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EFFECTS OF MATERNAL HEALTH EDUCATION ON THE HEALTH KNOWLEDGE AND ATTITUDE OF PREGNANT MOTHERS ATTENDING ANTE-NATAL CLINICS IN ANAMBRA STATE, NIGERIA

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ABSTRACT

Pregnancy continues to carry a high risk of death worldwide, despite numerous commitments to address the issues that increase maternal mortality. Maternal mortality is a tragedy for the family, as the death of a mother deprives the child of breast feeding and can result in infant mortality. Maternal health education is aimed at improving health knowledge of mothers and enhancing their health attitude. This study was designed to determine the effects of maternal health education on the health knowledge and attitude of pregnant mothers attending antenatal clinics in Anambra State. Demographic variables of level of education and parity were considered in this study. Quasi-experimental pre-test, post-test, design was used for the study. The sample consisted of 119 pregnant women attending antenatal clinics in the sampled health facilities in Anambra State. Purposive sampling technique was adopted for the study. A validated Maternal Health Knowledge and Attitude Questionnaire (MHKAQ) was used to collect data. Its reliability was established through Cronbach's Alpha method which yielded 0.84. Data collected were analysed using descriptive statistic of means for answering the research questions (mean difference). The null hypotheses were tested using Analysis of Covariance (ANCOVA) at .05 level of significance. The results among others showed that mothers with tertiary education recorded the highest mean difference health knowledge scores (10.57) and mean difference health attitude scores (13.24) over others. Maternal health education had significant influence on health knowledge of pregnant mothers ($P < .05$). Researchers therefore concluded that maternal health education increased health knowledge and enhanced positive attitude of pregnant mothers. Hence, the following recommendations among others were made: maternal health education must be upheld in every antenatal clinic. From time to time, the maternal health education program for antenatal mothers should be reviewed and restructured to meet up with their current health needs.

INTRODUCTION

Bbaale (2011) stated that antenatal care (ANC) plays an important role in ensuring a healthy mother and baby during pregnancy and after birth.

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ANC programmes are designed to maximize good health outcomes; low maternal and neonatal mortality, low postpartum anaemia, and appropriate birth weight. WHO (2013) defined health education as any combination of learning experiences designed to help individuals and communities improve their health, by increasing their knowledge or influencing their attitudes. Health education can be referred to as a process that informs, motivates and helps people to adopt and maintain healthy practices and life-styles,

advocates environmental changes as needed to facilitate this goal and conducts professional training and research to the same end (Basavanthappa, 2008). Rahman (2009) conducted a study on determinants of maternal health care utilization in Bangladesh. The study involved 41,549 respondents and their selected socio-demographic variables included mothers' age at birth, number of family members, mothers' education, residence, division, access to NGO, listens to radio, watched TV, and wealth quintile. Results showed that maternal education, mothers' age at birth, place of residence, access to mass media and NGO, and wealth quintile significantly increase the utilization rates for antenatal care, delivery care and post natal care.

Arthur (2012) conducted a study on wealth and antenatal care use, implications for maternal health care utilization in Ghana. The results have revealed that wealth still has a significant influence on adequate use of ANC. Education, age, number of living children, transportation and health insurance are other factors that were found to influence the use of ANC in Ghana. There also exists considerable variations in the use of ANC in the geographical regions and between the rural and urban dwellers. A study by Karlsen, Say, Souza, Hogue, Calles, Gulmezoglu and Raine (2011) on the relationship between maternal education and mortality among women giving birth in health care institutions indicated that lower levels of maternal education were associated with higher maternal mortality. Their results revealed that in the adjusted models, women with no education had 2.7 times and those with one and six years of education had twice the risk of maternal mortality of women with more than 12 years of education. There was a significantly higher risk of death among those with higher numbers of previous births. A study was conducted by Baradaran, Bahasadri and Razieh (2011) titled risk factors for pre-eclampsia: a study in Tehran, Iran. The study evaluated some risk factors for pre-eclampsia which is one of the most problematic complications of pregnancy. It was a retrospective case control study conducted on 318 pre-eclamptic women (case group) and 318 women who were normotensive at the time of delivery as the control group. Evaluated factors were maternal age, gestational age, nuliparity, mother's educational status, maternal body mass index (BMI), maternal haemoglobin and blood Rh, family history of pre-eclampsia, history of pre-eclampsia in a previous pregnancy, marital relations, urinary tract infection (UTI) during the present pregnancy, season of delivery, and method of contraception. Risk factors for pre-eclampsia were, UTI ($P = 0.04$); history of pre-eclampsia during previous pregnancy ($P = 0.003$; and winter season ($P = 0.001$).

Similarly, parity more than one was protective for pre-eclampsia. After adjusting for all possible confounding factors using multiple logistic regression, only pre-existing pre-eclampsia ($P = 0.004$) was a risk factor, whereas parity more than three (P 0.007) and anaemia (P 0.001) were protective for pre-eclampsia (Baradaran, Bahasadri and Razieh, 2011). Science Daily (2012) conducted a study entitled women's education level, maternal health facilities, abortion legislation and maternal deaths: a natural experiment in Chile from 1957 to 2007. A scientific analysis of 50 years of maternal mortality data from Chile has found that the most important factor in reducing maternal mortality is the educational level of women.

Educating women enhances women's ability to access existing health care resources, including skilled attendants for child birth, and directly leads to a reduction in her risk of dying during pregnancy and childbirth. Findings indicated that the most important factor that decreased the maternal mortality rate was educational level of women. For every additional year of maternal education there was a corresponding decrease in the maternal mortality rate of 29.3 per 100,000 live births. Another is a study by Igbokwe (2012) on knowledge and attitude of pregnant women towards antenatal services in Nsukka Local Government Area of Enugu state. Results showed that pregnant women had moderate level of knowledge of concept of antenatal services. Pregnant women from urban area had high level of knowledge of concept of antenatal services while their counterpart from the rural setting had moderate level of knowledge. Also, it was realized that pregnant women with secondary and tertiary education had positive attitude while those with no formal and primary education had negative attitude to antenatal services, and pregnant women from both urban and rural settings had positive attitude.

Knowledge refers to information, understanding, or skill that one gets from experience or education. It applies to facts or ideas acquired by studying, investigation, observation, or experience (Merriam-Webster, 2013). Health education attempts to increase knowledge on the subject. An increase in knowledge on the subject leads to a change in attitudes about healthy and unhealthy behaviours. Increased health knowledge and positive attitude is capable of influencing maternal morbidity and mortality among pregnant women. Maya (2010) stated that after India, Nigeria has the second highest maternal death rate in the world, 52,000 Nigeria women die every year. This means that every 10 minutes, one Nigerian woman dies due to child birth and pregnancy-related causes. In fact, while Nigeria represents only 2 per cent of the world's population, it accounts for over 10 per cent of the world's maternal deaths (Osotimehin, 2012). In this present study, the researchers developed detailed structured planned and more inclusive health education which was delivered to pregnant mothers on scheduled dates. It covered maternal health issues especially those causes/risk factors of maternal morbidity and mortality that can be handled by health education. Examples include anaemia, malaria, pre-eclampsia/eclampsia, infection/sepsis, frequency of childbirth, and malnutrition in pregnancy.

This study looked at variables such as level of education and parity, and effects they may have on health knowledge and attitude of pregnant mothers. For example with respect to level of education. Simkhada, Teijlingen, Porter and Simkhada (2007) in their study revealed that maternal education is one of the most commonly identified factors affecting antenatal care uptake. High educational status of mother is protective for pre-eclampsia (Baradaran, Bahasadri and Razieh, 2011). Maternal educational level is one of the factors that were found to influence the use of antenatal care in Ghana (Arthur, 2012). Study by Ezeruigbo (2013) revealed no striking pattern of utilization of ANC among women of various educational levels. It however revealed that the proportion of women that sought the services of skilled attendant during delivery increased with increasing level of education. Women of high parity tend to use antenatal care less than those with low parity

(Simkhada, Teijlingen, Porter and Simkhada, 2007). Parity more than one is protective for pre-eclampsia (Baradaran, Bahasadri and Razieh, 2011). Anaemia which is one of the causes of maternal mortality was found to be more prevalent among primigravidae (at first pregnancy) than the multigravidae (more than 4 pregnancies) (Idowu, Mafiana and Sotiloye, 2005). Number of living children was found to be significant in determining use of antenatal care services (Ezeruigbo, 2013). The researchers observed from some health facilities, that many mothers attend antenatal clinics but still develop some morbidities or even death. Again, there are cases of maternal death in Anambra State.

Statement of the Problem

Good health for mothers is an important public health concern. According to Centre for Health and Gender Equity (2014), pregnancy continues to carry a high risk of death worldwide, despite numerous commitments to address the issues that increase maternal mortality. Maternal mortality is a tragedy for the family, as the death of a mother deprives the child of breast feeding and can result to infant mortality. Globally, an estimated 287,000 women died during pregnancy and child birth in 2010, a decline of 47 per cent from levels in 1990. Most of them died because they had no access to skilled routine and emergency care. There has also been progress in Sub-Saharan Africa. But here in Nigeria, for example, unlike in the developed world, women's life time risk of dying during pregnancy is very high at 1 in 39. Increasing numbers of women are now seeking care during child birth in health facilities and, therefore, it is important to ensure that quality care provided is optimal (WHO, 2014). Consequences of inadequate maternal health education include poor knowledge of maternal health issues especially the causes/risk factors of maternal morbidity and mortality and negative attitude of the mothers. This invariably may result in haemorhage, infection, eclampsia, hypertension, unsafe abortions, malaria in pregnancy, anaemia in pregnancy, and female genital cutting. Maternal morbidity and mortality constitute a serious health problem that requires systematic investigations. Hence, the problem of this study posed in question form is: does maternal health education on maternal health issues lead to increased maternal health knowledge and positive attitude among pregnant mothers in Anambra State, Nigeria?

Purpose of the Study

The purpose of the study was to determine the effects of maternal health education on the health knowledge and attitude of pregnant mothers attending antenatal clinics in Anambra State. Specifically, the study determined the effects of maternal health education on the:

- Health knowledge scores of pregnant mothers of different levels of education after maternal health education.
- Health knowledge scores of pregnant mothers of different levels of parity after maternal health education.
- Health attitude scores of pregnant mothers of different levels of education before and after maternal health education
- Health attitude scores of pregnant mothers of different levels of parity before and after maternal health education.

Scope of the Study

The subjects of this study were pregnant mothers attending antenatal clinics in Anambra State. The researchers decided to study this class of women because they are the vulnerable group and most in need of this maternal health education programme. Areas of health education covered include; maternal health concepts, anaemia in pregnancy, malaria in pregnancy, pre-eclampsia/eclampsia, infection/sepsis, frequency of child birth, malnutrition in pregnancy and maternal immunization. Finally, the study was delimited to only four well-attended health facilities in Anambra State. Two urban and two rural health facilities. Two urban facilities were Nnamdi Azikiwe University Teaching Hospital (NAUTH) Nnewi, Odumegwu Ojukwu University Teaching Hospital, Amaku, Awka. Two rural health facilities were Primary Health Centre, Neni and Health Centre, Awka-Etiti. The study also examined the effect of level of education and parity on maternal health knowledge and attitude.

Research Questions

- What is the effect of maternal health education on health knowledge scores of pregnant mothers treated with maternal health education based on their educational levels?
- What is the effect of maternal health education on health knowledge scores of pregnant mothers treated with maternal health education based on their parity?
- What is the effect of maternal health education on health attitude scores of pregnant mothers treated with maternal health education based on their educational levels before and after maternal health education?
- What is the effect of maternal health education on health attitude scores of pregnant mothers treated with maternal health education based on their parity before and after maternal health education?

Hypotheses

- There is no significant difference in the mean health knowledge scores of pregnant mothers of different educational levels exposed to maternal health education.
- There is no significant difference in the mean health knowledge scores of pregnant mothers exposed to maternal health education based on parity.
- There is no significant difference in the mean health attitude scores of pregnant mothers of different educational levels exposed to maternal health education.
- There is no significant difference in the mean health attitude scores of pregnant mothers exposed to maternal health education based on their parity.

METHODS AND MATERIALS

Research Design

The design adopted for this study was quasi-experimental research design. Quasi-experimental design involves selecting groups, upon which a variable is tested, without any random pre-selection processes (Trochim, 2006).

Area of the Study

The area of the study was Anambra State. The state is one of the thirty-six states of Nigeria and is located in the south-east geo-political zone of the country.

Population for the Study

The population for the study consisted of all the pregnant women in Anambra State.

Sample and Sampling Technique

The sample size for the study was 119 subjects. Only health facilities were sampled and all the pregnant women attending antenatal clinics in the sampled health facilities at the time of the study constituted the sample. Purposive sampling technique was adopted in this study. For the purpose of having representatives from urban and rural areas, one urban area was purposively selected which was Nnamdi Azikiwe Teaching Hospital, Nnewi (NAUTH). Then one rural area which was Health Centre, Neni. These two health facilities have been purposively selected because they are adjudged to be well-attended in the state. The pregnant mothers who registered and attended antenatal clinics regularly in the two selected health facilities during the period of study, and who satisfied the inclusion criteria participated in the study. The inclusion criteria were: the subject must be confirmed pregnant, duly registered at antenatal clinic, must be between 28 and 32 weeks gestation; complies with ANC appointment dates, and had no impending cause(s) of maternal mortality.

Instrument for Data Collection

The instrument for data collection was a validated structured questionnaire entitled Maternal Health Knowledge and Attitude Questionnaire (MHKAQ) which has a reliability result of .84. The MHKAQ consisted of five sections. In section A, the respondents were required to provide the demographic information such as educational level and parity. Section B of the questionnaire was on health knowledge on maternal health concepts. Section C was on health knowledge on causes of maternal morbidity and mortality. Section D was on health knowledge on prevention of the causes of maternal morbidity and mortality. Section E was on maternal health attitude and has 9 four-point response form of questions of strongly agree, agree, disagree and strongly disagree.

Training of Research Assistants

One nursing staff each was selected from the two health facilities used for the study to get a total of two research assistants, who assisted in the teaching of the mother.

Control of Extraneous Variable of Interference

The research assistants were allowed to do the teaching to the subjects rather than the researchers. Though the researchers were observing. This enabled the subjects feel at home and minimized bias.

Method of Data Collection

Permission to conduct the study was requested for and obtained from management of the various health facilities. Ethical approval and verbal consent were obtained from the ethical committees of NAUTH and the mothers respectively. Arrangements were made with the various heads of the antenatal clinics in the various health facilities to ask all pregnant mothers within 28 to 32 weeks of gestation who registered to report weekly to the ANC for the training programme which lasted for a period of six weeks (once every week i.e. 6 sessions). Subjects were informed about the purposes of the study and their consent to participate in the exercise was obtained. Before the teaching interventions, the subjects were assembled in their individual health facilities and copies of the close-ended pre-test questionnaire were administered to the mothers to fill-in. The copies of the questionnaire administered were collected and scored later. This helped to ascertain their baseline health knowledge and attitude. The mothers then received six weeks sessions of teaching on issues especially health education on preventable causes of maternal morbidity and mortality (one session each week lasted for one hour). At the end of six weeks exercise, copies of the same questionnaire with the question items numbers reshuffled were re-administered to the subjects by the researchers and research assistants. Mothers who failed to attend up to 75 per cent of the teaching sessions were assumed to have suffered from experimental mortality and, therefore, would not participate in the post test evaluation. They all (119) attended up to 75 per cent, hence they all participated in the post test.

Method of Data Analysis

The descriptive statistics of mean scores were used for answering research questions. For all the null hypotheses, inferential statistics of analysis of covariance (ANCOVA) was used to test the hypotheses at .05 level of significance and appropriate degree of freedom.

RESULTS

Research question one

What is the effect of maternal health education on health knowledge scores of pregnant mothers treated with maternal health education based on their educational levels? Data

Table 1. Mean Difference of Health Knowledge Scores of Pregnant Mothers on Maternal Health Issues Based on Their Educational Levels

Source of Variation	N	Pretest Mean	Posttest Mean	Mean Difference	% Mean Difference
No Formal Education	1	15.00	17.00	2.00	13.33%
FSLC	12	17.92	25.00	7.08	39.51%
SSCE	55	16.85	24.93	8.08	47.95%
Tertiary Education	51	16.88	27.45	10.57	62.62%

answering this research question are contained in Table 1. Table 1 indicated mean difference scores for all the educational levels; however, the mean difference score for those in tertiary education was the highest (10.57; 62.62%). Pregnant mothers with senior secondary school certificate (SSCE) had mean difference score of 8.08 (47.95%), followed by those with first school leaving certificate (FSLC) with mean difference score of 7.08 (39.51%). Finally, those with no formal education had mean difference score of 2.00 (13.33%) in maternal health knowledge.

Research question two

What is the effect of maternal health education on health knowledge scores of pregnant mothers treated with maternal health education based on their parity (number of pregnancies)? Data answering this research question are contained in Table 2.

Research question three

What is the effect of maternal health education on health attitude scores of pregnant mothers treated with maternal health education based on their educational levels? Data answering this research question are contained in Table 3.

Table 3 showed that with mean difference of 13.24 (68%) in attitude for the pregnant mothers with tertiary education, they had more positive health attitude than others after being treated with maternal health education. Pregnant mothers with no formal education had mean difference of 13.00 (65%), followed by those with Senior Secondary Certificate who had mean difference of 11.06 (57%). Lastly, those with First School Leaving Certificate had mean difference of 10.33 (54%) in maternal health attitude.

Table 2. Mean Difference of Health Knowledge Scores of Pregnant Mothers on Maternal Health Issues Based on Their Parity

Source of Variation	N	Pretest Mean	Posttest Mean	Mean Difference	% Mean Difference
FIRST	25	16.76	26.20	9.44	56.32%
SECOND	26	17.50	27.42	9.92	56.69%
THIRD	37	16.81	24.35	7.54	44.85%
FOURTH & ABOVE	31	16.84	26.42	9.58	56.89%

Table 3. Mean Difference of Health Attitude Scores of Pregnant Mothers on Maternal Health Issues Based on Their Educational Levels After Maternal Health Education

Source of Variation	N	Pretest Mean	Posttest Mean	Mean Difference	% Mean Difference
No Formal Education	1	20.00	33.00	13.00	65%
FSLC	12	19.17	29.50	10.33	54.%
SSCE	55	19.57	30.33	11.06	57%
Tertiary Education	51	19.41	32.65	13.24	68%

Table 4. Mean Difference of Health Attitude Scores of Pregnant Mothers on Maternal Health Issues Based on Their Parity After Maternal Health Education

Source of Variation	N	Pretest Mean	Posttest Mean	Mean Difference	% Mean Difference
FIRST	25	19.48	32.68	13.20	68%
SECOND	26	19.77	31.23	11.46	58%
THIRD	37	19.27	30.46	11.19	58%
FOURTH & ABOVE	31	18.90	31.10	12.20	65%

Table 5. Summary of ANCOVA Analysis Testing the Null Hypothesis of No Significant Difference in the Mean Health Knowledge Scores of Pregnant Mothers of Different Education Levels Exposed to Maternal Health Education

Source of Variation	SS	df	MS	Cal. F	Crit. F	P < 0.05 Crit. F
Corrected Model	273.623	4	68.406			
Intercept	1187.552	1	1187.552			
Knowledge1	10.262	1	10.262			
Edu Levels	262.064	3	87.355			
Residual	1638.074	114	14.369	6.08	2.67	S
Total	82044.000	119				
Corrected Total	1911.697	118				

Table 2 revealed mean difference scores for all parity levels; though mothers with second pregnancy had the highest mean difference score of 9.92 (56.69%). Pregnant mothers with fourth pregnancy and above had mean difference score of 9.58 (56.89%), followed by those with first pregnancy who had mean difference score of 9.44 (56.32%). Lastly, those with third pregnancy had mean difference score of 7.54 (44.85%).

Research question four

What is the effect of maternal health education on health attitude scores of pregnant mothers treated with maternal health education based on their parity (number of pregnancies)? Data answering this research question are contained in Table 4.

Table 4 revealed that with mean difference of 13.20 (68%) in health attitude for the pregnant mothers with first pregnancy, they had more positive health attitude than others after being treated with maternal health education. Pregnant mothers with fourth pregnancy and above had mean difference of 12.20 (65%), followed by those with second pregnancy who had mean difference of 11.46 (58%). Finally, those with third pregnancy had mean difference of 11.19 (58%) in maternal health attitude.

Null hypothesis one

There is no significant difference in the mean health knowledge scores of pregnant mothers of different educational1 levels exposed to maternal health education. Data answering this hypothesis are contained in Table 5. Table 5 showed that at 0.05 level of significance, 3 and 118df, the calculated F6.08 is greater than the critical F2.67 (F-cal = 6.08 > F-table = 2.67, P<.05). The null hypothesis of no significant difference in the mean health knowledge scores of pregnant mothers of different educational levels exposed to maternal health education was rejected. Therefore, this implies that the health knowledge scores of pregnant mothers of different education levels are not the same. This is shown by the result of those with tertiary education having more health knowledge score than others and those with no formal education came last.

health education based on parity. Data answering this hypothesis are contained in Table 6.

Table 6 revealed that at 0.05 level of significance, 3 and 118df, the calculated F3.35 is greater than the critical F2.67 (F-cal = 3.35 > F-table value = 2.67, P < .05). The null hypothesis of no significant difference in the mean health knowledge scores of pregnant mothers exposed to maternal health education based on parity was rejected. Therefore, this implies that health knowledge scores of pregnant mothers based on their parity are not the same. This is shown by the result that those with second pregnancy had more mean health knowledge score than others and those with third pregnancy came last.

Null hypothesis three

There is no significant difference in the mean health attitude scores of pregnant mothers of different educational levels exposed to maternal health education. Data answering this hypothesis are contained in Table 7. Table 7 revealed that at 0.05 level of significance, 3 and 118df, the calculated F3.70 is greater than the critical F2.67 (F-cal = 3.70 > F table value = 2.67, P < .05). The null hypothesis of no significant difference in the mean health attitude scores of pregnant mothers exposed to maternal health education based on their levels of education was rejected.

Table 6. Summary of ANCOVA Analysis Testing the Null Hypothesis of No Significant Difference in the Mean Health Knowledge Scores of Pregnant Mothers Exposed to Maternal Health Education Based on Parity

Source of Variation	SS	df	MS	Cal. F	Crit. F	P < 0.05
Corrected Model	165.677	4	41.419			
Intercept	1747.523	1	1747.523			
Knowledge1	6.307	1	6.307			
PARITY	154.118	3	51.373	3.35	2.67	S
Error	1746.020	114	15.316			
Total	82044.000	119				
Corrected Total	1911.697	118				

Table 7. Summary of ANCOVA Analysis Testing the Null Hypothesis of No Significant Difference in the Mean Health Attitude Scores of Pregnant Mothers Exposed to Maternal Health Education Based on Their Levels of Education

Source of Variation	SS	df	MS	Cal. F	Crit. F	P < 0.05
Corrected Model	232.401	4	58.100			
Intercept	1132.049	1	1132.049			
ATTITUDE1	46.233	1	46.233			
Edu. Levels	179.141	3	59.714	3.70	2.67	S
Error	1838.523	114	16.127			
Residual	118360.000	119				
Corrected Total	2070.924	118				

Table 8. Summary of ANCOVA Analysis Testing the Null Hypothesis of No Significant Difference in the Mean Health Attitude Scores of Pregnant Mothers Exposed to Maternal Health Education Based on Their Parity

Source of Variation	SS	df	MS	Cal. F	Crit. F	P > 0.05
Corrected Model	124.218	4	31.055			
Intercept	1237.429	1	1237.429			
ATTITUDE1	49.248	1	49.248			
PARITY	70.958	3	23.653	1.39	2.67	NS
Error	1946.706	114	17.076			
Residual	118360.000	119				
Corrected Total	118360.000	118				

Null hypothesis two

There is no significant difference in the mean health knowledge scores of pregnant mothers exposed to maternal

Therefore, this implies that health attitude scores of pregnant mothers are not the same due to their educational levels. Those with tertiary education had more mean health knowledge score than others.

Null hypothesis four

There is no significant difference in the mean health attitude scores of pregnant mothers exposed to maternal health education based on their parity. Data answering this hypothesis are contained in Table 8. In Table 8, it was observed that at 0.05 level of significance, 3 and 118df, the calculated F1.39 is less than the critical F2.67 (F-cal = 1.39 < F table value = 2.67, P > .05). The null hypothesis of no significant difference in the mean health attitude scores of pregnant mothers exposed to maternal health education based on their parity was accepted. Therefore, this implies that health attitude scores of pregnant mothers are the same due to their parity.

DISCUSSION OF RESULTS

Effects of Maternal Health Education on the Health Knowledge of the Subjects

With respect to the mothers' level of education, the result of the study showed that the pregnant mothers with tertiary education had more (mean = 10.57) than others after being treated with maternal health education. Those with no formal education came last with mean difference score of 2.00 in maternal health knowledge. ANCOVA on the mean scores in health knowledge revealed that the effect of maternal health education in enhancing health knowledge of pregnant mothers differs significantly based on their educational levels. The finding that mothers with tertiary education had more than others is in agreement with that documented by Rahman (2009) which indicated that mothers' educational level significantly increases the utilization rates for antenatal care, delivery care, and post natal care. Arthur (2012) documented that education is one of the factors that influence the use of ANC. Notably is the finding by Baradaran, Bahasadri and Razieh (2011) that high educational status of mother was protective for pre-eclampsia. Study by Science Daily (2012) showed that the most important factor in reducing maternal mortality is the educational level of women and for every additional year of maternal education there was a corresponding decrease in the maternal mortality rate of 29.3 per 100,000 live births.

The findings that those with no formal education being last with mean difference score of 2.00 in maternal health knowledge is supported by the findings of Karlsen, et al (2011). Their findings indicated that women with no education had 2.7 times the risk of maternal mortality. This is because of lack of adequate health knowledge. Illiteracy is a predicament and can affect the mothers' understanding of maternal health issues taught at antenatal clinics. When the effect of maternal health education on maternal knowledge was analyzed based on parity, the result of the study showed that the pregnant mothers' with second pregnancy had more (mean = 9.92) than others after being treated with maternal health education. Those with third pregnancy came last with mean difference score of 7.54 in maternal health knowledge. ANCOVA on the mean scores in health knowledge revealed that the effect of maternal health education in enhancing health knowledge of pregnant mothers' differs significantly based on their parity. The mothers of second pregnancy had more mean scores

because perhaps they were more cautious at that level of parity and in other higher levels the subjects relaxed.

Effects of Maternal Health Education on the Health Attitude of the Subjects

Concerning education, the result of the study is not totally supported by the findings of Igbokwe (2012) which revealed that pregnant women with secondary and tertiary education had positive attitude, while those with no formal and primary education had negative attitude to antenatal care services. The present study revealed that pregnant women with tertiary education had positive attitude followed by those with no formal education. The result of those with no formal education may seem to be unbelievable to some people, but that is the result. The group paid attention during the teaching and lend themselves to learning. Attention is necessary for learning to occur. Those with secondary level education scored less than those with no formal education. With the data analysed according to parity, the result of the study showed that the pregnant mothers with first pregnancy recorded more (mean =13.20) than others after being treated with maternal health education. These mothers were eager and inquisitive to learn. Being their first pregnancy, their expectation of being mothers in few months may be high enough to motivate them. Again, first pregnancy is a motivating factor to depict positive attitude. Besides, the maternal health education is on maternal health issues which generate more interest for mothers being pregnant for the first time. Hence, they will like to adopt all possible measures to achieve a favourable pregnancy outcome of a live mother and baby. For other parity levels who had lower mean difference scores, it may be that because they have more experience that their excitement may no longer be high. This has implication for the timing of the maternal health education for pregnant mothers. Targeting the mothers with first pregnancy so that once they form the positive attitude, it carries them all through their parity levels.

Conclusions

Having examined the findings, the following conclusions have been reached.

- Mothers with tertiary education recorded significant highest mean difference health knowledge score (10.57) than others after being treated with maternal health education (Table 1). Hence, education influences knowledge.
- Mothers with second pregnancy recorded the highest mean difference health knowledge score over their counterparts. They recorded more mean difference health knowledge score (9.92) than others after being treated with maternal health education (Table 2).
- The pregnant mothers with tertiary education had more mean difference health attitude score than others (13.24) after being treated with maternal health education (Table 3). Hence education influences attitude too.
- The pregnant mothers with first pregnancy had more mean difference health attitude score than others (13.20) after being treated with maternal health education (Table 4).

- The effect of maternal health education in enhancing health knowledge of pregnant mothers differed significantly based on their educational levels ($P < .05$, Table 5).
- The effect of maternal health education in enhancing health knowledge of pregnant mothers differed significantly based on their parity ($P < .05$, Table 6).
- The effect of maternal health education in enhancing health attitude of pregnant mothers differed significantly due to their educational levels ($P < .05$, Table 7).
- The effect of maternal health education in enhancing health attitude of pregnant mothers did not differ significantly due to their parity ($P > .05$, Table 8).

Implications of the Study

Maternal health education is central to prevention of maternal morbidity, mortality and promotion of maternal health. Mothers should attend antenatal clinics regularly because the study revealed that attending antenatal clinics and listening to maternal health education increases health knowledge and enhanced health attitude. Subjects with tertiary education have shown to have the highest mean difference health knowledge score and the highest mean difference health attitude score. It implies that level of education influences health knowledge and attitude of mothers. Therefore, efforts should be made to design appropriate maternal health education packages that can meet the needs of mothers with different educational levels.

Recommendations

- From the finding that maternal health education is significant in influencing maternal health knowledge and attitude; the researchers recommended that maternal health education must be seriously upheld in every antenatal clinic.
- Health education unit should take up the responsibility of planning and designing health education program for pregnant mothers attending antenatal clinics.
- From time to time, the health education program should be restructured and reviewed to meet up with the health needs of the pregnant mothers.

REFERENCES

Arthur, D. 2012. *Wealth and antenatal care use: implications for maternal health care utilization in Ghana.* Retrieved March 24, 2013, from www.ncbi.nih.gov/pmc/articles/PMC 3484029/

Baradaran, K.M., Bahasadri, H.R. and Razieh, A. 2011. *Risk factors for pre-eclampsia: A study in Tehran, Iran-Tags.* Retrieved March 22, 2013, from http://connectionebscohost.com/articles/71177726/risk-factors-pre-eclampsia-study-teran-Iran

Basavanthappa, B.T. 2008. *Community health nursing.* New Delhi: Jaypee brothers medical publishers(p)ltd.

Bbaale, E. 2011. *Factors influencing the utilization of ANC content in Uganda.* Retrieved September 22, 2013 from www.ncbi.nlm.nih.gov/pmc/articles/PMC3562912/

Center for Health and Gender Equity 2014. *Maternal health.* Retrieved January 31, 2014 from www.genderhealth.org/ the_issues/maternal_health/

Ezeruigbo, C.F. 2013. Selected clients' characteristics as determinants of use of maternal health services in two communities in Enugu State, Nigeria. *Nursing and Midwifery Council of Nigeria Research Journal* (1)2; 6-12.

Idowu, O.A., Mafiana, C.F and Sotiloye, D. 2005. *Anaemia in pregnancy; A survey of pregnant women in Abeokuta, Nigeria.* Retrieved March 22, 2013, from www.ncbi.nlm.nih.gov/pmc/articles/pmc/18819481

Igbokwe, C.C. 2012. *Knowledge and attitude of pregnant women towards antenatal services in Nsukka local government area of Enugu state, Nigeria.* Retrieved June 29, 2014 from www.icidr.org/doc/KIDR.PDF contents/journal of research in education and society/JRESV 3nol-April 2012/knowledge and attitude of pregnant.pdf

Kalsen, S., Say, L., Souza, J., Hogue, C.J., Calles, D.L., Gulmezoglu, A. and Raine, R. 2011. *The relationship between maternal education and mortality among women giving birth in health care institutions: analysis of the cross-sectional WHO Global Survey on maternal and perinatal death.* Retrieved November 22, 2013 from www.biomedcentral.com/1471 -2458/11/606

Maya, Z. 2010. *Maternal mortality in nigeria : in indicator of women's status.* Retrieved November 25, 2012 from http:||www.consultancyAfrica.com|index.Php?Option=com conent and view =article and id =35and itemid = 191

Merriam-Webster, 2013. *Knowledge.* Retrieved September 22, 2013 from www.merriam-webster.com/dictionary/knowledge.

Osotimehin, B. 2012. *Maternal and child health: enhancing the lives of million of Nigerians.* Retrieved January 31, 2014 from www.vanguardngr.com/2012/10/maternal-and-child-health-enhancing-the-lives-of-millions-of-nigerians/

Rahman, K.M.M. 2009. Determinants of material health care utilization in bangladash. *Research Journal of Applied Sciences* 4(3)113-119. Retrieved December 19, 2012, from http://www.medwell journals.com/full text/ ? doi=rjasci 2009.113.119

Science Daily 2012. *Education, not abortion, reduces maternal mortality, study suggest.* Retrieved January 31, 2014 from www.sciencedaily.com/release/2012/05/ 12051014909.htm

Simkhada, B; Teijlingen, E.R.V; Porter, M. and Simkhada, P. 2007. *Factors affecting the utilization of antenatal care in developing countries: systematic review of the literature.* Retrieved March 24, 2013, from www.cdbph.org/documents/factors affecting the utilisation of antenatal care in developing countries systematic review.

WHO 2013. *Maternal, newborn and child health.* Retrieved March 9, 2013, from http://www.who.int/topics/maternal_health/en/

WHO 2014. *MDG5:Improve maternal health.* Retrieved January 31, 2014 from www.who.int/topics/millennium_development_goals/maternal_health/en/

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