CHARACTERISTICS OF PREGNANT WOMEN WITH ANEMIA

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Abstract, Background: Anemia is a global health problem. The prevalence of anemia in pregnant women worldwide is 38.2 percent. 50 percent of cases of anemia are caused by iron deficiency. Anemia in pregnancy is associated with an increased risk of preeclampsia, postpartum hemorrhage, infection, and length of hospitalization, while in the fetus and newborn, iron deficiency anemia can cause stunted fetal growth, low birth weight, and preterm birth. The occurrence of anemia in pregnant women is maternal age, education, occupation, knowledge and Body Mass Index (BMI). The purpose of this study was to determine the correlation between the characteristics of pregnant women and anemia
Method: Using an analytical observational design with a cross-sectional approach. The population in this study were all pregnant women, with a sample of 68 respondents, the technique of taking samples was accidental. sampling, the data were analyzed by chi square test.
Result: The results showed that pregnant women with moderate anemia were 76.6 percent and mild anemia were 26.3 percent, there was no significant correlation between maternal age and p value = 0.07, education p = 0.0.24, mother's occupation p value = 1.00, knowledge p = 0.97 with anemia, BMI was significantly related to the incidence of anemia with p = 0.04
Conclusion: There is a significant correlation between BMI and anemia, while maternal age, education, occupation and knowledge are not associated with anemia.

Keywords: anemia, pregnant women, characteristics

Background

Anemia is a global health problem. The prevalence of anemia in pregnancy varies, depending on socio-economic conditions, lifestyle, diet, and different attitudes and behaviors regarding health. The cause of anemia 50% due to iron deficiency. Other causes include deficiencies of other micronutrients (vitamin A, riboflavin (B2), B6, folic acid (B9), and B12), acute or chronic infections (such as malaria, hookworm infection, schistosomiasis, tuberculosis, and HIV), and synthesis abnormalities. lowered hemoglobin (such as hemoglobinopathies)[1,2].

The World Health Organization (WHO) in 2011 reported that around the world globally as many as 38.2% of

pregnant women experience anemia. with the highest prevalence in the Southeast Asia region, at 48.7%[1]. Based on the 2018 Basic Health Research (Riskesdas) data, the prevalence of iron deficiency anemia in pregnant women in Indonesia was 48.9%, this number has increased by 11.8 % when compared to figures in 2013 [3].

Data from the Karawang Health Office (2018) shows the percentage of anemia in pregnant women in Karawang Regency in 2018 was 8.60%. There are 50 Puskesmas and all of them have a coverage of giving 90 tablets plus blood >90%. However, there are still health centers with cases of anemia, one of which is Anggadita Health Center as much as 30% [4].

In developing countries anemia is still a problem and a cause of morbidity and mortality. As many as 75% of anemia occur due to iron deficiency, the high prevalence of iron deficiency and other micronutrients during pregnancy[5,6]. Maternal iron deficiency anemia can cause impaired physical performance, difficulty breathing, fatigue, palpitations, sleep difficulties, decreased cognitive performance, and behavior and postpartum depression. Anemia in pregnancy is associated with an increased risk of preeclampsia, postpartum hemorrhage, infection, and length of hospitalization[5]. In fetuses and newborns, iron deficiency anemia can cause stunted fetal growth, low birth weight, and preterm birth. Iron is also beneficial for metabolism and nerve function. Children born with iron deficiency are at risk of experiencing difficulties in cognitive development, social emotional, adaptive function, and motoric[7,8].

According to WHO, anemia in pregnancy is established when hemoglobin (Hb) <11 g/dL or hematocrit (Ht) <33%, and postpartum anemia, if Hb is <10 g/dL.1 The Center for disease control and prevention defines anemia as a condition with Hb levels <11 g/dL in the first and third trimesters, Hb <10.5 g/dL in the second trimester, and <10 g/dL in the postpartum period[9].

Pregnancy causes physiological changes in the mother, thereby increasing the risk of anemia, which is most vulnerable starting at around 20-24 weeks of gestation[10]. Iron deficiency anemia is currently the most common cause of anemia in pregnancy[11].

Pregnant women are one of the groups prone to malnutrition, which is caused by an increase in nutritional needs for both mother and fetus. The wrong diet in pregnant women has an impact on nutritional disorders, including anemia, less weight gain in pregnant women and impaired fetal growth[1.] Conditions that can cause anemia in pregnancy include maternal age, level of knowledge, maternal education, poor maternal age. too young (<20 years) are not ready to pay attention to the environment needed for fetal growth[12]. Ridayanti's 2012 study showed that there was a significant correlation between knowledge and the incidence of anemia. One of the factors that cause anemia in pregnant women is the lack of knowledge about the importance of consuming nutritious foods that can meet the needs of mothers and babies during pregnancy. A very important nutrient for pregnant women is iron, if the mother's intake is lacking it will increase the risk of anemia, which results in impaired fetal growth and development. The impact of anemia on pregnant women is abortion, premature labor, prolonged labor, postpartum hemorrhage, shock, intrapartum/postpartum infection. Esse P's research shows that most pregnant women have less knowledge about the causes, symptoms, and effects of anemia as well as the smoothing and inhibiting substances of iron absorption, as many as 33 people (65%). There is a significant correlation between the level of education and the incidence of anemia in pregnant women, this is because a person's level of education will affect awareness to behave in a healthy life and form a good mindset so that it will be easier for mothers to receive information and have adequate knowledge[14].

Method

This study uses an analytic observational design with a cross-sectional approach. The independent variables studied were maternal age, education, occupation, knowledge and BMI (Body Mass Index), while the dependent variable was the level of anemia. The population in this study were pregnant women in the working area of the Adiarsa Health Center. The number of samples was 68 respondents. The inclusion criteria were: pregnant women in the third trimester with anemia, willing to be respondents, while the

inclusion criteria were primigravida women suffering from tuberculosis, malaria and chronic diarrhea, kidney failure and impaired heart function and mothers experiencing hyperemesis gravidarum. Data collection was carried out using a structured questionnaire, in which each question item had an answer option provided. Hemoglobin examination using the Auto Hematology Analyzer method was carried out by laboratory staff. The study was carried out in July-August 2021. The statistical test used was the Chi square test.

Result

Respondents Characteristics

Table 1 Distribution of Respondents Characteristics at Adiarsa Public Health Center, Karawang Regency in 2021

Characteristics	Total	%
Age		
1. Resti	21	32.8
2. No Resti	43	67.2
Education		
1. SD	12	18.8
2. SMP	19	29.7
3. SLTA	28	43.8
4. PT	5	7.8
Occupation		
1. Employee	22	34.4
2. Unemployed	42	65.6
Knowledge		
1. Low	28	43.8
2. High	36	56.3
IMT		
1. Thin	28	43,8
2. Normal	32	50.0
3. Above Normal	1	1,6
4. Obesity	3	4.7
Anemia		
1. Medium	49	76.6
2. Light	15	23.4

Based on table 1 Most of the pregnant women are in the age group that is not happy (20-35 years old) as much as 67.2% and the smallest is the rest group (<20>35 years) as much as 32.8%. tertiary education as much as 7.8%. Most of the respondents do not work as much as 65.5% and 34.4% who work. The highest level of knowledge of respondents with a high level of knowledge is as much as. Based on the Body Mass Index (BMI), most of the normal BMI groups were 50%, skinny 43.8%, obese 4.7%, overweight 1.6%, most of the respondents had moderate anemia as much as 76.6% and mild anemia as much as 23.4%.

Correlation of Age, Education, Occupation, Knowledge and BMI to Anemia

Table 2.Correlation between maternal age, education, occupation, knowledge, BMI and anemia

Characteristic	Anemia		Total	P value	OR
	Medium	Light			
Age					
- Resti	17(81%)	4(19.0%)	21(100%)	0,07	1.461
- No resti	32(74.4%)	11(25.6%)	43(100%)		(0.403- 5.290

Characteristic	Anemia		Total	P value	OR
	Medium	Light			
Education					
- SD	11(91.7%)	1(8.3%)	12(100)%	0,24	-
- SMP	13(68.4%)	6(31.6%)	19(100%)		
- SLTA	20(71.4%)	8(28.6%)	28(100%)		
- PT	5(100%)	0(0.0%)	5(100%)		
Occupation					
- Employee	17(77.3%)	5(22.7%)	22 (100%)	1,00	1.063
- Unemployed	32(76.2%)	10(23.8%)	42(100%)		0.312-0.312
Knowledge					
- Low	22(78,6%)	6(21.4%)	28(100%)	0,97	1.222
- High	27(75.0%)	9(25.0%)	36 (100%)		0.377-3.963
IMT					
- Thin	26(81,2%)	6(18.8%)	32(100%)	0,04	-
- Normal	20 (71.2%)	8(100%)	28(28,6%)		
- Above Normal	0(100%)	1 (8,3%)	1(100%)		
- Obesity	3(100%)	3(100%)	3(100%)		

Table 2 shows that the proportion of respondents aged at rest experiencing moderate anemia is 81%, greater than the proportion of respondents aged not at risk for moderate anemia as much as 74.4%. The statistical test results obtained a p value of 0.07 (> 0.05). , it can be concluded that there is no significant correlation between maternal age and anemia. The results of the analysis obtained an OR value of 1,461, meaning that respondents aged at risk (<20>30 years) experiencing moderate anemia had 1,461 times the chance of experiencing anemia compared to the group of respondents aged not at risk.

Based on table 2, it can be seen that the proportion of respondents with low education experience moderate anemia as much as 91.7%, greater than the proportion of respondents with higher education levels experiencing moderate anemia as much as 71.4%. The statistical test results obtained p value = 0.24 (> 0 0.05), it can be concluded that there is no significant correlation between education and anemia.

In table 2 it can be seen that the proportion of respondents who work experience moderate anemia as much as 77.3%, greater than the proportion of respondents who do not work experience moderate anemia as much as 76.2% The results of statistical tests obtained p value = 1.00 (> 0.05), it can be concluded that there is no significant correlation between work and anemia. The results of the analysis obtained an OR value of 1.063, meaning that respondents who work have moderate anemia have 1,063 times the chance of experiencing moderate anemia compared to the group of respondents who do not work. Table 2 shows that the proportion of respondents with low knowledge experiencing moderate anemia is 78.6%, greater than the proportion of respondents with high knowledge experiencing moderate anemia as much as 71.2% The statistical test results obtained p value = 0.97 (> 0 0.05), it can be concluded that there is no significant correlation between knowledge and anemia.

Based on table 2, it can be seen that the proportion of respondents with a thin BMI experiencing moderate anemia is 81.2%, greater than the proportion of respondents with a normal BMI experiencing moderate anemia as much as 71.2%. The statistical test results obtained p value = 0.04 (<0, 05), it can be concluded that there is a significant correlation between BMI and anemia.

Discussion

Anemia

Based on table 1, 68 respondents of pregnant women who experience moderate anemia as much as 76.6 percent. This shows that at the Adiarsa Health Center, Karawang Regency, there are still many pregnant women who experience anemia. This shows that the incidence of anemia at the Adiarsa Public Health Center, Karawang Regency is greater than the incidence of anemia in Indonesia, which is 48.9 percent

The high prevalence of anemia has

a negative impact during pregnancy, such as increased morbidity and mortality, in pregnant women and children born. This causes functional consequences, namely the decline in the quality of human resources as a whole, which results in the emergence of disturbances or barriers to growth, both body cells and brain cells[15]. The high prevalence of anemia at the Adiarsa Public Health Center is possible from the different hemoglobin examination tools, thus giving different results. The general methods recommended by WHO to be used in surveying the prevalence of anemia in the population are hemoglobinometry using the cyanmeth method in the laboratory and the POCT hemocue system. This method is a reference for comparison and standardization of other methods[16]. According to RIFASKES 2011,5 nationally, the percentage of Puskesmas that have Hb Sahli is 46.3%, the rest do not have or use other hemoglobin measuring devices. The percentage of Puskesmas that have Hb Sahli and are used in MCH services is 37.7%. It has not been confirmed with accurate data how much use of Hb POCT measuring devices in health care facilities in Indonesia[17].

Correlation of age and anemia

Respondents who are at rest have moderate anemia as much as 81 percent, bigger than the age group that is not at risk as much as 74.4 percent. The results of statistical tests obtained p value = 0.07 (> 0.05), it can be concluded that there is no significant correlation between maternal age and anemia. The OR value is 1.461, meaning that respondents at risk age (<20>30 years) have a chance of 1.461 times experiencing moderate anemia.

The age of pregnant women is related to the reproductive organs for women's readiness to become pregnant, where the age of 20-35 years is the best time for pregnancy.

A woman > 35 years of age when pregnant will affect the body's physiologic function is not optimal, because it has entered the early degenerative period. So if pregnancy at the age of <20 years and> 35 years is a risk in pregnancy so that it can cause anemia, besides that it can also have an impact on miscarriage (abortion), babies born with low body weight (LBW), and delivery that is not smooth (complications). labor). Age factor is a factor that needs to be considered for a woman to get pregnant [18].

The results of the study are in line with those of Ikeu Faziha's research, showing that there is no correlation between age and the incidence of anemia [19]. Mylory's research shows that there is no correlation between age and the incidence of anemia with p value = 1.00[20]. Ononge et al. in his research that maternal age has a weak correlation with the incidence of anemia in pregnant women[21]. There is no correlation between maternal age and anemia, this is possible.

During pregnancy, respondents regularly and obediently consume iron tablets once a day with a dose of 60 mg. Blood supplement tablets are tablets given to pregnant women. Pregnant women are given 1 (one) time a day every day during pregnancy or a minimum of 90 (ninety) tablets, so that anemia does not occur.

Correlation of education and anemia

Respondents with low levels of education experienced moderate anemia as much as 91.7%, greater than respondents with higher education levels experienced moderate anemia as much as 71.4% The results of statistical tests obtained p value = 0.24 (> 0.05), it can be concluded that there was no significant correlation between education and moderate anemia.

The level of a person's health is related to the level of education. With increased education, it will be easier to accept the concept of healthy living independently, creatively and sustainably, also affecting the ability to receive information about nutrition[22].

The results of the study are in line with Siti Amalia's research showing that there is no correlation between education and anemia in pregnant women[23] and it means that there is no tendency for mothers with higher education levels not to suffer from anemia or vice versa. Ikeu Taziaha's research showed that there was no correlation between education and the incidence of anemia [19]. Melorys Lestari in her research on the incidence of anemia in pregnant women at the Karang Anyar Health Center, showed that there was no

correlation between education and the incidence of anemia in pregnant women with a p value of 0.239 (> 0 ,05)[20]. Different from the research results of Jin et al. which shows that the prevalence of anemia is higher in mothers with low levels of education[24].

There is no correlation between education and anemia, this is possible because with the increasing level of education a person will find it easier to receive information about health, especially about nutrition, but if it is not true in application in everyday life, it cannot change health conditions in high application. Pregnant women in receiving health information, especially in the field of nutrition, but if they cannot apply it correctly in daily life, they will not be able to change a person's health condition.

Correlation of Employment and anemia

Respondents who worked experienced moderate anemia as much as 77.3%, greater than those who did not work experienced moderate anemia as much as 76.2% The results of statistical tests obtained p value = 1.00 (> 0.05), it can be concluded that there is no correlation significant correlation between work and anemia. The OR value is 1.063, it means that respondents who work have moderate anemia have 1.063 times the chance of experiencing moderate anemia.

Work is an activity that is carried out routinely to earn income in meeting the needs of life as a symbol of one's status in society. The more children there are, the more needs are needed. Pregnant women who work, the greater the workload of pregnant women to meet their needs[25].

The results of the study are in line with Siti Amalia's research showing that there is no correlation between work and anemia in pregnant women[23].

The type of work that pregnant women do will affect pregnancy and childbirth. The greater the workload on pregnant women, the greater the occurrence of anemia, this is because pregnant women pay less attention to diet and lack of rest which results in the production of red blood cells not being formed optimally, resulting in pregnant women experiencing anemia.

Correlation of Knowledge and anemia

Respondents with low knowledge experienced moderate anemia by 78.6 percent, greater than respondents with high knowledge by 75 percent. The results of statistical tests obtained p value = 0.97 (> 0.05), it can be concluded that there is no significant correlation between knowledge and anemia.

The formation of a person's actions is influenced by knowledge because knowledge is a very important domain. One of the factors that influence the health behavior of pregnant women is knowledge that knows and understands the consequences of anemia and how to prevent anemia, so that it can avoid the effects of anemia during pregnancy[26].

The results of this study are in line with Diana Sukmaningtyas's research. The results show that there is no correlation between the level of knowledge and the incidence of anemia in pregnant women in the working area of the Puskesmas. Melory's in his research showed that there was no correlation between knowledge and anemia with p value = 0.431[20].

There is no correlation between knowledge and anemia. It is possible that knowledge is not the only factor that can affect the incidence of anemia in pregnant women, because knowledge is not the only factor that affects the occurrence of anemia in pregnant women, even with low knowledge about anemia. but if pregnant women always consume foods that contain lots of iron, the condition of anemia will not be experienced by pregnant women.

Correlation of BMI and anemia

Respondents with thin BMI experienced moderate anemia as much as 81.2%, greater than respondents with normal BMI as much as 71.2% The results of statistical tests with p value = 0.04 (<0.05), it can be concluded that there is a significant correlation between BMI with anemia.

The nutritional status of the mother is very important in achieving the welfare of the mother and fetus. The method that is often used to determine the nutritional status of a person is to calculate the Body Mass Index (BMI). Body Mass Index (BMI),

which is weight divided by height squared, is influenced by ethnicity and genetics and can also be used to measure adiposity and energy balance[27].

Nutrition of pregnant women is a healthy and balanced food that must be consumed during pregnancy and its needs will increase by 15% compared to the needs of normal women. This increase in nutritional needs is needed for the growth of the uterus (uterus), breasts (mammae), blood volume, placenta, amniotic fluid and fetal growth[28].

The results of the study are in line with Susi's research in 2019 there is a correlation between Body Mass Index and the Incidence of Anemia in Maternal Maternity[29]. Other studies have shown a correlation between nutritional status and the incidence of anemia conducted by Sukmaningtyas with a p value of 0.006[30]. Research by Detty Apriyanti shows From the Chi-Square statistical test, the p-value is 0.025 < 0.05, meaning that there is a correlation between nutritional status and the incidence of anemia in pregnant women. With value OR=0.232[25].

Pregnant women with poor nutritional status are at risk of experiencing chronic energy deficiency (KEK). Pregnant women who experience CED will cause impaired hemoglobin formation so that they are at risk of anemia[31]. Pregnant women are at risk of experiencing abnormal nutritional status if BMI < 18 /> large 22.9. In addition to nutritional anemia, it can cause fetal death in abortion, congenital defects, low birth weight and anemia in babies born so that it has a significantly higher impact on maternal morbidity and mortality and perinatal mortality. The condition of pregnant women with severe anemia can increase the risk of maternal and infant morbidity and mortality, the possibility of giving birth to LBW and premature babies is greater[32]. Therefore, nutritional monitoring of pregnant women is very important.

Conclusion

The prevalence of pregnant women who experience moderate anemia is 76.6 percent and mild anemia is 26.3 percent, BMI variables are significantly related to anemia, while maternal age, education, occupation and knowledge are not related to anemia, so it is necessary to increase promotion and education to mothers. pregnant women to fulfill nutrition and prevent anemia, especially in early pregnancy

References

1. Organization WH. The global prevalence of anaemia in 2011. Who. 2011. 1–48 p.
2. Gary C, Kenneth L SB. Williams Obstetrics. Mcgraw Hill; United States: Mcgraw Hill; 2018.
3. Kemenkes RI. Hasil Riset Kesehatan Dasar Tahun 2018. Kementrian Kesehat RI. 2018;53(9):1689–99.
4. Karawang DK. Profil Dinas Kesehatan Karawang Tahun 2018. In Karawang; 2018.
5. Di Renzo GC, Spano F, Giardina I, Brillo E, Clerici G, Roura LC. Iron deficiency anemia in pregnancy. *Women's Heal*. 2015;11(6):891–900.
6. Lee ACC, Katz J, Blencowe H, Cousens S, Kozuki N, Vogel JP, et al. National and regional estimates of term and preterm babies born small for gestational age in 138 low-income and middle-income countries in 2010. *Lancet Glob Heal*. 2013;1(1).
7. Rukuni R, Bhattacharya S, Murphy MF, Roberts D, Stanworth SJ, Knight M. Maternal and neonatal outcomes of antenatal anemia in a Scottish population: A retrospective cohort study. *Acta Obstet Gynecol Scand*. 2016;95(5):555–64.
8. Abu-Ouf NM, Jan MM. The impact of maternal iron deficiency and iron deficiency anemia on child's health. *Saudi Med J.* 2015;36(2):146–9.
9. Services H. Recommendations to prevent and control iron deficiency in the United States. Centers for Disease Control and Prevention. MMWR Recomm Rep. 1998;47(RR-3):1–29.
10. Garzon S, Cacciato PM, Certelli C, Salvaggio C, Magliarditi M, Rizzo G. Iron deficiency anemia in pregnancy: Novel approaches for an old problem. *Oman Med J*. 2020;35(5):1–9.
11. Pavord S, Daru J, Prasannan N, Robinson S, Stanworth S, Girling J.

UK guidelines on the management of iron deficiency in pregnancy. *Br J Haematol*. 2020;188(6):819–30.
12. Manuaba. Pengantar Kuliah Obstetri. Jakarta: Buku Kedokteran EGC; 2010.
13. E Puji, S Sri FN. Hubungan Pengetahuan Ibu Dan Pola Konsumsi Dengan Kejadian Anemia Gizi Pada Ibu Hamil Di Puskesmas Kassi-KassI. *J Media Gizi Pangan*. 2010;
14. Popa AD, Niţă O, Graur LI, Popescu RM, Botnariu GE, Mihalache L, et al. Nutritional knowledge as a determinant of vitamin and mineral supplementation during pregnancy. *BMC Public Health*. 2013;13(1):1–10.
15. RI D. Profil Kesehatan Indonesia Tahun 2008. In Jakarta: Departemen Kesehatan; 2009.
16. Faatih M. Penggunaan Alat Pengukur Hemoglobin di Puskesmas, Polindes dan Pustu. *J Penelit dan Pengemb Pelayanan Kesehat*. 2018;1(1):32–9.
17. Kesehatan BP dan P, RI. K. Laporan Riset Fasilitas Kesehatan (RIFASKES) 2011. Jakarta; 2012.
18. RI DK. Buku Acuan Pelayanan Kesehatan Mater- nal dan Neonatal. Jakarta. Jakarta: DepKes RI; 2005.
19. Tanziha I, Utama LJ, Rosmiati R. Faktor Risiko Anemia Ibu Hamil Di Indonesia. *J Gizi dan Pangan*. 2016;11(2):143–52.
20. Purwaningtyas ML, Prameswari GN. Faktor Kejadian Anemia pada Ibu Hamil. *Higeia J Public Heal Res Dev*. 2017;1(3):43–54.
21. Ononge S, Campbell O, Mirembe F. Haemoglobin status and predictors of anaemia among pregnant women in Mpigi, Uganda. *BMC Res Notes*. 2014;7(1):1–8.
22. South Australian Perinatal Practice Guidelines. *Anaemia In Pregnancy*. 2016.
23. Amallia S, Afriyani R, Utami SP. Faktor Risiko Kejadian Anemia pada Ibu Hamil di Rumah Sakit BARI Palembang. *J Kesehat*. 2017;8(3):389.
24. Jin L, Yeung LF, Cogswell ME, Ye R, Berry RJ, Liu J, et al. Prevalence of anaemia among pregnant women in south-east China, 1993-2005. *Public Health Nutr*. 2010;13(10):1511–8.
25. Afriyanti D. Faktor Risiko Yang Berhubungan Dengan Kejadian Anemia. *Menara Ilmu*. 2020;14(01):6–23.
26. Sulistyoningsih H. Gizi Untuk Kesehatan Ibu Dan Anak. Yogyakarta: Graha Ilmu; 2011.
27. Almatsier. Pengenalan Ilmu Gizi. jakarta: Bina Pustaka Sarwono.; 2017.
28. Iffah I, Dewi NHP, Mariamu M. Hubungan Pengetahuan dan Sikap Ibu Hamil Dengan Mitos Kehamilan di Wilayah Kerja UPTD Puskesmas Langsa Barat Kota Langsa. *Serambi Saintia J Sains dan Apl*. 2020;8(2):115–22.
29. Ratnawati S, Maula AR, Widarasari J, Tuparev III. Anemia pda Ibu Bersalin Di Puskesmas Sedong Kabupaten Cirebon Tahun 2019 KABUPATEN CIREBON TAHUN 2019. 2020;8:69–74.
30. World Health Organization. WORLD HEALTH STATISTICS - MONITORING HEALTH FOR THE SDGs. World Heal Organ. 2016;1.121.
31. Rukiah Y D. Asuhan Kebidanan. Jakarta: TransInfo Media; 2011.
32. Waryana SKM KM. Gizi Reproduksi. Yogyakarta: Pustaka Rihama; 2010.