Original Article

The Impact of Counseling on Compliance with Iron Tablet Consumption Among Pregnant Women: A Pre-Experimental Study

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ARTICLE INFO

Article History
Submit : Oct 2, 2024
Accepted : Feb 29, 2025
Published : March 30, 2025

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Citation
Astuti, W. W., Asiyah, S., & Putri, E. R. . (2025). The Impact of Counseling on Compliance with Iron Tablet Consumption Among Pregnant Women: A Pre-Experimental Study. Journal of Applied Nursing and Health, 7(1), 14–22. https://doi.org/10.55018/janh.v7i1.267

ABSTRACT

Background: Prevention of anemia in pregnant women by government programs given 90 iron supplement tablets during pregnancy. Giving iron will increase levels of hemoglobin. Compliance with iron tablet consumption influences the incidence of anemia in pregnant women. The research aimed to determine the effect of counseling on compliance with consuming iron tablets at the Gampeng Community Health Center, Kediri Regency.

Methods: The research design used was a pre-experiment, a one-group pretest, and a post-test with a population of 52 pregnant women and a sample of 46 pregnant women obtained by the simple random sampling technique. The inclusion criteria were pregnant women who were willing to be respondents, pregnant women in the first and third trimesters, and pregnant women without complications such as emesis or hyperemesis. The pre-test was carried out before the intervention, and the intervention was given once for 60 minutes. A post-test was then carried out after 7 days to see compliance with the consumption of iron tablets.

Results: The Mc Nemar test was used for statistical analysis (α =0.05). The study results were obtained before the intervention; Most pregnant women (56.6%) were compliant with consuming iron tablets, and after the intervention, Almost all pregnant women (93.5%) were compliant with consuming iron tablets. Statistical results obtained a p-value of 0.000 (α = 0.05), which means that counseling affected compliance with iron tablets at the Gampeng Community Health Center, Kediri Regency.

Conclusion: The results indicated the impact of counseling on pregnant women consuming iron tablets. Improving the knowledge of pregnant women can enhance iron adherence tablet consumption. ANC visits should be optimized to provide health information (especially about the importance of taking iron tablets).

Keywords: Counseling, Iron Tablets, Pregnant Women

Implications for Practice :

- Integrate Regular Counseling into ANC Services, Counseling sessions should be routinely integrated into antenatal care (ANC) visits to improve pregnant women's understanding of the importance of iron supplementation and increase compliance.
- Enhance Health Education Strategies, Health centers should adopt structured, engaging education strategies during pregnancy to empower women with knowledge, helping them make informed decisions about their health and nutrition.
- Train Healthcare Providers in Effective Communication, Midwives and other ANC providers should be trained in effective counseling techniques to ensure that health messages about iron tablet adherence

are clearly conveyed and understood by pregnant women.

Introduction

Anemia in pregnancy is a public health problem in developing countries(Stephen et al., 2018). Significant factors influencing the occurrence of anemia in pregnancy are maternal age and nutrition(Endang Wahyuningsih et al., 2023). During pregnancy, anemia is a hemoglobin concentration below 11.0 g/dl(Mutoharoh & Indarjo, 2024). Pregnant women who experience anemia are at risk of complications both during pregnancy and during childbirth. Anemia increases the risk of maternal death, prematurity, low birth weight and perinatal death(Hernawati, 2022). During the postpartum period, wound healing can take a long time(Endang Wahyuningsih et al., 2023). One thing that influences the incidence of anemia is compliance with the consumption of iron tablets in pregnant women. In normal women without pregnancy, adequate iron intake can be met only from a healthy and balanced nutritional menu. However, iron requirements will increase in pregnant women, and if nutrition is inadequate, it can cause anemia. Therefore, according to the Ministry of Health's recommendations, pregnant women must be supplemented with iron/Fe tablets. Pregnant women must consume at least 90 Fe tablets with a dose of 60 mg(Fajrin, 2020). Iron supplementation is an effective way because its iron content is supplemented with folic acid which can prevent anemia due to folic acid deficiency. Iron is a mineral that functions to help the formation of red blood cells in the fetus and placenta(Sulaiman M.H, Flora R, Zulkarnain M, Yuliana I, 2022).

According to the World Health Organization (WHO), in 2023, it was reported that globally, the prevalence of anemia in pregnant women in Asia was 49.4%. In developing countries, there are around 40% of maternal deaths related to anemia in pregnancy. Based on research, the percentage of pregnant women who experience anemia is 48.9%, meaning 5 out of 10 pregnant women in Indonesia experience anemia (Talimbung, 2023).

Coverage of pregnant women in East Java who received 90 iron tablets was 88.9%. In Kediri Regency, the coverage of pregnant women who received iron tablets was 83.4%. Meanwhile, in the Gampeng Community Health Center working area, the coverage of pregnant women who received iron tablets reached 90.9%. However, not all pregnant women who receive iron tablets consume them regularly.

The accuracy of the frequency and number of tablets taken per day and the method of consumption can all be used to assess pregnant women's compliance with health service recommendations. Non-compliance of pregnant women in consuming iron supplements can increase the risk of anemia(Fransisca, 2022).

The regularity of consuming iron tablets is influenced by several factors, including knowledge of pregnant women, motivation and family support(Agit Permana et al., 2019).

Knowledge is an essential factor in forming a complete attitude. Good knowledge is also needed to form and create good attitudes and actions. Pregnant women who know iron (fe) tablets and the consequences of iron (fe) deficiency in pregnancy will realize the importance of consuming iron (FE) tablets and comply with the rules given by health workers(Hastanti, 2019).

Pregnant women who are obedient in consuming Fe tablets can be measured by the accuracy of the number of tablets consumed and how to consume iron tablets. Pregnant women who are obedient in

taking Fe tablets can be influenced by the good knowledge of pregnant women about Fe tablets. A high level of maternal knowledge can form a positive attitude toward compliance in taking Fe tablets; without knowledge about it, it is difficult for mothers to instill the habit of being obedient in taking Fe tablets(Fajrin, 2020).

Knowledge contributes to the role of decision-making and daily actions. The mother's knowledge will undoubtedly affect the nutrition and food consumption patterns to fulfill the nutritional needs during pregnancy, including foods that contain vitamins and iron because if there is a lack of iron during pregnancy for a relatively long time, it will cause anemia. Lack of knowledge about anemia hurts health behavior, especially when a woman is pregnant because expertise is essential in implementing lifestyle and fulfilling nutritional needs(Zuiatna, 2021).

Knowledge regarding anemia, iron deficiency, and Iron-Folat Acid (IFA) supplementation remains low among Pregnant women, and improved social support to minimize barriers to uptake and a better understanding of the severe implications of anemia has been suggested as a means of enhancing IFA compliance(Saville et al., 2022).

One of the efforts made to increase the regularity of iron tablet consumption is by providing health education or counseling to pregnant women so that they understand the importance of consuming blood supplement tablets and will consume them according to the instructions of health workers. Counseling is a series of professional guidance that aims to change an individual's knowledge, attitude, and behavior (Demilew et al., 2020).

Information obtained from health workers is expected to change behavior in accessing health services. One way to change behavior is by providing counseling. Information obtained from various sources will affect the level of compliance(Lombok & Tahun, 2024).

Based on this background, the researcher intends to research the effect of counseling on pregnant women's compliance to consume iron tablets at the Gampeng Community Health Center, Kediri.

Methods

Study Design

This research uses a pre-experimental method (pre-experimental design) using a one-group pretest-posttest design because observations are carried out through a pretest first. Treatment or intervention is given, and then a posttest is given to determine the changes that occur before and after treatment or intervention.

Participants

This research was conducted at Gampeng Community Health Center, Kediri. The population in this study were all pregnant women in the 1st and 3rd trimesters who visited the Gampeng Community Health Center in May, totaling 52 mothers. The sampling technique used was simple random sampling with the inclusion criteria of pregnant women in the 1st to 3rd trimester who did not experience pregnancy nausea, vomiting or hyperemia. The exclusion criteria are pregnant women who experience digestive disorders that are contraindicated with iron tablets and pregnant women who experience hyperemia. So, we got a sample size of 46 respondents.

Instrument

This research has two variables: the independent variable and the dependent variable. The independent variable in this research is counseling, and the dependent variable is pregnant women's compliance with iron tablets. The instrument in this

study used a questionnaire sheet containing general data on respondents and a daily checklist sheet for the regularity of iron tablet consumption adopted from the KIA book (Kemenkes, 2024).

Intervention

After getting respondents according to the criteria, 46 pregnant women were gathered at the Health Center and explained the research procedure. Respondents must be accompanied by their husbands or one of the closest family members who will later serve as PMO (Drug Supervisor). Before being given counseling, respondents filled out a questionnaire (pre-test) containing general data (age, education, work, pregnancy history, and participation in pregnant women's classes) and a questionnaire about the regularity of iron tablet consumption in the last 7 days (according to data in the KIA book).

Counseling was given afterward. Counseling was carried out within 60 minutes. Using PowerPoint media and leaflets. Compliance with iron tablet consumption was evaluated 7 days after counseling. Respondents filled out the post-test, and the researcher ensured that the questionnaire answers were based on the iron tablet consumption recapitulation table in the KIA book that had been filled out by the PMO (Drug Supervisor).

Data Analysis

Data analysis uses univariate and bivariate analysis to determine the influence between independent and dependent variables. The data presented as a table is then analyzed using the Mc Namer Test using SPSS 17. The hypothesis is that if the P value <α (0.05), Ho is rejected, which means there is an influence.

Ethical Consideration

This study obtained ethical approval from the Institute of Health Science Karya Husada Kediri, East Java, Indonesia, and informed consent was secured from all participants, ensuring confidentiality, voluntary participation, and the right to withdraw at any time without consequence.

Results

Table 1. Characteristics of respondents based on the pregnant woman's age, education, job, gravida status and participation of the pregnant woman class (n=46).

Characteristics of Respondents	Amount	Percentage (%)
Age		
< 20 years old	1	2.2
20-35 years old	41	89.1
>35 years old	4	8.7
Education		
Basic (Elementary and Junior High School)	29	63.1
Secondary (Senior High School)	17	36,9
High (College)	0	
Job		
Housewife	22	47.8
Private Employees	12	26.1

Characteristics of Respondents	Amount	Percentage (%)
Farmer	12	26.1
Government Employees	0	0
Gravida		
Primigravida	17	37
Multigravida	23	50
Grandemultigravida	6	13
Participation in the pregnant woman class		
Yes	46	100
No	0	0

Based on **Table 1,** it can be interpreted that almost All pregnant women at the Gampeng Community Health Center were aged 20-35 years (89.1%), the majority of respondents with elementary education (63.1%), almost half of the respondents were housewives (47.85), a half multigravida respondents (50%), and all respondents attended classes for pregnant women (100%).

Table 2. The influence of counseling on pregnant women's compliance in consuming iron tablets at the Gampeng Community Health Center

Providing Counseling	Compliance					
	Obedient	%	Disobedient	%	total	%
Before	26	56,5	20	43,5	46	100
After	43	93,5	3	6,5	46	100
Analysis results	P value =0,000< 0,05					

Based on **Table 2**, It can be explained that before the mother got an education about Fe consumption, most respondents complied (56.5%) and did not comply (43.5%). Meanwhile, almost all respondents complied (93.5%) and did not comply (6.5%). The analysis was carried out using McNamer to determine the effect of counseling on compliance with iron consumption in pregnant women at the Gampeng Community Health Center. The results were obtained p value = 0.000 < α = 0.05. So, it can be concluded that H1 is accepted
which means there is an influence of counseling on pregnant women on Compliance in consuming iron tablets.

Discussion

This study aims to determine the effect of counseling on pregnant women's compliance with consuming iron tablets. The results of the study showed that before being given counseling, most pregnant women were not compliant in consuming iron tablets routinely. According to government recommendations, pregnant women must consume iron tablets once a day, at least 90 tablets during pregnancy(Sari & Djannah, 2020).

Compliance is defined as a condition that is appropriate in behavior shown by

individuals by taking actions by instructions and the scope of time of use. One of the factors that influence compliance is education.

In terms of education, most of the respondents had basic education, namely Junior High School (63.1%). Low education causes low health awareness and a lack of ability to receive health information. This situation causes Pregnant women to be unable to meet nutritional needs during pregnancy, causing anemia during pregnancy. However, information about how to properly consume Fe tablets can be obtained from various media and sources(Lombok & Tahun, 2024).

Several previous studies have stated that Maternal Education is a strong factor for higher iron tablet supplementation coverage and better compliance. Women with higher education are more likely to receive and understand messages about anemia and iron tablet supplementation, understand the importance of adequate iron tablets, understand advice from health workers, study and read package labels, and are unaffected by perceived side effects(Billah et al., 2022).

Compliance from research respondents increased, with almost all respondents being compliant in consuming iron tablets after receiving information from counseling. Counseling is a form of change with directed involvement or planned change because the changes that occur are deliberate changes with the presence of outsiders or some members of the system acting as agents of change who intensively try to introduce new ideas to achieve goals that external institutions have determined. Counseling on compliance with iron tablet consumption carried out by health workers to pregnant women using conscious information communication to help pregnant women take the right actions impacts compliance in consuming iron tablets(Nurdin & Aritonang, 2019).

In line with Goodman's theory that counseling is very effective in the process of changing a person's behavior, in this case, pregnant women who consume iron tablets. When previously negative behavior becomes positive, it can increase pregnant women's compliance with consuming iron tablets during pregnancy(Goodman & Thompson, 2017). Education about the consumption of iron tablets aims to inform pregnant women about the benefits of consuming table iron. By providing this information, it is hoped that pregnant women will understand they consume iron tablets.

Based on the results of previous research, the reason for pregnant women's compliance in consuming iron tablets is after receiving advice and counseling from health workers regarding the importance of consuming iron tablets, the benefits of iron tablets and the various sound effects of consuming iron tablets(Nimwesiga et al., 2021).

The results of the analysis using the Mc Namer Test, it was found that p-value = 0.000 < α = 0.05. This shows that there is an influence of counseling on pregnant women on compliance in consuming iron tablets.

This is supported by a meta-analysis study that found that women with good knowledge of iron and foliate (IFA) supplementation are more likely to adhere to the suggested IFA supplementation than mothers with poor knowledge. Mothers with a good understanding of supplementation may have higher levels of education, may be more likely to receive information about IFA needs, and may understand educational messages delivered through various media. Beyond this, knowledgeable women may be more concerned about their health and pregnancy outcomes and are more likely to utilize maternal health services(Desta et al., 2019).

Counseling is education that is carried out using dissemination of the message to instill confidence so that you are aware, know and understand, but also willing and able to carry out related actions with health.

The importance of education about the consumption of iron tablets for pregnant women, which is carried out continuously, can increase knowledge and change attitudes regarding the issue of consuming iron tablets in pregnant mothers. A good change in attitude will encourage someone to display wise behavior when using or consuming iron tablets

Relevance to Clinical Practice

The findings of this study highlight the importance of integrating counseling into antenatal care (ANC) services to improve compliance with iron tablet consumption among pregnant women. By enhancing knowledge through targeted education, healthcare providers can effectively reduce the risk of anemia during pregnancy. This approach supports more effective clinical practices in maternal health, emphasizing the need for proactive communication and patient engagement during routine ANC visits.

Conclusion

This study concludes that counseling has a significant positive effect on pregnant women's compliance with consuming iron tablets. Before receiving counseling, most respondents were non-compliant due to factors such as low levels of education and limited health awareness. After counseling, most respondents demonstrated improved compliance, highlighting the effectiveness of targeted health education interventions. Education, particularly through counseling, is crucial in increasing knowledge, changing attitudes, and promoting positive health behaviors. Continuous and structured counseling from health workers empowers pregnant women with the necessary information to understand the importance, benefits, and correct usage of iron tablets, ultimately helping to prevent anemia during pregnancy and improve maternal health outcomes.

Authors Contributions

All three authors contributed meaningfully to the completion of this study. Author 1 was responsible for the conceptualization and design of the study, as well as drafting the initial manuscript. Author 2 conducted the data collection and analysis and contributed to interpreting the results. Author 3 provided critical revisions, refined the manuscript, and ensured the work's overall coherence and academic quality. All authors have read and approved the final version of the manuscript and agree to be accountable for all aspects of the research.

Conflicts of Interest

The authors declare no conflict of interest.

Acknowledgment

The authors would like to express their sincere gratitude to all the pregnant women who participated in this study. Special thanks are extended to the midwives and healthcare staff who supported the data collection process. The authors also appreciate the contributions of colleagues who provided valuable insights and encouragement throughout the research process.

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