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Analysis of Iron Supplement Tablet Consumption Achievement in Pregnant Women Based on Demographic Characteristics in Indonesia

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ABSTRACT

Anaemia in pregnant women is still a health problem in Indonesia and can increase the risk of pregnancy and childbirth complications. One of the efforts to prevent anaemia is a carried out through the problem of giving Iron Supplement Tablets to pregnant women. However, the achievement of Iron Supplement Tablets consumption in Indonesia is still not optimal. This study aims to analysis the achievement of Iron Supplement Tablet consumption in pregnant women based on demographic characteristics in Indonesia. The research uses a descriptive quantitative design with a document review using secondary data from the 2023 Indonesian Health Survey. The variables analysis included Iron Supplement Tablet based on age group, education level, occupation and region of residence. The data is analysis descriptively through a percentage distribution and presented in the form of a graph. The results showed that most pregnant women in almost demographic groups were still taking iron supplement tablets in the category of <90 tablets. The highest proportion of iron supplement tablet by age was found in the 45-49 age group at 96.2%, education in the non-school group at 93.9%, based on work in the still in school group at 87.4% and residential areas were higher in rural areas at 80.9%. The results of the study show that the achievement of iron supplement tablet consumption in pregnant women in Indonesia is still not optimal in various demographic groups. Therefore, it is necessary to strengthen health education, improve the quality of antenatal care (ANC) service, and monitor iron supplement consumption more intensively, especially in vulnerable groups to support efforts to prevent anaemia during pregnancy.

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1. INTRODUCTION

Pregnancy is a natural process experienced by every woman and is an important period because the mother acts as the main source of nutrients for the growth of the fetus in the womb. The nutrients received by the fetus come from the mother's food intake through the placenta so that nutritional needs during pregnancy must be met properly. If nutritional needs are not meet pregnant women are at risk of experiencing various health problems, one of which is anaemia (Mutoharoh & Indarjo, 2024). Anaemia in pregnant women is a condition when the level of hemoglobin (Hb) in the blood is below the normal limit, which is less than 11 g/dL. Anaemia can have an impact on both the mother and the fetus, both in the short and long term. Short-term impacts included decreased productivity, health, and physical resilience of pregnant women. Meanwhile, the long-term impact can increase the risk of bleeding during childbirth, premature birth, low birth weight, stunting and increase maternal and infant mortality rates (Kemenkes RI, 2023a).

The World Health Organization (WHO) reports that 37% of pregnant women worldwide suffer from anemia (World Health Organization, 2025). In Indonesia, this condition still remains a national health issue. In the 2026-2029 National Medium-Term Development Plan (RPJMN), the government has set a target of reducing the prevalence of anaemia among pregnant women to 20% (Menteri Kesehatan Republik Indonesia, 2025). However, the results of the 2023 Indonesian Health Survey (SKI) show that the prevalence of anaemia among pregnant women in Indonesia remains at 27.7% (Kemenkes RI, 2023b). Anaemia in pregnant women remains a health challenge that needs to be prioritized.

One government effort to prevent anaemia in pregnant women is through the Iron Supplement Tablet program (Kemenkes RI, 2023a). This program has been in place since 1990, with a recommended intake of at least 80 tablets during pregnancy (Kemenkes RI, 2014). In addition, the WHO also recommends that preganant women take iron and folic acid supplemenys at a daily dose of 30-60 mg of iron and 400 mcg (0.4 mg) of folic acid to prevent anemia, puerperal sepsis, low birth weight and premature birth (Noptriani & Simbolon, 2022). In the latest National Medium-Term Development Plan, the target for iron-folic acid supplement intake has been increased to at least 180 tablets during pregnancy as part of efforts to reduce anemia among pregnant women (Kemenkes RI, 2020; Menteri Kesehatan Republik Indonesia, 2025).

The iron supplement tablet program has indeed beein in place for a long time, but the uptake of iron supplement tablets among pregnant women is sitill not optimal. The 2023 Indonesian Health Survey found that there are various reasons why pregnant women do not take or do not complete their iron supplements during pregnancy, such as forgetting (27%), nauseas or vomiting during pregnancy (22.4%), side effects (12.7%), disliking the taste and smell of the tablets (12.2%), feeling that the supplements were unnecessary or ineffective (6%) and getting tired of taking iron supplements (10%). This situation indicates that adherence to iron supplementation among pregnant women remains a challenge in efforts to prevent anemia. Low rates of iron supplement consumption may be affected by various demographic characteristics of pregnant women, such as age, education, occupation, place of residence and economic status. These characteristics relate to knowledge, health behaviors, access to health services and pregnant women's adherence to taking iron supplements (Kemenkes RI, 2023b).

The analysis of iron supplement consumption based on demographic characteristics is important because each group of pregnant women has different social, economic, and educational conditions, as well as different access to health care. These differences can affect pregnant women's knowledge, health behaviors, and adherence to taking iron supplement during pregnancy. Indentifying the levels of iron supplement use based on demographic characteristics can help the government and health workers develop more targeted intervention strategies to improve adgerence to iron supplementation among pregnant women in Indonesia.

Previous research has shown that adherence to iron supplements is determined by various factors, such as education, employment, family support, health worker support and antenatal care (ANC) visits (Nasrin & Andriani, 2024; Yanti et al., 2022). Iron supplement adherence refers to a

pregnant woman's practice of taking iron supplements in the recommended dosage, manner and schedule to help prevent anemia during pregnancy (Hidayati et al., 2024). Lower hemoglobin levels or a lower red blood cell countt reduce the blood's ability to carry oxygen. If left untreated, this condition can increase the risk of pregnancy complications such as preeclampsia, bleeding during childbirth, and even Maternal Mortality (Dai, 2021). The achievement of iron intake is one of important indicators in efforts to prevent anemia in pregnant women. Therefore, the study was conducted to analyze the achievement of iron supplement tablet consumption among pregnant women based on demographic characteristics in Indonesia using data from the 2023 Indonesian Health Survey.

2. METHOD

This study used a descriptive quantitative research design with a document review approach. Data used is secondary data from the 2023 Indonesian Health Survey published by the Indonesia Ministry of Health. Population of study is all pregnant women included in the 2023 Indonesian Health Survey. The study uses aggregate data available in the survey results report. Variables in the study were the consumption of iron supplements by pregnant women, categorized as consumption of <90 tablets and ≥90 tablets during pregnancy. Demographic variables include age group, education level, occupation and region of residence. Data analysis was conducted descriptively by presenting the percentage distribution of TTD consumption based on the demographic charactersitics of pregnant women in the form of graphs.

3. RESULTS AND DISCUSSION

Anaemia in pregnant women remains a common health problem, especially in developing countries. This condition is generally caused by low intake of iron and folic acid during pregnancy. Anaemia not only affects the mother's health but can also increase the risk of pregnancy and childbirth complications, such as low birth weight, preterm birth and neonatal death. WHO recommends iron and folic acid supplementation, as well as micronutrient supplementation during pregnancy to help prevent anaemia and support the health of both the mother and the fetus. Several studies have also shown that taking supplements during pregnancy is important in reducing the risk of anaemia remains high. South-East Asia is one of the regions with a relatively high rate of anaemia in pregnant women, at 48% (Buanasita et al., 2025).

Anaemia prevention efforts for pregnant women in Indonesia are carried out through adequate nutrition and health monitoring during pregnancy. Government recommends that pregnant women take at least 90 iron supplements during pregnancy to help prevent iron deficiency anaemia. Pregnant women are also recommended to consume a nutritionally balanced diet rich in iron, folic acid, vitamin B12, and vit C to help improve the body's absorption of iron. Prevention of anaemia is also supported by regular prenatal check-ups or antenatal care (ANC), food fortification treatment of comorbidities that can worsen anaemia, and reducing the consumption of tea and coffee with meals, as these can inhibit iron absorption. These efforts are being made to reduce the risk of anaemia and support the health of mothers and their fetuses during pregnancy (Kemenkes RI, 2023a).

Distribution of Iron Supplement Consumption by Age Group of Pregnant Women

The distribution of iron supplement tablets among pregnant women may differ across age group. These differences are related to the level knowledge, readiness for pregnancy, and adherence to taking iron supplement during pregnancy. Figure 1 shows the distribution of iron supplement consumption by age group of pregnant women.

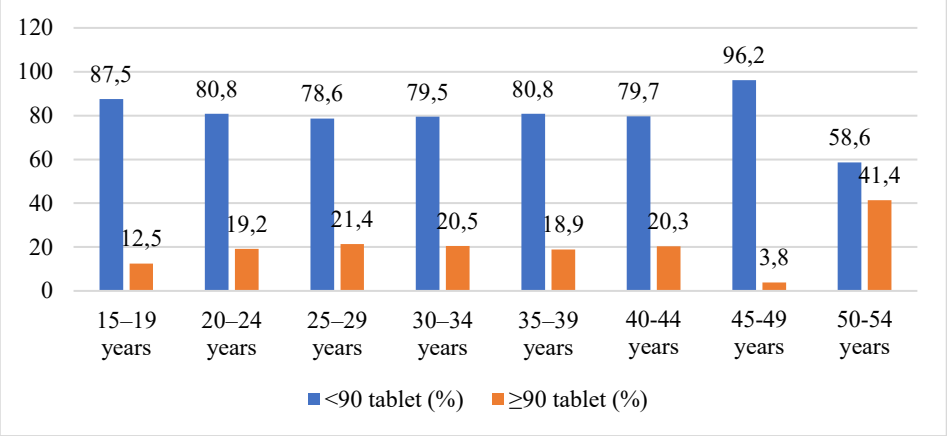

Figure 1. Distribution of Iron Supplement by Age of Pregnant Women

Based on Figure 1, iron-rich tablet consumption for pregnant women remains largely in the <90-tablet category for almost all age groups. Highest percentage of iron supplement consumption (<90 tablets) was found in the 45-49 age group at 96.2%, while the lowest percentage was found in the 50-54 age group at 58.6%. meanwhile, the highest rate of iron supplement consumption (≥90 tablets) was found in the 50-54 age group at 41.4%, while the lowest rate was found in the 45-49 age group at 3.8%. Curiously, the 45-49 age group had the highest proportion of iron supplement consumption, with less than 90 tablets, compared to other age groups. On the other hand, the 50-54 age group had a relatively higher proportion of iron supplement consumption of ≥90 tablets compared to other age groups, although consumption of fewer than 90 tablets remained more prevalent.

The achievement of recommended iron supplement intake among pregnant women in Indonesia is still not optimal across most age groups. Low consumption of iron supplements may be influenced by various factors, such as a lack knowledge, motivation and adherence to taking iron supplements among mothers as well as side effects after taking iron supplements (Syarifah et al., 2022). Non-compliance can also occur because the mother feels bored or does not understand the importance of consuming iron supplements during pregnancy. In fact, iron intake increases during pregnancy to support fetal growth and prevent anaemia in pregnant women. Consuming iron supplements regularly can help increase hemoglobin levels and reduce the risk of pregnancy complications, including anaemia and low birth weight (Rahim & Waluyo, 2022).

In the adolescent age group, low consumption of iron supplements is possibly influenced by a lack of preparedness and understanding regrading pregnancy and reproductive health. This condition requires attention because anaemia that goes untreated starting in youth can have an impact on reproductive health and pregnancy, including an increased risk of pregnancy complications and low birth weight (Sari et al., 2022). Low compliance in taking iron supplements may also be influenced by side effect experienced after taking them, such as nausea, stomach pain and constipation. The taste and smell of the tablets, disliked by many people, is also a factor (Kusnadi, 2021). Because of this, health education and support from health care workers to explain the benefits and how to take iron supplement correctly are needed to minimize side effects, so that pregnant women's adherence to taking iron supplements increases. Meanwhile, in the adult age group, adherence to iron supplement intake is generally better because pregnant women have more experience, knowledge and health awareness.

Distribution of Iron Supplement Consumption by Education Level

Educational level is one of the factors that can affect the knowledge and understanding of pregnant women regarding the importance of taking iron supplements during pregnancy. Pregnant women with higher levels of education generally find it easier to accept and understand health

information, so they tend to be more obedient in taking iron supplements. The distribution of iron supplements consumption by educational level of pregnant women is show in Figure 2.

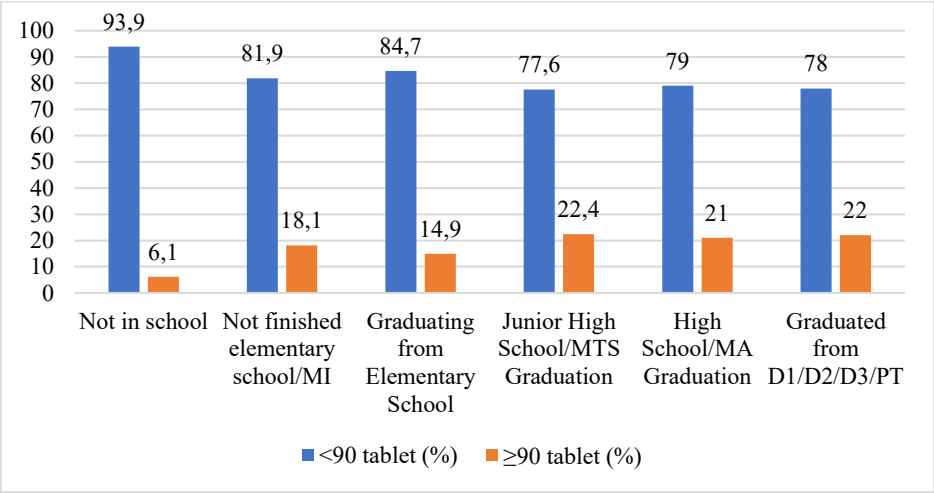

Figure 2. Distribution of Iron Supplement Consumption by Educational Level Of Pregnant Women

Based on Figure 2, Consumption of iron tablets among pregnant women mostly remains in the <90-tablet category across all education levels. The highest percentage of iron supplement consumption (<90 tablets) was found among pregnant women with no formal education, at 93.9%, while the lowest percentage was found among junior high school graduates at 77.6%. meanwhile, the highest rate of iron supplement consumption (≥90 tablets) was seen in the junior high school graduate group at 22.4%, while the lowest rate was seen in the non-schooled group at 6.1%. Interestingly, pregnant women with lower levels of education had a higher proportion of iron tablets consumption (<90 tablets) compared to other educational groups.

Low consumption rates of iron supplements at most educational levels indicate that adherence to iron supplement intake has not been optimal. Educational level can influence a woman's ability to receive, understand and implement health information, including the importance of taking iron supplements during pregnancy. Pregnant women in higher education generally have better knowledge and awareness, making it easier for them to understand the benefits of taking iron supplementation tablets regularly. Instead, pregnant women who have a lower level of education have limited access to health information and a limited understanding of the risk of anaemia during pregnancy.

Some studies in Ethiopia, Somaliland and East Africa indicated that the education level of mothers and their husbands, as well as knowledge about anaemia and the benefits of iron supplements, are strongly associated with adherence to iron supplement intake. Mother with elementary and junior high school education are known to be more consistent in taking iron supplements than mothers with no formal education (Anato & Reshid, 2025; Asmamaw et al., 2022). In fact, a good knowledge of anaemia and iron supplements can increase adherence to iron supplement intake by 2 to 4 times. Media exposure and health information also play a role in improving pregnant women's knowledge and adherence to iron supplementation (Tefera et al., 2023; Tegodan et al., 2021).

Nutrition and health education provided in a structured way, including counselling, approaching the family, and media based reminders such as text messages, has been shown to improve adherence to iron rich foods and hemoglobin levels in pregnant women (Anato & Reshid, 2025; Ramachandran et al., 2023). Anaemia during pregnancy is associated with an increased risk of prematurity, low birth wight and various other maternal complications (Barut & Mohamud, 2023; Litaqia & Mulat, 2025). Thus, education about the importance of iron supplement intake

needs to be improved, particularly among pregnant women with low levels of education, so that adherence to iron supplement intake during pregnancy can be optimized.

Distribution of Iron Supplements Consumption by Occupation

A pregnant woman's occupation can influence her compliance with taking iron supplements because it is related to daily activities, socioeconomic status, access to information and health services. Different types of work can also impact pregnant women's awareness of maintaining their health during pregnancy, including their compliance with taking iron supplements as recommended. Distribution of iron supplement consumption by occupation of pregnant women is shown in Figure 3.

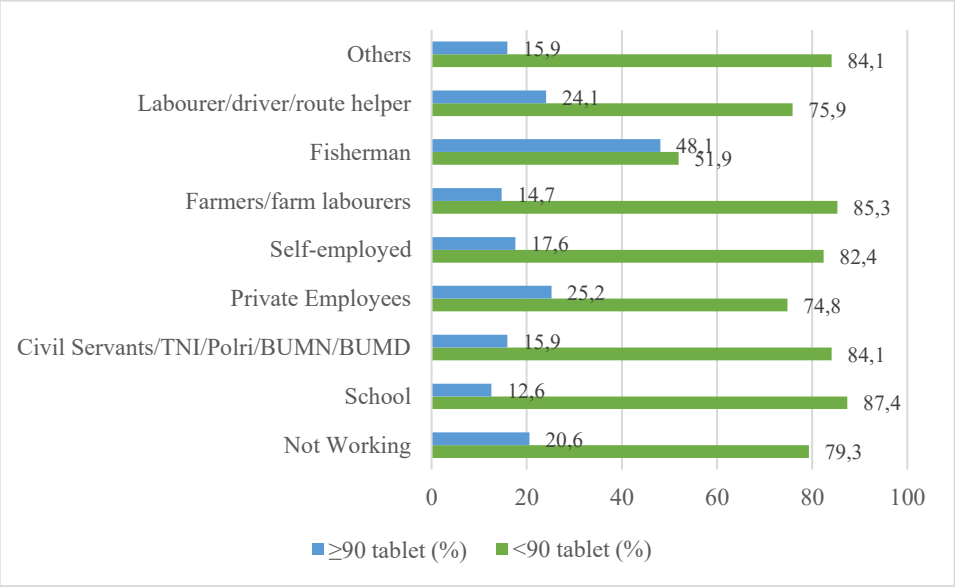

Figure 3. Distribution of Iron Supplement Consumption by Occupation of Pregnant Women

Based on figured 3, the consumption of iron supplements by pregnant women remains largely in the category of <90 tablets across almost all occupational groups. The highest percentage of iron supplement consumption (<90 tablets) was seen in pregnant women who are still in school (87.4%), farmers/agricultural workers (85.3%) and civil servants/military/police/state-owned enterprise employees and other workers at 84.1%. In contrast, the lowest percentage of iron supplement consumption (<90 tablets) was found among fishermen, at 51.9%. consumption of iron supplements of ≥90 tablets was highest among fishermen at 48.1%, while the lowest percentage was among pregnant women still in school at 12.6%. Interestingly, fishermen showed a relatively higher proportion of iron supplement consumption of ≥90 tablets compared to other occupational groups, although consumption of<90 tablets was more dominant.

Types of work can influence pregnant women's compliance in taking iron supplements because they are linked to socioeconomic status, access to health care, and opportunities to receive health information. However, some studies show that factors such as knowledge about anaemia and iron supplements, regular antenatal care visits, and adherence to iron supplement intake are more consistently associated with compliance than occupation types. Pregnant women who have visited antenatal care ≥4 times and have a good understanding of anaemia are known to have better compliance with iron supplement intake (Felipe-Dimog et al., 2021; Saeed et al., 2024).

In this study, pregnant women who were still in school had a higher proportion of iron supplement consumption of fewer than 90 tablets. This condition is probably influenced by a lack of preparation and understanding about reproductive health and the importance of taking iron supplements during pregnancy. On the other hand, fishermen consume a higher proportion of iron

supplements, with ≥90 tablets, compared to other occupational groups. Even so, previous research shows that mother's work generally does not have a strong and consistent effect on compliance with iron supplement intake after controlling for other factors such as education, knowledge, and access to health sevices (Godie, 2023).

Nutrition education interventions provided in a structured way are known to increase knowledge, compliance with iron supplement intake and reduce the prevalence of anaemia in pregnant women (Anato & Reshid, 2025). It is important because anaemia during pregnancy is shown to increase the risk of prematurity, low birth weight, postpartum hemorrhage, hypertension and perinatal mortality. The risk rises with severity of anaemia in pregnant women. For this reason, education and monitoring of iron supplement intake need to be improved across all occupational groups of pregnant women (Chen et al., 2024).

Distribution of Iron Supplement Consumption by Residential Area

Place of residence influences pregnant women's compliance in taking iron supplements because it is related to access to health care and health information. Pregnant women living in urban areas generally have easier access to healthcare facilities and health workers than pregnant women in rural areas. Distribution of iron supplement consumption by region of residence of pregnant women is shown in Figure 4.

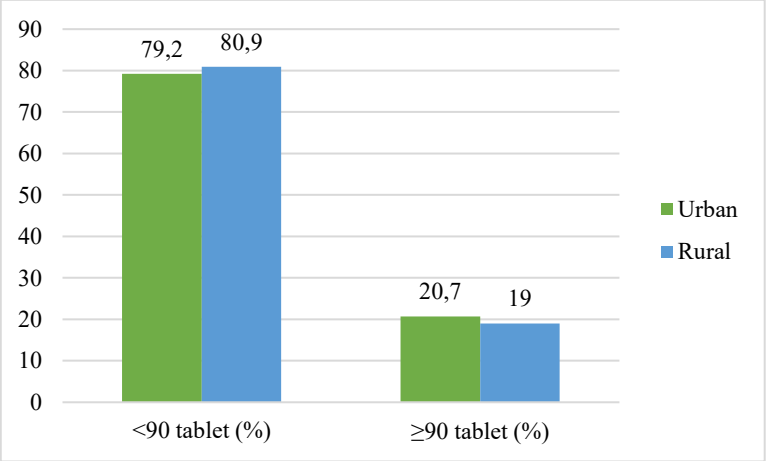

Figure 4. Distribution of Iron Supplement Consumption Among Pregnant Women by Region of Residence

Based on figure 4, Consumption of iron tablets among pregnant women in both urban and rural areas is still mostly in the category of <90 tablets. Percentage of iron supplement consumption <90 tablets was higher among pregnant women living in rural areas (80.9%) than in urban areas (79.2%). Meanwhile, consumption of iron supplements ≥90 tablets was higher in urban areas at 20.7%, while in rural areas it was 19%. Even though there is not a big difference, pregnant women in urban areas consume slightly more iron supplements as recommended than pregnant women in rural areas.

Residential area can influence the compliance of pregnant women in taking iron supplements. Pregnant women living in urban areas generally have easier access to health facilities, health workers, and health information, so they are more compliant in taking iron supplements during pregnancy. Instead, pregnant women in rural areas usually face challenges such as long distances to health facilities and limited access to health information. The geographical disparity creates inequality in the health of pregnant women, with compliance with iron supplement intake in rural areas still remaining below standard compared to urban areas (Kartikasari et al., 2025). Nevertheless, results show that iron supplement consumption compliance remains suboptimal in both urban and rural areas.

Lack of consumption of iron supplements in various demographic groups indicates that efforts to prevent anaemia in pregnant women need to be strengthened. If this condition is untreated, the risk of anaemia during pregnancy and complications such as low birth weight, prematurity and stunting increase. Results of this study can be used as reference for the government and healthcare workers in developing stategis to improve compliance with iron supplement intake in pregnant women. Intensified health education, accessible information materials and monitoring of iron supplement intake by antenatal care (ANC) services need to be enhanced, especially among pregnant women with low levels of education, young women, and in areas with limited access to health services. Additionally, family and community-based approaches can help increase support for pregnant women to take iron supplements as recommended.

This study has limitations because it uses secondary data from the 2023 Indonesian Health Survey, so it cannot explore other factors that can influence compliance with iron supplement intake, such as family support, frequency of antenatal care visits, side effects or the level knowledge of pregnant women. Further, this study is descriptive in design and cannot explain the causal relationships between variables. In spite of this, the study presents an overview of iron supplement consumption among pregnant women based on demographic characteristics in Indonesia.

4. CONCLUSION

Consumption of iron supplements by pregnant women is an important effort in preventing anaemia during pregnancy. According to the results of data analysis from the 2023 Indonesian Health Survey, iron supplement intake in pregnant women in Indonesia is still not optimal accross various demographic groups. The majority of pregnant women in almost all age groups, educational levels, occupations and region of residence consume less than 90 iron supplements during pregnancy. The proportion of iron supplement consumption <90 tablets was highest in the 45049 age group, non-educated group, pregnant women still in school and in rural areas. The results of this study show that demographic characteristics are associated with iron supplement consumption by pregnant women in Indonesia.

The effort to improve iron supplement consumption in pregnant women should be carried out through enhanced health education, improving access and quality of antenatal care, and more intensive and equitable monitoring, mainly among vulnerable groups. Health workers also need to educate pregnant women about the benefits of iron supplements and how to manage any side effects they may experience while taking them. Also, increasing access to health care, especially in rural areas, and using a family and community based approach can be effective strategies to encourage pregnant women who are taking iron supplements to follow the recommended dosage.

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