

ICASH-A34

**RELATIONSHIP OF EDUCATION, FAMILY INCOME, COMPLIANCE
AND PROCEDURE CONSUMPTION OF IRON TABLET TO
ANEMIA AMONG PREGNANT WOMEN**

Septi Indah Permata Sari^{1,*}, Aris Noviani¹, Rr. Sri Nuriyaty Masdiputri¹, Nurul Inayah²

¹Universitas 'Aisyiyah Yogyakarta, Yogyakarta, Indonesia (55292)

²Faculty of Public Health, Ahmad Dahlan University of Yogyakarta

*Corresponding author's email: septiindahps07@gmail.com

ABSTRACT

Background: In Indonesia, the contribution of anemia towards the maternal mortality is estimated to reach 10% up to 20%. Anemia may know as an initiating cause of various problems of infant and maternal mortality. Many ways have been done to overcome the case of anemia, but there are still so many pregnant women who suffer from anemia.

Aims: This study aimed to identify the relationship of education level, family income, compliance and procedure of iron tablet consumption with anemia in pregnant woman at Midwifery Primary Care (MPC), Pakem, Sleman, Yogyakarta.

Methods: This was an observational analytic study with cross sectional design. The samples of this study were 39 pregnant mothers in MPC, who met the criteria inclusion and exclusion. The data was analyzed by chi-square test.

Results: There were relationships between anemia and family income (p value = 0.042), compliance (p value = 0.017) and procedure of Iron tablet consumption (p value = 0.024). There was no relationship found between anemia on pregnant woman with education level (p value = 0.172).

Conclusions: The research above indicates anemia in pregnancy is not caused by a single factor and should be treated as a matter of various causes. As well as for researchers next urged to conduct further research on the nutritional intake of pregnant women and infectious diseases to determine the factors that are directly related to the incidence of anemia among pregnant women.

Keywords: Anemia in pregnancy, education level, family income, compliance and procedure of iron tablet consumption

INTRODUCTION

Based on the Indonesian Demographic and Health Survey (IDHS) In 2012, maternal mortality rate in Indonesia reached 359 per 100,000 live Nativity. The MMR in Indonesia is the highest when compared to other ASEAN countries [1]. The World Health Organization (WHO) estimates that 35-37% of pregnant women in Developing Countries and 18% of pregnant women in developed countries are anemic. However, many of them have suffered from anemia at the time of conception Early [2].

Although it does not rank first, anemia contributes to death in Indonesia estimated at 10% to 12% [3]. Anemia in pregnancy is a national issue because it reflects the value of socio-economic welfare of society. Anemia is considered a severe public health problem today, it is defined by the World Health Organization (2001) [4] as "a condition in which the blood's hemoglobin concentration is abnormally low as a result of the lack of one or more essential nutrients, any that is the origin of

this lack." Based on the Health Profile of Indonesia in 2010 the prevalence of anemia among pregnant women of 24.5%. This situation indicates that anemia is a public health problem.

Low hemoglobin levels can cause IUGR, abortion, the length of time of confinement for less thrust uterus, postpartum hemorrhage and vulnerable inbesiksi [5]. Oral or parenteral iron therapy should aim at replenishing body iron deficits. Iron deficiency in pregnancy has been defined by the National Academy of Sciences Panel on nutrition and pregnancy as ferritin levels lower than 12 mg per Ml [6]. Ferritin levels are considered the gold standard for the diagnosis of iron-deficiency anemia in pregnancy [7]. Based on the research results of Yogyakarta Special Region Health Department (2013) the incidence of anemia among pregnant women is still high at around 15-39% [8].

Research conducted by Dwi Astuti (2016) [9] showed the incidence of anemia among pregnant women was significantly related to the mother's education and compliance to consume iron tablets. Education is also one of the factors that influence the formation of behaviors that affect adherence and compliance with the consumption of iron tablets do Ante Natal Care (ANC). Family income is very influential in purchasing power, and use eats every day.

Based on data from the Health Office Yogyakarta (2013) [10] in Pakem 18.84% of pregnant women are anemic visit scope K1 93.12% and K4 91.28%. Results of a preliminary study conducted in Community Health Centers Pakem are 9 Midwifery Primary Care (MPC). Where MPC with the visit of the highest maternal which is located in MPC F, The number of visits to pregnant women in MPC F 2015 is 417 visits with an average of 35 visits pregnant women each month. While the number of visits to expectant mothers in another MPC of each month is still below 30 pregnant women.

Furthermore, preliminary study results obtained by the number of visits of pregnant women in March 2016 as many as 41 people. The amount collected from pregnant women who are not anemic is 23 people (56.09%), while as many as 18 who are anemic pregnant women (43.90%), with hemoglobin levels below 11 g / dl. It can be seen that almost half of pregnant women suffer from anemia in pregnancy.

Based on the above issues, from a variety of risk factors of anemia in pregnant women, researchers interested in conducting research on the relationship of education level, family income, compliance and procesure consumption of iron tablets with the incidence of anemia among pregnant women in MPC F Pakem Sleman, Yogyakarta. This is because of other factors has been widely studied and adapted to the characteristics of the respondents in the study site where the ANC pregnant women average more than a predetermined standard and no pregnant women who are experiencing infectious diseases.

METHODS

This was an observational analytic study with cross sectional design. To examine the dynamics of the correlation only between the risk factors with effects such as illness or a particular health status. Variables included risk factors and variables that include the effect observed while at the same time, so that research results are limited to the assessment of the relationship several factors studied [11].

This research was conducted in MPC F Watuadek located in the village, Pakem, Sleman, Yogyakarta. Time data collection takes place in June 2016. The population in this study were all pregnant women who had prenatal MPC F in June 2016 amounted to 48 pregnant women. In this study, the sampling technique used is total sampling the entire population who meet the inclusion and exclusion criteria used as samples and obtained 39 respondents.

Reasons take total sampling because according to Sugiyono (2007) [12] the number of the population less than 100 so that the entire population of the research sample everything. Criteria for inclusion in this study were pregnant women trimester II and III checkups in MPC F, Yogyakarta. While the exclusion criteria in the study are pregnant women who are being /has recently experienced bleeding and pregnant women who do not get the iron tablet.

Analysis of the data will be used univariate and bivariate. If the univariate analysis has been done, will be known the distribution of each variable, followed by bivariate analysis. The bivariate analysis conducted on two variables were related or correlated [11]. The data obtained from the field was analyzed using Microsoft Excel for calculation. Chi Square test performed using a significance level $\alpha = 0.05$ and Confident Interval (CI) of 95%. To determine the biological importance, in this study using a value Ratio Prevalence (RP).

RESULTS

The bivariate analysis was conducted to see the relationship between the independent variables consisting of education level, family income, compliance and the consumption of iron tablets with the dependent variable incidence of anemia among pregnant women.

1) Relationship Education Levels With The Incidence Of Anemia Among Pregnant Women

Table 1. Education Level Relationships with Genesis Anemia In Pregnant Women in MPC F

| Education Level | Genesis of Anemia | | | | | | P-value | CI 95% | RP |
|-----------------|-------------------|------|-----------|------|-------|------|---------|-------------|-------|
| | Anemia | | No Anemia | | Total | | | | |
| | n | % | n | % | n | % | | | |
| Low | 9 | 23,1 | 5 | 12,8 | 14 | 35,9 | 0,172 | 0,930-3,429 | 1,786 |
| High | 9 | 23,1 | 16 | 41,0 | 25 | 64,1 | | | |
| Total | 18 | 46,2 | 21 | 53,8 | 39 | 100 | | | |

As in Table 1 the results obtained Chi Square test p value > 0.05 is 0.172, with a 95% CI 0.930 to 3.429 (includes figure 1) so that it can be concluded that there is no relationship between level of education and the incidence of anemia among pregnant women in MPC F. Rated RP obtained by the 1,786, because the value of the 95% CI includes numbers 1 it can be concluded that the low level of education "is not necessarily" a risk factor for anemia in pregnant women.

2) Family Income Relationship With The Incidence Of Anemia Among Pregnant Women

Table 2. Relationship with Genesis Family Income Anemia In Pregnant Women in MPC F

| The level of income | Genesis of Anemia | | | | | | p-value | CI 95% | RP |
|---------------------|-------------------|------|-----------|------|-------|------|---------|-------------|-------|
| | Anemia | | No Anemia | | Total | | | | |
| | n | % | n | % | n | % | | | |
| Less Income | 10 | 25,6 | 4 | 10,3 | 14 | 35,9 | 0,042 | 1,153-4,321 | 2,232 |
| Enough Income | 8 | 20,5 | 17 | 43,6 | 25 | 64,1 | | | |
| Total | 18 | 46,2 | 21 | 53,8 | 39 | 100 | | | |

As in Table 2 the analysis results obtained p -value $< \alpha$ (0.05) is 0.042 with confidence interval range is from 1.153 to 4.32 (does not include the number 1), then H_0 is rejected, so it can be concluded that there is a relationship between family income levels with the incidence of anemia in pregnant women in MPC F Pakem Sleman, Yogyakarta.

3) Iron Tablets Consumption Compliance Relationship With The Incidence Of Anemia Among Pregnant Women

Table 3. Relationships Compliance Consumption Of Iron Tablets With Anemia In Pregnant Women In MPC F

| Compliance consumption of iron tablets | Genesis of Anemia | | | | | | <i>p</i> -value | CI 95% | RP |
|--|-------------------|------|-----------|------|-------|------|-----------------|-------------|-------|
| | Anemia | | No Anemia | | Total | | | | |
| | n | % | n | % | n | % | | | |
| Not obey | 10 | 25,6 | 3 | 7,7 | 13 | 33,3 | 0,017 | 1,307-4,784 | 2,500 |
| Obey | 8 | 20,5 | 18 | 46,2 | 26 | 66,7 | | | |
| Total | 18 | 46,2 | 21 | 53,8 | 39 | 100 | | | |

Chi Square test results are shown in Table 3 indicates a significance value of 0.017, which means p -value < 0.05 with 95% CI values do not include the number 1 is between 1.307 to 4.784, then H_0 is rejected. It can be concluded that there is a relationship between the consumption of iron tablet compliance with the incidence of anemia among pregnant women in MPC F.

4) Relationships of Procedure Consuming Iron Tablet With Incidence Of Anemia Among Pregnant Women

Table 4. Procedure Consumption Method relationship with Genesis Tablet Iron Anemia In Pregnant Women in MPC F

| Procedure Consuming Iron Tablet | Genesis of Anemia | | | | | | <i>p</i> -value | CI 95% | RP |
|---------------------------------|-------------------|------|-----------|------|-------|------|-----------------|-------------|-------|
| | Anemia | | No Anemia | | Total | | | | |
| | n | % | n | % | n | % | | | |
| False | 15 | 38,5 | 9 | 23,1 | 24 | 61,5 | 0,024 | 1,084-9,006 | 3,125 |
| Correct | 3 | 7,7 | 12 | 30,8 | 15 | 38,5 | | | |
| Total | 18 | 46,2 | 21 | 53,8 | 39 | 100 | | | |

As in Table 4 the results of a Chi-Square test of procedure consuming iron tablet relationship with the incidence of anemia in pregnant women. The significant value that was obtained was 0.024 (< 0.05) with CI values between 1.084 to 9.006 (does not include the 1) so that it can be concluded that there is a relationship between procedure consuming iron tablet with the incidence of anemia among pregnant women in MPC F. Value ratio prevalence obtained is equal to 3.125 ($RP \Rightarrow 1$) means that pregnant women are one of the iron tablet consumption 3,125 times greater risk for pregnant women is anemic compared to the right to consume iron tablets.

DISCUSSION

Educational attainment affects the changes in attitudes and behavior of healthy living. The level of higher education will facilitate the person or people to absorb information and implement it in their behavior and everyday lifestyle, particularly regarding health and nutrition. But someone who just graduated from elementary school is not necessarily less able to prepare food that meets nutritional requirements than other people are better educated. Due to low education even if the person is diligent in listening to the countryside and have always participated in nutrition counseling is not likely to be a better nutritional knowledge [13].

Values prevalence ratio (PR) obtained by the means 2,232 pregnant women whose income is less than (<Rp1.338.000) risk 2,232 times more likely to have anemia compared with pregnant women enough family income level. Income is a factor that most determines the quantity and quality of the food so that there is a close relationship between income nutrition consumption [14]. Revenues less purchasing power can affect pregnant mothers to buy the food needed during pregnancy. This resulted in less food intake and increased the risk of anemia during pregnancy [15]. Governments need to prioritize socio-economic status of the poorest populations in the planning of public policy and the need for more efficient prenatal care [16].

The major cause of anemia may be a diet low in meat, fish, or poultry. Heme iron from hemoglobin and myoglobin found in meat, fish, and poultry are effectively absorbed by receptors in the gut, whereas the bioavailability of non-heme iron from plants is low [17]. In determining the socio-economic status of the family, the only parameter used in this study was the monthly income of parents. This was a relatively harsh assessment, as other parameters were not included, for example, the total number of the members of the family, or any other earning family members besides parents. However, using only this parameter, the difference in the monthly family incomes between cases and controls was statistically significant [18].

Values obtained prevalence ratio of 2.5, and it appears that the RP value of more than 1, which means pregnant women who do not comply risk taking iron tablets anemia 2,5 times greater than pregnant women who dutifully consume iron tablets. Consumption of iron tablet is done routinely during pregnancy provides a better chance to avoid anemia in women who are pregnant [19]. Much needed compliance and awareness of pregnant women consume iron tablet that though the side effects of these drugs that sometimes cause nausea, vomiting, diarrhea and sometimes can cause constipation (constipation) [20].

Many factors cause iron intake are inadequate e.g., food intake is less due to the lack of economy, the low level of absorption of Fe in the intestine due to a lack of knowledge of mothers on the procedure for taking iron tablets, so when taking iron tablets unwitting mother also consume food or drinks that inhibit absorption iron such as tea, milk, and coffee [21]. Therefore women should eat iron tablets at night for the absorption process better. Needs to be disseminated to pregnant women consuming a iron table and proper way to reduce the side effects. Drink after a meal or before bedtime, and it would be better if you drink accompanied eat fruits such as bananas, papayas, oranges and others [20].

CONCLUSION AND RECOMMENDATION

The research above indicates anemia in pregnancy is not caused by a single factor and should be treated as a matter of various causes. So expect health workers in MPC F further improve the prevention programs anemia in pregnant women and provide information on the importance of compliance and how pregnant women consume iron tablet to reduce the incidence of anemia.

Pregnant women should routinely consume iron tablet at night using water, or by drinking Vitamin C. Also pregnant women also have to be smart in choosing the food that will be consumed, namely by increasing the intake of foods rich in iron such as meat, eggs, vegetables, and fruits.

As well as for researchers next urged to conduct further research on the nutritional intake of pregnant women and infectious diseases to determine the factors that are directly related to the incidence of anemia among pregnant women. There is also the need for the promotion of insecticide-treated bed nets (ITNs) and interventions such as mass media campaigns peer /outreach education, life skill programs to educate women on the advantages of early ANC booking and compliance with the use of prescribed medications.

REFERENCES

- [1] Ministry of Health of the Republic of Indonesia. Indonesia Health Profile. Jakarta. Director General of Public Health, Directorate of Community Nutrition. 2013
- [2] Short, M.W., Domagalaski, J.E. Iron deficiency anemia: evaluation and management. *Am Fam Physician*. 2013. 15:87(2):98-104. PMID:23317073
- [3] Hadi, H.. Double Burden Problems of Nutrition and Health Development Policy Implications Nasional. Yogyakarta. Essay. FK-UGM. 2005
- [4] Demmouche, A., Khelil, S. & Moulessehoul, S. Journal An Epidemiologic Study : Anemia Among Pregnant Women in the Sidi Bel Abbes Region (West Algeria). *J Blood Disord Transfus*. . 2011. 2:113. doi:10.4172/2155-9864.1000113
- [5] Clark, S.F. Iron deficiency anemia: Diagnosis and management. *Curr Opin Gastroenterol*. 2013 Jan 15;87(2):98-104
- [6] Vanderjagt, D.J., Brock, H.S., Melah, G.S., El-Nafaty, A.U., Crossey, M.J., Glew, R.H. Nutritional Factors Associated with Anaemia in Pregnant Women in Northern Nigeria. *J Health Popul Nutr*. .2007. 25(1):75–81. PMID: PMC3013266
- [7] Health Department D.I.Y. Yogyakarta. The City Health Profile Yogyakarta . 2013.
- [8] Astuti D. Factors Associated With Anemia Genesis On Pregnant Women In Puskesmas Undaan Lor Holy District, *Journal The 3rd University Research Colloquium*. 2016. ISSN 2407-9189.
- [9] Health Department D.I.Y. The Health Profile Sleman, Yogyakarta. 2013
- [10] Ministry of Health of the Republic of Indonesia. Nutritional Anemia and Blood Tablet Add to Women of fertile age, Jakarta. The Directorate General of Public Health, Directorate of Community Nutrition. 2001
- [11] Notoatmodjo S. Health Behavioral Sciences. Jakarta. PT Rineka Cipta. 2010
- [12] Sugiyono. Quantitative Research Methods, Qualitative and R & D. Bandung. Alfabeta. 2009
- [13] Soedarto. Synopsis of Tropical Medicine. Surabaya. Airlangga University Press. 2007
- [14] Sayoga, S. Nutrition Daughter. Jakarta. EGC. 2006
- [15] Andréia Cristina Campigotto, Maria do Carmo Andrade Duarte de Farias, Dayanne Chrystina Ferreira Pinto, Francisco Geysen Fontenele Albuquerque. International Archives Of Medicine : Factors Relating to Iron Deficiency Anemia in Pregnancy: An Integrative Review. 2015. *iMedPub Journals*: Vol. 8 No. 159 doi: 10.3823/1758
- [16] Hyeon-Jeong Choi, Hye-Ja Lee, Han Byul Jang, Ju Yeon Park, Jae-Heon Kang, Kyung-Hee Park, and Jihyun Song. Effects Of Maternal Education On Diet, Anemia, And Iron Deficiency In Korean School-Aged Children. *BMC Public Health*. 2011; 11: 870. Published online 2011 November 2016. doi: 10.1186/1471-2458-11-870. PMID: PMC3250969
- [17] N.S. Ali, R.W. Zuberi. The Relationship of Socio-Demographic Factors with Iron Deficiency Anaemia in Children of 1-2 years of Age. *Journal of Pakistan Medical Associations*. Division of Family Medicine. Department of Community Health Sciences, The Aga Khan University, Karachi. *J Pak Med Assoc*. 2001 Mar;51(3):130-2.
- [18] Arisman Nutrition in the Life Cycle. Jakarta. 2004. EGC
- [19] Rodrigues LP, Jorge SRPF . Deficiência de ferro na gestação, parto e puerpério. *Rev. Bras. Hematol. Hemoter*. 2010. 32 (2): 53-56. DOI: 10.1590/S1516-84842010005000057
- [20] Sulistyoningih. *Nutrition to Maternal And Child*. Yogyakarta. Graha Ilmu. 2011
- [21] Tarwoto & Wasnidar. Maternal Anemia Hami, Concepts And Penatalaksanaanya. Jakarta. Trans Info Media. 2007