years	18	45.0
	> 35 years	7	17.5
Education Level	Primary education	12	30.0
	Secondary education	18	45.0
	Higher education	10	25.0
Employment Status	Employed	14	35.0
	Unemployed	26	65.0
Parity	Primipara	20	50.0
	Multipara	20	50.0
Total		40	100

Interpretation:

Most respondents were aged 25–35 years (45%), had secondary education (45%), and were unemployed (65%). Parity was evenly distributed, indicating a balanced representation of first-time and experienced mothers.

Table 2. Distribution of Mothers' Knowledge About Iron Supplementation (Specific Data).

Knowledge Level	Frequency (n)	Percentage (%)
Good	14	35.0
Moderate	16	40.0
Poor	10	25.0
Total	40	100

Interpretation:

The majority of mothers had moderate knowledge regarding iron tablet supplementation. A quarter of respondents still had poor knowledge, highlighting the need for effective educational interventions.

Table 3. Distribution of Compliance with Iron Tablet Consumption.

Compliance	Frequency (n)	Percentage (%)
Compliant ($\geq 90\%$ tablets)	17	42.5
Non-compliant ($< 90\%$ tablets)	23	57.5
Total	40	100

Interpretation:

More than half of the pregnant women were non-compliant with iron tablet consumption, showing a gap between provision of tablets and actual adherence.

Table 4. Relationship Between Leaflet Education and Compliance.

Leaflet Education	Compliant	Non-Compliant	Total	p-value
Received	14	6	20	
Not Received	3	17	20	
Total	17	23	40	0.001

Interpretation:

Chi-square analysis indicated a significant relationship between receiving leaflet education and compliance with iron tablet consumption ($p = 0.001$). Mothers who received leaflet education were significantly more likely to consume iron tablets as recommended.

Discussion

The findings show that compliance with iron tablet consumption among pregnant women at Pujon Public Health Center remains a challenge, with more than half of participants failing to adhere to the recommended regimen.

Maternal age distribution indicated that most respondents were of reproductive age (25–35 years), a period considered optimal for pregnancy. Age alone, however, did not necessarily ensure sufficient compliance or knowledge about iron supplementation.

Educational background appeared to influence maternal knowledge and behavior. Mothers with secondary or higher education demonstrated better understanding of iron tablet benefits, consistent with previous studies linking education with improved maternal health practices.

Employment status analysis revealed that a majority of mothers were unemployed, which may increase available time for antenatal visits but does not automatically translate into adherence without proper guidance.

Parity was evenly split between primipara and multipara mothers. Experience alone did not guarantee compliance, highlighting that both first-time and experienced mothers may benefit from structured education on iron supplementation. Knowledge levels showed that only 35% of mothers had good understanding of iron tablet consumption, while 40% had moderate knowledge and 25% had poor knowledge. These results indicate a clear need for educational interventions. Compliance data revealed that 57.5% of mothers did not consume iron tablets according to recommended guidelines. This aligns with prior research indicating that knowledge gaps, forgetfulness, and perceived side effects reduce adherence.

Statistical analysis confirmed a significant positive effect of leaflet education on compliance. Mothers who received leaflets were more likely to take their iron tablets consistently compared to those who did not receive educational materials. This outcome supports the role of visual and written educational tools in enhancing understanding, retention, and motivation to follow recommended health behaviors during pregnancy. The findings suggest that leaflets complement verbal counseling during antenatal care, providing a tangible reference that mothers can consult at home, which helps reinforce knowledge and correct misconceptions. Despite routine health services, non-compliance remains substantial in the group that did not receive leaflets. This highlights the limitations of verbal counseling alone and the importance of multi-modal health education.

The findings of this study demonstrate that leaflet-based education had a significant effect on improving pregnant women's compliance with iron tablet consumption. Statistical analysis using SPSS showed a meaningful increase in compliance scores among respondents who received leaflet education, as evidenced by a significant p-value ($p < 0.05$). This result indicates that educational interventions using printed media can effectively influence maternal health behavior, particularly in promoting adherence to iron supplementation during pregnancy (Field, 2018).

Before the intervention, the majority of respondents demonstrated low to moderate compliance in consuming iron tablets, which is consistent with previous studies reporting poor adherence due to lack of knowledge, forgetfulness, side effects, and low perceived importance of iron supplementation (WHO, 2016). The baseline data reflect a common public health issue where pregnant women underestimate the risks of anemia during pregnancy.

After the leaflet education was implemented, a notable increase in compliance was observed. This improvement suggests that leaflets serve as an effective educational medium by providing concise, structured, and easily understandable information that can be repeatedly accessed by pregnant women at home. According to health education theory, repetition and visual reinforcement play a critical role in behavior change, particularly in adult learners (Notoatmodjo, 2018).

The significant difference between pre-test and post-test compliance scores in the intervention group supports the Health Belief Model, which emphasizes that increased knowledge and perceived benefits can motivate individuals to adopt healthier behaviors. The leaflet content likely enhanced mothers' understanding of anemia risks, benefits of iron tablets, and correct consumption practices, thereby strengthening their motivation to comply (Glanz, Rimer, & Viswanath, 2015).

In contrast, the control group, which received routine health information without structured leaflet education, showed minimal improvement in compliance. This finding reinforces evidence that passive or verbal-only education is often insufficient to produce sustained behavioral changes, especially in maternal nutrition practices (Darmawati et al., 2021).

The effectiveness of leaflet education in this study is also consistent with previous research conducted in primary healthcare settings, which found that printed educational media significantly improved adherence to iron tablet consumption among pregnant women (Sari et al., 2020). Leaflets are particularly suitable for use in Puskesmas due to their low cost, ease of distribution, and adaptability to local contexts.

Sociodemographic factors such as maternal age, education level, and parity may also influence compliance behavior. However, the significant post-intervention improvement suggests that leaflet education was effective across different respondent characteristics, indicating its broad applicability as a health promotion strategy (Polit & Beck, 2017).

From a public health perspective, improving compliance with iron supplementation is crucial in preventing anemia during pregnancy, which is associated with increased risks of maternal morbidity, preterm birth, and low birth weight. Therefore, the use of leaflet-based education can contribute to improved maternal and neonatal health outcomes at the community level (Kemenkes RI, 2022).

These results are consistent with prior studies showing that health education materials, particularly leaflets with clear, culturally appropriate messages, significantly improve adherence to preventive health behaviors. Overall, the study demonstrates that targeted leaflet

education is an effective strategy to improve pregnant women's compliance with iron supplementation, contributing to the prevention of maternal anemia and its associated risks for both mother and child.

4. CONCLUSION

This study concludes that leaflet education has a significant positive effect on pregnant women's compliance with iron tablet consumption at Pujon Public Health Center, Batu. Pregnant women who received leaflet-based education were more likely to adhere to the recommended iron supplementation regimen compared to those who did not receive educational materials. Despite routine antenatal care services, non-compliance remained prevalent among mothers who did not receive leaflets, highlighting the importance of structured and tangible educational interventions. These findings underscore the role of targeted health education in improving maternal knowledge, promoting adherence to preventive measures, and ultimately reducing the risk of anemia during pregnancy..

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