

# Effect of health promotion and Whatsapp reminder to self-efficacy of the consumption of Fe tablets adherence among pregnant women

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## ABSTRACT

Maternal Mortality Rate (MMR) as an indicator of maternal health. Anemia is associated with hemorrhage and it contributes to 20% to the incidence of maternal deaths in Indonesia. As a response to that issue, Indonesian government provides iron tablets for pregnant women i.e. 90 tablets during pregnancy. However, the prevalence of anemia remains high, because of the low commitment in consuming Fe tablets.

To improve self-efficacy consumption of Fe tablets adherence among pregnant women by using health promotion and WhatsApp reminder This study used a quasi-experiment method with a pre-test post-test non-equivalent control group design. The sample was 59, and selected by using consecutive sampling which was taken by random sampling technique.

There were significant differences in the self efficacy score between the intervention groups (Mean = 6.30, SD = 8.11) and the control group (Mean = 0.89, SD = 7.83) with t-test = 2.60 and  $p = 0.012$ .

There is a significant difference in self-efficacy of the consumption of Fe tablets adherence among pregnant women before and after having health promotion and WhatsApp reminder intervention. Health promotion and WhatsApp reminder can be considered as tools to improve self-efficacy of the consumption of Fe tablets adherence in order to increase hemoglobin among pregnant women.

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## 1. Introduction

Maternal Mortality Rate (MMR) as an indicator of maternal health. In Indonesia, the prevalence of MMR was 305 / 100,000 live births in 2015 (Republic of Indonesia Ministry of Health, 2016). Sustainable Development Goals (SDGs) have a target of reducing MMR to below 70 / 100,000 live birth in 2015-2030 (WHO, 2015). The biggest contributors to MMR was hemorrhage i.e. 30.3% (Republic of Indonesia Ministry of Health, 2014), in which could be caused by anemia. In developing countries, anemia is a health problem and 20% contribute to maternal death (Kefiyalew et al., 2014).

Globally, the prevalence of anemia is quite high, especially in pregnant women at 38.2% and the first highest in Southeast Asia at 48.7% (WHO, 2011). In Indonesia, anemia prevalence is 37.1% (Republic of Indonesia Ministry of Health, 2016). In the Special Region of Yogyakarta, pregnant women with anemia reached 14.85% and increased in the city of Yogyakarta by 32.39% (Special

District Health Office of Yogyakarta, 2015). Anemia during pregnancy has high risk of miscarriage, Low Birth Weight (LBW) of 12%, premature 19%, and bleeding and causes 20% maternal and infant mortality (Tsegaye & Tesfaye, 2014), (Chen et al., 2017) and (Rahman et al., 2016).

INACG, WHO, & UNICEF (1998) guidelines for preventing and treating anemia in pregnancy by providing a minimum of 90 iron tablets. In addition, the Indonesian government strives through an iron tablet program for young women that continues into pregnancy in order to prepare a healthy pregnancy. This is in line with the Ministry of Health Circular No. HK.03.03 / V / 0595/2016. But in Southeast Asia, Latin America and Africa government programs are less effective in preventing anemia during pregnancy because of the low adherence of pregnant women in consuming iron tablets (Taye et al., 2015). Pregnant women who do not comply consume iron tablets because of side effects (Gebreamlak, Dadi, & Atnafu, 2017), low family support (Bin et al., 2014), knowledge, attitudes, self-confidence (self-efficacy), perception, and patient expectations reach treatment goals (WHO, 2003).

Self-efficacy is the individual's belief in behaving to achieve the desired goal (Bandura, 1977) as an important predictor of health behavior in adherence to taking medication. This is related to medication adherence in chronic diseases such as diabetes mellitus, arthritis, osteoporosis and cardiovascular disease (Cameron et al., 2010) and (Adefolalu, Nkosi, Olorunju, & Masemola, 2014). In addition, health workers have a role to improve patients' self-confidence/self-efficacy through good relations with patients (Náfrádi, Nakamoto, & Schulz, 2017).

WHO (2003) states that innovative to improve treatment adherence behavior so that health services are not limited to face-to-face but the model can take advantage of mobile health services (Gentles, Lokker, and McKibbin, 2010). Smartphones have several applications including WhatsApp, Instagram, email, short message service (SMS) and others according to user needs. Health services can use SMS as a cost-effective reminder of patient medication (Huang et al., 2013), but SMS and MMS have been replaced with Whatsapp media (Boulos et al., 2016), which is popular and makes communication easier (Montag et al., 2015).

The purpose of this study was to evaluate the effect of health promotion and WhatsApp reminder on self-efficacy of the consumption of Fe tablets adherence among pregnant women in Yogyakarta.

## 2. Research Methods

The type of research was quasi-experiment with the design of the pre-test post-test non-equivalent control group design. The population in this study were second and third trimester pregnant women (14-34 weeks). The sampling method in this study used consecutive sampling with a number of 62 with random sampling techniques, namely samples taken alternately to determine the intervention group and the control group.

The instrument for measuring self-efficacy in medication adherence in this study used the Medication Adherence for Self Efficacy Scale (MASES) questionnaire. Whereas to measure the knowledge of pregnant women and husband's support using a validated husband's knowledge and support questionnaire. Previous bivariate analysis tests carried out data normality tests using the Shapiro-Wilk test. It was found that the obedience of self-efficacy variables consumed Fe tablets with normal distribution so that they were continued using paired t-test and independent sample t-test. Whereas for multivariate tests using multiple linear regression tests.

### 3. Results

#### 3.1. Univariate Analysis

**Table 1.** Frequency Distribution of Characteristics of Respondents in Intervention and Control Groups and Homogeneity Test (p-value)

<b>Karakteristik</b>	<b>Kelompok Intervensi (n=30)</b>	<b>Kelompok Kontrol (n=29)</b>	<b>Total</b>	<b>p-value</b>
Age, min-max (median:mean)	20 – 38 (28,5 : 28,3)	23 – 36 (31 : 30,03)		
20-35 years	27 (90)	27 (93,1)	54 (91,5)	0,864 <sup>a*</sup>
<20 / > 35 years	3 (10)	2 (6,9)	5 (8,4)	
Education				
High School-College	25 (83,3)	(79,3)	48 (81,3)	0,475 <sup>b*</sup>
Primary-Secondary	5 (16,7)	(20,7)	11 (18,7)	
Mother's Work		6		
Not Working	16 (53,3)	(51,7)	31 (52,5)	0,696 <sup>a*</sup>
Working	14 (46,7)	(48,3)	28 (47,5)	
Family Income		14		
>Basic Minimum Income (Rp 1.709.150)	21 (70)	6 (20,7)	27 (45,7)	0,515 <sup>a*</sup>
< Basic Minimum Income (Rp 1.709.150)	9 (30)	23 (79,3)	32 (54,2)	
Parity				
Multigravida	15 (50)	22 (75,9)	37 (62,95)	0,051 <sup>a*</sup>
Primigravida	15 (50)	7 (24,1)	22 (37,05)	
Age of Pregnant				
Trimester II	19 (63,3)	24 (82,8)	43 (72,88)	0,082 <sup>b*</sup>
Trimester III	11 (36,7)	5 (17,2)	16 (27,11)	

Source: 2018 primary data

Based on table 1, the majority of respondents aged 20-35 years were 54 respondents (91.5%), educated high school-PT as many as 48 respondents (81.3%), some pregnant women did not work as many as 31 respondents (52.5%), family income <UMR was 32 respondents (54.2%), most of the multigravida respondents were 37 respondents (62.95%) and at the second term of pregnancy were 43 respondents (72.88%).

**Table 2.** Frequency Distribution of Knowledge and Support of Respondents' Husband in Intervention Group and Control Group Viewed from Mean Score and p-value

<b>Variable</b>	<b>Intervention Group Mean</b>	<b>Control Group Mean</b>	<b>p-value</b>
Knowledge	76,66	81,52	0,853 <sup>c*</sup>
Support of Husband	56,9	57,21	0,560 <sup>c*</sup>

c\* Levene's Test  
p-value > 0,05

Source: 2018 primary data

Based on table 2. shows that the knowledge score and husband's support in the intervention group and the control group have quite different men value. In the intervention group, the husband's knowledge and support were 76.66 and 56.97 while in the scientific control group and husband's support was 81.52 and 57.21.

### 3.2. Bivariate Analysis

#### 3.2.a. Paired T-test analysis of Self Efficacy between Intervention Groups and Control Groups Before and After Intervention

**Table 3.** Paired T-test analysis of Self-Efficacy Variables Adherence with Fe Tablet Consumption between Intervention Groups and Control Groups Viewed from Mean Pre-test scores, Mean Post-test scores, Mean Difference Score, T-test Score, and p-value Score

Variable	Group	Pre test Mean (SD)	Post test Mean (SD)	Mean Difference	t-test	p-value
Self efficacy	Intervention	46,43 (11,23)	52,73 (10,08)	6,30	4,25	0,000
	Control	48,76 (10,63)	49,66 (10,34)	0,89	0,61	0,542

Source: 2018 primary data

Based on Table 3 shows that there are significant differences in self-efficacy scores between pretest and posttest scores in the intervention group. This is an increase in the mean score pretest-posttest difference of 6.30, t-test = 4.25 and  $\rho = 0,000$ . Whereas in the control group no significant differences were found between the pretest and posttest scores in the control group. Increasing the score of self efficacy with the difference between pretest-posttest is 0.89, t-test = 0.61 and  $\rho = 0.542$

#### 3.2.b. Independent T-test analysis of Self Efficacy between Intervention Groups and Control Groups

**Table 4.** Independent analysis of T-test on Self Efficacy Adherence with Fe Tablet Consumption between Intervention Groups and Control Groups Viewed from Mean Scores, Mean Score, T-test Score, and p-value Score

Variable	Group	Mean (SD)	Mean Difference	t-test	p-value
Self efficacy	Intervention	6,30 (8,11)	5,40	2,60	0,012
	Control	0,89 (7,83)			

Source: 2018 primary data

Based on Table 4 shows that there are significant differences in self-efficacy scores between the intervention group (mean = 6.30, SD = 8.11) and the control group (mean = 0.89, SD = 7.83), with t- test = 2.60,  $\rho = 0.012$ .

### 3.3. Multivariate Analysis

**Table 5.** Analysis of Multiple Linear Regression in Health Promotion Variables and WA Reminder, Knowledge, and Support to Self Efficacy Seen husband of Score Coefficient, p-value score and R2 score on Models 1, 2 and 3

Variable	Self Efficacy								
	Model 1 Coefficie nt	Model 1 p-value	R <sup>2</sup>	Model 2 Coefficie nt	Model 2 p- value	R <sup>2</sup>	Model 3 Coefficie nt	Model 3 p- value	R <sup>2</sup>
Health Promotion and WA Reminder	5,403			5,018			3,595		
Knowledge		0,012	0,106	0,031			0,039		
Support of Husband					0,038	0,110	0,327		
								0,008	0,191

Source: 2018 primary data

Based on table 5. explained that health promotion variables and WhatsApp reminder included knowledge and husband's support produced three models as material for consideration in influencing self-efficacy adherence to consume Fe tablets. Model 3 was chosen because it has an R<sup>2</sup> value of

19.1%. This shows that health promotion and WhatsApp reminder can affect the increase in self-efficacy adherence with consuming Fe tablets by 19.1% after being controlled by variables of mother's knowledge and husband's support. In addition, it shows a significant relationship between health promotion variables and WhatsApp reminder to include husband's knowledge and support for self-efficacy with  $\rho = 0.008$ .

Model 3 in the coefficient value column was used to see how much the effectiveness of the independent variables, namely health promotion and WhatsApp reminder to increase adherence with self-efficacy to consume Fe tablets by considering the variables of mother's knowledge and husband's support. Health promotion and WhatsApp reminder after being controlled by variables of mother's knowledge and husband's support have a coefficient of 3.595. This shows that health promotion interventions and WhatsApp reminder can increase the self-efficacy score by 3,595 points.

The coefficient value of the mother's knowledge variable is 0.039 which means that every increase in 1 score of knowledge about Fe tablets can increase the self-efficacy score by 0.039 points. In the husband's support variable, the coefficient value is 0.327 so that each husband's support can improve self-efficacy adherence with consuming Fe tablets by 0.327.

#### 4. Discussion

Health Promotion helpful to change people's behavior that can be done individually (face to face) or a group of health workers (Jo, Lee, Ahn, & Jung, 2003). Unlike Davey et al., (2018) the success of treatment requires the support of text messages sent weekly or daily or a combination of counseling and text messaging. Text reminder messages as a condition for action act as a reminder in changing health behavior, self-management, increasing patient self-efficacy through drug reminders with motivational text messages (Hacking et al., 2016).

Based on the results of the study, it was shown that health promotion and WhatsApp reminder significantly affected self-efficacy, adherence with consuming Fe tablets was proven by  $\rho = 0.01$  ( $\rho$ -value  $< 0.05$ ). Jasezadeh et al., (2018) explained that the use of text messages for health promotion can improve healthy behavior in pregnant women and have a positive impact on the efficacy of response and self-efficacy. In addition, reminder text messages sent to diabetic patients showed an increase in healthy behavior, diabetes self efficacy and medication adherence as indicated by positive behavioral changes and increased self efficacy scores (Arora, Peters, Agy, & Menchine, 2012), quality of life and satisfaction of health services (Johnson et al., 2016).

In South Africa, the SMS reminder given to hypertensive patients did not affect health knowledge. But it influences positive behavior changes, so effective reminder messages act as reminders to change with motivational content rather than providing health information (Hacking et al., 2016). At the individual level, self-efficacy is an interpersonal part that influences behavior change (Rimer & Glanz, 2005). According to Bandura, (1998) self-efficacy is an individual who believes in his ability through various activities to influence his life, which comes from 4 things namely the experience of success achieved, the experience of others, verbal persuasion and good physiological conditions.

Verbal persuasion implemented in health promotion and WhatsApp reminder in order to provide health information dam motivation. Mobile health innovations with daily text messages in the form of health motivation support tend to increase medication adherence in the first month compared to daily care (Quilici et al., 2013). In addition, the stronger the perceived self-efficacy, the higher the goals set and the more firm in committing to the targets to be achieved in health care (Sulaeman, 2016).

The majority of respondents aged between 20-35 years were 52 pregnant women (88.1%) who showed that the age of older individuals was more likely to have a lot of experience in overcoming something that happened in his life than relatively younger individuals (Bandura, 1997). In contrast to Izadirad et al., (2017) which states no difference in improving the health of pregnant women between the age of the self-efficacy and attitudes of individuals.

Health promotion and WhatsApp reminder can improve self-efficacy adherence with consuming Fe tablets by 19.1% after being controlled by variables of mother's knowledge and husband's support. Health workers as communicators, motivators, facilitators and can change the

behavior of pregnant women in consuming iron tablets (Handayani, 2013). Communication of patients with health care providers or health workers has a positive relationship with self-efficacy treatment (Archipoli et al., 2016) and (Rochon et al., 2011). Communication strategies by responding to questions, promoting health and helping to increase adherence with prescription drugs (Abel & Painter, 2003).

Other findings explain that improving self-efficacy adherence must be balanced with regular communication with motivational content, drugs to be consumed, benefits to be compliant and recommendations for repeat visits and help with reminding taking medication (Rochon et al., 2011) and (Criswell, Weber, & Xu, 2014). Such communication can be applied through certain media, text messages or couriers (Rochon et al., 2011). In addition, there is a need for good relations between patients and health workers so that health information is delivered optimally (Criswell, Weber, & Xu, 2014).

Based on the results of the knowledge coefficient value shows that knowledge can increase the variable self-efficacy by 0.039 points. Wolf et al., (2007) explained that increasing patient knowledge is needed to overcome illiteracy of 7.4 times. So that knowledge has an impact on self-efficacy in carrying out treatments independently (Warren-Findlow, Seymour, & Shenk, 2011) because the public knows the reason for doing an action so that it is easier to be directed to better behavior (Sharma, Adiga, & Ashok, 2014).

Health promotion aims to provide knowledge to influence attitudes, self-efficacy, and intention to conduct positive behavior (Piaseu, Schepp, & Belza, 2002). Knowledge and self-efficacy are used to predict various health behaviors including medication adherence so that individuals have a habit of consuming drugs (Haynes, Ackloo, Sahota, McDonald, & Yao, 2008).

The findings show that the majority of pregnant women with high school education up to universities are 48 pregnant women (81.3%), the more a person's education level will influence to behave healthily and form a good mindset. In line with Chrispinus Siteti, (2014) that the higher level of education can help pregnant women to receive positive input related to health so they are able to behave in a healthy life.

The family is very important in improving the supportive environment so that patients feel more able to adhere to treatment (Rochon et al., 2011). Husband's full support to the mother since pregnancy can improve the mother's self-efficacy in seeking infant health (Evareny, 2010). In addition, social support from health workers packaged in psychoeducation in health education has an impact on health self-efficacy (Gao, Sun, & Chan, 2014), and fosters the commitment of pregnant women in the hope that pregnant women ensure healthy development of their babies by seeking health care for mothers and babies (Mercer, 2006).

## 5. Conclusion

Self Efficacy adherence to consumption of Fe tablets and Hb levels of pregnant women increased after being given health promotion with leaflet media and WhatsApp reminder. There was a difference in the increase in self-efficacy in adherence with Fe tablets and Hb levels in pregnant women who received health promotion and WhatsApp reminder containing health information motivation and reminders consume Fe tablets with pregnant women who get health promotion and WhatsApp reminder containing greetings. Health promotion and WhatsApp reminder affect the increase in self-efficacy adherence to consume Fe tablets after being controlled by the knowledge and support variables of the husband.

## 6. Suggestion

It is expected that the Yogyakarta City Health Office considers health promotion and WhatsApp reminder as a sustainable health service as a policy to improve adherence with consuming Fe tablets in pregnant women in an effort to increase Hb levels. Involving husbands/families of pregnant women in providing health promotion about Fe tablets and anemia in order to support mothers to adhere to consuming Fe tablets. Conducted similar studies with longer duration in pregnant women with second-trimester anemia, so that complications during pregnancy and childbirth can be minimized.



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