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Effect of nursing intervention on women's knowledge about pregnancy problems and utilization of obstetrics care services in Edu, Kwara State, Nigeria

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ABSTRACT

Purpose: This study assesses the effect of nursing intervention on the knowledge of women about pregnancy-related problems and utilization of obstetrics care services in Edu, Nigeria.
Methods: Pre-test post-test control of quasi-experimental design was adopted for the study. Researchers-designed questionnaire was used for data collection and a split-half test was used to determine the reliability of the instrument. One hundred and twenty women were exposed to ten weeks of community-based nursing education intervention sessions, (sixty experimental groups and sixty control groups). Pre-tests administered to sampled women before nursing health education intervention sessions and followed by Post-test. The results were analyzed using mean and standard deviation while the *t*-test was used to test the hypothesis at an Alpha level of 0.05.
Results: The findings showed the positive effect of a nursing health education intervention on the knowledge of women about pregnancy problems with pre-intervention on experimental group mean of 63.33, and post-intervention mean of 72.22 with *t*-value of 1.26 less than the table value of 1.96. The study further showed a mean score of 35.97 experimental group and 28.33 for the control group with a t-value of 1.64, which shows little effect of intervention on the willingness of women to utilize obstetrics care services in Edu, Nigeria.
Conclusion: The study concluded that the nursing health education intervention programme in this study on pregnancy-related problems programmes had a positive effect on the knowledge of women but had no effect on the utilization of OCS by women in Edu Local Government Areas. We recommended that health education programmes should be intensified to improve the knowledge level of women and encourage the use of obstetric care services in the community.

1. Introduction

Maternal health refers to the health of women during pregnancy, childbirth, and the postpartum period. It encompasses the healthcare dimensions of family planning, preconception, prenatal/antenatal care, and postnatal care to reduce maternal morbidity and mortality (WHO, 2007). Preconception care includes education, health promotion, screening, and other interventions among women of reproductive age to reduce risk factors that might affect future pregnancies. The goal of prenatal/antenatal care is to detect early any potential complications of pregnancy and to prevent them and if possible to direct the woman to appropriate specialist medical services. Basic essential obstetric care is performed at the health care center level to address, or stabilize the pregnant woman before referral. This obstetric care is to prevent main obstetric complications following delivery, these complications are antepartum haemorrhage, eclampsia, prolonged labour, uterine rupture, post-partum haemorrhage, repair of vaginal and cervical tears, and retained placenta (Sunday, 2007). Health facilities should be able to provide for resuscitation and basic care of the newborn, especially in the management of hypothermia and hypoglycemia, including

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measurement of birth weight as recommended by the Federal Ministry of Health Nigeria (Federal Ministry of Health, 2007). Most maternal deaths seem to occur between the third trimester and the first week after delivery however, the provision of skilled attendants at the time of delivery and access to emergency obstetric care remain the most effective measures to reduce morbidity and mortality (De Bernis, Sherratt, Abouzahr, & Van Lerberghe, 2003). Improved maternal health is achieved through skilled care at every birth and adequate management of pregnancy, childbirth, and the postpartum period. Camacho A, Castro M & Kaufman R. (2006).

Information about women's awareness and knowledge about the danger signs of pregnancy complications and the need for treatment is important because it indicates the existence of knowledge that can be transferred into action. Unfortunately, the majority of women in Nigeria do not have adequate knowledge about pregnancy complications and their treatment, even though such knowledge is important. The results of National showed that only 40.7 percent of the women, who had their most recent birth in the five years preceding the survey, knew about the signs of pregnancy complications. In other words, about 6 in 10 women were not aware of the symptoms of pregnancy complications. Among women who reported that they knew the signs of pregnancy complications, 51.4 percent mentioned vaginal bleeding as one of the signs (Nigeria Demographic and Health Survey, 2008). Wrong position of the baby in the womb, women's tiredness, prolonged labour, and swollen limbs were mentioned as other signs of pregnancy complications by 26.1, 18.3, 17.7, and 14.9 percent respectively of the women. Other health problems such as fainting, convulsion, and breathlessness were mentioned as signs of pregnancy complications by less than 5 percent of the women. The Indonesia Demographic Health Survey (IDHS, 2017), data, also revealed that the proportion of ever-married women who knew of at least one symptom of complications during delivery and after delivery was 44.8 and 27.4 respectively, indicating that the majority of the women were not aware of the symptoms of complications at two crucial stages of their pregnancy and post-partum period.

In spite of the availability of health care facilities that provides affordable maternal health services in terms of essential obstetric care services, drugs and medical facilities by the government to women of childbearing age in Nigeria particularly in Kwara State, women of childbearing age in Edu Local Government Area (LGA), were not patronizing the health facilities. Many women of childbearing age attended the first antenatal care visit late and refuses to report early pregnancy related problems during antenatal care visits in Edu LGA, and subsequently deliver their babies at home whom were attended to by unskilled attendants in an unhygienic condition. The delay in reporting PRP at ANC visit put women of childbearing age in Edu LGA at high risk of pregnancy associated problems. The delays led to complication and consequently loss of lives of mothers and / or newborn babies during pregnancy/ delivery or shortly after delivery of baby as a result of unidentified complications before delivery. In the year 2016, about 35 WCA loses their lives during pregnancy and shortly after delivery of baby (Edu Local Government Area Health Information Unit, 2016). This loss of lives has become worrisome to not only the researchers but to the authorities of LGA. Based on the observed maternal and child morbidity and mortality in Edu LGA, this study examined the effect of Nursing Health Education Intervention Programme (NHEIP) on knowledge of and utilization of obstetric care services before and after intervention among women in Edu LGA, Nigeria.

The study objectives

The specific objectives of this study aimed at:

1. Examine the knowledge level of women of childbearing age about pregnancy-related problems before and after NHEIP in Edu Local Government Area of Kwara State
2. Assess the utilization level of Obstetric care services among women of childbearing age before and after NHEIP in Edu Local Government Area of Kwara State

Research Questions

3. Will the knowledge level of women of childbearing age about pregnancy related problems be affected before and after NHEIP in Edu Local Government Area of Kwara State?
4. Will the utilization level of Obstetric care services among women of childbearing Age be affected before and after NHEIP in Edu Local Government Area of Kwara State?

Hypothesis

HO_1. Nursing health education intervention programme has no significant effect on the knowledge of women of childbearing age about Obstetric care services in Edu Local Government Area of Kwara State.

HO_2. Nursing health education intervention programme has no significant effect on the willingness of women of childbearing age to utilize Obstetric care services in Edu LGA of Kwara State.

2. Material and method

This study was a quasi-experimental research design using pre-test and post-test control group design to compare two groups that is, women in experimental group and those in control group, to determine the effect of nursing health education intervention on the knowledge and access to obstetric care services by women in Edu LGA, Nigeria. The total population for this study consisted of 97,602 Females from which women of childbearing age were drawn for this study (NPC, 2006). The sample of 120 WCA who were either pregnant or has one or more children were selected from 160 households in the two districts of Edu LGA. A multiple stage sampling method was used, that is, six political wards were selected by simple random sampling, (three from Lafiagi and other three wards selected from Tsonga district) constituting two study groups. The systematic sampling procedure was used to select 160 households from each of the political wards that is, house numbering was conducted in each ward, and the selection of houses was made from the buildings list in each ward at intervals of every third building from a starting number depending on the length of the street.

In 160 households selected in the two districts, 120 WCA (60 experiment groups and 60 control groups) were purposively sampled for this study. The sample size of 120 WCA for this study was determined based on Stroker's (1985) cited by Strydom, 2011) table titled 'Sampling in the quantitative paradigm'. This approach was adopted because it was found to be empirical and easy to adapt for survey studies in the communities. The percentage sample recommended for ranges of the population was used for the selection of appropriate sample size for Primary Health Centers, clients, and caregivers respectively. Hence, 120 WCA (60 Experimental and 60 Control groups) were sampled for this study according to Strydom (2011).

The research instrument used was a 25-item researchers-designed questionnaire on knowledge of PRP and utilization of Obstetric care services among women. The questionnaire consisted of three sections; the first section sought information on the knowledge about pregnancy-related problems designed in the form of Yes or No answer mode, and the second section was on the utilization of Obstetric care service designed in a modified three-point Likert type scale responses; A – Always (5points), ST-Some Times (3points) and NA-Not Always–scored (1 point) used to obtained information from WCA in Edu LGA of Kwara State. The instrument covered components of pregnancy problems and Obstetric care service to ensure face and content validity upon which WCA knowledge and utilization were defined. The questionnaire was transcribed into Nupe language and used as interview schedule for WCA who could neither read nor write in English Language. The reliability of the instrument was determined by pre-testing using split-half test of Cronbach statistic of reliability and result of 0.68 coefficient of reliability was obtained from a pilot study.

2.1. Data collection procedure

The data collection process started by the collection of Ethical approval for the conduct of this study from the authorities of Edu LGA and community leaders of the study areas. The respondents were approached with a copy of the permission letter that was read to women and the purpose of the study was explained to them for informed consent at various households selected for the study. The data collection was in three phases which include the pre-intervention phase (pre-test), intervention phase, and post-intervention phase (post-test).

2.2. Pre-intervention

The pre-intervention phase was the first week used for advocacy visits to community leaders in the two study areas to seek permission and cooperation for the conduct of the study and the head of the households and sampling of women for the study was done. Health personnel which comprised of nurses and community health educators working in the health centers of the studied communities were recruited and trained as research assistants. Three types of educational materials were prepared for use as teaching materials for women that is, pamphlets and posters, docudrama (video documentation), and a family planning services post sign chart. The husbands and household heads where the WCA residents were visited and the purpose of the study was explained to them. In the second week, the women of childbearing age in the study areas were approached through the head of the households and their husbands who consented to the researcher's request to assemble women for the study. The women were assembled at the primary health center at Lafiagi and in Shonga community secondary school hall with a seating capacity of 80 and 100 respectively.

A day and time were fixed for the meeting with the research assistants following the development of the instructional materials and a training workshop conducted for research assistants. Another meeting was scheduled for the second day of the week with women of childbearing age who volunteered to participate in the study. The WCA was assembled at the Primary Health Care Center, Lafiagi District, the researchers did a self-introduction and briefed women on the purpose of the study. The WCA were assured of safety and confidentiality and their informed consent for their participation in the study was sought. The women were interviewed by the researchers for 25 min each using the researchers' designed interview schedule-check list. The same procedure was carried out at the community Secondary school hall in Shonga district to obtain information from 120 WCA, (60 women in the experimental group and 60 women in the control group) for the pre-tests respectively.

2.3. Intervention phase

On the first day of intervention, WCA were briefed separately on the purpose of the study and they were allowed to discuss freely and ask questions for clarifications. The WCA was grouped into two; the experimental group (60 women from Lafiagi district) was exposed to nursing health education intervention on Pregnancy-Related Problems (PRP) and Obstetric Care Services (OCS) at the primary health center and the control group (60 women from the Tsonga district) had nursing health education intervention on transmission and control of sexually transmitted infections in community secondary school hall. The grouping was done on a district basis which is about 168 km apart to control the exchange of information among women in the two groups. The degree of separation of women in the experimental and control groups might not be perfect because the districts share common boundaries and this made randomization of the subjects in the groups impossible. However, the decision on which district served as experimental or control was determined by the utilization of obstetric care services outcome as revealed by the health information unit of the LGA.

The community–based nursing health education intervention was conducted for the period of ten weeks that is, the second week to the eleventh week of the study period.

The intervention programme started with a video show and health teaching on pregnancy problems and obstetric care services for the experimental group and health teaching on transmission and control of HIV/AIDS infections for the control group every Thursday and Sundays at the village primary schools and Town halls designated for the intervention throughout the intervention periods. The researchers met with the experimental and control groups twice every week for 45 min nursing health education intervention programme per month at the community level using lecture and discussion methods of health education. At the end of the tenth-week intervention programmes, a week revision of all the topics taught was done on the eleventh week on both experimental and control groups respectively.

2.4. Post-Intervention Phase

The post-intervention session was conducted on the twelfth week of the intervention period, the researchers and research assistants re-administered the same sets of questionnaire/interview schedules used during the pre-test phase to women in both experimental and control groups in the two districts.

2.5. Data analysis

Descriptive statistics of mean and standard deviation were used to answer research questions and inferential statistics of *t*-test were used to test null hypotheses at 0.05 level. The points scored by respondents on knowledge and accessibility were summarized using percentage mean scores from their responses. Knowledge of the respondents on the items on pregnancy-related problems was categorized into two, categories, high knowledge for respondents who chose yes and low knowledge for the respondents who chose no. On the other hand, utilization of obstetric care services was categorized into three categories, very high access if the respondent chose always, high access if the respondent chose not always, and poor access if the respondent chose not at all.

3. Results

Research question 1: *What is the knowledge level of women of childbearing age about* pregnancy-related problems *before and after the nursing health education intervention programme in Edu Local Government Area of Kwara State?*

Table 1 shows pre-intervention mean scores of 63.33 for the experimental group and 51.67 for the control group, while the post-intervention mean of 72.2 for the experimental group and 46.11 for the control group. This result implied that a higher number of WCA in the experimental group had baseline knowledge about pregnancy-related problems before HEIP, but the knowledge of women was significantly improved following the HEIP.

Research Question 2: What is the knowledge level of women of childbearing age about Obstetric care services before and after HEIP in Edu Local Government Area of Kwara State?

Table 2 shows pre-intervention mean scores of 34.33 for the experimental group and 26.51 for the control group, while post-intervention

Table 1
Summary of Mean and Standard Deviation Scores on Knowledge of Women of Childbearing Age about Pregnancy-Related Problems.

		Pre-intervention			Post-intervention
Group	N	X ± S.D	S.E	X ± S.D	S.E
Experimental group	60	63.33 34.44	4.46	72.22 42.14	5.44
Control group	60	51.67 33.85	4.37	46.11 36.87	4.75

Table 2
Mean and Standard Deviation Scores of knowledges of Women of Childbearing Age about Obstetric Care Services.

		Pre-intervention		Post-intervention	
Group	**N**	**X ± S.D**	**S.E**	**X ± S.D**	**S.E**
Experimental group	60	34.33 20.66	4.27	41.09 27.23	3.25
Control group	60	26.51 26.13	3.33	26.31 20.91	3.73

Hypothesis 1: The nursing health education intervention programme has no significant effect on the knowledge of Women of Childbearing Age about Pregnancy related problems in Edu LGA of Kwara State.

mean scores showed 41.09 for the experimental group and 26.31 for the control group respectively. This result indicated a very low knowledge level of WCA about obstetric care services in both the experimental group and control group before HEIP with a little improvement in knowledge among the experimental group following the HEIP.

Hypothesis 1. The nursing health education intervention programme has no significant effect on the knowledge of Women of Childbearing Age about Pregnancy-related problems in Edu LGA of Kwara State.

Table 3 *shows the pre-intervention on the experimental group mean of* 63.33, *while the post-intervention mean of* 72.22 *with t-value of* 1.26 *which is less than the table value of* 1.96. *The null hypothesis is at this moment accepted at a* 0.05 *level of significance. This implied that the nursing health education intervention on the knowledge of WCA about pregnancy-related problems does not have a significant effect on the knowledge of women of childbearing age.*

HO_2. The nursing health education intervention Programme has no significant effect on the willingness of WCA in the Experimental Group and those in the Control Group to utilize obstetric care services in Edu LGA of Kwara State.

Table 4 shows the mean score of 35.97 for the experimental group and 28.33 for the control group with t-value of 1.64, the null hypothesis is hereby accepted at a 0.05 level of significance. This implied that despite the intervention about obstetric care services, HEIP had no significant effect on the willingness of women of childbearing age to utilize obstetric care services in Edu LGA of Kwara State.

4. Discussion

This study on the assessment of the effect of a nursing health education intervention on women of childbearing age knowledge about Pregnancy-Related Problems (PRP) and utilization of obstetric care services revealed at the baseline level of women's knowledge about pregnancy-related problems showed a higher level of knowledge among the experimental group before HEIP compared with the control group. But the study further showed a significant improvement on the knowledge about PRP among WCA in the experimental group after the intervention, especially in the area of identifying symptoms and signs like severe headache, bleeding per vagina, swollen lower extremities, and blood pressure observation respectively however; WCA knowledge about Obstetric Care Services (OCS) was lower compared with their knowledge about PRP with low mean scores before and after HEIP. The situation in the control group was different as WCA knowledge was low in both PRP and OCS mean scores before and after intervention.

This implied that there was an effect of the nursing health education intervention programme on the knowledge of WCA about PRP but had no significant effect on the women's knowledge about OCS in Edu Local Government Area of kwara State. This finding is consistent with the study on the significance of knowledge in shaping health-seeking behaviour by several authors (Myer & Harrison, 2003), Smith, Dmytraczenko, Mensah & Sidibe, 2004) and Stekelenburg, Kyanamina, Mukelabai, Wolffers & Van Rosmalen, 2004). But it disagreed with the report of Nigeria National Demographic Health Survey which revealed that only 40.7 percent of the women, who had their most recent birth in the five years preceding the survey, knew about the signs of pregnancy complications. In other words, about 6 in 10 women were not aware of the symptoms of pregnancy complications as well as treatment. Among women who reported that they knew the signs of pregnancy complications, 51.4 percent mentioned vaginal bleeding as one of the signs. The wrong position of the baby in the womb, women's tiredness, prolonged labour, and swollen limbs were mentioned as other signs of pregnancy complications in very low percentages of the women (Camacho, Castro & Kaufman, 2006).

This study further showed WCA affirmation on the presence of pregnancy-related problems (PRP) and admitted that it is beneficial to detect early pregnancy-related problems, although some of the women could not associate PRP with pregnancy but considered these pregnancy problems as normal physiological changes in pregnancy. Based on this erroneous perception, many of these PRP conditions were not reported early at the health centers for immediate management. This finding supported Indonesia's demographic health survey data, which indicated that the majority of the women were not aware of the symptoms of complications at two crucial stages, that is during pregnancy and the postpartum period (IDV, 2004). The findings in this study further justified a similar study in Turkey which revealed that the majority of participants (68 %) were aware of breast cancer but could not associate the condition with pregnancy but of genetic origin (Karayurt, Ozmen, Cetinkaya, 2008). This low level of WCA knowledge will probably lead to a delay in reporting early for antenatal and obstetric care services and this will have a deleterious effect on the health of women in Edu LGA. This result corroborates a study conducted in Shanghai China, that about 50 percent of WCA also, did not know that anaemia in pregnancy and other obstetrics complications can be prevented through regular attendance of ANC and PNC only much fewer (28.8percent) could correctly understand the new-born deformity related to pregnancy and labour (Zhao and Asli, 2009).

A study by Abd El Aziz, Ola, & Ibrahim, (2009) also revealed that even though there was a highly significant improvement in knowledge items of the intervention group from pre to post-test, some women did not understand breast inflammatory diseases such as PRP. This result agreed with the study findings which observed that pregnant women are aware of some symptoms of pregnancy-related problems but unfortunately, they do not realize that they need medical treatment due to their

Table 3
A *t*-test Result on the Knowledge about Pregnancy-Related Problems among WCA in the Experimental Group.

Experimental Group	X	S.D	S.E	df t P value
Pre-intervention	63.33	34.56	4.46	59 1.26 0.072
Post-intervention	72.22	42.15	5.44	

$t = 1.26$, df 58, $p < 0.05$.
HO_2. Nursing health education intervention Programme has no significant effect on the willingness of WCA in Experimental Group and those in Control Group to utilize obstetric care services in Edu LGA of Kwara State.

Table 4
A t-test on the Utilization of Pregnancy related problems among WCA between Experimental Group and Control Group. Experimental group $n_1 = 60$, Control $n_2 = 60$.

Utilization of obstetric care services	**Intervention group**	**Mean**	**S.D**	**df t value**	**P value**
obstetric care services	**Experimental group**	35.97	21.88	118 1.64	0.052
	Control group	28.33	28.91		

(2-tailed), df = 118, $p < 0.05$.

wrong understanding of PRP during pregnancy and the availability of OCS (Phoxay, Okomura, Nakamura, & Wakai, 2001).

The nursing health education intervention programme on WCA knowledge about pregnancy-related problems showed a significant change in terms of identifying different types of PRP after the intervention but had little effect on attributing pregnancy-related problems to their existing health problems during pregnancy. This result corroborates the study in Shanghai, China, and is consistent with the results of NDHS (2008) in Nigeria (Camacho et al, 2006), Smith et al, 2004) and Stekelenburg et al, 2004). The findings of this study showed significantly different outcomes in terms of women's knowledge about PRP and OCS, but WCA knowledge about PRP was significantly higher when compared with their knowledge about OCS before and after HEIP. This disparity in knowledge may probably be responsible for WCA not willing to report at health centers for obstetric care services. However, following the post-intervention period there was an improvement in WCA knowledge about PRP but no significant difference in the control groups was observed. This finding aligned with a study that reported that the influence of knowledge on health behaviour has been tested by Mann-Whitney non-parametric statistic in Southern Laos and found the linkage between knowledge and utilization of health care services using the mean ranks to determine whether the maternal health care user-group and the non-user group have different characteristics in terms of women's knowledge about pregnancy complication. They concluded that, if the mean of rank is significantly different between two groups then the two groups are considered to have dissimilar characteristics (Phoxay, Okomura, Nakamura & Wakai (2001). This study's finding is also in agreement with a study on the knowledge and willingness to utilize antenatal care services among women of childbearing age in Ilorin-east Local Government Area, which found that more than two-thirds of the respondents (87.7percent) were aware of antenatal care services and are willing to use the following pre and post interventions (Adewoye, Musa, Atoyebi & Babatunde, 2014) and further supported a similar study on the effect of HEIP about breast cancer among Women in Egypt respectively (Abd El Aziz et al.(2009).

On the utilization of obstetric care services, post-intervention showed a significant effect of HEIP on the experimental group over the mean score for the control group but showed no significant difference in the mean scores of pre and post-intervention on the utilization of obstetric care services, which implied that despite the intervention about obstetric care services among women in the experimental group. This implied that HEIP had no significant effect on the willingness of women of childbearing age to utilize obstetric care services in Edu LGA of Kwara State. This finding is in disagreement with a study by Abd El Aziz et al. (2009) in Egypt.

5. Conclusion

Based on the findings of this study, the following conclusions were drawn:

I. Nursing health education intervention programme in this study on various pregnancy-related problems programmes had a positive effect on the knowledge of WCA about pregnancy-related problems in Edu LGA.
II. Nursing health education intervention programme in this study using obstetric care services teaching protocol did not affect the knowledge of women of childbearing age about OCS in Edu local Government Areas.
III. Nursing health education intervention programme in this study did not affect the willingness of WCA to utilize obstetric care services.

6. Limitation of the study

This study was delimited to only women of childbearing age in only three traditional districts of Edu LGA. The researchers were constrained by limited funding to extend the study to the entire local government in the senatorial zone. The inability to extend the study to the entire LGA and women of childbearing age to speak out due to the confidential nature of the topic under study affected the sample population and limited data collected for this study.

7. Recommendations

Based on the conclusion of this study, the following recommendations were made:

1. Governments at all levels of health care especially in Edu, Kwara State Ministry of Health, and Non-governmental organizations need to strengthen the existing knowledge levels of WCA about Pregnancy related problems and obstetric care services in the primary health care centers in the communities.
2. Maternal health services as a matter of policy should be instituted in all health institutions with priority on nursing health education intervention about pregnancy-related problems in communities of Edu LGA, Kwara State.
3. Nursing health education intervention programmes especially on the significance of women of childbearing age visits to health centers for obstetric care services and reporting early any obstetric problem experienced during pregnancy.
4. A faith-based maternal health services especially a quality and well-designed Islamic and Christian integrated obstetric care services package should be made to improve understanding and willingness to utilize obstetric care services among WCA in all communities in Edu LGA and the country at large.

CRediT authorship contribution statement

Umar N. Jibril: Conceptualization, Investigation, Project administration. **Arimiyau A. Sanusi:** Methodology, Supervision. **Abdullahi N. Adamu:** Funding acquisition, Writing – review & editing. **Joel O. Aluko:** Data curation, Formal analysis. **Emmanuel E. Anyebe:** Software, Validation. **Mulikat A. Ibraheem:** Visualization, Writing – original draft. **Moridiyat O.A. Adeyemo:** . **Imam A. Abubakar:** Data curation, Investigation.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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References

Abd El Aziz, H.M., Ola, A. & Ibrahim, A.H.K. (2009). Effect of A health education intervention Program about Breast Cancer among Women in a Semi-urban Area in Alexandria, Egypt.*The Journal of the Egyptian Public Health Association,*2009; *84(1-2): 219-43.*

Adewoye, K.R., Musa, I.O., Atoyebi, A.O. & Babatunde, A.O. (2014). Knowledge and access of antenatal care services women of child bearing age in Ilorin-east Local Government Area. International Journal of Science and Technology. 2014; VOL. 3 NO. 3. Retrieved from http://www.ejournalofsciences.org.

Camacho, A., Castro, M. & Kaufman, R. (2006). Cultural aspect related to the health of Andean women in Latin America: a key issue for the progress towards the attainment of Millenium development goals. The int. J. Gyneacol Obstet. 2006; 94 (3): 357-363.

De Bernis, I, Sherratt, D.R., Abouzahr, C., & Van Lerberghe, W. (2003). Skill attendant for pregnancy, childbirth and postnatal care, British. 2003; *nds push up maternal death.* http://www.hartford-hwp.com/archieves/54b/074.html. 24/10/200retrieve on 10 March 2021.

Edu Local Government Area Health Information Unit. (2016). Annual records of maternal morbidity and mortality rate.2016; (unpublished).

Federal Ministry of Health. (2007). *Integrating maternal, newborn and child health strategy. Abuja, Government of Nigeria.*

Karayurt, O., Ozmen, D., Cetinkaya, A.C. (2008). Awareness of breast cancer risk factors and practice of breast self-examination among high school students in Turkey. BMC Public Health; pp; 8: 359.

Myer, L., & Harrison, A. (2003). Why Do women seek antenatal care late? Perspectives from rural South Africa. *Journal of Midwifery and Women's Health, 48*(4), 268–272.

National Population and Family Planning Board, Statistics & Ministry of Health Indonesia .(2017). Indonesia Demographic Health Survey. Availbel on https:// dhsprogram. com/pubs/ pdf/FR342/FR342, retrieved on 23rd July, 2021.

National Population Commission (NPC:2006). (Nigeria) and ORC Macro. Nigeria Demographic and Health Survey 2003. Calverton, Maryland: NPC and ORC Macro. *Commission.* Federal Republic of Nigeria, Available on www.google.org.

Nigeria Demographic and Health Survey. (2008). *Preliminary report and national population commission.* Federal Republic of Nigeria,(2008; retrieved from www. google.org.

Phoxay, C., Okomura, J., Nakamura, Y., & Wakai, S. (2001). Influence of women's knowledge on Maternal health care Utilization in Southern Laos. *Asia Pacific Journal of Public Health;, 13*(1), 13–19.

Qi Zhao,Asli, K., Yi G&Biao, X.(2009). Knowledge and attitude on maternal health care among rural-to-urban migrant women in shanghai, china.

Smith, K., Dmytraczenko, T., Mensah, B., & Sidibe, O. (2004). *Knowledge, attitude and practices related to maternal health in Bla, Mali: Result of a baseline survey*. Maryland: Partners for Health Reform plus.

Stekelenburg, J., Kyanamina, S., Mukelabai, M., Wolffers, I., & Van Rosmalen, J. (2004). Waiting too long: Low use of maternal health services in Kalabo, Zambia. *Tropical Medical and International Health, 9*(3), 390–398.

Strydom, H. (2011). Sampling in the quantitative paradigm. *Research at Grass Roots. Pretoria: Van Schaik Publishers*, 222-235.

World Health Organisation. (2007). *Maternal mortality: estimates developed by WHO, UNICEF, UNFPA, and the World Bank.*.