Age and Education Level as Determinants of Compliance to Iron and Folic Acid Supplements Among Pregnant Women Attending Antenatal Clinics in State Government Hospitals in Uyo Senatorial District

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Abstract

The study determined the extent to which pregnant women attending Antenatal clinics in State Government Hospitals in Uyo Senatorial District comply with their iron and folic acid intake. Cross-sectional survey design was used for the study. The population for the study consisted pregnant women that attend antenatal clinics in selected hospitals in Uyo Senatorial district of Akwa Ibom State. "FACTORS ASSOCIATED WITH COMPLIANCE TO IRON AND FOLIC ACID SUPPLEMENTATION QUESTIONNAIRE (FACIFASQ)" was developed and used by the researcher to collect data for the study. The instrument was face and content validated by experts in the field and the reliability coefficient of the instrument 0.88 using Cronbach's statistical analysis was used. Data obtained were analyzed using SPSS and simple regression analysis. Findings of the study revealed that there is significant influence of age and level of education on pregnant women compliance to iron and folic acid supplements. It was recommended that pregnant women of older age range should Endeavour to consume Iron and folate supplements for the sake of their good health and safe delivery. They should not allow the side effects to delude them from the benefit of taking iron and folic acid during their pregnancy periods. Also, Health education activities should be carried out to increase awareness among women and in the community of the importance of iron and folate supplementation in pregnancy.
Keywords: folic acid, supplements, iron, pregnant women, antenatal, age

Introduction

Iron deficiency has be considered as a serious forum of under- nutrition and is thought to be the most common cause of Anemia globally accounting for more than half of anemia cases in pregnancy. Anemia occurs in all stages of development but is more prevalent in pregnant women and children. Beard (2012) states that during pregnancy iron requirements are greater than average absorbable iron because the physiologic demands for iron during pregnancy increase from 0.8mg to ≤ 7.5mg of absorbed iron. World Health Organization (2009) defines Anemia in pregnancy as a haemoglobin concentration below 11g/dL during the first and third trimesters and below10.2g/dl during the second trimesters or an haemotocrit less than 32%. Folic acid, on the other hand is needed for the cell growth of the pregnant mother and foetus. During pregnancy serum folate levels decrease due to a reduced dietary intake or reduced absorption resulting in folic acid deficiency anemia (Fraser & Anderson, 2014). The high physiological requirement for iron & folic acid is difficult to meet with most diets hence iron prophylaxis is necessary during pregnancy. WHO (2009) recommends that as normal part of the prenatal care, all pregnant

women in areas of high prevalence of malnutrition should routinely receive iron and folate supplements together with appropriate dietary advice to prevent anaemia.

Statement of Problem

Anaemia during pregnancy is a worldwide problem (WHO, 2012). It is associated with increased maternal and prenatal mortality and morbidity. (Ezugwu, mbah Chigbu & Onah, 2013). Iron deficiency is the most common cause of anaemia during pregnancy and it contributes to low birth weight, lowered resistance to infection, poor cognitive development and reduced work capacity (Zakia, Ibrahim, Seham, Hend & Khattab, 2011). As noted by Gathigi (2011), folic acid deficiency leads to adverse consequences, pregnancy complications and congenital malformations. Iron and folic acid supplementation during pregnancy is therefore recommended by WHO, (2009) in addition to adequate diet, for prevention of malaria and treatment of parasitic infections. In Akwa Ibom State, supplementation programmes for iron and folic acid have been put in place by the State Ministry of Health. Despite the presence of these programmes, there is still high prevalence of anaemia (64%) among pregnant women, (Reproductive Health Survey, Ministry of Health, 2013). This may be as a result of lack of compliance to Iron and folic acid supplements. This study is therefore undertaken to assess the level of compliance and the factors associated with compliance to iron and folic acid supplementation among pregnant women in State Government Hospital in Uyo Senatorial District.

Purpose of the Study

The Purpose of this study is to determine the extent to which pregnant women attending Antenatal clinics in State Government Hospitals in Uyo Senatorial District comply with their iron and folic acid intake. Specifically, the study seeks to:

1. Ascertain the influence of the women's age on their compliance to iron and folic acid supplements.
2. Determine the influence of the women's level of education on their compliance to iron and folic acid supplements.

Research Questions

The following research questions shall be answered in the course of this research:

1. What is the influence of pregnant women's age on their compliance to iron and folic acid supplement in State Government Hospitals in Uyo Senatorial District?
2. What is the influence of the level of education of pregnant women on their compliance to iron and folic acid supplement in State Government Hospitals in Uyo Senatorial District?

Research Hypotheses

1. There is no significant relationship between age of pregnant women and their compliance to iron and folic acid supplements in state government hospital in Uyo Senatorial District.

2. There is no significant relationship between the pregnant women's level of education and their compliance to iron and folic acid supplements in state government hospital in Uyo Senatorial District.

Review of Related Literature

Overview of Iron and Folic Acid Supplements

Iron is a metallic element widely distributed in nature with an atomic number 26 and atomic weight of 55.847. Aisen. Ennis and Wesslin (2012) describe iron as a constituent of haemoglobin which is stored in the body as ferritin and haemosiderin. The total quantity of iron in the body is about 4g, with the following distribution; 65 – 68% in the haemoglobin, 4% in the muscle as myoglobin, 1% in the form of various heme compounds which take part in intracellular oxidation, 0.1% in the plasma as transferrin, 25-30% is stored in the reticuloendothelial system and liver in the form of ferritin. The dietary sources of iron occurs in two forms; heme and nonheme. Heme iron forms about 10% of dietary iron and is derived from fish, meat and chicken and is well absorbed. The nonheme iron forms about 90% of dietary iron which is in the form of iron salts and is available in vegetables, grains and cereals. The greater part of the iron in food is not absorbed by the body but the factors affecting its absorption are not fully understood (Conrad and Umberit, 2014). The presence of other dietary constituents may play a part. Iron is mainly absorbed from the small intestine. This is regulated in such a way that it is only absorbed when required while the excess dietary iron will be excreted in faeces. Therefore, women should be advised to take iron supplements with orange juice or vitamin C supplement since iron is best absorbed in an acid medium.

In pregnancy, women require a greater amount of iron due to an expanded red cell volume, the needs of the fetus and placenta, and blood loss at delivery (Woolf, 2012). The prevalence of iron deficiency among pregnant women varies from country to country. Globally, fifty six million pregnant women (41.8%) are affected with anaemia mostly due to iron deficiency. The effects of iron deficiency as stated by Woolf (2012) include increased fatigue in the mother, decreased work performance, cardiovascular stress due to inadequate haemoglobin and low blood oxygen saturation, impaired resistance to infection, poor tolerance to heavy blood loss and surgical interventions at delivery. The postulated risks to the fetus relate to the impaired delivery of haemoglobin and oxygen to the uterus, placenta and developing fetus (Woolf, 2008).

Folic acid also known as folate, vitamin M, vitamin B9 or folacin, is biologically important due to tetrahydrofolate and other derivatives after its conversion to dihydrofolic acid in the liver (Aisen, Ennis & Wesslin, 2012). The human body needs folate to synthesize DNA, repair DNA and form building blocks of RNA and act as a cofactor in certain biological reactions and is needed for protein synthesis in all cells. It is vitamin B that is needed for cell replication and growth. Growing tissues, such as those of a fetus and rapidly regenerating cells like red blood cells and immune cells have a high need for folate as stated by (Gathigi, 2011). Children and adults both require folic acid to produce healthy red blood cells and prevent anaemia. The recommended daily allowance for adults is 400 ug. This is based on the amount needed to maintain normal blood folate concentrations and prevent neural tube defects for women capable of becoming pregnant. The recommended dietary allowances for folic acid among non pregnant and pregnant women are 170 ug and 400 ug respectively (Wardlaw, 2012). Folate deficiency can result from low intake or lack of dietary intake, inadequate absorption which is often associated with alcoholism, increased requirement as in pregnancy. Deficiency can also occur in vitamin B12 deficiency and in diarrhea. Women, who could become pregnant, are advised to eat foods rich in folic acid or take 400 micrograms of synthetic folic acid daily or a combined supplement of iron and folic acid in order to have adequate folate levels in the blood and prevent problems

associated with its deficiency. Age has been found to be significantly related with compliance. Fleming, (2015) reported that older women were better compliant with anticoagulant therapy, while the younger patients felt that the therapy was unduly burdensome. A study on pharmacologic compliance on long term prophylaxis treatment on the other hand reveal no difference with respect to age between compliant and non compliant patients (Frank, 2012). In a study done in Nigeria on factors associated with compliance to iron supplementation; single and teenage mothers and those aged 35 years and above were less likely to be compliant, married women, living in urban area and those aged 20-29 years were more compliant with iron supplementation (Dairo & Lawovin, 2013).

Low compliance has been associated with a number of factors including the mother's level of education (literacy), poor utilization of prenatal health-care services, lack of knowledge and/or patient fears about the tablets and community beliefs, attitudes and practices that affect women's perception regarding tablet use. Women with higher level of education can better understand causes and consequences of anaemia and role of iron supplement. Women with higher education are much more likely to have received iron and folic acid supplements from health personnel than those with no education, as such the proportion of uneducated women who comply to iron and folic acid supplements declines steadily as education is said to be a change agent (Fotso & Ezeh, 2009). Pregnant woman who are not educated, tend to be ignored by health services professional, as they felt they would not understand their condition and therefore neglect to communicate relevant user-friendly and sensitive information to them (Anderson, 2013). Therefore, it is a well recognized fact that mother's education has a positive impact on health care services utilization. Underutilization of health care facilities by expectant mothers is often due to lack of knowledge and as corroborated by Kuma (2012), who observed that 33 per cent of women did not adhere to iron and folic acid supplements due to ignorance.

Summary of literature Review

The chapter outlines the overview of Iron and Folic Acid and as well recommend that pregnant women should take recommended daily doses to avert deficiency and diarrhea that might likely affect the fetus

Methods and Procedure

Research Design
The research design for this study is cross-sectional survey design

Area of Study
The area for the study is Uyo Senatorial distirct in Akwa Ibom State.

Population of the Study
The population of the study consisted of pregnant women that attended antenatal clinics in selected hospitals in Uyo Senatorial district of Akwa Ibom State.

Sample and Sampling Technique
A sample size of 351 respondents was drawn from 4046 pregnant women using Taro Yamane's (1967) formula, through stratified random sampling technique.

Instrument for data collection
The instrument for data collection was tagged "FACTORS ASSOCIATED WITH COMPLIANCE TO IRON AND FOLIC ACID SUPPLEMENTATION QUESTIONNAIRE (FACIFASQ) developed by the researcher.

Validity of the Instrument
The instrument was made to pass through face and content validity by experts in the field.

Reliability of the Instrument
Cronbach Alpha technique was used to determine the reliability of the instrument (FACIFASQ), using 20 respondents from General Hospital, Ukana in Essien Udim Local Government Area in Ikot Ekpene Senatorial District because it was outside the study area.

Method of Data Collection
Analysis of the data was done using Statistical Package for the Social Science (SPSS) and simple regression analysis. The results of the statistical analysis for the hypotheses was tested for significance at 0.05 alpha levels.

Result and Discussion of Findings

Research Question One
The research question sought to find out the influence of pregnant women's age on their compliance to iron and folic acid supplement in State Government Hospitals in Uyo Senatorial District. To answer the research question, descriptive analysis was performed on the data as presented in table 1.

Table 1: The influence of age on pregnant women compliance to iron and folic acid supplements. (N = 351)

Age	N	$\overline{X}$	SD	Mean Difference
Younger (30 years and below)	128	18.01	2.43	a-b (1.21)
Middle Age (31 to 40 years)	158	16.80	1.15	b-c (2.51)
Older ((41 years and above)	65	14.29	0.46	a-c (3.72)
Total	**351**	**16.78**	**2.12**	

Source: Field Survey

Table 1 presents descriptive statistics of the influence of age of pregnant women on their compliance to iron and folic acid supplements. From the table, it was observed that the women identified with younger age had the highest mean (18.01) of compliance to iron and folic acid supplements. This was seconded by those identified with medium age (16.80), while the least on the table were the older women (14.29). It was also observed that mean difference between the younger and medium aged pregnant women was (1.21). That which exists between the medium and the older was (2.51) while the difference between the younger and older aged pregnant women was (3.72).

Research Question Two
The research question sought to find out the influence of pregnant women's educational level on their compliance to iron and folic acid supplement in State Government Hospitals in Uyo

Senatorial District. To answer the research question, descriptive analysis was performed on the data as presented in table 2.

Table 2: The influence of level of education on pregnant women's compliance to iron and folic acid supplements.

Level of Education	N	X	SD	Mean Difference
a. High	119	18.61	1.84	a-b (1.7)
b. Average	121	16.91	1.13	b-c (2.24)
c. Low	111	14.67	1.03	a-c (3.94)
Total	**351**	**16.78**	**2.12**	

Source: Field Survey

Table 2 presents the descriptive statistics of the influence of level of education on pregnant women compliance to iron and folic acid supplements. From the table, it was observed that the highly educated pregnant women were identified with highest mean level (18.61) of compliance to iron and folic acid supplements. This was seconded by those identified with average level of education (16.91), while the least in the group were women with low level of education (14.67). It was also observed that, the mean difference of 1.7 lain between the high and average level of education, 2.24 lain between average and low level of education while 3.94 lain between the high and low. The result therefore means that the level of education of pregnant women has remarkable effects on their compliance to iron and folic acid supplements.

Hypothesis One

The null hypothesis states that there is no significant influence of age of the pregnant women on their compliance to iron and folic acid supplements in State Government hospitals in Uyo Senatorial District. In order to test the hypothesis, two variables were identified as follows:-

1. Age of the pregnant women as the independent variable
2. Their compliance to iron and folic acid supplements as the dependent variable.
   One-way analysis of variance was used to determine the F-value (See table 3)

Table 3: One-way analysis of variance of the influence of age of the pregnant women on their compliance to iron and folic acid supplements in State Government hospitals in Uyo Senatorial District.

Age	N	$\bar{X}$	SD
Older	65	14.29	0.46
Medium	158	16.80	1.15
Younger	128	18.01	2.43
Total	351	16.78	2.12

Source of variance	SS	Df	Ms	F
Between group	595.31	2	297.66	
Within groups				106.64*
	971.36	348	2.79	

Total	**1566.667**	**350**		

***significant at 0.05 level; df = 2 & 348; critical F - value = 2.99**

The above Table 3 presents the obtained F-value as (106.64). This value was tested for significance by comparing it with the critical F-value (2.99) at 0.05 level with 2 & 348 degrees of freedom. The obtained F-value (106.64) was greater than the critical value (2.994). Hence, the result was significant, meaning that there is significant influence of age of the pregnant women on their compliance to iron and folic acid supplements in State Government hospitals in Uyo Senatorial District.

Hypothesis Two

The null hypothesis states that there is no significant influence of the level of education of the pregnant women on their compliance to iron and folic acid supplements. In order to test the hypothesis, two variables were identified as follows:-

1. Level of education of the pregnant women as the independent variable
2. Their compliance to iron and folic acid supplements as the dependent variable.

One-way analysis of variance was used to determine the F-value (See table 4)

TABLE 4: One-way analysis of variance of the influence of the level of education of the pregnant women on their compliance to iron and folic acid supplements.

Groups	**N**	**X**	**SD**
High	119	18.61	1.84
Average	121	16.91	1.13
Low	111	14.67	1.02
Total	351	16.78	2.12

Source of variance	**SS**	**Df**	**Ms**	**F**
Between group	897.78	2	448.89	
Within groups	668.89	348	1.92	233.54*
Total	**1566.667**	**350**		

***significant at 0.05 level; df = 2 & 348; critical F - value = 2.99**

The above Table 4 presents the obtained F-value as (233.54). This value was tested for significance by comparing it with the critical F-value (2.99) at 0.05 level with 2 & 348 degrees of freedom. The obtained F-value (233.54) was greater than the critical F-value (2.99). Hence, the result was significant, meaning that there is significant influence of the level of education of the pregnant women on their compliance to iron and folic acid supplements.

Discussion of Findings

The result of the data analysis in table 3 was significant due to the fact that the obtained f-value (106.64) was lower than the critical f-value (2.99) at 0.05 level with 2 & 348 degree of freedom. The result implies that there is significant influence of age on pregnant women compliance to

iron and folic acid supplements. The result therefore was in agreement with the research findings of (Dairo & Lawovin, 2013) who said that factors associated with compliance to iron supplementation; single and teenage mothers and those aged 35 years and above were less likely to be compliant, married women, living in urban area and those aged 20-29 years were more compliant with iron supplementation. The significance of the result caused the null hypotheses to be rejected while the alternative one was accepted.

The result of the data analysis in table 4 was significant due to the fact that the obtained f-value (233.54) was greater than the critical f-value (2.99) at 0.05 level with 2 & 348 degree of freedom. The result implies that there is significant influence level of education on pregnant women compliance to iron and folic acid supplements. The result therefore was in agreement with the research findings of Collin (2007) who argued that better educated women are more aware of their problems, know more about the availability of health care services and use the information more effectively to maintain or achieve good health status, he also said that Mother's education may also act as a proxy variable of a number of background variables representing woman's higher socio-economic status, thus enabling her to seek proper medical care whenever she perceives it necessary. The result also agrees with the findings of Fotso & Ezeh, (2009), who opined that women with higher education are much more likely to have received iron and folic acid supplements from health personnel than those with no education, as such the proportion of uneducated women who comply to iron and folic acid supplements declines steadily as education is said to be a change agent. The significance of the result caused the null hypotheses to be rejected while the alternative one was accepted.

Conclusion

Based on the findings of the work, the researcher concludes that there is no significant influence of age and pregnant women's level of education on their compliance to iron and folic acid supplements in state government hospital in Uyo Senatorial District.

Recommendations

1. Health care providers of maternal and neonatal care should be competent enough to explain to the pregnant women on the importance of iron-folic acid supplementation during pregnancy and postpartum period; the correct dosage and duration of supplementation for the prevention and treatment of anemia; anemia detection in pregnant women; and when to refer women for further diagnosis and treatment.
2. The pregnant women of older age range should endeavour to consume Iron and folate supplements for the sake of their good health and safe delivery. They should not allow the side effects to delude them from the benefit of taking iron and folic acid during their pregnancy periods.

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