

The Effect of *PSIDUGA* Behaviour Program on Improving *PSIDUGAB* Behaviour and Hemoglobin Levels in Pregnant Women with Anaemia

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ABSTRACT

Aim: To appraise the effect of the *PSIDUGA* program on hemoglobin levels in pregnancy women with anaemia.

Methods: Design of the study was a quasi-experimental study to find out the influence of the *PSIDUGA* program on Hemoglobin levels in pregnancy women with anaemia. Ninety-four pregnancy women with anaemia were randomly recruited which assigned into the experimental group (EG) and the control group (CG). Of this, 46 participants in the EG received the *PSIDUGA* program and the usual care whereas the CG only received the usual care. Hemoglobin levels were measured by the clinical device provided by Cikedal Public Health Center. To determine the between group of the effect of the program was analyzed by using an Independent *t*-test, whereas to report the within group effect of the program was analyzed by using Paired *t*-test.

Result: The result showed that the mean score of hemoglobin levels in the EG was significantly higher than those in the CG after received the program ($p < 0.05$).

Conclusion: This study revealed that a *PSIDUGA* program clearly indicated positive effect on improving hemoglobin levels in pregnancy women with anaemia.

Keywords: Iron supplement, anaemia, pregnant women, *PSIDUGA* behavior program

INTRODUCTION

Anaemia in pregnancy was a global health problem especially in developing countries and Indonesia among these¹. Anaemia in pregnancy is present when the haemoglobin (Hgb) level less than 11 g/dl². In Indonesia, there was 36.4% in the urban areas, whereas in rural areas was 37.8%. It was contributed amount 20% of morbidity and mortality rate in pregnancy³. A previous study had been shown that during pregnancy about 1000 mg of iron is required in which 300 mg for fetus, placenta and the rest for the growing uterus⁴.

Iron is a mineral that found in many proteins and enzymes that is the body needs. Most of the iron in the body is found inside Hgb. Hcpidin is a substance of the Hgb which recognized the iron to entrance into the circulation. Ferroportin is binded by hepcidin to remove the iron from the plasma, absorption iron in the cellular from enterocytes, and release of the iron from reticulum endothelial system⁵

Anaemia during pregnancy occurred due to lack of consuming Fe tablets during pregnancy and difficult to access and get the information^{6,7}. Anaemia during pregnancy had negative impact on the health both for the pregnant women and the neonates. They are low birth weight, preterm labor, intrauterine growth restriction and perinatal mortality⁸. To prevent these, the Indonesian government through the Ministry of Health, Republic of Indonesia delivered the iron supplement amount 90 tablets to the pregnant women to prevent anaemia. However, most of them were not compliance to consume the iron supplement due to boredom and lack of family members⁹.

There were several studies that have been conducted regarding family members in pregnant women. A previous study reported that family members could facilitate and

control the pregnant women to consume the iron supplement regularly so that their Hgb improve and reduce the boredom¹⁰. The family members especially their husband plays a significant role in supporting mothers to consume Fe tablets daily. Family members are the most influencing factor which contributes to the compliance of Fe tablet consumption in pregnant women rather than knowledge and education levels¹¹. In addition, family members especially their husband encourages and motivates the pregnant women to achieve the desired goals¹².

PSIDUGA behaviour program is a counselling approach that entails a series of sequential step to facilitate the pregnant women to prevent anaemia. This program combines between perception of pregnant women and family members to prevent and treat anaemia during pregnancy. *PSIDUGA* behaviour program was adopted from the 5A's self-management support program which consisted of assess, advice, agree, assist, and arrange. This program aimed to improve the health behaviour and clinical outcomes both in the chronic illness and prevent acute illness¹³.

A previous study has been conducted regarding improving the health behaviour and clinical outcomes by using 5A's self-management support program. The result demonstrated that this program was able to improve the health behaviour and clinical outcomes in patient with chronic illness by involving family members¹⁴. However, until present time, there have been no published that use a 5A's self-management support program by using *PSIDUGA* behaviour program could improve the *PSIDUGA* behaviour and haemoglobin in pregnant women to prevent anaemia.

PSIDUGA behaviour program, come from Indonesian term, aimed to promote and improve the health behaviour of pregnant women by consuming iron supplement regularly to improve haemoglobin levels to prevent anaemia. This program also involved the family support, it comes from the family members especially their husband. *PSIDUGA* behaviour consisted of obedience to consume

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iron supplement regularly, exercise especially for women during pregnancy, and stress management during pregnancy. Therefore, the *PSIDUGA* behaviour program was important to be done by adopting a 5A's self-management support program to improve the *PSIDUGA* behaviour and haemoglobin in pregnant women to prevent anaemia.

METHODOLOGY

This study was a quasi-experimental study, two groups, pre-test and post-test design. It was conducted between December 2016 to May 2017 at the Cikedal Public Health Center, Pandeglang District, Indonesia. The calculate of sample size was based on the power analysis technique with a significance level of .05, power of .80, and the effect size (d) was .40 from a previous study¹⁰. There were 94 participants who completed the study which were 47 participants in the EG and 47 participants in the CG.

Samples were employed based on the inclusion criteria, then randomly divided to either the EG or the CG that used matching technique based on the age. The EG received the *PSIDUGA* program and the usual care while the CG only received the usual care based on the guideline for pregnant women from Cikedal Public Health Center, Pandeglang District, Indonesia.

The inclusion criteria was pregnant women from trimester 1 and 2, capable to communicate in Indonesian language, both written and verbal, can be contacted by home visit and telephone, have no hearing disorder, have family member(s) who stay together with the participant and have no mental health problem. Participants signed informed consents before they participated in this study and would be terminated if they developed a severe situation and condition during the program or cannot participation during the intervention run.

The researchers provided a booklet named "*PSIDUGA* behaviour" which contained information regarding prevention and treatment anaemia during pregnancy, how family members and mother perception influence in improving Hgb, and how iron supplements work in the body especially in the pregnant women. This booklet was made by the researchers. Every participant followed this booklet as a guideline to perform the *PSIDUGA* behaviour program to prevent anaemia during pregnancy.

Data collection: The Demographic Data Questionnaire (DDQ), *PSIDUGA* behaviour questionnaire, and Hgb measurement, were used in this study. The DDQ was developed by the researchers consisted of age, and education level. *PSIDUGA* questionnaire, an instrument used to measure the *PSIDUGA* behaviour, was developed by the researchers with Cronbach's alpha coefficient .88. This instrument divided into three subscales which were informational support, emotional support, instrumental support, and award support with total 20 questions. Each item has been measured by using a four-point Likert scales. The higher score of *PSIDUGA* behaviour questionnaire indicated that pregnant women were more frequent to perform *PSIDUGA* behaviour to prevent anaemia. Hgb was measured by using Hemo Smart Gold®.

Procedure of the *PSIDUGA* behaviour program:

Participants in the EG received the *PSIDUGA* behaviour program, that comprised of; 1) assessing present behaviour to prevent anaemia, 2) providing specific information regarding prevention anaemia during pregnancy by involving family member of the participants, 3) collaborating among the participants, family members, and the researchers to set the goals regarding *PSIDUGA* behaviour, 4) assisting the family members and the researchers to grow the achievement strategies to meet the goals, and 5) motivating the participants and their family members to preserve their *PSIDUGA* behaviour to achieve the goals, furthermore conducting follow-up sessions both telephone and face to face. Meanwhile, participants in the CG only received the usual care. The program was conducted 10 months both at the Cikedal Public Health Center, and the participant's home.

Ethical consideration: This study was granted (122/LPPM-UNAS/VIII/2016). Permission to access the pregnant women to prevent anaemia during pregnancy was granted (800/1027/Dinkes/X/2016). A standard informed consent procedure was conducted for each participant and their family members. The participants well-informed regarding the principles of respect for privacy, confidentiality, anonymity, autonomy. In addition, they could decide to participate or withdraw anytime without penalty during conducting the program.

Data analysis: The results of the data in this study were entered, recoded, cross-checked and analysed using SPSS for Windows version 20.0. The DDQ was examined by using data statistics, while to identify the characteristic difference at the baseline between the EG and the CG was analysed by using Chi-square and Independent *t*-test. Before determine the statistical analysis properly, the researchers were conducted the assumption of normality and homogeneity of variance of the variables. The Independent *t*-test was used to test mean score differences of the *PSIDUGA* behaviour and the Hgb between the EG and the CG. Furthermore, to test the mean score differences of the *PSIDUGA* behaviour and the Hgb in both the EG and the CG before and after received the *PSIDUGA* behaviour program were analysed by using Paired *t*-test.

RESULTS

In the CG, the mean age of the participants was 24.13 (SD = 3.20) and in the EG was 24.63 (SD= 3.12). Most of the participants had graduated from senior high school (42.85%) in the CG, and (47.61%) in the EG. It can be concluded that there were no significantly different regarding age and educational levels between the CG and EG. The DDQ are available in Table 1.

Effect of *PSIDUGA* behaviour program on *PSIDUGA* behaviour to prevent anaemia in pregnant women

The *PSIDUGA* behaviour mean score between the EG and the CG before receiving the program demonstrated no significant difference ($p > .05$). However, after receiving the program, the mean score of the *PSIDUGA* behaviour showed a significance difference between the EG and the CG ($p < .05$) (Table. 2).

The proportion of the *PSIDUGA* behaviour mean score within the EG and the CG is presented in the Table

3. Participants in the EG showed significant difference of the *PSIDUGA* behaviour mean score before and after receiving the program ($p < .05$). However, participants in the CG demonstrated that there was no significantly different of the *PSIDUGA* behaviour mean score before and after receiving the program ($p > .05$).

Effect of *PSIDUGA* behaviour program on the haemoglobin (Hgb) in pregnant women: The Hgb mean score between the EG and the CG before receiving the program demonstrated no significantly different ($p > .05$). In

contrast, after receiving the program, the Hgb mean score demonstrated a significance difference between the EG and the CG ($p < .05$) (Table. 4).

The comparison of the Hgb mean score within the EG and the CG is presented in the Table 5. Participants in the EG showed significant difference of the Hgb mean score before and after receiving the program ($p < .05$). However, participants in the CG showed that there was no significantly different of the Hgb mean score before and after receiving the program ($p > .05$).

Table 1: Demographic Data Questionnaire (n = 94)

| Variables | EG | | CG | | p |
|----------------------------|-----------|-----------|-----------|-----------|-----|
| | n | % | n | % | |
| Age (Min – Max = 20 – 32) | M = 24.63 | SD = 3.12 | M = 24.13 | SD = 3.20 | .28 |
| Educational levels | | | | | .11 |
| Elementary school | 15 | 35.72 | 16 | 38.09 | |
| Junior high school | 5 | 11.91 | 5 | 11.92 | |
| Senior high school | 20 | 47.61 | 18 | 42.85 | |
| Bachelor degree | 2 | 4.76 | 3 | 7.14 | |

Table 2. Pre-test and post-test mean score of the *PSIDUGA* behaviour

| Variables | Experimental group | | Control group | | t | p |
|--------------------------|--------------------|------|---------------|------|---------|-----|
| | M | SD | M | SD | | |
| <i>PSIDUGA</i> behaviour | | | | | | |
| Pre-test | 47.68 | 4.01 | 47.15 | 4.44 | -.60 | .54 |
| Post-test | 86.87 | 2.14 | 47.49 | 4.66 | -.52.57 | .00 |

M = mean SD = standard deviation

Table 3: Comparison of the pre-test and post-test mean score of the *PSIDUGA* behaviour

| Variables | Pre-test | | Post-test | | t | p |
|--------------------------|----------|------|-----------|------|-------|-----|
| | M | SD | M | SD | | |
| Experimental group | | | | | | |
| <i>PSIDUGA</i> behaviour | 47.68 | 4.01 | 86.87 | 2.14 | 64.05 | .00 |
| Control group | | | | | | |
| <i>PSIDUGA</i> behaviour | 47.15 | 4.44 | 47.49 | 4.66 | 1.31 | .19 |

M = mean SD = standard deviation

Table 4. Pre-test and post-test mean score of the Hgb

| Variables | Experimental group | | Control group | | t | p |
|-------------------|--------------------|------|---------------|------|--------|-----|
| | M | SD | M | SD | | |
| Haemoglobin (Hgb) | | | | | | |
| Pre-test | 9.94 | 0.54 | 9.81 | 0.49 | -1.26 | .20 |
| Post-test | 14.61 | 0.70 | 9.61 | 0.58 | -37.53 | .00 |

M = mean SD = standard deviation

Table 5. Comparison of the pre-test and post-test mean score of the Hgb

| Variables | Pre-test | | Post-test | | t | p |
|------------------------|----------|------|-----------|------|-------|-----|
| | M | SD | M | SD | | |
| Experimental group Hgb | 9.94 | 0.54 | 14.61 | 0.70 | 43.42 | .00 |
| Control group Hgb | 9.81 | 0.49 | 9.61 | 0.58 | -1.72 | .09 |

DISCUSSION

The result of the study demonstrated that most of participants aged 24.63 years in the EG and 24.13 in the CG. A previous research found that the prevalence of anaemia during pregnancy was productive age and this peaks at 20 – 25 years old. In term of educational levels, both in the EG and the CG graduated from senior high school¹⁶.

Effect of *PSIDUGA* behaviour program on *PSIDUGA* behaviour: The improvement of the *PSIDUGA* behaviour in this study was due to application of *PSIDUGA* behaviour program. It was facilitate behaviour change to prevent anaemia during pregnancy by improving Hgb. Previous studies reported that *PSIDUGA* behaviour program

stimulated the individual's performance of the health behaviour, met the goals behaviour action and improved Hgb^{14,17}.

In this study, the step of *PSIDUGA* behaviour program was performed consecutively each week throughout twenty-four period. The first step was assess. This step in the study was to help the researchers to receive deep knowledge regarding current behaviour and belief of pregnant women in term of preventing anaemia during pregnancy. The second step was advice, the researchers delivered specific information individually related to the *PSIDUGA* behaviour to prevent anaemia during pregnancy to ensure the respondents and their family members well-understood. The finding of this step was identical to a prior research which reported that giving

specific information by providing education can improve the behaviour for preventing anaemia during pregnancy by improving Hgb¹⁷. Previous study revealed that providing individually education made the participants to feel free to increase knowledge by using problem solving when they found the barriers^{14,18}.

The researchers also distributed a *PSIDUGA* behaviour booklet. A previous study reported that participants who have a booklet during the study revealed that it was benefit and increase their knowledge in their lives¹⁹. Furthermore, another study has been found that created a booklet could improve a participant's knowledge¹⁸. The next step of *PSIDUGA* behaviour program was agree, whilst performing the program, the participants and their family members worked together with the researchers to suit the goals related to the preventing anaemia during pregnancy and the improving Hgb every week.

The next step of *PSIDUGA* behaviour program was assist. The participants developed the action plans. While conducting the program, various participants faced some obstacles regarding the obedience to consume the iron supplement. They reported that Indonesian has some beliefs regarding a variety of food during pregnancy such as they did not allow to consume more vegetables and meats. Consequently, some of the participants had difficulty to manage the barriers to perform *PSIDUGA* behaviour to prevent anaemia during pregnancy. Thus, to solve the barriers can be carried out by taking the family members to remain the participant regarding their belief in term of food.

The last reason for the improvement in *PSIDUGA* behaviour to prevent anaemia during pregnancy in the study was because of the participants getting follow-up both by face to face and telephone weekly. The performance of *PSIDUGA* behaviour program in the pregnant women has been followed up by the researchers every week. This discovery was related to another study that face to face and phone calls follow-ups at the participant's homes which were effective in improving *PSIDUGA* behaviour²⁰. Nevertheless, the finding of the study was opposite with another study reported that follow-up by using a telephone could not improve behaviour and clinical outcomes in patients with chronic illness²¹.

Effect of *PSIDUGA* behaviour program on Haemoglobin (Hgb): The mean score of Hgb was statistically improve in the EG than those in the CG. In addition, there was a significantly different of the mean score between the EG and CG. Factors that contributing on improving the Hgb in the EG after receiving the *PSIDUGA* behaviour program were as follow.

The first reason on increasing Hgb in study was because of the participants and their family members in the EG conducting fit in term of choosing the food that contain vitamin B complex and obedience to consume the iron supplement during pregnancy. This result was parallel with another study reported that the iron supplement, vitamin B12, and folate acid which consume regularly could improve the Hgb in pregnant women²². Iron is a substance that required in the body for cellular metabolic functions. Iron could be a toxic when it presents in profusion, strict rule is needed to prevent iron insufficient or iron

excess²³. Therefore, Iron and other foods that contain iron are necessary for women during pregnancy to avoid anaemia.

CONCLUSION

In this study, the *PSIDUGA* behaviour program consisted of assess, advice, agree, assist, and arrange. This program was individualized and directed to improve the *PSIDUGA* behavior and Hemoglobin in women during pregnancy after 10 months in the EG than in the CG. The result indicated that this program had benefit, feasible, effective, and appropriate to be applied in women during pregnancy to prevent anaemia by improving Hemoglobin.

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