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# Visual and Audio Planned-Media to Enhance Compliance and Hemoglobin Level of Anemic Pregnant Women

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**Abstract**

Pregnant women with anemia is still globally found and it becomes a crucial problem in which most of the anemia is caused by iron deficiency The purpose of this study was to increase the compliance and hemoglobin of pregnant women seen from the number of Fe tablets consumed at Putri Ayu Public Health Center in 2020. This study used a quasi-experimental research design with pre-, post-test design with intervention and control group. The sample of each group was 35, which meant that the total sample was 70 participants. The statistical methods used were univariate and bivariate analysis and Mann Whitney to attest the effectiveness of audio-visual media to enhance anemic pregnant women's compliance and hemoglobin level. This study obtained different mean values between control and intervention groups in consuming Fe tablets. Moreover, there was an increase of hemoglobin level of the participants. This means that mathematically it indicates that there is a difference in compliance with the consumption of Fe and HB tablets after intervention. In addition, the results also showed that health education interventions using audio-visual media was more effective in increasing compliance with pregnant women Fe tablets and Hemoglobin compared to control group with speech explanation. As resulted from the study, the audio-visual media was effectively increase anemic pregnant women's compliance and hemoglobin level.

***Keywords:*** Compliance; anemia; pregnant women; Fe tablet.

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## 1. Introduction

Anemia, which is caused by iron-inadequacy is a worldwide-mainstream micronutrient inadequacy [1-3]. Stevens and his colleagues reported that the dominance of anemia in prenatal period was 38% worldwide. It was equal to 32 million pregnant moms around the world with 23 percent in developed countries and 52 percent of them in developing countries. Moreover, in Central and West Africa and Asia were the majority of the anemic pregnant women [4-6]. A survey in Indonesia estimated the prevalence of anemic pregnant women was 50% from overall cases. It was proven by the discovery in Bara Health Center that encountered more than 110 pregnant women and 37.2% of them were struggling with anemia [7].

Anemia throughout pregnancy is potentially dangerous for pregnant mother. It influenced not only mother, but also the fetus or newborn baby. The affected-moms are more likely to have perinatal infection, pregnancy-induced hypertension, poor weight, pattern labor, placenta previa, accidental hemorrhage, premature rupture or membrane, postnatal sepsis, sub involution, embolism, postpartum cognitive impairment and behavioral difficulties [6-8]. The worst possibility may lead to maternal death [9].

Moreover, anemia during pregnancy also infected the fetal condition that widely increase prenatal mortality rate [10]. It might risk to prematurity, low weight baby, intrauterine growth retardation, poor Apgar score, fetal distress, neonatal distress and neonatal anemia [8, 10, 11]. Furthermore, newborn babies of anemic mothers have a high risk of growth problem, slow intellectual development, and developmental troubles such as in cognitive, social-emotional and adaptive competences. Worse possibilities might lead to morbidities and mortalities.

However, anemia's dangerous effects can be prevented by taking iron supplement regularly to enhance hemoglobin level. Iron supplement will increase hemoglobin into normal level that is suitable for pregnant women. This improvement will happen if the anemic pregnant women comply their Fe tablet consumption regularly. The Fe tablet consumptions for anemic pregnant women is approximately 90 tablets during pregnancy. Nevertheless, a study proved that only 33.3% anemic pregnant women obey Fe tablet consumption [12]. Many study affirmed that the compliance of anemic pregnant women to consume Fe tablets was very low [13].

Moreover, WHO recommended treatment, controller and prevention for anemia during pregnancy. The recommended program promoted a behavioral change by health educational program [14]. Health educational program is recommended due to its effectiveness in enhancing knowledge, compliance and decreasing pervasiveness of anemia during pregnancy [15].

Low compliance among anemic pregnant women is caused by the lack of knowledge regarding dangerous risks of anemia for mom and fetus. The knowledge regarding iron tablet to increase hemoglobin might be low as well. Thus, the compliance for consuming Fe tablet was very low. The other factors that might cause anemic pregnant women had low compliance in consuming Fe tablet are illustrated in graph below:

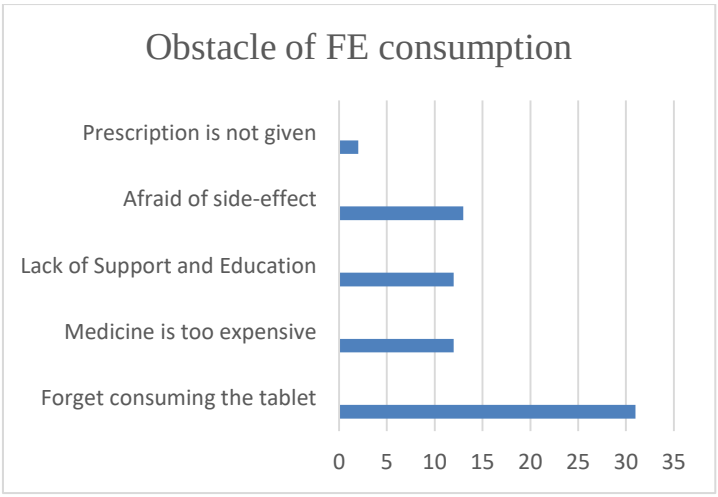


**Figure 1:** The obstacles and reasons of consuming Fe tablets incompliance

The figure 1. Illustrated the reasons of pregnant women with low compliance of consuming Fe tablet. The highest reason (44.2%) was the problem of forgetting the consumption of Fe tablets. Moreover, the second highest reason (18.57%) was the fear of side-effect such as vomiting, dizzy, chemical ingredients, etc. The other (17.14%) assumed that the anemic pregnant women were lack of support and knowledge and the other (17.14%) believed that the Fe tablet was too expensive to afford. The lowest reason (2.86%) was the unavailability of prescription from nurse or doctor.

As the maturity of pregnant women, they might understand the importance of consuming Fe tablet during their pregnancy. Yet, the pregnant women still have low compliance on consuming Fe tablet. Whereas, Fe tablets for pregnant women with anemia have many advantages to prevent and overcome the dangerous risks of anemia. This advantage is less known by anemic pregnant women. Therefore, many attempts are delivered to overcome the low compliance of pregnant women with anemia. One of the attempts is education and training programs specifically for anemic pregnant women [16]. The objective of the education and training programs is to enhance the comprehension about the risk and danger of anemia during pregnancy. Further, the program also promoted compliance increase of consuming Fe tablets and alternate to healthy dietary lifestyle. As study proved the significant correlation between knowledge and compliance of consuming Fe tablet [17-18].This study attempted to reveal the effectiveness of audio-visual planned-media to enhance compliance of consuming Fe tablet and the increase of hemoglobin level among anemic pregnant women.

## 2. Methods

### Study design and setting

This study applied a quasi-experimental study among pregnant women in Putri Ayu Public Health Center. The pregnant women were consecutively selected and registered to obtain a nutritional education through planned-media with designed-video in an intervention group. Meanwhile, another group were asserted into general education with power point presentation in a control group. The data were finally collected after ten months of

continuous education with planned-media intervention. The participants were registered from January to November 2020. Moreover, follow-up and assessment were also conducted between these periods. During the pandemic Covid-19, the study was conducted by following the health protocols from Indonesian government's regulations. The participants were wearing mask to cover their nose and mouth. Moreover, the participants and the researchers were wearing transparent face shield to cover their face from bacteria and viruses. All the people involved in the study obeyed to wash hands frequently and applied hand sanitizers to prevent the Covid-19 disease. Since the study is a long term observation, the researchers arranged a study design to maintain the consistency and assigned the objective of the study so that it would not went outside from the topic and timeline. The study design was illustrated in the following diagram:

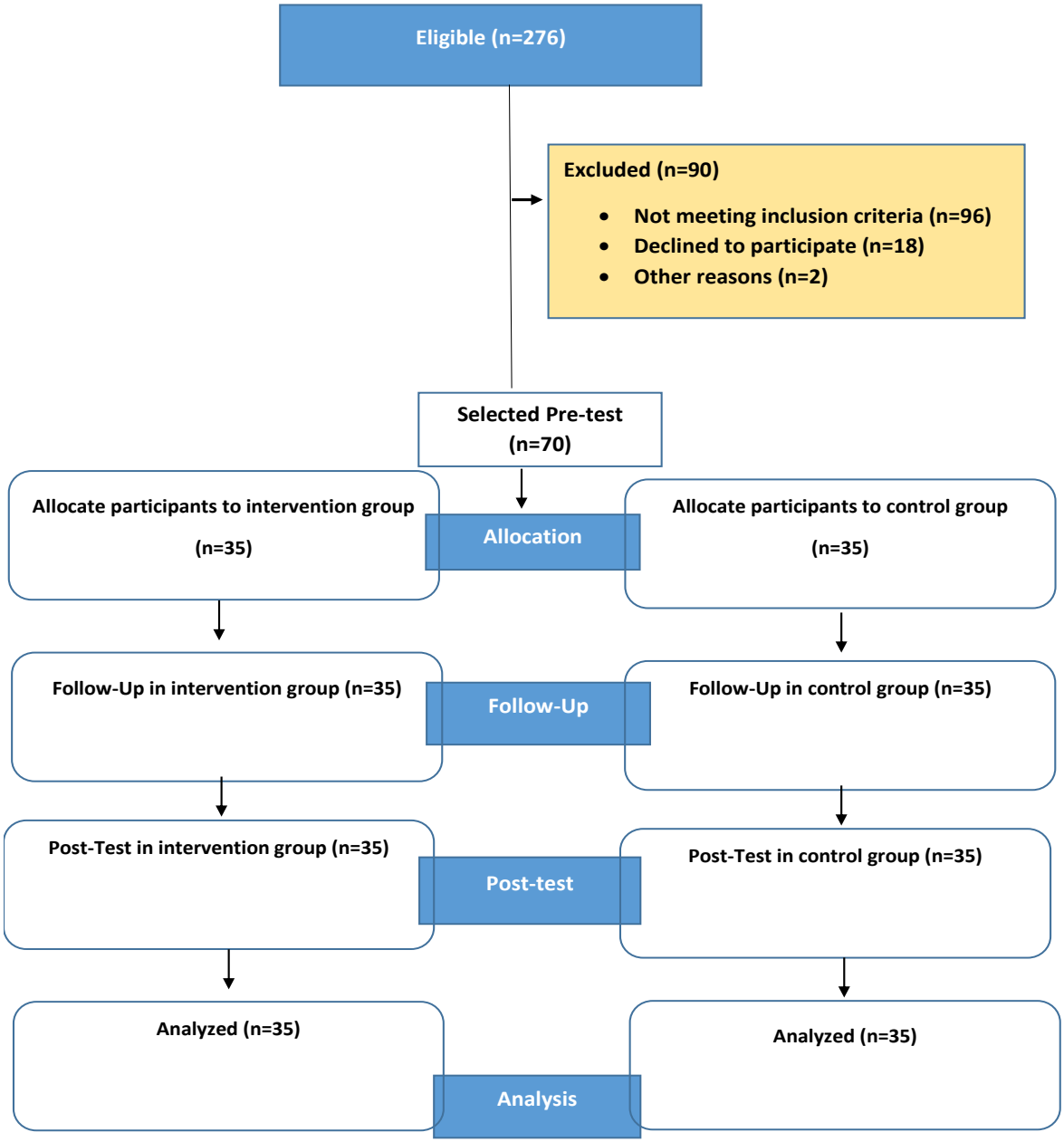


**Figure 2:** Study design

### *2.2 Population and Sample*

All pregnant women who visited Putri Ayu Health Center were eligible as participants in this study. However, this study took sample purposively for pregnant women with anemia who visited Putri Ayu Health Center in 2020. Specifically, the study selected the willing anemic pregnant women who could obey the rules during the program. Therefore, only 70 pregnant mothers with anemia who were willing to comply the program, which are divided into 2 groups namely intervention group and control group.

### *2.3 Audio-Visual Planned-media intervention*

Both intervention and control groups received same information and treatment about anemia during pregnancy and how to improve their compliance of consuming Fe tablet. However, the difference was only the media for informing the information. The intervention group received audio-visual planned-media. Meanwhile the control group receive that information through traditional seminar by speech. The education was held at the registration day and it took place for one to two hours. After the session finished, the video was distributed to a private WhatsApp group (for intervention group). While the control group got an educational book. Follow up was done every month during ANC visit at Putri Ayu Health Center. The audio-visual planned-media was about definition of iron tablets and its functions for pregnant women. It contained information about the amount of iron tablets during pregnancy and its procedures of consumption during pregnancy. Furthermore, the audio-visual media also contained the dangerous effects of the lack of iron in pregnancy in detailed-explanation and visualization. The last, the audio visual media displayed how to overcome anemia during pregnancy and how to increase compliance of consuming Fe tablets during pregnancy.

### *2.4 Instrument for data collection*

The study applied a structured-questionnaire to obtain data based on the topic of the study. The questionnaire consisted of closed-ended questions for participants and it consisted of three sections. The first section was a questionnaire for pretest and it contained sociodemographic data of respondents and information about respondents' health and condition. The next part of the questionnaire was question about the compliance of consuming Fe tablet during pregnancy and the reasons and hemoglobin report as well. The second part of questionnaire was follow-up questions for compliance and hemoglobin report. The third part for pretest that consisted of respondents' sociodemographic details and data of respondents' health and the compliance of consuming Fe tablet and the reasons.

### *2.5 Ethical Clearance*

The participants have obtained a written consents contained any information regarding this program. The written consents were distributed before the pretest and data collection to ensure participants' willingness to comply this program. Moreover, an ethical clearance was acquired from Health Research Ethics Committee of Jambi Heath Polytechnic under the registered number LB.02.06/2/18/2020.

### *2.6 Data collection*

After the ethical clearance issued, the researchers chose a helper team to support data collection. The researcher team approached the potential respondents who were in a waiting line during their visit in Putri Ayu Health Center. The researchers requested their willingness to be participants and checked if they met the criteria as respondents in the study. Further, the respondents were given an explanation regarding the study and they were asked to join the treatment. With the help of research assistants, the follow-up questionnaires were distributed to participants monthly for 10 months and the researchers conducted a post-test as the closing of the program.

### *2.7 Outcome measure*

The prior outcome for the study was the effectiveness of audio-visual media for enhancing compliance of consuming Fe tablets and hemoglobin level of anemic pregnant women after ten months' intervention. Moreover, secondary outcome was the increase of knowledge, body weight and change of medication intake of the respondents after intervention.

### *2.8 Statistical analysis*

The data were analyzed using Statistical Package for Social Sciences, SPSS, for Windows, version 20. Descriptive statistics were used to demonstrate demographic characteristics of participants. Furthermore, univariate analysis was conducted to observe the mean score of compliance and compare it between the pre and post-test. Moreover, a bivariate analysis with Mann Whitney was conducted to detect the effectiveness of audio-visual planned-media in enhancing compliance of anemic pregnant women in consuming Fe tablets and the increase of hemoglobin level.

## 3. Result and Discussion

**Table 1:** Socio-demographic of respondents

| Characteristic | Categories | N | % |
|---|---|---|---|
| Age (Years) | 20-25 | 17 | 24.2% |
| | 26-30 | 33 | 40.7% |
| | 30-35 | 20 | 26.1% |
| | ➢ 35 | 0 | - |
| Highest Education attained | No Formal Education | 0 | - |
| | Primary | 0 | - |
| | Secondary | 0 | - |
| | Tertiary | 40 | 57.2% |
| | Undergraduate | 17 | 24.2% |
| | Diploma | 13 | 18.5% |
| Occupation | House wife | 24 | 28.2% |
| | Employee | 13 | 18.5% |
| | Civil Servant | 21 | 25.2% |
| | Teacher | 5 | 7.1% |
| | Labor | 2 | 2.8% |
| Number of Children | 0 | 27 | 38.5% |
| | 1 | 26 | 32.8% |
| | 2 | 13 | 18.5% |
| | 3 | 4 | 5.7% |

Table 1 above illustrated socio-demographic details of respondents in the study. 24.2 % of them aged between 20-25 years. Majority of the respondents aged between 26-30 years (40.7%). Then the anemic pregnant women aged 30-35 were 26.1% of respondents. Moreover, the lowest educational background was Tertiary school (in Indonesia is Senior High School) that was the most common educational background in Indonesia. In the study, 57.2% of participants had tertiary educational background. 24.2% of the participants were undergraduate alumnae and 18.5% of the participants were alumnae of diploma. The participants' occupations were house wife (28.2%), Employee (18.5%), Civil Servant (25.2%) Teacher (7.1%) and Labor (2.8%). Besides, 38.5% of the participants were having their first pregnancy. 32.8% of the participants were having their second pregnancy. Moreover, 18.5% of the participants were having third pregnancy and 4 of the participants were having their fourth pregnancy.

**Table 2:** Compliance and Incompliance of Consuming Fe tablet

| Variables | Parameters | Pre-test | | Post-test | |
|---|---|---|---|---|---|
| | | Intervention group (n=35) | Control group (n=35) | Intervention group (n=35) | Control group (n=35) |
| Purchase the medicine | Always | 12 | 12 | 28 | 12 |
| | Sometimes | 19 | 18 | 5 | 19 |
| | Never | 4 | 5 | 2 | 4 |
| Take the medicine daily | Always | 10 | 6 | 28 | 11 |
| | Sometimes | 19 | 21 | 7 | 22 |
| | Never | 6 | 8 | 0 | 2 |
| Reduces the number of medicine | Always | 17 | 10 | 0 | 8 |
| | Sometimes | 8 | 17 | 6 | 18 |
| | Never | 10 | 8 | 29 | 9 |
| Skip the medicine | Always | 17 | 15 | 0 | 6 |
| | Sometimes | 17 | 18 | 2 | 20 |
| | Never | 1 | 2 | 33 | 9 |

Table 2 above portrayed anemic pregnant women's compliance and incompliance of consuming Fe tablet during pregnancy. In the pre-test, 12 of 35 (34%) participants in both intervention and control group were used to purchase the prescribed-medication. Moreover, 19 (54.2%) participants in intervention group sometimes purchased the prescribed-medicine and 18 (51.4%) participants in control group as well. Furthermore, 4 (11.4%) respondents in intervention never bought prescribed-medicine during the pregnancy with anemia and 5 (14.2%) people in control group as well. After the education class, 28 (80%) women in intervention group increased their compliance in purchasing the medicine. 5 pregnant women were struggling to comply and 2 of them never bought medicine. In control group, 12 (34%) pregnant women complied to purchase prescribed-medicine.

Meanwhile, 19 of the 35 participants in control group were struggling to comply by buying medicine sometimes and 4 (14.2%) control group's participants did not comply the medication by never purchased medicine.

Moreover, 10 (28.6%) participants in intervention group and 6 (17.1%) participants in control group obeyed the medication by taking the Fe tablet daily. 19 (54.2%) people in intervention group and 21 (60%) participants in control group took Fe tablet sometimes. 6 (17.1%) participants in intervention group and 8 (22.8%) participants in control group never took Fe tablet. In contrast, after the educational class, 28 of 35 intervention group's participants, which was equal to 80% participants consumed the Fe tablet daily. Meanwhile, only 12 (31.4%) participants in control group consumed Fe tablet daily. Further, 7 (20%) participants in intervention group consumed Fe tablet sometimes and none of the intervention group's participants absent consuming Fe tablet. It was contrast in control group, where 22 (62%) participants consumed Fe tablet sometimes and 2 (5.7%) of the control group participants never consumed Fe tablet even though the educational class in control group had been complied. Furthermore, 17 (48.5%) participants in intervention group and 15 (42.8%) participants in control group skipped to take Fe tablet. 17 (48.5%) participants in intervention group sometimes skipped the Fe tablet consumption and 18 (51.4%) participants in control group skipped the Fe tablet sometimes. However, after the intervention none of the participants in the intervention group skipped the Fe tablet. Moreover, 6 (17.1%) participants in control group skipped the Fe tablet. Then, 2 (5.71%) participants in the intervention group still skipped the Fe tablet consumption sometimes and 20 (57.1%) participants in control group still skipped the Fe tablet sometimes. 33 (94.3%) of the intervention group's participants never skipped the Fe tablet consumption and in the control group, only 9 (25.7%) participants who never skipped the Fe tablet.

**Statistical test - Compliance of consuming Fe tablet**

| | Compliance of consuming Fe tablet |
|---|---|
| Mann-Whitney U | 235.500 |
| Wilcoxon W | 865.500 |
| Z | -4.445 |
| Asymp. Sig. (2-tailed) | .000 |

a. Grouping Variable: Group

**Hemoglobin Level Statistical test**

| | Hemoglobin level |
|---|---|
| Mann-Whitney U | 338.000 |
| Wilcoxon W | 968.000 |
| Z | -3.391 |
| Asymp. Sig. (2-tailed) | .001 |

**Figure 3**

As the result from the Mann Whitney above, the present study proved that audio-visual planned-media was effective to enhance anemic pregnant women's compliance in consuming Fe tablet due to the statistical test that obtained Asymp. Sig. (2-tailed) = 0.000 (<0.05). the result indicated that there was a difference of compliance between control and intervention group after the education session with audio-visual planned media.

Moreover, the hemoglobin level of the anemic pregnant women in intervention group also improved. It was proved by the result of Mann Whitney's Asymp. Sig. (2-tailed) value = 0.001 (<0.05) indicated the improvement of hemoglobin level among the anemic pregnant women in intervention group.

This study illustrated that most of the anemic pregnant women still had poor compliance of Fe tablet consumption. The compliance was influenced by many factors such as the low knowledge regarding advantages and disadvantages anemia and Fe tablet. Therefore, an educational class and training was required to increase the compliance of anemic pregnant women.

The present study established a significant increase of compliance among anemic pregnant women in consuming Fe tablet during pregnancy with Audio-visual planned media intervention. This finding was in line with previous findings that audio-visual media enhanced knowledge and comprehension of participants because audio-visual media involved many senses such as hear and visual senses[22]. Moreover, as the compliance increased, the hemoglobin level among anemic pregnant women also enhanced well. The hemoglobin level is crucial determiner of health pregnancy because both the mom and baby needs iron to survive. Thus, health education and training program usefully helped people, especially anemic pregnant women who are struggling with anemia during pregnancy.

## 4. Conclusion

Although anemia during pregnancy is inevitable, it can be prevented and maintained to decrease the hazardous risks. by implementing education and training programs for anemic pregnant women. The study found that anemic pregnant women in intervention group obtain higher score on post-test compliance and higher hemoglobin level than anemic pregnant women in control group. This suggests that the audio visual planned-media successfully and effectively enhanced anemic pregnant women's compliance and hemoglobin level. The implementation of audio-visual planned-media can be applied to minimize the dangerous risk of anemia during pregnancy. It also allows the pregnant women to accustom and modify to healthy lifestyle to maintain their health during pregnancy[19]. Moreover, with a proper and engaging education and training, anemic pregnant women can easily recognize and obtain various sources of food that contains iron. The anemic pregnant women will remember to take FE tablets routinely, minimize the side effect of forgetting taking pills and regulate their pills routine [20-22].

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## 5. Conflict of interest

The authors have completed and submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest and none was reported.

## 6. Funding resources

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