Knowledge of Risk Factors and Preventive Measures for Anaemia in Pregnancy Among Childbearing Mothers in Imo East Senatorial District, Imo State, Nigeria

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Abstract

Anaemia in pregnancy is one of the world's leading causes of death and disability among women of reproductive age. This study investigated knowledge of risk factors and preventive measures for anaemia in pregnancy among childbearing mothers in Imo East Senatorial District, Imo State. Four research questions and two null hypotheses guided the study. A descriptive cross-sectional survey research design was adopted for the study. The population for the study consisted of 742,576 childbearing mothers. A sample size of 432 childbearing mothers was drawn from the entire population using a two-stage sampling procedure. Researchers' designed "Knowledge of Risk Factors and Preventive Measures of Anaemia in Pregnancy Questionnaire (KRFPMAPQ) was used for data collection. Kuder- Richardson statistics was used to determine the internal consistency of KRFPMAPQ and a reliability index of .83 was obtained. Descriptive statistics of frequency counts and percentages as well as Pearson Chi-square were used to analyse and answer the research questions and test the hypotheses respectively. Findings revealed that childbearing mothers in Imo East Senatorial District, Imo State possessed high knowledge (68.9%) of risk factors and preventive measures (79.2%) of anaemia in pregnancy respectively. There were significant differences in the knowledge of risk factors and preventive measures for anaemia in pregnancy among CBMs in Imo State senatorial District, Imo State based on level of education. Findings suggest that government through the partnership of non-governmental organizations should make good antenatal care accessible and affordable to all pregnant women.

Key words: Knowledge, Anaemia, Pregnancy, Preventive Measures and Childbearing Mothers.

Introduction

Anaemia in pregnancy continues to be a common problem among childbearing mothers all over the world. It is an important health issue resulting in high maternal morbidity and mortality. Anaemia in pregnancy is a major public health problem with about two billion people being anaemic worldwide (Anlaakuu & Anto, 2017). Ivoke et al. (2013) submitted that anaemia in pregnancy constitutes a major global public health problem and is one of the world's leading causes of death and disability among women of reproductive age. Globally, it is estimated that 58.27 million women are anaemic during pregnancy, of whom 55.75 million (95.7%) live in developing countries (Nduhiu-Githnji, 2010; Nwizu, Iliyasu, Ibrahim, & Galadanci, 2011). Furthermore, Ivoke et al. (2013) reported that anaemia occurs in 52 per cent of pregnant women in developing countries compared with 23% in the developed economies of the world. Nwizu et al. (2011); and Ivoke et al. (2013) explained further that recent estimates suggest that up to 60 per cent of pregnant women in developing countries including Nigeria may be anaemic, and nearly 7 per cent of pregnant women are severely anaemic. The authors submitted that it has been estimated that anaemia accounts for 3.7 per cent and 12.8 per cent of maternal deaths during pregnancy and child-birth in Africa and Asia, respectively and has been associated with low neonatal birth weight. Also, Chathuranga, Balasuriya, and Peera (2014) reported that the global prevalence of anaemia in pregnancy is estimated to be approximately 41.8 per cent varying from a low of 5.7% in the United States of America to a high of 75 per cent in Gambia.

Anaemia in pregnancy is one of the commonly encountered medical disorders during pregnancy. Anderson (2005) defined anaemia in pregnancy as haemoglobin concentration of less than

11g per deciliter when peripheral blood is examined. It is one of the most serious problems and a common condition that is seen in many women who are pregnant (Fareeda, 2011). Anaemia in pregnancy occurs when the number or size of a person's red blood cells are too low. Red blood cells are important because they carry oxygen from the lungs to all parts of the body. Fareeda (2011) explained that any woman with haemoglobin of less than 11gm/dl- 11.5gm/dl at the start of pregnancy will be regarded anaemic. Contextually, anaemia in pregnancy refers to a haemoglobin concentration of less than 11g per deliciliter in pregnancy. As pregnancy progresses, the blood is diluted. It is estimated that more than half of pregnant women in the world have a haemoglobin level indicative of anaemia (< 11.0g/dl). Most women start pregnancy without sufficient store of iron to meet their body's increased demands, particularly in the second and third trimesters. If they get to the point where they no longer have enough iron to make the haemoglobin they need, they become anaemic.

The amount of blood in the body increases during pregnancy, until the person has almost 50 per cent more than usual. At this period, more iron will be needed to make more haemoglobin for all that additional blood and for the growing baby and placenta. Women develop anaemia in pregnancy due to increased demand for iron and vitamins resulting from physiological requirements. The common causes of anaemia in pregnancy include: nutritional deficiencies (iron, folic acid, & vitamin B12), parasitic diseases (hookworm and schistosomiasis), acquired immuned deficiency syndrome, genetic red blood disorders (sickle cell anaemia), bone marrow suppression, chronic blood loss and underlying malignancies (Sifakis &Pharmakides, 2000; Nwizu et al., 2011; Ivoke et al., 2013; Australian Women and New Born Health Services, 2013). Anaemia in pregnancy is associated with some risk factors which include morning sickness that is severe enough to cause frequent vomiting, having two more pregnancies close together, multiple pregnancies, having poor iron diet and if pre-pregnancy menstrual flow was heavy (Fareeda, 2011). Risk factor in the context of this study refers to variable(s) that increase somebody's chances of developing anaemia in pregnancy.

The most common symptom of anaemia in pregnancy is tiredness. Other symptoms may include: headache, weakness, palpations, dizziness, indigestion, loss of appetite, dyspnoea, oedema, congestive cardiac failure, and hair loss (Sifakis &Pharmakides, 2000; Sharma &Shanka, 2010). Anaemia in pregnancy is associated with many maternal and foetal complications, such as: poor weight gain in mother and unborn baby, preterm labour, postnatal sepsis, anesthesia risk, antepartum haemorrhage, pregnancy induced hypertension, premature rupture of the membrane, dysfunctional labour, embolism and uterine sub-involution. It is also linked with foetal health problems such as foetal distress, poor intellectual developmental milestones, perinatal asphyxia, failure to thrive and death (Australian Women and Newborn Health Services, 2013). Prevention of anaemia would therefore help to reduce the high maternal mortality in developing countries including Nigeria.

Preventive measures refer to interventions directed to avert the emergence of specific disease or conditions, thereby reducing their incidence and prevalence in a given population. Preventive measures according to Salama (2011) refer to actions aimed at eradicating, eliminating or minimizing the impact of a disease or disability. Preventive measures can be achieved through modification or removal of risk factors for a disease or any health condition. Contextually, preventive measures refer to strategies and methods applied to limit the occurrence of anaemia among CBMs. The primary aim is to protect the health of women and their babies during pregnancy so as to achieve at the end of the pregnancy, a healthy mother and a healthy baby. These can be achieved through early, accurate estimation of gestational age, identification of patients at risk for complication, ongoing evaluation of both mother and foetus as well as anticipation of problems and intervention if possible, to prevent or minimize mortality (Charles & Urania, 2016). Early detection and appropriate management of health problem, such as anaemia during pregnancy can help to preserve the wellbeing of both the mother and the baby. With regular antenatal care, health care providers can spot health problems early (Mark, Joanne, Grant, Van, & Jocelyn, 2015). It also allows for early treatment which can cure many problems and prevent others. Successful prevention of anaemia among CBMs will be dependent on their knowledge of the disease and its consequences.

Knowledge is information, understanding and skills that one gains through education, training or experience. To have knowledge is to be empowered (Abdullahi &Bassallahi, 2011). Knowledge is the possession of information or the ability to locate it. The process of acquiring and retaining knowledge in memory is called learning and is a product of the experiences at hand. When it comes to health promotion and disease prevention, probably the critical type of intervention involves the

communication of risk information to the public (Vahabi, 2005). Thus, the accumulation of knowledge should not begin much when people initially encounter a disease, rather the process of acquiring knowledge should begin much earlier in people's lives. From the foregoing, it is apparent that knowledge is all about a person's level of information on the subject. Contextually, knowledge refers to the amount of information CBMs in Imo East Senatorial District have on factors that increase their risk of developing anaemia in pregnancy and measures to prevent them. The importance of knowledge of risk factors and preventive measures of anaemia in pregnancy among CBMs is vital in reducing complications and outcomes.

Childbearing mothers are women within their reproductive years (15-49 years). These are women who because of their physiological disposition have been designed by nature to bear children. The women are also the most vulnerable group in the society due to problems associated with pregnancy and child birth. Contextually, CBMs refers to women who have given birth or are still giving birth in Imo State. While life-threatening risks associated with pregnancy are shared by all CBMs, it is undeniable that some are more at the risk of developing these complications because of their level of education (Nwizu et al., 2011). Education exposes women to new ideas and information. This exposure can impact a woman's attitude towards disease and biomedicine, and can also improve her ability to communicate with health care professionals to make autonomous in the obstetric decision-making process (Surrendra, Fresier, Savita, & Nasreen, 2006). Childbearing mothers are the most vital component to reducing complications and birth outcomes through the knowledge of preventive measures of anaemia in pregnancy. Unfortunately, literature reviewed has not shown the knowledge of risk factors of anaemia in pregnancy and preventive measures among CBMs in Imo East Senatorial District, Imo State, Nigeria. This therefore, necessitated the study in the area. Specifically, the study determined CBMs' knowledge of: risk factors for anaemia in pregnancy; preventive measures for anaemia in pregnancy and their associated socio-demographic factor of education level. It was hypothesized that there is no significant difference in the knowledge of risk factors and preventive measures for anaemia in pregnancy among CBMs in Imo East Senatorial District, Imo State based on level of education.

Method

Design of the Study: The study adopted a descriptive cross-sectional survey research design. Cross-sectional survey research design collects data to make inferences about a population of interest at one point in time.

Area of the Study: The study was conducted in Imo East Senatorial District, Imo State. Imo East Senatorial District is one of the senatorial districts in Imo State, and shares common boundaries with Orlu, Obowo, Isu, Ohaji Egbema, Okigwe, Ihitte Uboma and Isiala Mbano Local Government Area, all of which are in Imo West and Imo North senatorial districts. The senatorial district is made up of nine local government areas: Aboh Mbaise, Ahiazu Mbaise, Ezinihitte Mbaise, Ikeduru, Mbaitoli, Ngor-Okpala, Owerri North, Owerri West and Owerri Municipal. The researchers observed that most mothers in the senatorial district do not easily access quality foods and health care services because of their high cost, thus predisposing them to pregnancy complications, such as: anaemia in pregnancy. Some cultural practices inherent in the senatorial district such as lack of interest in antennal care, food taboo, and belief in traditional medicine and self-medication were also observed by the researchers to have been predisposing CBMs in the senatorial district to anaemia in pregnancy. Moreso, literature in indicated that anaemia in pregnancy is prevalent among pregnant women in Imo State. Thus, the researchers deemed the area appropriate for the study.

Population for the Study: The population for the study comprised CBMs from the nine LGAs that make up Imo East Senatorial District, which is estimated to be 742,576 (National Population Commission [NPC], 2017).

Sample and Sampling Technique: The sample for the study consisted of 432 CBMs living in Imo East Senatorial District, Imo State. The sample was selected by the aid of Cohen, Manion, and Morrison (2011) sample size determination random table guideline, that when a population 500,000 and above at 95% confidence level (5% interval), the sample size should be 384 and above. Multi-

stage sampling procedure was employed to draw the sample size for the study. In the first stage, four out of the nine LGAs in the senatorial district were drawn using simple random sampling technique of balloting without replacement. Secondly, four communities each were drawn from the four selected LGAs using simple random sampling technique of balloting without replacement, and this gave a total of 16 communities. Thirdly, 27 CBMs with greater experience were purposively drawn from each of the 16 selected communities to arrive at the sample size of 432.

Instrument for Data Collection: Researchers' designed Knowledge of Risk Factors and Preventive Measures of Anaemia in Pregnancy Questionnaire (KRFPMAPQ) was used for data collection. It consisted of three sections: A, B, and C. Section A consisted of one item on the respondent's demographic variable of level of education. Section B consisted of seven items on anaemia in pregnancy while section C consisted of five items on the preventive measures of anaemia in pregnancy. Three experts validated the instrument. Two came from the Department of Human Kinetics and Health Education, University of Nigeria, Nsukka; one came from the Department of Health Education, Alvan Ikoku Federal College of Education, Owerri, Imo State. Kuder-Richardson (K-R 21) statistics was used to compute the reliability of the instrument, and a reliability index of .83 was obtained. This was adjudged high and reliable for embarking on the study. This is in accordance with Udegbu (2007), that if the reliability coefficient is .67 and above, it will be accepted for use in a study.

Data Collection: A total of 432 copies of the questionnaire were administered, out of which 414 were returned, which gave a return rate of 95.8 per cent. The 414 copies of the questionnaire returned were properly filled out and used for data analysis.

Data Analysis: Data were analysed with IBM SPSS software version 23 using frequency counts, percentages, and chi-square statistic. The research questions were answered using percentages while the null hypotheses were tested using pearson chi-square ($\chi2$) test at .05 level of significance. In determining level of knowledge and preventive measures, Okafor (1997) criterion was adopted. By these, a score below 20 per cent was interpreted very low knowledge (VLK), a score of 21-39 per cent was interpreted low knowledge (LK), a score of 40-59 per cent was interpreted average knowledge (AK), a score of 60-80 per cent was interpreted high knowledge (HK), and a score above 80 per cent was interpreted very high knowledge (VHK).

Results

Table 1: Childbearing Mothers' Knowledge of Risk Factors for Anaemia in Pregnancy(n = 414)

S/n	Knowledge of Risk Factors for Anaemia in Pregnancy	Yes n (%)	No n (%)	Decision
1.	The risk of developing anaemia in pregnancy is higher if the woman has morning sickness that is severe enough to cause frequent vomiting.	264(63.8)	150(36.2)	HK
2.	The risk of developing anaemia in pregnancy is higher among women with multiple pregnancies (twin).	226(64.3)	148(35.7)	HK
3	Having poor iron diet during or before pregnancy is a risk factor of anaemia in pregnancy.	315(76.1)	99(23.9)	HK
4	Having two or more pregnancies close together is a risk factor of anaemia in pregnancy.	267(64.5)	147(35.5)	HK
5	Inherited disease such as sickle cell is a risk factor of anaemia in pregnancy.	352(85.0)	62(15.0)	VHK

6	Heavy pre-pregnancy menstrual flow is a risk factor of anaemia in pregnancy.	211(51.0)	203(49.0)	AK
7	Chronic blood loss during pregnancy is a risk factor of developing anaemia in pregnancy.	320(77.3)	94(22.7)	HK
	Overall percentage	**68.9%**	**31.1%**	**HK**

Table 1 shows that overall, CBMs' knowledge of risk factors for anameia was 68.9 per cent. This implies that CBMS in Imo East Senatorial District of Imo State possessed high knowledge of risk factors of anaemia in pregnancy.

Table 2: Childbearing Mothers' Knowledge of Preventive Measures for Anaemia in Pregnancy (n = 414)

S/n	Knowledge of Preventive Measures for Anaemia in Pregnancy	Yes n (%)	No n (%)	Decision
1.	Eating balanced diet during pregnancy can help to reduce the risk of developing anaemia in pregnancy	344(83.1)	70(16.9)	VHK
2.	Eating more of fruit, vegetables, fats and protein can help limit the risk of developing anameia in pregnancy	347(83.8)	67(16.2)	VHK
3	Adequate nutrition before and during pregnancy can help prevent the risk of developing anaemia during pregnancy	357(86.2)	57(13.8)	HK
4	Early and regular antenatal visit can prevent the occurrence of anameia during pregnancy	253(61.1)	161(38.9)	HK
5.	Prevention of malaria during pregnancy can help reduce the risk of developing anaemia during pregnancy	338(81.6)	76(18.4)	VHK
	Overall percentage	79.2%	20.8%	HK

Table 2 shows that overall, CBMs' knowledge of preventive measures of anaemia in pregnancy was 79.2 per cent. This implies that CBMs in Imo East Senatorial District of Imo State possessed high knowledge of preventive measures of anaemia in pregnancy.

Table 3: Childbearing Mothers' Knowledge of Risk Factors for Anaemia in Pregnancy Based on Level of Education (n = 414)

S/n	Knowledge of Risk Factors for Anaemia in Pregnancy	Primary Education (n = 97) n (%) D	Secondary Education (n = 112) n (%) D	Tertiary Education (n = 205) n (%) D
1.	The risk of developing anaemia in pregnancy is higher if the woman has morning sickness that is severe enough to cause frequent vomiting.	58(59.8)[AK]	83(74.1)[HK]	123(60.0)[HK]
2.	The risk of developing anaemia in pregnancy is higher among women with multiple pregnancies (twin).	58(59.8)[AK]	82(73.2)[HK]	126(61.5)[HK]

3	Having poor iron diet during or before pregnancy is a risk factor of anaemia pregnancy.	68(70.1%)[HK]	74(66.1)[HK]	173(84.4)[VHK]
4	Having two or more pregnancies close together is a risk factor of anaemia in pregnancy.	59(60.8)[HK]	70(62.5)[HK]	138(67.3)[HK]
5.	Inherited disease such as sickle cell is a risk factor of anaemia in pregnancy.	75(77.3)[HK]	87(77.7)[HK]	190(92.7)[VHK]
6.	Heavy pre-pregnancy menstrual flow is a risk factor of anaemia in pregnancy.	46(47.4)[AK]	54(48.2)[AK]	111(54.1)[AK]
7.	Chronic blood loss during pregnancy is a risk of developing anameia in pregnancy.	58(59.8)[AK]	81(72.3)[HK]	181(88.3)[VHK]
		62.1%[HK]	**67.7%[HK]**	**72.6%[HK]**

Table 3 shows that overall, CBMs in all level of education possessed high knowledge: primary education (62.1%), secondary education (67.7%), tertiary education (72.6%) of risk factors of anaemia in pregnancy. The table also revealed that irrespective of CBMs level of education, they had average knowledge that having a heavy pre-pregnancy menstrual flow can predispose a woman to anaemia during pregnancy.

Table 4: Childbearing Mothers' Knowledge of Preventive Measures for Anaemia in Pregnancy Based on Level of Education (n = 414)

S/n	Knowledge of Preventive Measures for Anaemia in Pregnancy	Primary Education (n = 97) n (%) D	Secondary Education (n = 112) n (%) D	Tertiary Education (n = 205) n (%) D
1.	Eating balanced diet during pregnancy can help reduce the risk of developing anaemia in pregnancy.	61(62.9)[HK]	89(79.5)[HK]	194(94.6)[VHK]
2.	Eating more of fruit, vegetables, fats and protein can help limit risk of developing anaemia in pregnancy.	64(66.0)[HK]	89(79.5)[HK]	194(94.6)[VHK]
3.	Adequate nutrition before and during pregnancy can help prevent the risk of developing anaemia during pregnancy.	70(72.2)[HK]	91(81.3)[HK]	196(95.6)[HK]
4.	Early and regular antenatal visit can prevent the occurrence of anaemia during pregnancy	42(43.3)[AK]	77(68.8)[HK]	134(65.4)[HK]
5.	Prevention of malaria during pregnancy can help reduce the risk of developing anaemia in pregnancy.	61(62.9)[HK]	85(75.9)[HK]	192(93.7)[VHK]
		61.5%[HK]	**77.7%[HK]**	**88.8%[VHK]**

Table 4 shows that overall, CBMs with primary and secondary education possessed high knowledge (61.5%) and (77%) of preventive measures of anaemia in pregnancy respectively while CBMs with tertiary education possessed very high knowledge (88.8%) on the same issue. The table

further shows that irrespective of the CBMs' level of education; they had high and very high knowledge of preventive measures of anaemia in pregnancy in all the indices expect CBMs with primary education (43.3%) who had average knowledge that early and regular antenatal visit can prevent the occurrence of anaemia in pregnancy.

Table 5: Chi-Square Test on Knowledge of Risk Factors of Anaemia in Pregnancy among CBMs in Imo East Senatorial District Based on level of Education (n = 414)

Variable	N	Knowledge of Risk Factors of Anaemia in Pregnancy		x^2 value	Df	p-value
		Yes O(E)	No O(E)			
Primary Education	97	69(78.3)	28(18.7)			
Secondary Education	112	86(90.4)	26(21.6)	12.552	2	.002[*]
Tertiary Education	205	179(165.4)	26(39.6)			

*Significant (p < .05)

The chi-square test for independence in Table 5 shows that there was a significant difference (x^2 = 12.552, df = 2, p-value = .002 <.05) on the knowledge of risk factors of anaemia in pregnancy based on the level of education of women. The null hypothesis of no significant difference was rejected since p-value was less than .05 level of significance at 2 degree of freedom. This implies that significant difference existed in the knowledge of risk factors of anaemia in pregnancy among CBMs in Imo East Senatorial district of Imo State based on level of education.

Table 6: Chi-square Test on Knowledge of Preventive Measures of Anaemia in Pregnancy among CBMs in Imo State East Senatorial District, Based on Level of Education (n = 414)

Variable	N	Knowledge of Preventive Measures of Anaemia		x^2 –value	Df	p-value
		Yes O(E)	No O(E)			
Primary Education	97	69(83.9)	28(13.1)			
Secondary Education	112	91(96.9)	21(15.1)	40.046	2	.001[*]
Tertiary Education	205	198(177.3)	7(27.7)			

The chi-square test for independence in Table 6 shows that there was a significant difference (x^2 = 40.046, df = 2, p-value = .001 < .05) on the knowledge of preventive measures for anaemia in pregnancy based on level of education. The null hypothesis of no significant differences was rejected since p-value was less than .05 level of significance at 2 degree of freedom. This implies that significant difference existed in the knowledge of preventive measures of anaemia in pregnancy among CBMs in Imo East Senatorial district of Imo State based on level of education.

Discussion
The findings of the study in Table 1 showed that childbearing mothers in Imo East Senatorial District had high knowledge (68.9%) of the risk factors of anaemia in pregnancy. The findings were expected and therefore not surprising because studies indicated that anaemia is a common condition that is seen in many women who are pregnant. The result was in line with the findings of Fareeda (2011) who reported that the risk of developing anameia in pregnancy is higher if the woman has morning sickness that is severe enough to cause frequent vomiting, having two or more pregnancies close together, having poor iron diet and if pre-pregnancy menstrual flow was heavy. The findings also agree with the findings of Ivoke et al. (2013) who reported that inherited disease, such as sickle cell anaemia, chronic blood loss and underlying malignances are common causes of anaemia in pregnancy. The finding was in consonance with the explanation of Nwizu, Iliyasu, Ibrahim, and Galadanci, (2011) that anaemia occurs in 52 per cent of pregnant women in the developing countries

compared with 23 per cent in the developed economies of the world. The findings have implications for government and non-governmental agencies to increase their availability and conduct sustained awareness campaigns to all women of childbearing age as anaemia in pregnancy is an important factor for maternal and infant mortality.

The findings in Table 2 showed that CBMs had high knowledge (79.2%) of the preventive measures of anaemia in pregnancy. The findings were expected and therefore not surprising because they agree with the assertion of Singh and Choudhary (2009) that adequate nutrition before and during pregnancy has greater potential for a long-term health of both mother and child and is important during the course of pregnancy. The finding is in consonance with the explanation of Dana (2012) that eating well during pregnancy can ensure that the mother experiences fewer complications such as anaemia in pregnancy. The findings were in line with the recommendations of O'Daffer (2001) that woman who are pregnant should eat plenty of vegetables, fruit, whole grain foods, quality protein, such as (fish, eggs, milk, cheese, nuts etc) and plenty of pure water. The findings were in conformity with the recommendations of Tomal, Khan, Hossian, and Shabuz (2005) that pregnant women should take special foods in order to get rid of pregnancy-complications including anaemia. The findings agree with the explanation of Mark et al. (2015) that with regular prenatal care, health care providers can spot health problems early. These findings have implications for health care providers to encourage and advice mothers to register early for and attend antenatal clinics regularly during pregnancy so that those at risk can be identified and the complications can be managed timely to avoid further complications.

The findings in Table 3 showed that CBMS in all levels of education possessed high knowledge primary education (62.1%), secondary education (67.7%), and tertiary education (72.6%) of risk factors of anaemia in pregnancy. Findings in Table 5 showed that there was significant difference in the knowledge of risk factors of anaemia in pregnancy among CBMs in Imo East Senatorial district of Imo State based on level of education. The findings were expected and therefore not surprising because education has consistently been found to be associated with the use of maternal health care services. The higher a woman's level of education, the more likely she is to utilize maternal health care services and to take better care of herself. Education exposes women to new ideas, information and to modern institutions. An educated woman may have the knowledge of the risk factors to anaemia in pregnancy and will want to avoid them, unlike uneducated woman who is limited in knowledge. The findings were in line with the finding of Rahana, Muhammad, Azhar, and Saleem (2011) who reported that education level had strong association with the occurrence of anaemia and its severity. The findings agree with the findings of Nwizu et al. (2011) who reported that there was a significant association between level of education and anaemia. The reason for this finding could be as a result of improvement in the utilization of antenatal services by CBMs in the senatorial zone due to the effort made by the government to increase the number of health centres in the State.

The findings in Table 4 showed that CBMS with primary and secondary education possessed high knowledge (61.5%) and (77%) respectively on the preventive measures of anaemia in pregnancy while mothers with tertiary education possessed very high level of knowledge (88.8%) on the same issue. The findings in Table 6 showed that there was a significant difference in the knowledge of preventive measures of anaemia in pregnancy based on level of education. The findings were expected and therefore not surprising. The findings agree with the findings of Tomal et al. (2005) who reported that education of mothers, and taking special foods during pregnancy were found to be associated with pregnancy-related complications, such as anaemia. Female literacy and maternal morbidity were intention in an inverse relationship that is improving the former will reduce the later.

Conclusion

The findings have shown that CBMs in Imo East Senatorial District possessed high knowledge (68.9%) of risk   factors of anaemia in pregnancy. Childbearing mothers in Imo Senatorial District possessed high knowledge of preventive measures of anaemia in pregnancy. There was significant difference in the knowledge of risk factors of anaemia in pregnancy among childbearing mothers in Imo East Senatorial District of Imo State based on level of education. There

was significant difference in the knowledge of preventive measures of anaemia in pregnancy among childbearing mothers in Imo East Senatorial District of Imo State based on level of education.

Recommendations

Based on the findings and discussion, the following recommendations were made:

1. Government through the partnership of non-governmental organizations should make good antenatal care accessible and affordable to all pregnant women.
2. There is need for improvement of diagnostic ability of anaemia by the health workers
3. Health education talks on nutrition needs for the mother and the growing foetus and should be carried out by the government and other health stakeholders.
4. There is need to institute measures and programmes that will help to educate mothers on the need to intimate antenatal care early.
5. There is need for awareness creation on birth spacing and nutritional counseling on consumption of iron-rich foods and iron supplementations to prevent anaemia among pregnant women with special emphasis on those with low income and large family size.
6. There is need for ongoing education about the health implications of anaemia among women of reproductive age.

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