

The Effect of Alarm Use on the Awareness of Taking Iron Supplements (Haemoglobin Levels) as a Prevention of Haemorrhagic Postpartum

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ABSTRACT

Anemia is one of the indirect causes of Postpartum Hemorrhage (HPP) during childbirth. The development of iron supplement alarm reminders can be used as an alternative intervention to increase awareness and consumption of iron supplements as a preventive measure against HPP. This study aims to analyze the Effect of Alarm Usage on Awareness in Consuming Iron Supplements (Hemoglobin Levels) as a Prevention of HPP in the Working Area of the Tempurejo Community Health Center, Jember Regency. The research employs a one-group pre-post-test design (pre-experiment) with a cross-sectional approach involving 30 respondents through Accidental Sampling. Data collection includes coding, editing, tabulation, and subsequent manual and computer-based analysis using Paired T-Test. Among the 30 respondents, the awareness of taking iron supplements before using the alarm showed non-compliance in 22 respondents (73.3%) and compliance in only 8 respondents (26.7%), with all 30 (100%) pregnant women experiencing anemia, either moderate (73.3%) or mild (26.7%). After the alarm was used, the number of respondents aware and compliant in taking iron supplements increased to 27 respondents (90%), with only 3 respondents (10%) remaining non-compliant. This was also indicated by an increase in normal Hb levels in 18 respondents (60%). The P-value was 0.000 and $\alpha = 0.05$, meaning $r < \alpha$, indicating the influence of alarm usage on awareness in consuming iron supplements (hemoglobin levels) as a preventive measure against HPP. This is crucial for pregnant women to regularly consume iron supplements for safe and healthy childbirth. Midwives should consistently remind pregnant women to consume a minimum of 90 supplements during pregnancy and adapt to technological advancements by using gadgets familiar to the community.

Keywords: Alarm Use, Awareness, Iron Supplements, Haemorrhagic Postpartum

ABSTRAK

Anemia merupakan salah satu penyebab tidak langsung dari HPP yang terjadi pada saat persalinan. Perkembangan alarm minum suplemen zat besi dapat dijadikan sebagai media alternatif intervensi untuk meningkatkan kesadaran mengkonsumsi suplemen zat besi sebagai pencegahan HPP. Penelitian ini bertujuan untuk menganalisis Pengaruh Penggunaan Alarm Terhadap Kesadaran Minum Suplemen Zat Besi (Kadar Hemoglobin) Sebagai Pencegahan HPP di Wilayah Kerja Puskesmas Tempurejo Kabupaten Jember. Penelitian ini menggunakan desain one-group pre-post test (pra eksperimen) dengan pendekatan cross sectional terhadap 30 responden dengan cara Accidental Sampling. Pengumpulan data meliputi coding, editing, tabulasi kemudian dianalisis secara manual dan komputer dengan Paired T Test. Dari 30 responden, kesadaran minum suplemen zat besi sebelum menggunakan alarm yaitu tidak patuh sebanyak 22 responden (73,3%) dan patuh hanya 8 responden (26,7%) dengan kondisi 30 (100%) wanita hamil mengalami anemia baik sedang (73,3%) maupun ringan (26,7%). Setelah alarm digunakan, jumlah responden yang sadar dan patuh dalam minum suplemen zat besi sebanyak 27 responden (90%) dan yang tidak patuh sebanyak 3 responden (10%) yang diindikasikan pula dengan adanya peningkatan kadar Hb normal sebanyak 18 responden (60%). Nilai P: 0,000 dan $\alpha = 0,05$ yang berarti $r < \alpha$, dengan demikian terdapat pengaruh penggunaan alarm terhadap kesadaran mengkonsumsi suplemen zat besi (kadar hemoglobin) sebagai pencegahan HPP. Hal ini sangat penting bagi ibu hamil untuk rutin mengkonsumsi suplemen zat besi sebagai bekal persalinan yang aman dan sehat. Bidan hendaknya selalu mengingatkan ibu hamil untuk rutin mengonsumsi minimal 90 suplemen selama masa kehamilan. Selain itu bidan juga perlu mengikuti perkembangan zaman dengan menggunakan gadget yang sudah dikenal masyarakat.

Kata Kunci : Penggunaan Alarm, Kesadaran/Kepatuhan, Tablet Besi, Pendarahan Post Partum.

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I. INTRODUCTION

Haemorrhagic Postpartum (HPP) is a bleeding or loss of blood of 500 cc or even more

that occurs after labor. HPP can occur before, during and after birthing placenta.² Medically, the causes of postpartum hemorrhage are caused

by 4T, namely muscle tone (uterine atony), trauma (birth canal tear), tissue (placental retention or residual placenta) and thrombin, which referring to blood coagulation disorder.³ Anemia is one of indirect causes from HPP which occurs during labor. When anemia is found on maternal during labor, it might cause contraction disorder, reduction of the mother's strength, prolong latent phase, placental retention, HPP and uterine atony.¹

The Indonesian Demographic and Health Survey has a maternal mortality rate of 305 per 1,000 live births.⁴ Whereas in East Java in 2019, the biggest causes of maternal mortality were bleeding and infection.⁵ According to data in the coverage section of iron supplements, from such numbers of pregnant women who obtained iron supplements ≥ 90 supplements, only 38.1% of them consumed ≥ 90 supplements, while the remaining (61.9%) consumed < 90 supplements.⁶ The data showed that 61.9% of pregnant women did not consume iron supplements as recommended. From Tempurejo Health Center of Jember regency in 2020, there were 77 pregnant women having anemia and 25 of them got HPP during labor. While in 2021, there were 75 cases of anemia on pregnant women and 23 of them experienced HPP. The condition occurred due to wrong perception of pregnant women and their inaccuracy of behavior in consuming iron supplements. Moreover, there were lack of health promotion both in urban and rural areas, sufficient role of health workers to motivate pregnant women on consuming iron supplements and awareness of consuming iron supplements.⁷

Pregnant women in Tempurejo never use a reminder to take iron supplements. They just relied on their midwife or health workers to remind them. One of the simple and appropriate technology's utilization to improve the awareness of taking medication is the use of smartphone facilities which integrated with digital applications for medication reminders, because the society has already been familiar with the use of smartphones as one kind of gadgets used by them.⁸ Both of pregnant women and midwife in Tempurejo never thought if smartphone could be used as a reminder for taking iron supplements in a timely manner. In the previous research by

Riyanto, there was significant difference between the attitude and adherence of female teens to taking blood supplement tablets between the control and intervention groups before the intervention.⁹ The digital medication reminder application that is paired with the patient's smartphone can be used as a reminder to take medication with aim to increase patients' awareness of consuming iron supplements so that the expected therapeutic outcomes could be achieved. The development of alarm for drinking iron supplements could be used as an alternative media intervention to improve the awareness of consuming iron supplements as a prevention of HPP.

II. METHOD

This research was a type of quantitative research with a quasy experiment design. The research design was a pre and post-test group design with two groups of subjects. This design was used to compare the measurement results before and after treatment in these groups. Data of pregnant women in the third trimester was obtained from the Maternal and Child Health Book and interview when they came to get Antenatal Care (ANC). The data collection technique used a checklist which fulfilled by respondents. Its contained dose adherence, time and how to consume Fe tablets then respondents must ticked the column when they consumed Fe tablets with alarm. To strengthen the results of respondents' compliance, maternal's Hb levels were also checked before and after using an alarm by audio on a smartphone (Can be seen in tables 2 and 4). Hb levels could help researchers assessed the seriousness of respondents to enforce compliance in consuming iron tablets. This data was taken from July to August 2022.

III. RESULT AND DISCUSSION

The Awareness of Taking Iron Supplements as Prevention of HPP before Using the Alarm

Table 1. Frequency Distribution of Respondents Based on Awareness of Taking Iron Supplements as Prevention of HPP Before Using the Alarm toward Third Trimester Pregnant Women at Tempurejo Health Center, Jember Regency in 2022

No	Iron Supplements Compliance	Frequencies	Percentage (%)
1	Compliant	8	26.7
2	Not Compliant	22	73.3
	Total	30	100

Source: Primary Research Data August 2022

Table 2. Frequency Distribution Based on Hb Levels before Using the Alarm toward Third Trimester Pregnant Women at Tempurejo Health Center, Jember Regency in 2022

No	Hb Levels	Frequencies	Percentage (%)
1	Mild Anemia	8	26.7
2	Moderate Anemia	22	73.3
	Total	30	100

Source: Primary Research Data August 2022

Based on table 1, it showed that 8 respondents (26.7%) were aware of consuming iron supplements before using the alarm while 22 others (73.3%) were not. From table 1, it's obviously seen that 8 respondents (26.7%) were awareness on drinking iron supplements before using the alarm while 22 others (73.3%) were not compliant. In other side, table 2 showed there were 22 pregnant women (26,7%) who got mild anemia, while those with moderate anemia were 22 respondents (73,3%). The data from table 2 strengthened data of table 1, which indicated respondents didn't compliant could impact to their Hb levels. No one had normal Hb levels.

Indifference of pregnant women to the awareness of taking iron tablets regularly caused by ignorance of pregnant women about the impact that occurs during childbirth. They think that iron tablets do not contribute to their health. Family which were less concerned about the

habits of pregnant women in consuming iron tablets also contributed the condition of pregnant women who had low Hb levels. Winkjosatro on his book said, anemia of pregnant women was caused by the wrong perception and the inappropriate behavior of pregnant women when taking iron supplements. There is also a lack of counseling for pregnant women both in urban and rural areas, the lack of the role of health workers in motivating pregnant women to consume iron supplements and the compliance of pregnant women while consuming iron supplements that were relatively low.⁷

The impact of anemia in pregnancy is increasing the probability of miscarriage, while the impact of anemia in labor is premature birth, uterine inertia, uterine atony, prolonged labor, atonic bleeding and low birth weight (BBLR) births with a weak baby. In addition, the impact of anemia during the puerperium is uterine subinvolution, resistance to infection, low milk production and stress.¹⁰

Therefore, anemia must be managed because it harms both the mother and fetus. Since 1975, Indonesian Government has worked to prevent and treat anemia on pregnant women¹¹. The activities carried out including giving out vitamin (B6, B12) and mineral supplements (folic acid, iron supplements). These vitamins and minerals are used for the formation of red blood cells. Pregnant women got iron supplements from health center or Posyandu for continuity consumption during pregnancy. Preferably, 90 iron supplements are given during pregnancy up to 42 days of postpartum period with a dose of 1x1 per day.¹¹ Though attempts have been made by the government to reduce anemia in pregnant women, the prevalence of anemia is still fairly significant today.

The Awareness of Taking Iron Supplements as Prevention of HPP after Using the Alarm

Table 3. Frequency Distribution of Respondents Based on Awareness of Consuming Iron Supplements as Prevention of HPP After Using Alarms toward Third Trimester Pregnant Women at Tempurejo Health Center, Jember Regency in 2022

No	Iron Supplements Compliance	Frequencies	Percentage (%)
1	Compliant	27	90
2	Not Compliant	3	10
	Total	30	100

Source: Primary Research Data August 2022

Table 4. Frequency Distribution Based on Hb Levels after Using the Alarm toward Third Trimester Pregnant Women at Tempurejo Health Center, Jember Regency in 2022

No	Hb Levels	Frequencies (%)	Percentage (%)
1	Normal	18	60.0
2	Mild Anemia	10	33.3
3	Moderate Anemia	2	6.7
	Total	30	100

Source: Primary Research Data August 2022

Based on table 3, it could be seen that 27 respondents (90%) were aware of consuming iron supplements after using the alarm while only 3 respondents (73.3%) were not compliant. Table 5 revealed that, of the 30 respondents, 18 (60%) had normal Hb values after using the alarm.

Iron supplements are important vitamins and minerals for pregnant women to prevent defects in the development of newborns and maternal death caused by severe anemia. Therefore, these supplements are needed by pregnant women. It is appropriate for a pregnant woman to get 90 iron supplements during her pregnancy¹¹.

Fulfillment of iron supplements is characterized by normal Hb levels, namely 11.0 g/dL.¹¹ Furthermore, there is an increasing need for iron in pregnancy for the growth of the placenta, fetus and the addition of red blood cell

mass. Some actions are required so that iron needs can be met and pregnant women do not experience iron deficiency anemia.¹²

Based on table 4, it showed that from 30 respondents, those who had normal Haemoglobin levels were 18 respondents (60%), mild anemia 10 respondents (33.3%) and moderate anemia just 2 respondents (6.7%). It proved that using the alarm increased the awareness of pregnant women on taking iron supplements, and became to affect the rising of Hb levels.

During this research, every pregnant woman who came for Antenatal Care (ANC) had been asked for using their smartphone's alarm to remind for drinking iron supplements on the same time setting. The sound of smartphone's alarm could make pregnant women remember about their obligation for taking iron supplements. Utilizing smartphone features that are integrated with digital applications for medication reminders is one simple and efficient technological solution to increase medication compliance.⁸ The digital medication reminder application that is connected to the patient's smartphone can be utilized as a reminder to take medication with the aim to increase awareness of taking the patient's iron supplements so that the expected therapeutic outcomes can be achieved. Therefore, the development of iron supplements drinking alarm can be used as an alternative media intervention to increase the awareness of consuming iron supplements as a prevention of HPP.

On the other hand, the results of this study were also strengthened by Riyanto in his research which found if there was no significant difference between the attitude and adherence of female teens to consume iron supplements between the control and intervention groups before the intervention where was after one month intervention but it began significantly difference after the three-month intervention. It means, repeated reminders to take iron tablets will have an effect on awareness of pregnant women.⁹

In line with Ammaradhev, results of their study showed that there was a alteration in compliance with iron supplement consumption in the form of an increase in compliance of pregnant women in the compliant category from 22.7% to

72.7%. Pregnant women who experienced an increase in compliance with iron supplement consumption after the alarm trial were 86.4%. In addition, based on the results of bivariate analysis, it was found that the use of alarms had an effect on pregnant women's adherence to taking iron tablets.¹³

Reminder repetition should always be echoed to all pregnant women to minimize the incidence of HPP when the time of delivery arrives.

The Effect of Using the Alarm on Awareness of Drinking Iron Supplements as Prevention of HPP

Table 5. Cross Tabulation of The Effect of Using the Alarm on Awareness of Consuming Iron Supplements as Prevention of HPP at Tempurejo Health Center Jember Regency In 2022

Before	After		Total		%	P value
	Compliant	Not Compliant	F	%		
Compliant	7	23.3	1	3.3	8	26.7
Not Compliant	20	66.7	2	6.7	22	73.3
Total	27	90	3	10	30	100

Source: Primary Research Data August 2022

Table 5 above showed that out of 30 respondents, 22 respondents (73.3%) did not take their iron supplements, whereas 8 respondents (26.7%) did so before using the alarm. On the other hand, 27 responders (90%) complied after utilizing the alarm, whereas the remaining 3 (10%) did not. In addition, based on the results of computerized Paired T Test analysis with the SPSS For Windows 22 program, P Value was obtained: 0.000 and $\alpha = 0.05$ meaning $r < \alpha$, so H_0 was rejected and H_a is accepted, and there is an effect of using the Alarm on awareness of drinking iron supplements as a prevention of HPP at the Tempurejo Health Center, Jember Regency in 2022.

IV. CONCLUSION AND RECOMMENDATION

In Tempurejo there was condition, 30 women had an anemia during pregnancy and it caused by disobedient to drink iron supplements. Anemia in pregnant women caused HPP in labor. This research tried to give treatment using alarm to escalate pregnant women's awareness of consuming iron supplements. Before treatment 30 pregnant women (100%) were anemia and not

aware of taking the iron supplements (73,3%). After the alarm was used, the number of awareness of consuming iron supplements was 27 respondents (90%) and those who were not aware were 3 respondents (10%). The awareness of consuming iron supplements was proven by the improvement of normal Hb levels of 18 respondents (60%). Therefore, it could be concluded that there was an effect of alarm use on the awareness of taking iron supplements as a prevention of Haemorrhagic Postpartum at Tempurejo Health Center, Jember Regency with P value: 0.000 and $\alpha = 0.05$. The concern for pregnant women in consuming iron supplements should not stop when the research is over. Midwives should always remind pregnant women to consume regularly at least 90 supplements during pregnancy and also need to keep up with the times by using a gadget which is already known by society. For the next research, it will be good if there has another way to remind every pregnant woman increasing better health and good habits.

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