International Journal of Innovative Healthcare Research 10(1):84-91, Jan.-Mar., 2022

© SEAHI PUBLICATIONS, 2022 **www.seahipaj.org** **ISSN: 2354-2950**

Factors Associated With HIV Prevalence: A Comparative Study Among Pregnant Women Attending Public And Private Hospitals In Rivers State

[1]Uzoma-Ogbuku, Constance Chinonye & [2]Dr K.C. Patrick-Iwuanyanwu

[1&2]African Centre for Excellence, Centre for Public Health and Toxicological Research, University of Port Harcourt, Port Harcourt, Nigeria

[1]uzomaconstance1@gmail.com; [2]kctrendy@yahoo.co.uk

Correspondence: [1]uzomaconstance1@gmail.com

ABSTRACT

Background: Human immuno-deficiency virus in pregnancy has become of huge importance in HIV research because of its contribution to the spread of the virus especially among children. The aim of this research is compare the factors associated with HIV prevalence among pregnant women attending public and private hospitals in Rivers State. **Method:** The study was done between March, 2020 and April, 2020 using a laboratory based cross-sectional study design. A convenience sampling method was used to select a sample of 309 pregnant women. **Results:** a statistically significant relationship was observed between number of pregnancy and HIV prevalence in both the public and the private health facilities ($p<0.05$). There was a significant association between HIV prevalence and gravidity in both facilities ($t=2.15$, *$p=0.003$ vs. $p=0.001$*). HIV prevalence was significantly associated with parity in public facility, but none in the private facility (*$p=0.02$ vs.0.235*). **Conclusion:** Those with higher gravidity also had higher HIV prevalence than primigravida in both the private and public health facilities. It was therefore recommended that international organizations and nongovernmental organizations should begin to partner with private hospitals so as to increase the testing capacity in the sector.

Keywords: Factors, Hospitals, Pregnant women, Rivers State

INTRODUCTION

Human immuno-deficiency virus in pregnancy has become of huge importance in HIV research because of its contribution to the spread of the virus especially among children. Report showed that 1.4 million pregnant women lived with the virus globally and over 1 million of these women accessed the antiretroviral drug regimen for prevention of vertical transmission of this virus with 79% coverage in sub-Sahara Africa (UNICEF, 2018). Vertical transmission of this virus is responsible for more than 90% of the infection in children globally. Close to 7000 persons were said to get infected on daily basis and nearly 5000 of them die from the virus particularly because of inadequate access to HIV prevention and treatment services (Etukumana et al., 2011). Adeyemo et al. (2014) noted that, as at 2011, 17.3 million children below18 years had lost one or both parents to AIDS, and more were grossly affected with heighten risk of poverty, school drop-out, homelessness, and discrimination among others. In Asia (Nepal), HIV sero-prevalence in pregnant women was 0.62%, the occurrence is highest (1.4%) in women within 35-39years age group (Rijal et al., 2014).

In sub-Saharan Africa, a sub-region with close to 12 per cent of the world's population, more than two-thirds (68%) of the world's population of people are with HIV (Adeyemo et al., 2014). Unlike in other parts of the globe, women are the most affected group in sub-Saharan Africa. Women accounts for (61%) while 94% of children infected with this virus globally lived in this region. The commonest route of transmitting this virus in sub-Saharan Africa is through coitus which is mainly heterosexual, and vertical

transmission is the second and is responsible for over90% of infections in children (Adeyemo et al., 2014). Nigerian national HIV prevalence among pregnant women consistently moved from 1.8% in 1991 to 5.8% in 2001 but dropped to 4.4% in 2005. In 2010, it was said to be 4.1% and an urban hospital-based study conducted in Jos, north-central Nigeria in 2011 revealed a prevalence rate of 8.9% as its result (Adeyemo et al., 2014). Several survey carried out in different parts of Nigeria showed these prevalence of HIV among pregnant women: 7.8% in Minna, 11.0% in Port Harcourt, 3.8 percent in Abakaliki and Enugu; and in Benin City, 5.2% (Adeyemo et al., 2014). Despite the calculated efforts of WHO and UNICEF in the prevention, management and control of HIV and the problems associated with HIV, it is still a major public health concern.

Human immuno-deficiency virus is one of the main causes of death among young women (Uchendu, 2020). The report from UNICEF 2018 has it that 1.4 million women that are pregnant are said to have HIV globally, HIV prevalence among pregnant women in Port Harcourt was 11.0% according to Adeyemo et al., (2014). In 2013, 54% of women that are pregnant in middle- and low-income countries were not screened for Human immuno-deficiency virus which is a key step to the assessment of prevention and treatment regimen for HIV (UNAIDS, 2014). Vertical transmission of the virus can happen in-utero, intrapartum and post-partum through breast feeding.

Screening of all blood samples of pregnant women for HIV particularly during antenatal booking will enable the health care giver to identify pregnant women that are reactive to HIV as most people with the virus are not even aware that they have the disease. There is however paucity of literature on comparative study of HIV prevalence among pregnant women in private and public hospitals in Nigeria with no known comparative study on HIV prevalence in Rivers State. There is need for such studies to facilitate evidence-based intervention programmes that would ensure that all pregnant women receive the best care available that will result in prevention of vertical transmission of HIV.

In order to ensure that pregnant women with HIV have the best care possible, there is need to carry out more studies on prevalence of HIV among women that are pregnant, this hopefully may bridge the knowledge gap in that area and also bridge the literature gap on comparative studies on the prevalence of HIV among pregnant women and provide stakeholders with the necessary information and data to carry out intervention programs that will be of great benefit to people living with HIV and the population at large, hence this study. The study was guided by the following research questions:

1. What is the association between HIV prevalence and pregnancy-related characteristics of pregnant women attending ante-natal care clinics in Port Harcourt Metropolis, Rivers State?
2. What are the pregnancy-related characteristics of pregnant women attending ante-natal care clinics in Port Harcourt Metropolis, Rivers State?

METHODOLOGY

The cross-sectional laboratory based research design was adopted. The population for this study comprised of all the pregnant women that presented to the selected private and public hospitals in Port Harcourt Metropolis from March 2020 to April 2020. A sample size of 436 was selected using a convenience sampling technique. The data collection was done through a laboratory test. The blood samples of pregnant women were collected alongside their socio-demographic and pregnancy-related information between 1st March 2020 and 30th April 2020 from the four selected private and public hospitals. The participant's samples were collected by the laboratory Scientist under the watch of the researcher in the phlebotomy room of the respective hospitals. At the end of sample collection, the samples were carried to the central laboratory where further investigation was made to ascertain the prevalence of HIV.

The reliability of the study instruments was ensured by the use of three rapid HIV test kits that are similar in terms of sensitivity and specificity of 99.8%, 99.9% respectively. The HIV test kits used for the identification of IgG-IgM were Alere Determine HIV-1/2 (Alere), Uni-Gold HIV (Trinity) and HIV1/2 STAT-PAK (Chembio). Data collected were analyzed using frequency, percentage and regression.

RESULTS

The results of the study are presented

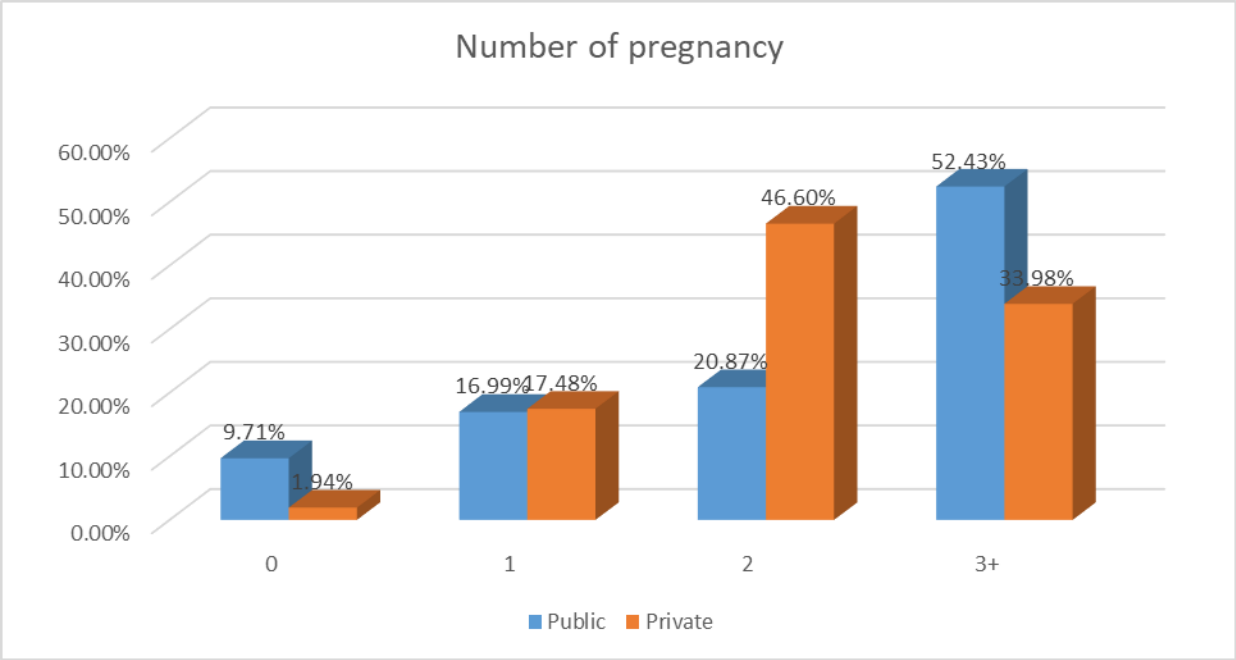

Fig 1: Percentage distribution showing number of pregnancies

The result showed that more than half (52.43%) of those in public facility compared to those in private hospital (33.98%) had three or more pregnancies.

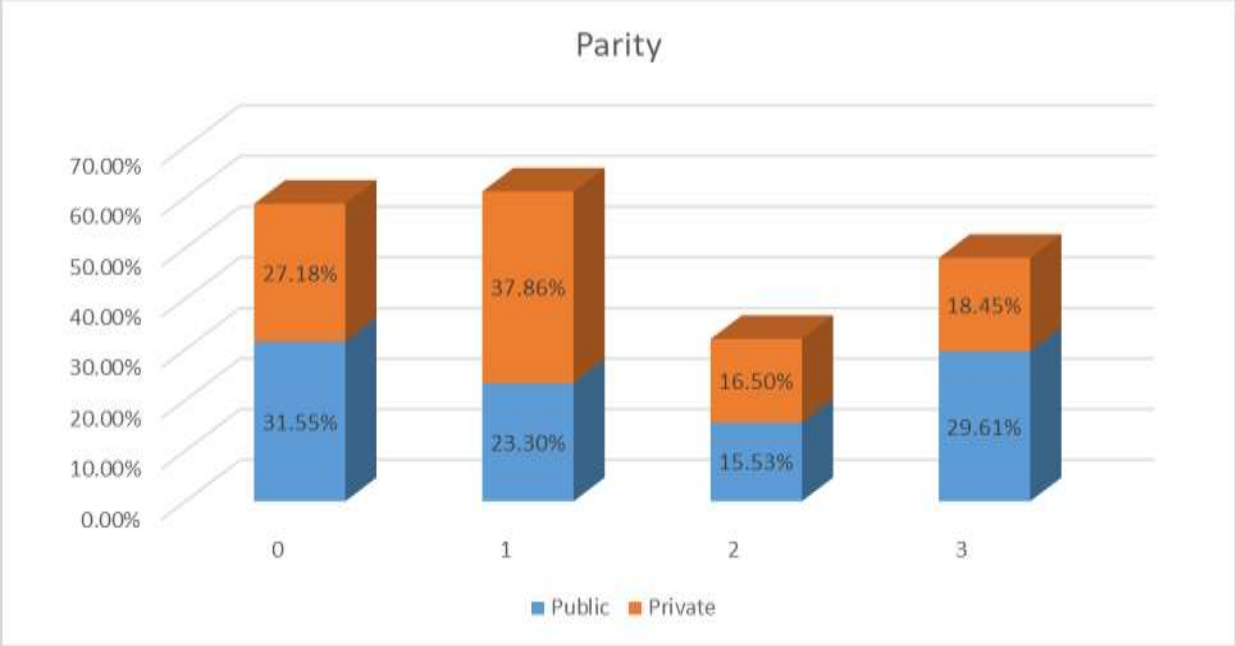

Fig 2: Percentage distribution showing parity of respondents

The result showed that more (29.61%) of those in public facility compared to those in private hospital (18.45%) had three or more children.

Table 1: Relationship between Pregnancy-related characteristics and prevalence of HIV in Public and Private Facilities (Bivariate Logistic Regression)

Variable	Public		OR (95% CI)	p-value	Private		OR (95% CI)	p-value
	HIV+	HIV-			HIV+	HIV-		
Number of Pregnancy	Freq (%) n=21	Freq (%) n=185			Freq (%) n=7	Freq (%) n=96		
≥3	18 (85.71)	90 (48.65)	6.30 (1.80-22.23)	*0.018**	5 (71.43)	30 (31.25)	5.5 (1.02-29.98	*0.03**
≤2	3 (14.29)	95 (51.35)			2 (28.57)	66 (68.75)		
Parity								
≥2	15 (71.43)	78 (42.16)	3.43 (1.27-9.24)	*0.02**	4 (57.14)	32 (33.33)	2.67 (0.56-12.64)	0.387
≤1	6 (28.57)	107 (57.84)			3 (42.96)	64 (66.67)		

**Statistically significant ($p<0.05$)*

Number of Pregnancy (Gravidity)

From the bivariate logistics regression model (**Table 1**), a statistically significant relationship was observed between number of pregnancy and HIV prevalence in both the public and the private health facilities. For the public health facilities, participants that had 3 or more pregnancies showed a 6.30 fold increase for contracting HIV compared to those that had 2 pregnancies and less (OR: 6.30, 95% CI: 1.80-22.23, *p=0.018*). And for the private health facilities, participants that had 3 or more pregnancies showed a 5.5 fold increase for contracting HIV compared to those that have had 2 pregnancies and less (OR: 5.50, 95% CI: 1.02-29.98, *p=0.03*).

Number of Children (Parity)

From the bivariate logistics regression model (**Table 1**); a statistically significant association was observed between number of children and HIV prevalence in public health facilities alone. For the public health facilities, participants that have 2 or more children showed a 3.43 fold increase for contracting HIV compared to those that have null or 1 child (OR: 3.43, 95% CI: 1.27-9.24, *p=0.02*). Private health facilities did not show a statistically significant difference.

Table 2: Association between pregnancy-related characteristics and prevalence of HIV in Public and Private Facilities

Pregnancy-related characteristics	Public		Fischer's Exact p	p-value	Private		Fisher's Exact p
	HIV+	HIV-			HIV+	HIV-	
	Freq (%) n=21	Freq (%) n=185			Freq (%) n=7	Freq (%) n=96	
Gravidity							
≥3	18 (85.71)	90 (48.65)	0.001*µ		5 (71.43)	30 (31.25)	0.043*µ
≤2	3 (14.29)	95 (51.35)			2 (28.57)	66 (68.75)	
Parity							
≥2	15 (71.43)	78 (42.16)	5.39	*0.02**	4 (57.14)	32 (33.33)	0.235µ
≤1	6 (28.57)	107 (57.84)			3 (42.96)	64 (66.67)	

**Statistically significant (p<0.05), µ=Fisher's Exact p, recommended for values less than 5 in an association*

Number of Pregnancy (Gravidity)

A statistically significant association was observed between number of pregnancy and HIV prevalence in both the public and the private health facilities. For the public health facilities, participants that have had 3 or more pregnancies showed a statistically significant higher prevalence for HIV compared to those that have had 2 pregnancies and less (85.71% vs. 414.29%; *p=0.001*). And for the private health facilities, participants that have had 3 or more pregnancies showed a statistically significant higher prevalence for HIV compared to those that have had 2 pregnancies and less (71.43% vs. 28.57%;*p=0.043*) as shown in **Table 2**

Number of Children (Parity)

A statistically significant association was observed between parity and HIV prevalence in public health facilities alone. For the public health facilities, participants that have 2 or more children showed a statistically significant higher prevalence for HIV compared to those that have null or 1 child (71.43% vs. 28.57%; *p=0.02*). Private health facilities did not show a significant difference (p=0.235) as shown in **Table 2**.

Table 3: Type of health facility and Pregnancy-related Characteristics of participants

Characteristics	Type of Health Facility				*df*	*Chi-Square (χ^2) (p-value)*
	Public n=206		Private n=103			
	Freq	%	Freq	%		
Number of Pregnancy						
0	20	9.71	2	1.94		
1	35	16.99	18	17.48	3	30.71
2	43	20.87	48	46.60		*(0.001)**
3+	108	52.43	35	33.98		
Mean	***2.77±1.79***		***2.34±1.12***			2.15 *(0.003)*$^{\beta}$
Parity						
0	65	31.55	28	27.18		
1	48	23.30	39	37.86	3	8.96
2	32	15.53	17	16.50		*(0.029)**
3+	61	29.61	19	18.45		
Mean	***1.63±1.59***		***1.31±1.15***			1.82 *(0.070)*

**Statistically significant (p<0.05), β=Student t-test (p-value)*

Study participant's mean age was statistically significantly higher for private health facilities compared to public health facilities (*32.29 ± 5.47vs. 30.77 ± 5.68 years)* (t=2.21, *p=0.03*). Those within the age ranges of 20-29, 44.66% (92) and 30-39, 44.66% (92) where statistically significantly higher for the public health facilities and 30-39, 63.11% (65) for the private health facilities (*p=0.02*) as shown in **Table 3.**

Mean number of pregnancy of participants was statistically significantly higher for public health facilities compared to private health facilities (*2.77 ± 1.79*vs. *2.34 ± 1.12*) (t=2.15, *p=0.003*), with those of the women having 3 or more pregnancies, 52.43% (108) statistically significantly higher for the public health facilities and 2 pregnancies, 46.6% (48) for the private health facilities (*p=0.001*).

Furthermore, mean number of children (parity) of participants was statistically significantly higher for the public health facilities compared to the private health facilities (*1.63 ± 1.59vs. 1.31 ± 1.15*), with most of the women having three or more children, 29.61% (61) statistically significantly higher for the public health facilities and at least one child for the private health facilities, 37.86% (39) (*p=0.029*) as shown in **Table 3.**

DISCUSSION OF FINDINGS

In this study, 27.18% (28), 37.86% (39), 16.50% (17) and 18.45% (19) of the pregnant women that registered for antenatal in the selected private health facilities had no previous child, 1 child, 2 children and ≥3 children respectively. This implies that HIV prevalence was highest among women with one previous child and lowest among women with two previous children. There was however no statistically significant relationship between HIV seroprevalence and parity. This may be due to the smaller number of study participants that attended antenatal care during the study period due to COVID-19 pandemic. This finding corroborates with results from a study by Etukumana et al. (2011) in a rural Nigerian mission hospital and contrasts with findings by Adeyemo et al. (2014) which showed a statistically significant difference between HIV seroprevalence and parity. This may be due to the fact that increased parity invariably means increased sexual exposure and contacts and increased sexual contacts results in increased susceptibility to HIV infection.

In this study, in an ascending order, 1.94% (2), 17.48% (18), 46.60% (48) and 33.98% (35) of the pregnant women had no previous pregnancy, 1 pregnancy, 2 previous pregnancies and ≥3 previous pregnancies. This implies that HIV prevalence was highest among women with two previous pregnancies and lowest among women with no previous pregnancies. There was a statistically significant difference between gravidity and HIV seroprevalence. Participants that had 3 or more pregnancies showed a 5.5 fold increase for contracting HIV compared to those that had 2 pregnancies and less (OR: 5.50, 95% CI: 1.02-29.98, *p=0.03*). This finding corroborates with findings from a research work by Adeyemo et al. (2014). This may be as a result of increased unprotected sexual contact results in increased gravidity which will results in increased HIV infection susceptibility among the pregnant women.

In this study, 31.55% (65), 23.30% (48), 15.53% (32) and 29.61% (61) of the pregnant women that registered for antenatal care at the public health facilities in an ascending order, had no previous child, 1 child, 2 children and ≥3 children respectively. There was a statistically significant association observed between number of children and HIV prevalence in public health facilities alone. For the public health facilities, participants that had 2 or more children showed a 3.43 fold increase for contracting HIV compared to those that have null or 1 child (OR: 3.43, 95% CI: 1.27-9.24, *p=0.02*). This result is similar to findings by Agida et al. (2010) in Makurdi, Nigeria; Adeyemo et al. (2014) in Ogun State, Nigeria; Fouedijo et al. (2017) in Yaounde. This finding however, contrasts with finding from a study conducted by Agboghoroma and Iliyasu (2015) which showed no statistically significant difference, although HIV prevalence was slightly higher in women with higher parity. This may be due to the fact that increased parity invariably means increased sexual exposure and contacts and increased sexual contacts results in increased susceptibility to HIV infection.

In this study, in an ascending order, 1.94% (2), 17.48% (18), 46.60% (48) and 33.98% (35) of the pregnant women had no previous pregnancy, 1 pregnancy, 2 previous pregnancies and ≥3 previous pregnancies. There was a statistically significant difference between gravidity and HIV seroprevalence

among pregnant women in the public health facilities. For the public health facilities, participants that have had 3 or more pregnancies showed a 6.30 fold increase for contracting HIV compared to those that have had 2 pregnancies and less (OR: 6.30, 95% CI: 1.80-22.23, *p=0.018*). This finding corroborates with the result from a review conducted by Adeyemo et al. (2014) and also findings by Fouedijo et al. (2017). This may be as a result of increased unprotected sexual contact which culminates in increased gravidity which in turn results in increased HIV infection susceptibility among the pregnant women. Primigravidity was a protective factor. Studies showing contrasting opinions were not found.

The prevalence of HIV is more in multipara than in primipara in both private and public health facilities 57.14% (4) and 71.43% (15). Those with higher gravidity also had higher HIV prevalence than primigravida in both the private and public health facilities with 71.43% (5) and 85.71% (18) respectively. There was a statistically significant relationship between HIV prevalence and gravidity and no significant relationship between HIV prevalence and age and parity in the private hospital. There was also a statistically significant relationship between HIV seroprevalence and parity and gravidity, however there was no statistical significant difference between HIV seroprevalence and age in the public health facilities. This is in agreement with findings in a study conducted by Adeyemo et al. (2014) in Ogun State, Nigeria which showed a higher HIV prevalence rates in older pregnant women in both private and public health facilities and also showed a statistical significant relationship between HIV prevalence and gravidity and parity in the public health facilities, but HIV prevalence was found to be more in primipara than multipara in the private health facilities. This study also did not show a significant relationship between HIV prevalence and age in both private and public health facilities. These findings may have been influenced by lack of uniformity in the variables collected for the study in both facilities in Ogun State, Nigeria.

CONCLUSION

Those with higher gravidity also had higher HIV prevalence than primigravida in both the private and public health facilities. There was a statistically significant relationship between HIV prevalence and gravidity both in the private and in the public health facilities and no significant relationship between HIV prevalence and age in both and parity in the private hospital.

RECOMMENDATIONS

The following recommendations were made based on the findings of the study

1. International organizations and nongovernmental organizations should begin to partner with private hospitals so as to increase the testing capacity in the sector.
2. In order to increase testing capacity for HIV, health care providers should be taught on how to perform the test using rapid diagnostic kits which can give same day result.
3. Rivers State government should revisit their local and state wide HIV epidemic and assess the situation of the epidemic with particular focus on HIV in pregnancy and make the necessary plans that will enhance assess to HIV care in the state especially for pregnant women.

Ethical Considerations

Approval for this research work was sought for and obtained from the ethical review committee of University of Port Harcourt, Port Harcourt. An introductory letter was obtained from African centre for excellence, center for public health and toxicological research (ACEPUTOR) and was given to the Medical Directors of the private hospitals. Informed consent was sought for and an authorization letter was also obtained from the Rivers State Primary Health Care Management Board. A written Informed consent was sought for and obtained from study participants and blood samples were collected in the phlebotomy room of the laboratory to ensure privacy.

REFERENCES

Adeyemo, B., Gayawan, E., Olusile, A., & Komolafe, I. (2014). Prevalence of HIV infection among pregnant women presenting to two hospitals in Ogun State. *HIV and AIDS Review*,Nigeria.http://dx.doi.org/10.016/j.hivar.2014.03.002.

Agboghoroma, C.,& Iliyasu, Z. (2015). HIV prevalence and trends among pregnant women in Abuja, Nigeria: A 5-year study. *Trop J Obstet Gynaecol, 32* (1), 82-89.

Agida, E. T., Abu, P., Echikwonye, M., Hwande, T. S., Ayeni, H. A. D., & Swende, T. Z. (2010). HIV Prevalence amongst Clients Attending Antenatal Clinic at the Federal Medical Centre, Makurdi.*Nigerian Journal of Medicine, 19*(3), 295-297.

Etukumana, E., Thacher, D., & Sagay, S. (2011). Obstetrics risk of HIV infection among antenatal women in a rural Nigerian hospital. *Niger Med J.*, 52 (1), 24-27.

Fouedijo, J., Fouelifack, F., Fouelifa, L., & Mbu, R. (2017). Prevalence and associated factors of HIV infection among pregnant women attending antenatal care at the Yaounde central hospital. *Int J Reprod Contracept Obstet Gynecol, 6*(7), 2698-2703.

Rijal, M., Neupane, B., Ahrestha, A., &Vaidhya, K. (2014).Distribution of HIV among pregnant women visiting a tertiary care hospital in Kathmandu, Nepal.*Asian Pacific Journal Of Tropical Disease, 4* (2), S602-S604.

Uchendu, J.O., (2020), Mortality Synopsis among women of Reproductive Age group in Nigeria: A Hospital-based study. West Afr. J med. Jan-Mar 2020, 37(1):74-78.

UNAIDS (2014). Children and Pregnant Women living with HIV. The Gap Report 2014, 1-20.

UNICEF (2018). Addressing the global HIV epidemic among pregnant women, mothers, children and adolescents. UNICEF's Global HIV Response. www.unicef.org 2018-2021, 1-17.