



# **Effect of Health Education on Utilization of Safe Motherhood Services among Women of Reproductive Age in Rivers-East Senatorial District**

**Goodluck Azuonwu<sup>1\*</sup>, Comfort Emma Elechi<sup>2</sup> and Wondikom Fortune Uloma<sup>2</sup>**

<sup>1</sup>*Department of Nursing Science, University of Port Harcourt, Nigeria.*

<sup>2</sup>*Department of Human Kinetics, Health and Safety Studies, Ignatius Ajuru University of Education, Port Harcourt, Nigeria.*

## **Authors' contributions**

*This work was carried out in collaboration among all authors. Author GA designed the study and performed the statistical analysis. Author CEE wrote the protocol and wrote the first draft of the manuscript. Author WFU managed the analyses of the study and managed the literature searches. All authors read and approved the final manuscript.*

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## **ABSTRACT**

Proper utilization of safe motherhood services helps to improve maternal well-being, enhances healthy pregnancy and safe delivery outcomes thereby reducing maternal mortality. The aim of the study was to investigate the effect of health education on utilization of safe motherhood services among women of reproductive age in Rivers-East Senatorial District. The study adopted the quasi-experimental research design. The population for the study consisted of 567,861 women within the ages of 15-49 years. A multi-stage sampling procedure was used to select a sample size of 400 for the study. The instrument used for data collection was a structured questionnaire with a reliability index of 0.75. Data was analysed using mean, standard deviation and eta square statistics to answer the research questions while t-test was used to test the hypothesis. The result of the study showed that health education had a significant effect on the utilization of safe motherhood service ( $\eta^2 = 0.39, p < 0.05$ ). The result of the study revealed that respondents in the intervention group had

\*Corresponding author: Email: [goodator2002@yahoo.com](mailto:goodator2002@yahoo.com);

a mean score of 53.80, SD=10.26. It was concluded that health education had a significant large effect on the utilization of safe motherhood services among women in the study location. It was recommended amongst others that the State government in collaboration with the local government areas provide functional health education units in the health facilities and at community levels to make health education on maternal health a continuous activity in order to enhance the utilization of the services by women of reproductive age as a strategy to reduce maternal deaths. Also healthcare professionals should incorporate health education in their effort to promote the utilization of maternal healthcare services thereby improving the overall health and wellbeing of women.

*Keywords: Health education; knowledge; safe motherhood services; maternal health; river-east.*

## 1. INTRODUCTION

Most maternal deaths can be prevented if women have access to appropriate health care before, during and after childbirth. Hence, safe motherhood is a means of ensuring women have access to the needed care to ensure their safety and optimal health throughout pregnancy and childbirth [1]. Lapinni and Ayinmodu in a related view said safe motherhood has to do with ensuring that all women receive the necessary care they need to have a safe and healthy pregnancy and childbirth [2]. Also, Adhikari submitted that safe motherhood is designed in a way that the women are ensured of high-quality gynaecological, family planning, prenatal, delivery and postpartum care [3]. Thus, safe motherhood is a means of saving the lives of women and improving their health as well. The aims of safe motherhood include improving maternal and child health thereby preventing maternal and prenatal morbidity/mortality, it is also required in order to obtain the desired outcome of pregnancy [3,4,5].

Safe motherhood also enhances the quality and safety of women's live through the adaptation of combination of health and non- health strategies. The scheme is achieved through a programme of inter-linked steps which strive to provide family planning services to prevent unwanted pregnancies, safe abortions (where abortion is legalized couple with efficient management and treatment of complication of unsafe abortions are accessible), prenatal and delivery care at the community level with quick access to first-referral services for complication and postpartum autopsy services, promotion of breast feeding, immunization and nutrition services. Safe motherhood ensures the safety of overall pregnancy and health of mother and child. Therefore, unsafe motherhood involves maternal morbidity/mortality due to complications in

pregnancy and child birth related cases which can be avoided or prevented [6].

Health education deals with the dissemination of health information to influence people's knowledge, attitude and behaviour towards healthy practices. According to Adeniyi, Oyapero, Ajieroh, Sofola and Asiyani, health education provides learning experiences on health and health related topics [7]. It is any combination of learning experiences designed to help individuals and communities improve their health, by increasing their knowledge or influencing their attitudes [8]. New Hampshire Department of Education's study (as cited by Nwabenu) highlighted that health education is geared towards motivating people to improve and maintain their health, prevent diseases as well as reduce their risky behaviours [9]. It is aimed at empowering people to take responsibility for their own well-being by gaining control over the underlying factors that influence health. Annet's study (as cited by Htoo & Ratana) established that many countries of the world have adopted giving health education to mothers as a strategy to improve maternal health [10]. Giving health education to women is a means of encouraging them to utilize maternal health/safe motherhood services. Thus, health education is a strategy used to implement health promotion and prevent diseases.

Utilization can be said to be the action of making practical and effective use of something. It is the extent to which a given group uses particular services. Thus, utilization in this study is the patronage of safe motherhood/maternal health services by women of reproductive age to improve themselves and ensure healthy pregnancy/safe delivery outcomes. Women of reproductive age are childbearing mothers between fifteen and forty- nine (15-49) years who undergo the process of pregnancy and childbirth. Women of reproductive age are among the

vulnerable group in the community. In separate studies, Samuel and Vincent affirmed that women of reproductive age constitute a large group in the community [11,12]. Okelade highlighted that women of reproductive age are faced with large burden of poor health due to risks associated with pregnancy and child bearing [13].

Ango, Oche, Abubakar, Awosan, Kaoje and Raji researched on effects of health education intervention on knowledge and utilization of health facility delivery services by pregnant women in Sokoto state, Nigeria [14]. It was a quasi- experimental study with results the mean age of the respondents in the intervention and control groups was 26.67±6.01 and 27.80±6.53 years respectively. Umar, Mansur, Abubakar, Kehinde, Aminu and Edzu carried out a research on utilization of health facility delivery services and associated factors among pregnant women in Sokoto state, Nigeria [15]. The results showed that the mean age of the respondents was 27.2 ±6.27 and majority 72 (31.0%) of the 232 respondents were aged between 25-29 years.

Studies conducted have shown that health education has effect on the utilization of safe motherhood services. For instance, the study of Umar, Garba, Joel, Rejuaro, Aliyu and Durojaye established that there were significant increases in post intervention mean scores of respondents on knowledge and utilization of post natal care service [16]. Also, Ango et al. [14] in their study found out that there was an increase in the proportion of the respondents in the intervention group who identified danger signs of pregnancy than in the control group, hence the need for health education on the utilization of safe motherhood services [11].

Moreover, socio-demographic variables such as age, level of education and others had been found to significantly influence knowledge and utilization of safe motherhood services among women of reproductive age. Demographic studies have shown that in Kenya, Ghana and Nigeria, women who are within 21-30 years are more likely to utilize safe motherhood services compared to those older than 35 years and above [17-20]. The level of education of women would likely influence the utilization of maternal/safe motherhood services. Other studies have demonstrated that educational status of women increased the utilization of maternal health services [21-24]. Mtushi, Mpembeni and Jahn carried out a study on

effectiveness of community based safe motherhood promoters in improving the utilization of obstetric care [25].

In Rivers State, several measures have been instituted by the government to reduce, if possible prevent maternal mortality. Such measures include building health care facilities and equipping them, as well as posting skilled personnel (nurses, midwives, doctors and other health workers) to render skilled services. Other services include annual celebration of maternal and child health week/safe motherhood day with the distribution of free mosquito nets to pregnant and nursing mothers, free intermittent preventive treatment of malaria and tetanus immunization, family planning services, and recently the introduction of free mama pack kit for pregnant women who register and deliver in the health facilities across the 23 local government areas in the state. However, even though these services are provided, their utilization has remained very poor particularly to women in Rivers-East Senatorial District. It is against this background that the researcher has decided to investigate the effect of health education on utilization of safe motherhood services among women of reproductive age in Rivers-East Senatorial District.

## 2. METHODOLOGY

The research design implemented for the study was quasi-experimental. The population for the study consisted of 567, 861 women of reproductive age in Rivers East Senatorial District. A sample size of 400 was obtained for the study which was determined using Taro Yamane's formula for calculation of sample size.

$$n = \frac{N}{1 + N(e)^2}$$

Where, n=Sample size in the study  
 N=Population of women of reproductive age  
 e=Error margin acceptable (tolerable) in the study

The multistage sampling procedure was adopted for the study where Local government Areas were divided into clusters from which random sampling was done. Two groups (Control and intervention group) were used in the study to determine the effect of health education on the use of safe motherhood. The instrument for data collection was a structured questionnaire titled

“Utilization of Safe Motherhood Services Questionnaire”. The instrument of the study had 2 sections. Section A featured question items on demographic information of respondents, while Section B consisted of questions that focused on the utilization of safe motherhood services. No lecture or awareness on safe motherhood was given to the control group while the intervention group was educated on safe motherhood prior to administration of the questionnaires.

The reliability index of 0.75 for the instrument was determined using Cronbach alpha; it was therefore considered reliable for the study. Data were analysed using Statistical Product for Service Solution (SPSS version 21.0).

### 3. RESULTS

The results of the study are presented in the tables below.

Table 1 shows the mean and standard deviation of the effect of health education on the utilization of safe motherhood services among women of reproductive age. The result of the study showed that respondents in the intervention group had a mean score of  $53.80 \pm 10.26$  while respondents in the control group had a mean knowledge score of  $63.86 \pm 10.82$  with a mean difference of 10.05 at the post test. The eta square statistics was calculated to ascertain the effect of the intervention on the group. An eta square statistics of 0.39 was obtained indicating a large effect of health education on the utilization of safe motherhood services among women of reproductive age.

Table 2 reveals the mean and standard deviation ratings of effect of health education on the utilization of safe motherhood services among women of reproductive age based on age. The result of the study showed that respondents in the intervention group within ages 15-19years had mean utilization score of  $82.00 \pm 0.00$ , while respondents in the control group aged 25-29years had highest mean score of  $66.19 \pm 15.99$ . The eta square statistics of 0.102 indicated a moderate effect of health education on the utilization of safe motherhood services among women of reproductive age based on age.

Table 3 depicts the mean and standard deviation of effect of health education on the utilization of safe motherhood services among women of reproductive age based on level of education. The result of the study showed that respondents in the intervention group with secondary

education had mean utilization score of  $55.64 \pm 11.28$ , while respondents in the control group with tertiary education had a mean utilization score of  $69.61 \pm 7.37$ . The eta square statistics of 0.036 indicates a small effect of health education on the utilization of safe motherhood services among women of reproductive age based on level of education.

Independent sampled t-test was conducted to compare the effect of health education on the utilization of safe motherhood among the intervention and control group. The result of the study showed that there was a significant effect in the pre-test scores of the intervention group score ( $M=53.80$ ,  $SD=10.26$ ) and post-test of the controlled group ( $M=63.86$ ,  $SD=10.82$ ) of utilization of safe motherhood  $t(267)=15.75$ ,  $p = 0.00$ . The null hypothesis which states that health education has no significant effect on the utilization of safe motherhood services among women of reproductive age in Rivers East Senatorial district was thus not accepted.

A one-way analysis of covariance (ANCOVA) was carried out for this study. The independent variable- age of women, included five levels: 15-19years, 20-24years, 25-29years, 30-34years and  $\geq 35$ years. The dependent variable was the post intervention knowledge scores and the covariate was the pre-intervention knowledge score. The ANCOVA was significant,  $F(3, 268) = 5.83$ ,  $p < .001$ ; however, only 10.7% ( $\omega^2 = .107$ ) of the total variance in the post intervention utilization scores was accounted for by the five levels of women’s age. The null hypothesis which states that health education has no significant effect on the utilization of safe motherhood services among women of reproductive age in Rivers-East Senatorial District based on age was thus not accepted.

A one-way analysis of covariance (ANCOVA) was conducted for this study. The independent variable, educational levels of women, included four levels: no formal education, primary, secondary and tertiary education. The dependent variable was the post intervention knowledge scores and the covariate was the pre-intervention utilization score. The ANCOVA was significant,  $F(3, 268) = 3.22$ ,  $p < 0.05$ ; however, only 8.6% ( $\omega^2 = .086$ ) of the total variance in post intervention utilization scores was accounted for by the five educational levels of women’s age. The null hypothesis which states that health education has no significant effect on the utilization of safe motherhood services among

**Table 1. Mean and Standard deviation on effect of health education on the utilization of safe motherhood services**

Test	Group	M	SD	M.D	Eta	Decision
Pre-test	Intervention	37.25	1.55			
Pre-test	Control	52.76	8.69	15.51	0.18	Large effect
Post-test	Intervention	53.80	10.26			
Post-test	Control	63.86	10.82	10.05	0.39	

**Table 2. Mean and standard deviation of effect of health education on the utilization of safe motherhood based on age**

Age	Intervention		Control		Eta	Decision
	M	SD	M	SD		
15-19years	82.00	0.00	59.96	11.74	0.102	Moderate effect
20-24years	55.00	9.68	65.35	8.81		
25-29years	55.60	7.58	66.19	15.99		
30-34years	46.87	6.64	65.54	8.73		
≥35years	53.20	5.89	64.67	9.36		
Total	53.69	10.21	63.86	10.82		

**Table 3. Mean and standard deviation ratings of effect of health education on the utilization of safe motherhood based on level of education**

Level of Education	Intervention		Control		Eta	Decision
	M	SD	M	SD		
No formal Education	47.71	1.60	56.60	11.72	0.036	Small effect
Primary			61.40	8.33		
Secondary	55.64	11.28	64.73	10.46		
Tertiary	49.50	4.98	69.61	7.37		
Total	53.69	10.21	63.86	10.82		

**Table 4. Paired t-test on health education has no significant effect on the utilization of safe motherhood services**

Test	Group	M	SD	M.D	z-value	Df	p-value	Eta	Decision
Pre-test	Intervention	37.25	1.55						Reject
Pre-test	Control	52.76	8.69	15.51	9.29	378	0.00		H <sub>0</sub>
Post-test	Intervention	53.80	10.26						
Post-test	Control	63.86	10.82	10.05	15.75	267	0.00*		

women of reproductive age in Rivers East Senatorial District based on level of education of women of reproductive age was thus not accepted.

## 4. DISCUSSION

### 4.1 Effect of Health Education on the Utilization of Safe Motherhood Services

The findings of this study showed that health education had a significant large effect on the utilization of safe motherhood services among women of reproductive age with the eta square

statistics of 0.39 and a mean difference of 10.05 in the post-test. The findings of this study is expected thus not surprising because health education deals with the dissemination of health information to influence people's behaviour towards health practices including the utilization of safe motherhood services. Certainly, health education intervention is used in promoting health services utilization just as the intervention carried out in this study was a concise effort geared towards the teaching and learning of safe motherhood services thus, the effect on the utilization of such services. The findings of this study is in keeping with the findings of Mtushi, Mpembeni and Jahn in Mtwara rural district,

Tanzania where the authors submitted that community-based safe motherhood intervention was effective in promoting the utilization of obstetric care and skilled attendant at delivery [25].

The findings of this study also agreed with that of Eman, Omnia and Huny whose study was focused on the effectiveness of community-based health education intervention about safe motherhood among pregnant females in Sharkia Governorate, Egypt with a result which indicated an increase in the total services utilization score regarding safe motherhood services such as family planning (from  $6.88 \pm 1.28$  to  $10.86 \pm 1.72$ ) and Breast feeding score (from  $16.92 \pm 2.30$  to  $22.42 \pm 2.74$ ) [25]. The findings of this study is also in consonance with the findings of Umar, Garba, Joel, Rejuaro, Aliyu and Durojaye on impact of health education intervention on knowledge and utilization of postnatal care services which showed that health education intervention has a positive impact on utilization of postnatal care services among women with pre-intervention mean scores of 56.67 and post intervention scores of 92.91 [16]. The findings of Ango, Oche, Abubakar, Awosan, Kaoje and Raji whose result showed a statistically significant increase in the utilization of health facility delivery services among the intervention group participants also agrees with the present study [14]. This report also agrees with the findings of Lee, Park, Ndombi and Nam on impact of the interventions on 4<sup>+</sup> antenatal care services utilization in which the authors submitted that interventions focused on improving awareness, increased 4<sup>+</sup> ANC utilization [26]. The fact that the above studies adopted the same study design and intervention, that is, health education intervention, might be implicated for the similarity found between the studies.

The finding of this study is also in agreement with that of Htoo and Ratana who established that many countries of the world have adopted giving health education to mothers as a strategy to improve maternal health and that giving health education to women is a great means of encouraging them to utilize maternal health/safe motherhood services [10]. The findings of this study also gives credence to the assertion of Vincent that, health education is a combination of learning opportunities and teaching activities designed to facilitate voluntary adaptation of behaviour that are conducive to health [12]. The findings are however in variance with that of

Umar et al. [16] which reported poor utilization of delivery care services by women of reproductive age [16].

#### **4.2 Effect of Health Education on the Utilization of Safe Motherhood Services Based on Age**

The findings of this study showed a significant moderate effect of health education intervention on utilization of safe motherhood services among women of reproductive age based on age with an eta square statistics of 0.102. The result of the study showed that respondents in the intervention group aged 15-19years had mean utilization score of  $82.00 \pm 0.00$ , while respondents in the control group aged 25-29years had highest mean score of  $66.19 \pm 15.99$ . It can be deduced from the findings of this study that more of the younger respondents consented to the use of the safe motherhood services after the intervention than the older ones. This might be due to the fact that these women who are mainly in their youth age were more receptive to behavioural change impacted by the intervention probably because they recently entered into motherhood while the older ones who have had several motherhood experiences would have felt business as usual, that is, though, the intervention had an effect on their utilization of safe motherhood services, they may not be prompt to action like the younger mothers.

The findings of this study is in line with several other studies including those by Ajaegbu [17], Lidorah [18], Onasoga et al. [27] Amadi [19] and Akowuah et al. [20] which showed that younger women were more likely to utilize safe motherhood services compared to their older counterparts [17,18,19,20,27]. Though the previous studies were not intervention studies like the present one, they all concretize the fact that the younger women are more prompt to action in maternal healthcare services utilization. The finding of this study also in support of that by Acharya whose study on the demographic and socio-economic factors affecting antenatal health services utilization in Nepal, showed that age was a significant factor that influenced utilization of safe motherhood/maternal health care services and that younger age predicts more of the odds to know and utilize maternal health care services [28]. This similarity found between the present study and that of Acharya might be due to the fact that age is a strong epidemiological

**Table 5. Analysis of covariance on health education on the utilization of safe motherhood services by age of women of reproductive age**

Source	Type III sum of squares	df	Mean square	F	Sig.	Partial eta squared
Corrected Model	11474.64 <sup>a</sup>	11	1043.15	10.92	.000	.319
Intercept	22983.76	1	22983.76	240.71	.000	.484
Pre-utilization	44.37	1	44.37	.46	.496	.002
Group	538.83	1	538.83	5.64	.018	.021
Age	2784.99	5	556.99	5.83	.000	.102
Group * age	4930.01	4	1232.50	12.91	.000	.167
Error	24539.06	257	95.48			
Total	1032819.00	269				
Corrected Total	36013.70	268				

\*Significant,  $p < 0.05$  level of Significance  
a. R Squared = .319 (Adjusted R Squared = .289)

**Table 6. Analysis of covariance on the effect of health education on the utilization of safe motherhood by level of education of women of reproductive age**

Source	Type III sum of squares	df	Mean square	F	Sig.	Partial eta squared
Corrected Model	8941.89 <sup>a</sup>	7	1277.41	12.32	.000	.248
Intercept	19123.46	1	19123.46	184.37	.000	.414
Pre-utilization	32.53	1	32.53	.31	.576	.001
Group	3542.65	1	3542.65	34.15	.000	.116
education	1001.80	3	333.93	3.22	.023	.036
Group * education	1018.65	2	509.32	4.91	.008	.036
Error	27071.81	261	103.72			
Total	1032819.00	269				
Corrected Total	36013.70	268				

a. R Squared = .248 (Adjusted R Squared = .228)

variable which cannot be excluded when dealing with maternal health services utilization.

Also, the finding of this study can be explained by the assertion of Yar-Zever and Said which indicated that young pregnant women are eager to attend maternal health services in fear of obstetric complications as compared with older women that might be used to child delivery procedures [29]. The findings of the study is however in variance with the findings of Kalule-Sabiti, Amoateng, and Ngake who submitted that there was no significant difference between young and old mothers with regards to utilization of antenatal care services [30].

#### **4.3 Effect of Health Education on the Utilization of Safe Motherhood Services Based on Level of Education**

The findings of this study showed a significant small effect of health education intervention on utilization of safe motherhood services among women of reproductive age based on level of education with an eta square statistic of 0.036. The result of the study showed that respondents in the intervention group with secondary education had mean utilization score of  $55.64 \pm 11.28$ , while respondents in the control group with tertiary education had a mean utilization score of  $69.61 \pm 7.37$ . This is because the educational level of the respondents can enhance the understanding of the intervention package and also, education enhances better socio-economic status which is an enabling factor for the utilization of any health care service.

This is in support of the report by Park, who noted that education of women is a driving force for utilization of health care services and that educated women generally do not have early pregnancies, are able to space their pregnancies, have better access to information related to health and make better use of health care services [31]. The findings of this study is also in keeping with that of Teferra, Aleu and Woldeyohannes on institutional delivery service utilization and associated factors among mothers in Sekela District, North West of Ethiopia which demonstrated that educational status of participants increased their institutional delivery service utilization [23]. Similarly, Alemayehu and Mekonnen, El-Shiekh and Kwaak and Ghosh, Siddiqui, Barik and Bhaumik, in their respective studies reported that educated women are more likely to utilize maternal services than the less

educated ones [32-34]. These findings equally agree with that of Azuh, Azuh, Fasina, Adekola, Amoo and Oladosun and Dimbuene et al. [24] that maternal education significantly increased the utilization of maternal health care services [24,35]. However, the findings of the study are at variance with the findings of Okonofua, Ntoimo, Ogungbangbe, Anjorin, Imongan and Yaya on predictors of women's utilization of primary health care for skilled pregnancy care in rural Nigeria which reported that women with primary and secondary level of education were more likely to receive delivery care in PHCs than the highly educated women [36]. Also Roy, Sahoo and Sarangi reported that educational status of women did not significantly affect their utilization of maternal health care services [37]. The difference in results between the previous studies and the present study could be as a result of the type of study design used, location and timing.

#### **5. CONCLUSION**

Based on the study, it was concluded that health education had a significant large effect on the knowledge and utilization of safe motherhood services among women of reproductive age in Rivers East Senatorial District.

#### **6. RECOMMENDATIONS**

Based on the findings of the study, the local and state governments are to provide health education units in the health facilities that are functioning, especially at community levels to ensure continuation of health education on maternal health. Also, there should be incorporation of health education by healthcare professionals is a veritable tool for the promotion and utilization of maternal healthcare services, thus improving the overall health and well-being of women. Finally, the use of churches, town hall, market squares and other public places as a means of dissemination of maternal health by health educators and personnel is a useful tool.

#### **CONSENT AND ETHICAL APPROVAL**

Ethically, explanations were done & ethical approval has been collected and preserved by the authors. Written informed consent was obtained from the relevant Local Government Authorities, community heads and respondents concerning the nature of the study and what they stand to benefit.



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## COMPETING INTERESTS

Authors have declared that no competing interests exist.

## REFERENCES

1. Igbokwe CC, Adama GN. Knowledge and practice of safe motherhood initiative among childbearing mothers attending maternal and child health (MCH) clinics in Nsukka health district. *Journal of Research in Education and Society*. 2011;2(1):221.
2. Lapinni SO, Ayinmodu TK. Hand book on primary health care and some contemporary issues on health. Ilorin: Musty Graohix Press; 2016.
3. Adhikari S. Pillars of safe motherhood: Public Health Notes. 2018.  
Available: <http://www.publichealthnotes.com/tag/direct-Causes-for-the-majority-of-maternal-deaths>.
4. Alabi ZA. Knowledge, attitude and perception of married men towards safe motherhood in Ibadan north local government area, Oyo State, Nigeria; 2016.  
Available: <https://adhlui.com.ui.edu.ng/jspui/e/123456789/447>.
5. Titiloye MA, Alabi Z, Imaledo J. Knowledge and practice of married men towards safe motherhood in Ibadan north local government area to maternal and child health information: Implications for sustainable development. *Information Development, Oyo state, Nigeria. International Journal of Nursing and Midwifery*. 2019;11(17):68-74.
6. Azuonwu G, Elechi CE, Wondikom. FU Effects of health education on knowledge of safe motherhood services among women of reproductive age in Rivers East Senatorial District, Rivers State. *Asian Research Journal of Gynaecology and Obstetrics*. 2020;4(4):34-40.
7. Adeniyi AA, Oyaperu A, Ajieroh V, Sofola O, and Asiyambi O. Effect of health education intervention conducted by primary health care workers on oral health knowledge and practices of nursing mothers in Lagos State. *Journal of public Health in Africa*, 2018;9(2):833.
8. World Health Organization; 2018. Retrieved: May 19<sup>th</sup>, 2018.  
Available: <https://www.who.int/topics/health-education>.
9. Nwabenu OI. The place of health education in environmental health. *Nigerian Journal of Health Education*. 2018;22(1):102-118.
10. Htoo HKS, Ratana S. The effects of community based safe motherhood pictorial handbook health education intervention in Pa- Oh ethnic group, Myanmar. *Journal of Medicine and Medical Sciences*. 2011;2(10):1171-1179.
11. Samuel ES. Human sexuality and family health education. Nsukka: Afro Orbis Publishing Company; 2010.
12. Vincent C. Community health care practice in developing countries. Imo, Owerri: Springfield Publishers; 2012.
13. Okelade O. Knowledge of family planning methods and utilization among women of reproductive age in Nigeria. *BioMed Central Journal of Health*, 2016;7: 209.
14. Ango UM, Oche MO, Abubakar IS, Awosan KJ, Kaoje AU, Raji MO. Effect of health education intervention on knowledge of health facility delivery services by pregnant women in Sokoto State, Nigeria. *International Journal of Contemporary Medical Research*. 2018; 5(6):77- 83.
15. Umar MA, Mansur OO, Abubakar S, Kehinde JA, Aminu UK, Edzu UY. Utilization of health facility delivery services and associated factors among pregnant women in Sokoto state, Nigeria. *Journal of Dental and Medical Sciences*. 2018;17(10):59- 66.
16. Umar NJ, Garba NS, Joel LA, Rejuaro M, Aliyu U, Durojaiye A. Impact of health education intervention on knowledge and utilization of postnatal care services among women in Edu local government of Kwara state, Nigeria. *Journal of Basic and Clinical Reproductive Sciences*. 2017;6(1): 136–141.
17. Ajaegbu OO. Perceived challenges of using maternal healthcare services in

- Nigeria Journal of Art and Sciences. 2013; 65(3):47-68.
18. Lidoroh SA. Factors associated with utilization of maternal health care services in western province, Kenya. Published M.SC Dissertation, University of Nairobi. 2013.
  19. Amadi SU. Demographic and socio-economic factors influencing utilization of maternal health services in some selected rural communities in Igbo-Etiti local government area, Enugu State Nigeria. Published Master's Thesis, University of Nigeria; 2015.
  20. Akowuah JA, Agyei-Baffour P, Awunyo-Vitor D. Determinants of antenatal health care utilization by pregnant women in third trimester in Peri – Urban Ghana. *Journal of Tropical Medicine*; 2018.
  21. Tej-Ram J, Nawi N, Miguel SS. Factors affecting the use of maternal health services in Madhya Pradesh State of India: a multilevel analysis. *International Journal for equity in Health*. 2011;10:59.
  22. Idris SH, Gwarzo UMD, Shehu AU. Determinants of place of delivery among women in a semi-urban settlement in Zaria Northern Nigeria. *International Journal of Population Research*. 2012; 10(11):5-7.
  23. Teferra AS, Alemu FM, Woldeyohannes SM. Institutional delivery service utilization and associated factors among mothers who gave birth in the last 12 months in Sekela District, North West of Ethiopia: A community - based cross sectional study. *Journal of BMC (Pregnancy and Childbirth)*. 2012;12:(1)74.
  24. Dimbuene ZT, Amo-Adjei J, Amagai D, Mumah J. Women's education and utilization of maternal health services in Africa: a socioeconomic status analysis. *Journal of Biosocial Science*. 2018; 50(6):725-748.
  25. Mtushi D, Mpembeni R, Jahn A. Effectiveness of community based safe motherhood promoters in improving the utilization of obstetric care. The case of Mtwara Rural District in Tanzania. *Journal of BMC Pregnancy Childbirth*. 2010;10.
  26. Lee H, Park SJ, Ndombi GO and Nam EW. Community-based maternal and child health project on 4+ antenatal care in the Democratic Republic of Congo: A difference-in-differences analysis. *Reproductive Health*, 2019;16(157).
  27. Onasoga AO, Osaji TA, Alade OS, Egbuniwe MC. Awareness and barriers to utilization of maternal health care services among reproductive women in Amassoma community, Bayelsa State. *International journal of Nursing and Midwifery*. 2013; 6(1):10- 15.
  28. Acharya SK. Demographic and socio – economic factors affecting antenatal health services utilization in Nepal. *Journal of Development and Administrative Studies*. 2016;24:1-2.
  29. Yar-Zever IS, Said IY. knowledge and barriers in utilization of maternal health care services in Kano State, Northern Nigeria. *European Journal of Biology and Medical Science Research*. 2013;1(1):1-14.
  30. Kalule-Sabiti I, Amoateng AY, Ngake M. Effect of socio-demographic factors on the utilization of maternal health care services in Uganda. *Journal of African Population Studies*. 2014;28(1):515 – 525.
  31. Park K. Textbook of preventive and social medicine (21<sup>st</sup>ed). Jabalpur, India: M/S Banarsidas Bhanot Publishers. 2011.
  32. Alemayehu M, Mekonnen W. The prevalence of skilled birth attendance utilization and its correlates in North West Ethiopia. *Biomedical Research International*. 2015;(1):1-8.
  33. El- Shiekh B, Kwaak A. Factors influencing the utilization of maternal health care services by nomads in Sudan. *Research, Policy and Practice*. 2015;5:23.
  34. Ghosh S, Siddiqui MZ, Barik A, Bhaumik S. Determinants of skilled delivery assistance in a rural population: Findings from an HDSS site of rural west Bengal, India. *Journal of Maternal and Child Health*, 2015;19(11):2470-9.
  35. Azuh D, Azuh A, Fasina F, Adekola P, Amoo E, Oladosun M. Knowledge of socio-demographic factors influencing health services usage among pregnant mothers in Nigeria. *International E- Journal of Advances in Social Sciences*. 2017;3(9):1043-1050.
  36. Okonofua F, Ntoimo L, Ogungbangbe J, Anjorin S, Imongan W, Yaya S. Predictors of women's utilization of primary health care for skilled pregnancy care in

- rural Nigeria. BMC Preganncy and Childbirth. 2018;18:106.
37. Roy S, Sahoo A, Sarangi L. Factors affecting utilization of maternal health care services in urban area of Bhubneswar, India. Journal of Pharmacy and Community Medicine. 2017;3(3):138-144.

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