

## The Effectiveness of Pregnant Women Class to Increase Knowledge and Hemoglobin Level

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### ABSTRACT

**Background:** Intrauterine Fetal Death (IUFD) is a birth process of a conception result in a state of death. It is also a contributor to death for Infant Mortality Rate (IMR). Pregnant Woman Class is a government effort to reduce IMR. However, the implementation has not been maximized. This study aimed to determine the effectiveness of pregnant woman class in increasing the level of knowledge and hemoglobin (Hb) levels of the pregnant woman.

**Subjects and Method:** This was a Randomized Controlled Trial (RCT). The population of the study consisted of 170 pregnant women was selected randomly from 3 Community Health Centers with the highest infant mortality rates. The dependent variables were knowledge and Hb levels. The independent variable was pregnant woman class. The level of knowledge was measured by questionnaire with Cronbach's alpha by 0.64. Hb level was measured with Easy Touch GCHB. The Mean differences in knowledge and Hb between pregnant women class and control groups, before and after participating in pregnant woman class, were tested by independent t-tests.

**Results:** Before the intervention, the level of knowledge of the pregnant women class group (Mean= 31.07; SD=8.21) was comparable with the control group (Mean=29.30; SD=8.22), with  $p=0.162$ . It indicated the randomization success. After the intervention, the level of knowledge of

pregnant woman class group (Mean=35.07; SD=2.24) was higher than the control group (Mean= 29.10; SD= 4.77), and it was statistically significant ( $p<0.001$ ). It indicated that the pregnant woman class was effective in increasing the knowledge of pregnant women. Before the intervention, the Hb level of pregnant woman class group (Mean=11.92, SD=2.18) was comparable with the control group (Mean= 11.44; SD= 2.05), with  $p=0.162$ . It indicated the randomization success. After the intervention, the Hb level of the pregnant woman class group (Mean = 12.82; SD = 0.92) was higher than the control group (Mean=11.56; SD=1.05), and it was statistically significant ( $p<0.001$ ). It showed that pregnant woman class was effective in increasing the Hb level of pregnant women.

**Conclusion:** Pregnant woman class was effective in increasing the knowledge and the Hb level of pregnant women.

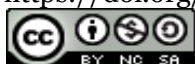
**Keywords:** pregnant woman class, knowledge, hemoglobin, IUFD

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### BACKGROUND

Intrauterine Fetal Death (IUFD) is a birth process of a conception result in a state of death. It occurs at 28 weeks pregnant. It is often referred to as stillbirth. IUFD is also the

biggest contributor to the high infant mortality rate (Elvira, 2017). IUFD is caused by several factors, such as maternal, fetal, and placental factors.

Maternal factors are age, illness during pregnancy (anemia, preeclampsia, infection in pregnancy, and acute hypotension), education level, nutritional disorders (Gerungan, Pascoal, and Lontaan, 2016).

The Ministry of Health conducted several efforts to overcome the IUFD, including the program of giving Fe tablets to pregnant women, pregnant women class, Maternal and Child Health (MCH) handbook (Ministry of Health, 2014). Based on the literature review result, the MCH implementation was still very low; besides, it had a great chance to overcome MCH problems (Fuada and Setyawati, 2015).

The implementation of pregnant woman class still has many shortcomings from its inputs, processes, and outputs which include infrastructure, human resources and cross-sectoral cooperation (Nurdiyan et al., 2016). The optimization of the utilization of pregnant woman class is important in increasing maternal knowledge about nutritional status, danger signs of pregnancy, and food intake of pregnant women. It is expected to change the attitudes and behavior of pregnant women to live healthy lives. As a result, the IUFD rate decreases.

Based on the Infant Mortality Rate (IMR) globally in 2017, there are 2.5 million infants die in the first month of life. There are around 7,000 newborns deaths every day, 1 million babies die on the first day of birth, and 1 million babies die on the sixth day of birth (WHO, 2019). Infant and Neonatal Mortality is one of the indicators of the realization of good health and welfare on Sustainable Development Goals (SDGs) in the period of 2015 to 2030 (Hoelman et al., 2016).

Based on the result of the Indonesian Demographic and Health Survey (IDHS) in 2017, the Neonatal Mortality Rate (AKN) was 15 per 1,000 live births. This rate has not reached the SDGs target by 12 per 1,000 live

births (Ministry of Health, 2018). The AKN in Central Java in 2017 was 6.5 per 1,000 live births. The AKN in Wonogiri Regency was 7.3 per 1,000 live births (Central Java, 2018).

The number of neonatal mortality in Wonogiri Regency in 2016 was 62 infants. The highest rate of the incidence was 8 babies in the working area of Sidoharjo Community Health Center. In addition, there were 6 babies in Ngadirojo and Jatiroto Community Health Centers, but only 5 babies were reported (Wonogiri, 2017).

One of the factors that affect IUFD is maternal factors. These factors are age, illness during pregnancy, maternal malnutrition, education level, and maternal knowledge (Gerungan et al., 2016), (Sulansi and Mbira, 2013). Indicators that show the decrease of IUFD rates are neonatal mortality rate decreases, maternal knowledge increases, mothers do not have anemia, and pregnant women have good nutritional status. One of the efforts in overcoming IUFD is increasing maternal knowledge through pregnant woman class. Based on several studies, pregnant woman class can increase the level of maternal knowledge, maternal attitude, maternal skill, maternal readiness in labor, and postpartum satisfaction (Novadela and Supriatiningsih, 2013), (Sasnitari et al., 2017), (Linarsih, 2013).

Pregnant woman class is held at least 4 times, with monthly meetings. The optimal utilization of pregnant woman class is expected to provide a measurable change towards understanding, changes in attitudes and behavior of pregnant women. The level of knowledge is measured by using existing questionnaires. Besides, anemia is measured by looking at the hemoglobin (Hb) level test (Ministry of Health, 2014).

Based on the description above, IUFD is one of the indicators towards the achievement of health status in an area. The IUFD in Wonogiri Regency is still high; therefore, the

author conducted this study to know the utilization of pregnant woman class in decreasing the number of IUFD in Wonogiri Regency.

## SUBJECTS AND METHOD

### 1. Study Design

This was a Randomized Controlled Trial (RCT) conducted in Wonogiri health office, Wonogiri, East Java, from April 01 to August 31, 2019.

### 2. Population and Sample

The population of the study consisted of 170 pregnant women in the working area of Health Office, Wonogiri Regency, in April 2019. The sample of the study was selected by clustered random sampling. In this study, 1 pregnant woman class with the highest MMR and IMR were selected in the 3 working areas, namely Ngadirojo, Sidoharjo, and Jatiroto Community Health Centers. 10 pregnant women in the working area of the Wonogiri I and Selogiri Community Health Centers who did not participate in the Pregnant Woman Class were selected as a control group. The inclusion criteria of the sample were pregnant women with 20 to 32 weeks pregnant, pregnant women without abnormalities/complications, and pregnant women who were willing to participate in the pregnant woman class.

### 3. Study Variables

The dependent variables were knowledge and Hb levels. The independent variable was the pregnant woman class.

### 4. Operational Definition of Variables

**Pregnant woman class** was a study group of 10 pregnant women with activities in the form of joint discussion about overall maternal and child health. It was facilitated by trained health workers. The parameter of the pregnant woman class was the frequency of the pregnant women class that was conducted once a month for 4 months. The duration was 120 minutes for each meeting.

The media were flipcharts, leaflets, and food models in the form of examples of food menus that fit the needs of pregnant women.

**Intra-Uterine Fetal Death (IUFD) rate** was a value in the form of the rate that caused the occurrence of fetal death in the womb during pregnancy at 20 weeks pregnant. IUFD parameters were hemoglobin (Hb) level in maternal blood and level of maternal knowledge.

### 5. Study Instruments

The level of maternal knowledge was measured by questionnaires in the manual book of pregnant woman class implementation. It contained data of respondent characteristics (age, gestational age, parity) and the level of maternal knowledge. Hb level was measured by using a digital Hb measuring device namely "Easy Touch GCHB". The blood sample was taken from the fingertip and placed on a stick that was connected with an analysis tool.

### 6. Data Analysis

The measurement of hemoglobin level, level of knowledge, and maternal nutritional status was carried out before and after the implementation of pregnant woman class. They were recorded in the observation sheet.

The level of knowledge was measured before and after the 4 times meeting of pregnant woman class. The respondents answered 10 pre-test questions in each meeting in the true-false questions form and 10 post-test questions in the multiple-choice form. The result was assessed by giving 1 score for the correct answer and 0 score for the wrong answer. The level of knowledge before the action was obtained from the sum of all pre-test questionnaire scores from 4 meetings. The level of knowledge after the action was obtained from the sum of all post-test questionnaire scores from 4 meetings.

The validity and reliability tests of the questionnaire have been conducted. The validity test value was  $0.6 > 0.4$ , which Means

the questionnaire was valid. The reliability test with a Cronbach Alpha value was 0.64 > r table by 0.31, which Means the questionnaire was reliable.

Data analysis in the form of description of respondent characteristics was presented using frequency table with Mean and standard deviation. The association between the factors studied were analyzed using bivariate analysis with Pearson correlation. The effectiveness of the pregnant woman class on the variables studied was analyzed using paired sample t-test.

**7. Research Ethic**

The study ethics in this study included the approval sheet based on the information, anonymity, and confidentiality. It was signed carefully during the study process. This study has received a recommendation from the National Unity and Politics Office of Wonogiri Regency Government number 045.2/ 135 dated February 8<sup>th</sup>, 2019. The approval letter of

the ethical study permit was obtained from the Research Ethics Committee at Dr. Moewardi Hospital, Surakarta, Indonesia, No.522/IV/HREC/2019, on April 15<sup>th</sup>, 2019.

**RESULTS**

**1. Sample Characteristics**

The characteristics of the study subject with the highest number of experimental group based on the highest number of ages between 23 to 26 years were 11 people (36.7%). In the control group, the age range 27 to 30 years was 3 people (30%). In addition, the age range 35 to 37 years and 38 to 40 years were 3 people (30%).

The highest number of gestational age in the experimental group was at 28 to 32 weeks gestational age. The highest number of parity of the control group and experimental group was parity 2. All study subject in the experimental group worked as housewives, as well as the control group.

**Table 1. Sample Characteristics**

Variables	Group		
	Case N (%)	Control N (%)	
Age	19 to 22 years	3 (10%)	0 (0%)
	23 to 26 years	11 (36.7%)	1 (10%)
	27 to 30 years	6 (20%)	3 (30%)
	31 to 34 years	6 (20%)	0 (0%)
	35 to 37 years	2 (6.7%)	3 (30%)
	38 to 40 years	3 (6.7%)	3 (30%)
Gestational Age	20 to 23 weeks	8 (26.7%)	5 (50%)
	24 to 27 weeks	6 (20%)	2 (20%)
	28 to 32 weeks	16 (53.3%)	3 (30%)
Parity	1	10 (33.3%)	2 (20%)
	2	16 (53.3%)	5 (50%)
	>2	4 (13.3%)	3 (30%)
Education	Junior high school	18 (60%)	3 (30%)
	Senior high school	10 (33.3%)	6 (60%)
	Diploma/Bachelor	2 (6.7%)	1 (10%)
Occupation	Private employee	0 (0%)	3 (30%)
	Housewife	30 (100%)	7 (70%)
History in Attending Pregnancy Class	Yes	23 (76.7%)	9 (90%)
	No	7 (23.3%)	1 (10%)

## 2. The result of bivariate analysis

Before the intervention, the level of knowledge of the pregnant woman class group (Mean=31.07; SD= 8.21) was comparable to the control group (Mean=29.30; SD= 8.22), with  $p=0.162$ . It indicated the randomization success. After the intervention, the level of knowledge of the pregnant woman class group (Mean=35.07; SD=2.24) was higher than the control group (Mean= 29.10; SD= 4.77), and it was statistically significant ( $p<0.001$ ). It indicated that the pregnant woman class was effective in increasing the knowledge of pregnant women.

Before the intervention, the Hb level of the pregnant woman class group (Mean= 11.92, SD=2.18) was comparable to the control group (Mean=11.44; SD= 2.05), with  $p=0.162$ . It indicated the randomization success.

After the intervention, the Hb level of the pregnant woman class group (Mean= 12.82; SD = 0.92) was higher than the control group (Mean = 11.56; SD = 1.05), and it was statistically significant ( $p<0.001$ ). It showed that the pregnant woman class was effective in increasing the Hb level of pregnant women. The result of the analysis stated that pregnant woman class was effective in increasing the knowledge and the Hb level of the pregnant woman.

## DISCUSSION

Based on the result of this study, the age of the experimental group at age 23 to 26 years was younger than the control group at age 27 to 30 years. It indicated that 23 to 26 years were the most age participated in the pregnant woman class than the age group >26 years. Result conducted by Emiyanti, that mothers who are not at risk that are 62 mothers (87.3%) participate the most in the pregnant woman class compared to mothers who are at risk that is 9 mothers. (12.7%) (Emiyanti et al., 2017).

These results were not in line with a study conducted by Widiantari et al. (2016), which stated that there was many mothers aged 20 to 35 years did not participate in the pregnant woman class, that were 71 mothers (69%).

The gestational age in the experimental group that participated the most in the pregnant woman class was at 28-32 weeks of gestational age, while in the control group was at 20-20 weeks of gestational age. Gestational age had a significant correlation on the level of pretest knowledge of the experimental group. It also had a correlation on the level of posttest knowledge of the control group. The level of knowledge was affected by gestational age. 1-12 weeks gestational age has a great effect on the knowledge of pregnant women (Paridah, 2018).

The parity level of the control and the experimental group was parity 2. In this study, the level of parity was related to the history of the mother participating in the pregnant woman class. Mothers with more than one level of parity are enthusiastic in participating the pregnant woman class despite having experience of previous pregnancies (Emiyanti et al., 2017).

In this study, the level of parity did not affect the level of knowledge of the respondents both the experimental and the control group. It was not in line with a study conducted by Budiarti et al. (2018), that the level of parity affected the level of maternal knowledge.

All respondents in the experimental group worked as housewives, as well as the control group. Most of the respondents worked as housewives. It showed that housewife had more time to participate in the pregnant woman class and increase the knowledge. However, not all housewives participated in the pregnant woman class due to the homework.

According to Budiarti et al. (2018), the occupation has a significant correlation on the education level of pregnant women. Pregnant woman class significantly affected and increased the level of knowledge in the experimental group. Pregnant woman class can increase maternal knowledge about maternal health (Linarsih, 2013; Novadela and Supriatiningsih, 2013).

Pregnant women's class significantly affected and increased Hb level on the experimental group. Pregnant woman class affected Hb level on the experimental group before treatment (Mean=11.3, SD=0.54) and after treatment (Mean=11.9, SD=0.59) (Agustiningsih and Muwakhidah, 2018).

Factors that affect Hb levels in pregnant women are knowledge, education, socio-culture, consumption of Fe tablets, nutritional status, history of infectious diseases, history of hemorrhage, parity, age, ANC frequency, and pregnancy distance (Sumiyarsi et al., 2018).

One of the pregnant woman class meetings is discussing the nutrition of pregnant women (Ministry of Health, 2014). Education about nutrition of pregnant women has a positive effect on hemoglobin level ( $p=0.001$ ) (Adi et al., 2012).

After carrying out the pregnant woman class for 4 months, the level of knowledge of the experimental group was significantly higher than the control group. In addition, the Hb level of the experimental group was higher than the control group. This is in line with a study from Adi et al., that education about nutrition affects the level of knowledge and hemoglobin level in the experimental group (Adi et al., 2012).

Based on this study, there was one respondent gave birth to her baby, and her baby died at <6 days of age. The cause of the death was asphyxia. Directly, the determinant factor causing asphyxia in neonates was low birth weight ( $b= 1.61$ ; 95% CI= 0.86 to 2.37;

$p<0.001$ ); indirectly, the factor affecting asphyxia in neonates was premature ( $b= 0.93$ ; 95% CI= 0.13 to 1.74;  $p= 0.023$ ); another factor was maternal age <20 and  $\geq 35$  years ( $b= 0.97$ ; 95% CI= 0.05 to 1.87;  $p= 0.034$ ), primiparous parity  $\geq 4$  or ( $b= 1.00$ ; 95% CI= 0.16 to 1.85;  $p= 0.021$ ) (Lestari et al., 2017).

From the result above, it can be concluded that the pregnant woman class affects the level of knowledge and Hb level of pregnant women. Therefore, a good level of knowledge and a good Hb level can reduce IUFD in Wonogiri Regency. The further study is expected to be able to measure the pregnant woman class activities on their skills, level of depression, and readiness to become parents.

#### CONFLICT OF INTEREST

There is no conflict of interest.

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