



Use of reminder box for the amount of iron tablet consumption in pregnant women

Penggunaan kotak pengingat terhadap jumlah konsumsi tablet besi pada ibu hamil

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Abstract

One of the health issues affecting pregnant women in Indonesia is iron deficiency anemia. Iron tablet supplementation is used to manage anemia, but this program has not been successful because of low compliance from forgetfulness. The use of a reminder can increase the amount of iron pill consumption. This study aimed to determine how much iron pill ingestion was impacted by the reminder box. This kind of research uses a post-test-only control group, which has a quasi-experimental design. Sixty respondents were divided into 30 intervention groups and 30 control groups. The intervention group received iron tablets in a box marked with the day, date, and time as a reminder to take their prescription, while the control group received theirs in plastic. Both groups were observed for 30 days, recording their observations on a monitoring form. An impartial t-test was utilized in the data analysis. The average amount of iron tablets ingested did not differ between the intervention and control groups ($p= 0,417$), although the intervention group consumed more than the average amount. Reminder boxes enhance consumption, but additional proof is required. It is unclear whether placing reminders where they are simple to notice and access will impact compliance.

Keywords: Consumption, iron tablet, reminder box

Abstrak

Anemia defisiensi besi salah satu masalah kesehatan ibu hamil di Indonesia. Pengendalian anemia dilakukan melalui suplementasi tablet besi, namun program ini belum tercapai karena kepatuhan yang rendah disebabkan faktor lupa. Meningkatkan jumlah konsumsi tablet besi dapat dilakukan dengan menggunakan pengingat. Tujuan penelitian untuk menilai pengaruh kotak pengingat terhadap jumlah konsumsi tablet besi. Jenis penelitian adalah quasi eksperimen dengan posttest-only control group design. Sampel sebanyak 60 responden, yang terdiri dari 30 kelompok intervensi dan 30 kontrol. Kelompok intervensi diberikan tablet besi dalam kotak pengingat yang dilabeli hari, tanggal, waktu dan tanda panah sebagai penuntun minum obat dan kelompok kontrol dalam plastik. Kedua kelompok dipantau selama 30 hari dan dicatat pada format monitoring. Analisis data menggunakan uji-t independen. Hasil, tidak ada perbedaan rata-rata jumlah konsumsi tablet besi antara kelompok intervensi dan kontrol dengan ($p= 0,417$), namun dari nilai rata-rata, pada kelompok intervensi jumlah konsumsi lebih banyak. Kesimpulan, kotak pengingat dapat meningkatkan jumlah konsumsi tablet besi pada ibu hamil.

Kata Kunci: Konsumsi, tablet besi, kotak pengingat

Introduction

Anemia is a global public health problem in women of childbearing age and pregnant women (Fite et al., 2021). The WHO reports that the percentage of pregnant women who experience anemia is 36,5%, and the highest prevalence is in Southeast Asia, reaching 46,6% (WHO, 2021). The prevalence of Anemia in Indonesia has been reported to have increased by 48,9% (Kemenkes RI, 2018). Target of Sustainable Development Goals (SDGs), it is hoped that the prevalence of anemia can be reduced in the reproductive age group 15-49 years by 50% in 2025 (Global Health Report, 2017).

Iron deficiency is a common cause of pregnancy anemia (Tuncalp et al., 2020). Lack of iron (Fe) intake is a determinant factor in anemia, and pregnant women are included in the risk group (Friedrich & Friedrich, 2017). Iron deficiency anemia negatively affects health, social and economic development, and pregnancy outcomes (Khalafallah & Dennis, 2012). The risk of premature birth and LBW increases when the mother has anemia during pregnancy (Rahman et al., 2020). Approximately 50% of cases of anemia during pregnancy are caused by a lack of iron. It can also be affected by different population groups and areas, which vary according to local conditions (WHO, 2011).

Iron is an essential nutrient required for the synthesis of hemoglobin, and its requirement increases during pregnancy. Therefore, iron and folic acid supplementation is administered to increase the hemoglobin concentration and reduce the incidence of anemia during pregnancy (Mithra et al., 2014). The World Health Organization (WHO) recommends that every pregnant woman consume one tablet of iron folate daily, as much as 30-60 mg of elemental iron and 0,4 mg of folic acid, to prevent iron deficiency and anemia during pregnancy (WHO, 2013). However, these efforts have not achieved the expected results, particularly in Indonesia.

Riskesdas (2018) reported that the number of pregnant women received iron tablets reached 73,2%, but only 38.1% consumed them as recommended. The province of Aceh also reported a high distribution of iron tablets. However, according to recommendations, 79,47% did not take them, and 23,1% did not take iron tablets because they forgot (Kemenkes RI, 2018).

Based on these data, adherence to iron tablet consumption among pregnant women is very low. One obstacle is the forgetting factor. Studies conducted in several developing countries, including Indonesia, reported that the main cause of low adherence of pregnant women in consuming Fe iron tablets was forgetfulness, in addition to other causes (Lutsey et al., 2008). This causes the amount of iron tablets consumed by mothers during pregnancy to be insufficient, following the recommended amount.

Efforts to improve compliance have been widely developed, including those that have become popular through digital/smartphone-based reminder media that provide various features to help patients and service providers improve their drug compliance (Al Rahmad et al., 2022; Dayer et al., 2013). The use of technology-based media has many advantages but also has limitations. Similar to the use of smartwatches as a supporting tool to improve compliance, these devices require battery charging and should be worn for a long time on a patient's wrist (Sailer et al., 2015).

In addition, technology-based reminders, such as reminder phones, text messages, pagers, interactive voice response systems, telephone video calls, and programmed electronic audiovisual reminder devices, are not practical for wider implementation. Therefore, practical reminder-based interventions must be tested to determine their value in improving compliance (Fenerty et al., 2012).

This study used a simple, easy, and inexpensive tool available in every household in the form of ice cubes or ice shapes, which can be used to store iron tablets. This reminder is suitable for use by every pregnant mother, especially women in rural and urban communities, because it does not require additional energy. Therefore, this study aimed to compare the amount of iron tablet consumed using reminder boxes and plastic containers to improve pregnant women's compliance with consuming iron tablets.

Methods

The study used a quasi-experimental approach with a *post-test-only control group design*. The research was conducted from January to February 2019 in the Public Health Center Darul Imarah

region. Sixty pregnant women were included in this study included 60 pregnant women. The participants were divided into two groups, each comprising 30 people.

The determination of the number of samples in the study is based on the Gay and Diehl theory (1992), which states that the large sample for experimental research is 15 people per group (Riyanto & Hatmawan, 2020). Sampling was performed by random sampling using a random number generator based on the data from the registry of a cohort of pregnant mothers. The first 30 numbers were used as a sample for the intervention group, and the next 30 for the control group (plastic group).

The material of the reminder box was ice cubes with dimensions of 1 x 1,5 cm consisting of 30 slots/sacks where iron tablets were stored to be consumed by the mother every day. Previously, the reminder box cover was labeled with the day, date, and time of taking the drug, as well as an arrow sign as a guide to the mother starting to take iron tablets, from tablets to 1-30.



Figure1. The memory boxes

The intervention was carried out by administering iron tablets to the respondents after a pregnancy examination by a midwife from the Public Health Center Darul Imarah cell enumerator. The remaining boxes were filled with iron tablets for each slot. In the control group, the iron tablets were placed in a plastic container containing 30 tablets. The enumerator explained how to use it and reminded respondents to store or place the reminder box in an easily visible and accessible place.

The data collected included the mother's characteristics and daily consumption of iron tablets. An enumerator monitored daily iron tablet consumption in both groups for 30 days, and the results were recorded on the prepared monitoring sheet.

The data analysis in this study used nonparametric tests because the data were not distributed normally; therefore, the difference in the average amount of iron tablets consumed by pregnant women between the intervention and control groups was analyzed using the Mann-Whitney test. The data analysis was performed using SPSS version 22. This research was awarded Ethical Clearance (EC) from the Health Research Ethics Commission (KEPK) of Poltekkes Kemenkes Aceh (No. LB.02.03/2996/2018).

Result and Discussion

The results of this study reveal the following characteristics of respondents:

Table 1. Characteristics of respondents

Characteristics of Mother	Reminder box		Plastic	
	n	%	n	%
Mother's age				
20 to 35 years	28	93,3	29	96,7
> 35 years	2	6,7	1	3,3
Mother's work				
Working	0	0	4	13,3
not work	30	100	26	86,7
Education				
Basic	11	36,7	8	26,7
Middle	14	46,7	14	46,7
High	5	16,7	8	26,7

Table 1 shows the age of the majority of respondents in the intervention or control group, namely in the age group 20-35 years with percentage of 93,3% and 96,7% respectively. The percentage of job respondents in the intervention group (100 %) did not work and in the control group did not working was 86,7%. According to educational level, both the intervention group and the control majority were in the middle class (Primary and Higher High School).

Data on the consistency of mothers who consumed iron tablets are shown in Table 2.

Table 2. Difference between intervention and control groups (n= 30)

Variable	Mean Rank	Z	p-value
Reminder box	32,30	-0,812	0,417
Plastic	28,70		

Based on Table 2, the rating rate in the reminder box group was 32,30, higher than that in the plastic group (28, 70). The statistical test results showed no difference in the average iron tablet consumption between the reminder box and plastic groups ($p= 0,417$). It is suggested that the ratio of the number of iron tablets consumed by pregnant women in the reminder box group and the plastic group did not differ, but if viewed from the rate of the number of tablets consumed more in the group of pregnant mothers using reminder boxes than in the pregnant mother group using plastic medicines.

The results of this study showed that there was no statistically significant difference in the average amount of iron tablet consumption between the intervention and control groups, although the number of iron tablets consumed was greater in the group that used the reminder box than in the control group. It was known that there was no difference in compliance in both groups because some respondents had nausea and side effects that occurred when consuming iron tablets; therefore, respondents stopped consuming the iron tablet they received.

In addition, the storage factor of reminder boxes and plastic is placed in places such as drawers and cabinets so that it is not visible to the mother and away from reach, causing the mother to refuse to consume it at the recommended time (Hadi et al., 2017).

Factors influencing the increased consumption of iron tablets in some respondents were influenced by the reminder box placed on the dining table or near the bed, which is easily accessible and always visible to increase the mother's motivation to consume iron tablets. In this case, the presence of reminder media motivated respondents to remember the importance of consuming iron tablets (Telisa & Eliza, 2020).

This study is consistent with the study of Nahrisah et al. (2020), who argued that to improve the obedience of mothers among them, it is necessary to provide an atmosphere that supports mother obedience, such as placing

reminders in places that are easy to see and asking for a reminder to husbands or family members (Nahrisah et al., 2020).

This opinion is also supported by other studies that concluded that drug reminder packaging positively affects drug compliance and clinical outcomes (Boeni et al., 2014). In line with these findings is a systematic review study conducted by Boeni et al., which reports that of the 30 studies reviewed, found overall that drug reminder packaging has a positive effect on compliance (Boeni et al., 2014)

In addition, this study showed that the influence of the side effects felt by the mother of nausea becomes an obstacle to compliance. These results are consistent with the Srivastaka et al. study, which found at least two main reasons for mothers' non-compliance with iron tablets: the forgetting factor of 63,0% and the following due to the side effects felt of 49,5%. Research conducted in Enugu, Nigeria, also revealed that one of the main obstacles to compliance with iron tablet consumption is the presence of gastrointestinal side effects of iron supplements (Ugwu et al., 2014).

However, side effects and forgetfulness can lead to poor compliance. Although the intake of iron and folate is relatively high, most women do not immediately start taking supplements regularly at the right time because of forgetting or experiencing adverse side effects. (Siabani et al., 2018)

During these attempts to improve the mother's compliance, the consumption of iron tablets was insufficient, such as providing reminders or others. This study showed that reminders increased the average number of iron tablets consumed. This is possible because of the presence of reminders that encourage behavioral changes. This opinion is consistent with research assessing the impact of adding a plan reminder on implementation intentions to support behavioral change, which concluded that adding plan reminders leads to better compliance and better memory of plans, although not automatically increased (Wicaksono et al., 2019).

Based on this experience, efforts to improve compliance among pregnant women can be made in two ways. In addition to providing reminders to take medication, it is also important to provide clear information about the importance of iron tablets, the possible side

effects that may arise, and how to reduce and address them.

According to Siabani et al. that to meet the need for iron and folate in pregnant women can be enhanced by minimizing the side effects of iron and using strategies to remind mothers to consume pills on time will improve compliance (Siabani et al., 2018).

The limitation of this study is that the Puskesmas nursing enumerator provided a reminder box as a place to store iron tablets to the pregnant mother respondent. The researchers did not conduct further observations in the respondent's home to determine whether the area of placement of the reminder media is suitable so that it is easier for the mother to see and access it when necessary. However, enumerators have explained how to use them and their placement locations.

Conclusion

There was no statistical difference between the number of iron tablets consumed in the reminder box and the plastic group. However, the ratio of the number of iron tablets consumed was higher in the Reminder Box group than that in the plastic drug group.

Advice and efforts to improve compliance can be made by providing clear education on the importance of iron tablets for the health of the mother and fetus, the possibility of side effects that are usually mild, and how to reduce and deal with them. Additionally, reminder boxes increased the daily intake of iron tablets in the intervention group. However, it requires further proof that the placement of reminder media in a strategic area, always visible and accessible, will have a greater impact on compliance.

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