



# Knowledge of Prevention of Mother-to-Child Transmission of HIV and Its Uptake among Antenatal Care Attendees in a Tertiary Hospital in Abakaliki, Nigeria

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## Authors' contributions

This work was carried out in collaboration between both authors. Author NCE designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Both authors managed the analyses of the study. Author NCE managed the literature searches. Both authors read and approved the final manuscript.

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## ABSTRACT

**Background:** Human immunodeficiency virus (HIV) is one of the leading causes of significant mortality among children especially in Africa. Mother-to-child Transmission can occur during pregnancy, labor or delivery and breastfeeding. Prevention of mother-to-child transmission (PMTCT) programme aims at prevention of HIV transmission from infected pregnant woman to her unborn/newborn baby (vertical transmission).

**Objective:** To assess knowledge of PMTCT and its' uptake among antenatal care (ANC) attendees in Federal Teaching Hospital Abakaliki, Nigeria.

**Methods:** A descriptive cross-sectional study conducted among 400 women attending antenatal care clinic (ANC) in Abakaliki using a systematic sampling technique. The clients were interviewed using a pre tested semi-structured interviewer administered questionnaire. Knowledge of PMTCT was assessed by the proportion of respondents who answered correctly knowledge questions.

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Uptake of PMTCT services was assessed by the proportion of respondents who were counseled and tested for HIV in the index pregnancy and respondents' adoption of infant feeding options and use of ARV.

**Results:** The mean age of respondents was 28±9 years. The majority (97%) of the respondents were married and had formal education. All the respondents (100%) were aware of HIV/AIDS with 84% good knowledge of PMTCT. Uptake of PMTCT of HIV was significantly associated with respondent's educational status. Majority of respondents (96%) were willing to undergo HIV testing in the current pregnancy and 89.5% were unwilling to breastfeed if found HIV positive but chose exclusive replacement feeding. Uptake of breastfeeding option was significantly associated with respondent's educational level ( $p<0.01$ ). Ninety seven percent of respondents were willing to use ARV if found positive. Sero-prevalence rate among respondents was 1.8%.

**Conclusion:** Knowledge of PMTCT of HIV among respondents was high. Uptake of breastfeeding option was statistically significant with level of education.

**Recommendation:** There is need for sustained public awareness creation on PMTCT services available in our health institutions.

*Keywords: Knowledge; PMTCT; uptake; ANC attendees.*

## 1. INTRODUCTION

Following the discovery of a case of human immunodeficiency virus (HIV) in Los Angeles in 1981 [1,2] and in Nigeria in 1985 and official report at the International Conference on AIDS in 1986 [3], HIV/AIDS pandemic has become a major and serious health problem all over the world [4]. The HIV/AIDS epidemic predominantly affects female (57%) than males (43%) [1]. The epidemic in Nigeria has since extended beyond the high risk groups to the general population. The antenatal HIV rates are less variable by age group although young adults appear most affected.

Mother-to-child transmission of HIV (MTCT) is when an HIV positive woman passes the virus to her unborn or newborn baby. In infant and young children, over 90% HIV infection is acquired through the mother [5]. HIV may be transmitted to the infant during pregnancy, at the time of delivery, and through breastfeeding; most transmission is thought to take place during delivery. For a mother known to be HIV infected prenatally, the additional risk of transmission of HIV to her infant through breastfeeding has been estimated at 14% [5]. The risk is as high as 29% for mothers who acquire HIV postnatally. Many studies indicated that the risk of breast milk transmission is higher in the first few months of life with a subsequent tapering off of risk. The risk persists as long as the infant is breastfed. HIV transmission is also higher if the mother has mastitis [5]. Other factors known to increase the risk of transmission include high maternal viral load, recurrent sexually transmitted diseases (STDs), malaria, vitamin A deficiency, preterm

delivery, infected amniotic fluid (chorioamnionitis), vaginal delivery, duration of membrane rupture, placental disruption, invasive procedures during delivery, mechanical nasal suction after delivery, breastfeeding especially mixed feeding [5].

Some measures aim to reduce MTCT during pregnancy: provision of voluntary counseling and testing, diagnosis and provision of aggressive treatment of malaria and sexually transmitted infections (STIs), provision of basic antenatal care including iron supplementation, education on PMTCT and infant feeding options, anti-retroviral therapy (ART) for PMTCT, risk reduction/safer sex measures [5]. During labor and delivery: delayed rupture of membrane (ROM), minimal digital examination after rupture of membrane, cleanse vagina with hibitane or other viricides if available, reduced use of assisted delivery [5]. After delivery: clean newborn immediately of maternal secretion and blood, support safer infant feeding, if breast milk is chosen as an option encourage exclusive breastfeeding and advise early cessation if mother is not on highly active anti-retroviral therapy (HAART), advise milk substitute where conditions are suitable and no breastfeeding after six months especially when the mother is not on HAART [5].

Knowledge of PMTCT by pregnant mothers is very important in prevention of Mother-to-child transmission of HIV. The most effective intervention to reducing transmission from mother-to-child depends on a woman's knowledge of her HIV status. It has shown to increase the uptake of PMTCT services leading

to reduction in MTCT of HIV [6]. Uptake of PMTCT interventions is critical to the reduction in pediatric HIV infection.

Voluntary counseling and testing (VCT) which is the corner stone and entry point into the PMTCT programme [7] would enable mothers to establish their sero status before PMTCT interventions can be carried out. The risk of transmission of HIV from mother-to child is as high as 45% without PMTCT services [6]. It has been shown that adherence to PMTCT services reduces the risk of MTCT to as low as 5% [6]. The most important way to achieve PMTCT uptake is through ANC and HIV counseling and testing of all pregnant women in accordance with PMTCT programme. Other core PMTCT interventions include modification of obstetric practices, Use of anti-retroviral drugs (ARVs) and Infant feeding options. Availability of PMTCT services therefore is not the solution to uptake (utilization) of services. The availability of infant feeding counseling, pediatric ARVs as well as infant feeding options needs to be intensified. The Nigeria National goals for PMTCT as contained in the AIDS policy is to reduce the HIV transmission from Mother-To-Child by 50% as well as increase access to quality HIV preventable services such as counseling and testing by 50% by the year 2015 [8]. Achievement of this is through four (4) main strategies of HIV prevention. These include: primary prevention of HIV infection in women of reproductive age group and their partners, family planning for the prevention of unwanted pregnancies among HIV positive women.

## **2. MATERIALS AND METHODS**

### **2.1 Study Area**

This study was carried out at the ANC clinic of the Federal Teaching Hospital Abakaliki, Ebonyi State, Nigeria. The hospital is a tertiary health centre and research institution. Abakaliki is located in the administrative capital of Ebonyi State in the Southeast part of Nigeria. About three-quarters (of 4.3 million) of the population dwell in the rural area with farming as their major occupation [9]. The facility which serves as the teaching hospital for the College of Health Sciences of Ebonyi State University Abakaliki has a total of 604 beds. It offers specialist services in all specialties of Medicine and also serves as a center for the training of specialist Doctors. About 50 women attend antenatal care in the facility on each working day and

approximately 4000 women book annually with an average of 1,500 deliveries per annum [9].

### **2.2 Study Design**

This was a health facility based descriptive cross-sectional study carried out between January and April 2015.

### **2.3 Study Instrument**

A pretested semi structured questionnaire which was developed by the researcher was used for the study. This was administered to the women using the local language, Igbo by trained research assistants. Information was obtained on socio-demographic characteristics of the clients, their knowledge on HIV/AIDS transmission and uptake of PMTCT services.

### **2.4 Study Population/Selection Criteria**

The study population consisted of pregnant women attending antenatal care in Federal Teaching Hospital Abakaliki who consented to and had voluntary counseling and testing for HIV/AIDS during booking for antenatal care. The respondents were given health talk on health promotion campaign.

### **2.5 Sample Size Determination**

The minimum sample size for the study was determined by the formula used for single proportions [10]. A total of 400 respondents were recruited for the study based on a type 1 error ( $\alpha$ ) of 0.05, a tolerable margin of error of 0.05 and a prevalence of 0.5% representing the proportion of women attending antenatal care who had good knowledge of PMTCT from a study in Nigeria [10].

### **2.6 Sampling Technique**

A systematic sampling technique using facility register was used to select the clients as they present in the antenatal care clinic on each day of data collection. The last six months attendance to the antenatal clinic was used to determine the sampling frame. An average of 1014 clients present in the antenatal clinic on a monthly basis. The period of data collection for the study was one month, hence a sampling frame of 1014 was used. Sampling interval was determined by dividing the sampling frame of 1014 by the sample size of 400, hence a sampling interval of 3 was used. So every third client was recruited for the study, based on the

order of registration of clients on each day of the study. The index patient was selected by simple random sampling method through balloting and to ensure that a patient was not selected twice, there was a register for all clients that had been included in the study and this was cross checked by the research assistants before a new client was included.

## 2.7 Data Analysis

Data analysis was done using Statistical Package for Social Sciences (SPSS) statistical software version 20. Frequencies and cross tabulation were generated. Chi square test of statistical significance was used in the analyses and level of significance was determined by a p-value of less than 0.05. Clients' knowledge of PMTCT was assessed by the proportion of respondents who answered correctly knowledge questions. Uptake of PMTCT was assessed by the proportion of respondents who were counseled and tested for HIV in the index pregnancy and respondents' adoption of various infant feeding options.

## 2.8 Ethical Consideration

Ethical approval was obtained from the Research and Ethics Committee of the Federal Teaching Hospital Abakaliki with approval number FETHA/REC/Vol.1/2015/047 and written informed consent was obtained from the study participants with explanations on the confidentiality of the information collected.

## 3. RESULTS

Table 1 shows the socio-demographic characteristics of the respondents. The mean age of respondents was 28±9.0 years.

Table 2 shows respondents' knowledge of ways of PMTCT. Most respondents (97.8%) identified correctly that limiting spread of HIV in the population will reduce mother-to-child transmission. A good proportion of respondents had good knowledge of ways of preventing mother-to-child transmission of HIV as shown Table 2.

### 3.1 Uptake of PMTCT Services by ANC Attendees

From Table 1, most respondents (64.3%) booked in their second trimester while 27.7% booked in

third trimester and only 8% booked in their first trimester.

Eight percent of respondents in first trimester had average of five visits, 64.3% in second trimester made four visits while 27.7% in third trimester made three visits.

**Table 1. Socio-demographic characteristics of respondents**

Variable	Frequency (n =400)	Percent (%)
<b>Age years</b>		
Mean (±SD)	28±9.0	
<b>Age group (years)</b>		
≤24years	75	18.7
25 – 29 years	204	51.0
30 – 34 years	85	21.3
≥35 years	36	9.0
<b>Ethnicity</b>		
Igbo	387	96.7
Others*	13	3.3
<b>Religion</b>		
Christianity	391	97.7
Others**	9	2.3
<b>Marital status</b>		
Married	388	97.0
Never married	8	2.0
Separated	4	1.0
<b>Educational attainment</b>		
No formal education	10	2.5
Primary education	36	9.0
Secondary education	219	54.8
Tertiary education	135	33.7
<b>Employment status</b>		
Housewife/unemployed	67	16.8
Salaried employment	100	25.0
Self employment	233	58.2
<b>Booking gestational age (weeks)</b>		
≤ 13	32	8.0
14 – 27	257	64.3
28 – 40	111	27.7

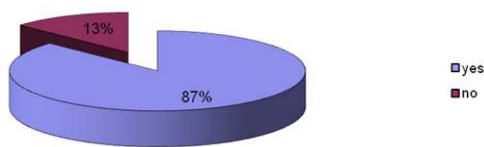
\*Hausa, Yoruba; \*\* Islam, Traditional religion

Eighty seven percent of respondents were counseled and tested for HIV in their last pregnancy. Knowing ones HIV status was the major reason for accepting HIV test by 46.7% respondents while to protect my child and reduce fear and anxiety accounted for 34.8% and 17.2% respectively. Only 7 respondents were sero-positive for HIV antibodies. Sero-prevalence rate among ANC attendees was 1.8%.

All the respondents were aware of exclusive breastfeeding and exclusive replacement feeding while 61.8% were aware of foster feeding. Majority (89.5%) of the respondents chose exclusive replacement feeding as option if tested HIV positive.

**Table 2. Respondents’ knowledge of ways of prevention of mother-to-child transmission**

Knowledge of ways of PMTCT of HIV	Frequency	Percent (%)
Limiting the spread of HIV in the population	391	97.8
Use of family planning to prevent unwanted pregnancy	389	97.3
Taking antiretroviral (ARV) by infected mothers	380	95.0
Giving ARV to newborn within few hours of delivery	374	93.5
Use of Caesarean section for delivery	368	92.0
Avoidance of instrumental delivery	321	88.3
Avoidance of episiotomy	309	77.3
Avoidance of mixed feeding	307	76.8
Use of infant formulae for newborn	282	70.5
Practicing exclusive breastfeeding for a short time	271	67.8
Avoidance of early rupture of membrane	254	63.5



**Fig. 1. Distribution of respondents who were counseled and tested in their last pregnancies**

Eighty seven percent of respondents were counseled and tested in their last pregnancies, 13% were not counseled and tested.

Knowing ones HIV status was the major reason for accepting HIV test by 46.7% out of 384 ANC attendees while to protect my child and reduce fear and anxiety accounted for 34.8% and 17.2% respectively. About 1.3% had the test simply because their husband approved it.

Majority (85.7%) of the respondents chose exclusive replacement feeding as option while 14.3% chose exclusive breastfeeding even when tested HIV positive .

Table 5 shows factors associated with uptake of breastfeeding option. Uptake of breastfeeding option was significantly associated with respondent’s level of education. Not a significantly higher proportion of respondents who were <30 years showed willingness to breast feed their new born when compared to those > 30 years, ( $p>0.05$ ). A higher proportion of the respondents who had secondary education and above showed willingness to breast feed their new born when compared with those who had primary education and less and the difference in proportions was found to be statistically significant ( $p<0.01$ ).

The majority of respondents (89.5%) were unwilling to breastfeed their new born baby if tested HIV positive. Respondent’s reason for

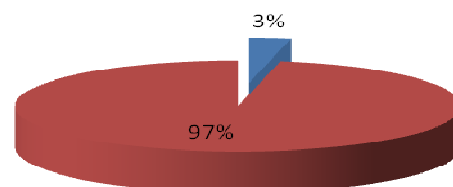
choosing to breastfeed were cultural acceptability (54.3%), cheap (29.9%) and to avoid domestic violence (15.8%). About 10.5% chose infant formulae in order to protect their children. Only 11% of respondents were willing to have Caesarean section if tested HIV positive while majority (89%) opted for vaginal delivery. Out of seven (7) sero-positive respondents, 28.6% were willing to breastfeed their newborn.

**Table 3. Reasons for respondents accepting to do HIV test**

Reasons for accepting to do HIV test	Frequency	Percent (%)
Want to know my HIV status	197	46.7
To protect my child	134	34.8
To reduce fear and anxiety	66	17.2
Husband approves of it	5	1.3

**Table 4. Infant feeding options by respondents if tested HIV positive (n=400)**

Options	Frequency	Percent (%)
Exclusive breastfeeding	57	14.3
Exclusive replacement feeding	343	85.7



**Fig. 2. Respondents’ willingness to use ARV if tested positive (n=400)**

Ninety seven percent (97%) of respondents were willing to use ARV.

**Table 5. Factors associated with uptake of breastfeeding option (n=400)**

Variables	Will breastfeed if HIV positive		Percent (%)	X <sup>2</sup> (P-value)
	Yes	No		
<b>Age</b>				
<30	27	252	9.7	0.63 (0.10)
≥30	15	106	12.3	
<b>Level of education</b>				
Primary education and less	19	27	41.3	52 (0.01)
Secondary education and above	23	331	6.5	
<b>Employment status</b>				
Housewife/unemployed	12	55	17.9	4.71 (0.10)
Salaried employment	10	90	10.0	
Self employment	20	213	8.5	

#### 4. DISCUSSION

All the respondents were aware of HIV/AIDS and 51% of ANC attendees were in the age range 25-29 years. They had good knowledge of PMTCT compared to 21% of those in age range of 30-34 years. This is comparable to a study in Nnewi where awareness of HIV/AIDS was 99% [11] and in Lagos where knowledge of HIV/AIDS and PMTCT among respondents was 100% [12]. This high level of knowledge may be as a result of the high level of HIV/AIDS awareness campaign carried out by the government in collaboration with various non-governmental organizations in Ebonyi State. There is need to sustain this high level of knowledge for individuals and communities to be armed with the necessary information that will enable them protect themselves against HIV/AIDS and MTCT of HIV.

Knowledge of PMTCT of HIV by pregnant mothers is very important in the prevention of mother-to-child transmission. This will enable the individuals, families and communities take decisions that affect their lives.

A National HIV/Syphilis sentinel survey in Nigeria showed that 89.9% of respondents had good PMTCT [13], while in Lagos and Zaria 100% [12] and 94.6% [14] of the respondents aware of HIV/AIDS respectively. In Nnewi, awareness of HIV/AIDS was 99% [11].

This study found level of education of the ANC attendees to be significantly associated with uptake of breast feeding options ( $p= 0.01$ ). This is comparable with another study in Lagos where the respondents' educational level was significantly associated with knowledge of HIV transmission and PMTCT [12]. It is obvious that the better educated the respondent, the more access she would have to information on HIV. Most of the respondents were in the self and paid employment status with good access to mass media. This may have led to the high level of

knowledge of HIV/AIDS transmission and PMTCT among them.

The utilisation of PMTCT services in relation to the booking gestational age showed that 64.3% of respondents booked in their second trimester while 27.7% and 8% booked in third and first trimesters respectively. This finding is similar to a study by Aliyu AA et al in Abuja, Nigeria where 54% presented in their second trimester [15] and differs from that of Afolabi in Ilesa, Nigeria where the respondents presented mostly during third trimester [16]. All the respondents were aware of HIV/AIDS and majority (90.6%) of ANC attendees were in the age range 25-29 years. They had good knowledge of PMTCT compared to 19% of those in age range of 30-34 years. This is comparable to a study in Nnewi where awareness of HIV/AIDS and PMTCT was 99% [11] and Lagos with 100% awareness [12]. This high level of knowledge may be as a result of the high level of HIV/AIDS awareness campaign carried out by the government in collaboration with various non-governmental organizations in Ebonyi State. There is need to sustain this high level of knowledge for individuals and communities to be armed with the necessary information that will enable them protect themselves against HIV/AIDS and MTCT of HIV.

This study also found that almost all the respondents knew correctly various factors that increase MTCT of HIV/AIDS: advanced stage of HIV/AIDS (98.5%), infection acquired during pregnancy (96.3%) and vaginal delivery (94.3%), mixed feeding (87.3%) and breastfeeding (81.7%). It also showed that majority had good knowledge of ways of prevention of Mother-to-child transmission of HIV: limiting spread of HIV in the population (97.8%), use of family planning to prevent unwanted pregnancy (97.3%), use of ARV by infected mothers (95%), giving ARV prophylaxis to newborn within few hours of delivery (93.5%), use of Caesarean section for delivery (92%), avoidance of mixed feeding

(76.8%), use of exclusive replacement feeding for newborn (70.5%) and practice of exclusive breastfeeding for few months (67.8%). This is similar to a finding that prevention of HIV infection in women and unintended pregnancy among HIV-positive women were the most cost effective ways to prevent HIV infection in infants [17].

The study found significant association between knowledge of PMTCT with respondents' marital status, level of education and occupation ( $p=0.001$ ). This is in conformity with of Lagos where the respondents' educational level was significantly associated with the level of knowledge [18]. It is obvious that the better educated the respondent, the more access she would have to information on HIV. The ANC attendees were mostly civil servants with good access to mass media. In all 84% good knowledge of PMTCT was found among ANC attendees.

Uptake of PMTCT services was determined by acceptability of VCT and infant feeding options. This study found that 87% of the respondents were counseled and tested in their last pregnancy with 96.6% pretest and 88.1% posttest counseling rate in their current pregnancy.

The study revealed that 96% of the respondents' were willing to do HIV test. This is comparable to a study in Lagos where the willingness to do HIV testing among pregnant women was 96.1% [18] and in contrast with the study in Zaria where only 14.5% were tested [14]. Some factors that influenced respondents to accept HIV test were desire to know their HIV status (46.7%) and to protect their Children from contracting the disease (34.8%), reduce fear and anxiety (17.2%), husband approval (1.3%). Similar findings were reported in Kagara village Tanzania [19].

Respondents' willingness to use ARV if tested HIV positive was high (97%). This is higher than the study in South Africa where 86% showed willingness to take AZT if found positive [20] and in contrast with the study in Zimbabwe where 50% opted for Zidovudine prophylaxis to prevent MTCT [21]. Improved awareness, good counseling and the study being carried out in a PMTCT centre have all contributed to increased uptake of PMTCT services among the respondents. Sero-positive respondents' unwillingness to use ARV was fear of side effect and inability to reduce transmission of the virus.

Majority of respondents (83%) showed unwillingness to breastfeed if found HIV positive but rather opted for infant formulae and only few (11%) were willing to do Caesarean section if tested HIV positive. About two-third of sero positive respondents (71.4%) opted for infant formulae while 28.6% were willing to breastfeed their new born ( $n=7$ ).

Only 42.9% of sero positive respondents agreed to have Caesarean section in their current pregnancy. This is similar to a study in South Africa where two-third of HIV positive mothers accepted infant formulae [22] and contradicted Abuja study where uptake of replacement feeding is low ranging from 18% to 50% at separate sites even when the formula was given free [15] and a report in Lagos where many women preferred breastfeeding even if they were found HIV positive. This was because about half of the respondents were ignorant of the association between breast milk and HIV transmission [18]. It was observed that cultural acceptability and avoidance of domestic violence were reasons for accepting breast feeding while protection of their Children, better future and better infant feeding option were reasons for choosing infant formulae. Rejection of infant formulae was due to fear of stigma and domestic violence. Respondents' uptake of Caesarean was low and related to fear of trauma/death, cost and cultural unacceptability. Sero -prevalence of HIV among ANC attendees was found to be 1.8%. This is about half the HIV prevalence rate in Ebonyi State (3.3%) [3].

## 5. CONCLUSION

Knowledge of PMTCT among attendees was high. Integration of PMTCT services into all the routine reproductive health services (Maternal and Child health services clinic) will increase access to HIV counseling and testing in Federal Teaching Hospital Abakaliki.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

## REFERENCES

1. Federal Ministry of Health: Introduction to magnitude of the problem of HIV/AIDS and MTCT; Prevention of Mother-To- Child Transmission of HIV (PMTCT). Nigeria Curriculum; National Guideline Abuja. 2007;1-8.

2. Gottlieb MS. Pneumocystic pneumonia Los Angeles 1981. AMJ Public Health. 2006;96(6):980-1.
3. Kanki PJ, Adeyi O, Idoko JA. AIDS in Nigeria: A nation on the thresholds Chapter 2. The Epidemiology of HIV/AIDS in Nigeria Harvard Centre for Population and Development Studies. 2006;5-7.
4. Killings LO. The first postmodern pandemic 25 years of HIV. J. Intern Med. 2008; 263(3):218-48.
5. Family Health International. The new guidelines for prevention of Mother-To-Child Transmission (PMTCT) and infant feeding in the context of HIV. 2010;7-10.
6. Federal Ministry of Health. HIV/AIDS situation in Nigeria; introduction. National HIV/AIDS and Reproductive Health Survey (NARHS) Abuja. 2007;3-5.
7. Tindyebwa D. Handbook of pediatric HIV/AIDS in Africa; By the African Network for the care of the Children affected by AIDS. 2004;91-4.
8. Federal Ministry of Health. HIV/AIDS situation in Nigeria; introduction. National HIV/AIDS and Reproductive Health Survey (NARHS) Abuja. 2007;1-3.
9. Onoh RC, Umeora OJ, Agwu UM, Ezegwui HU, Ezeonu PO, Onyebuchi AK. Pattern and determinants of antenatal booking at Abakaliki. South East Nigeria. Ann Med Health Science Res. 2012;2:169-75.
10. Araoye MO. Subjects selection. Research Methodology with Statistics for Health and Social Sciences. 2<sup>nd</sup> Edition. Ilorin: Nathadex Publishers. 2004;115-129.
11. Igwegbe AO, Ilika AL. Knowledge and perception of HIV/AIDS and Mother-To-Child transmission among antenatal mothers at Nnamdi Azikiwe University Hospital Nnewi. J. Chin Pract. 2005;8(2): 97-101.
12. Agbogbovbvia T. An assessment of the awareness, attitude and anticipated practice regarding HIV/AIDS in women attending ANC in Lagos. Medline. 2002;11:9-11.
13. Federal Ministry of Health. Technical Report on 2007 National HIV/Syphilis Sentinel survey among pregnant women attending ANC in Nigeria. FMOH/NASCAP: Abuja; 2008.
14. Adelaiye RS. Factors influencing the uptake of voluntary counseling and testing of HIV in antenatal clinic in Ahmadu Bello University Teaching Hospital Zaria. A Master in Public Health Thesis. 2005;36-38.
15. Mohammed A, Shehu AU, Aliyu AA, Zoaka AI. Infant feeding options, practices and determinants of feeding practices among HIV sero-positive mothers in Abuja, Nigeria. Nigerian Medical Journal. 2010;51(1):14-17.
16. Tilahun W. Utilization of PMTCT services among pregnant women in Western Amhara region Addis Ababa, Ethiopia. 2008;35-41.
17. Afolabi MO. HIV voluntary counseling and testing of pregnant women in PHC centre in Ilesa Nigeria. The Internet Journal of Third World Medicine ISSN 1539-4646.
18. Ekanem EE, Gbadegesin A. Voluntary counseling and testing (VCT) for human immunodeficiency virus: A study on acceptability by Nigeria women attending antenatal clinic. Afr J Reprod Health. 2004;8(2):91-100.
19. Killewo JZ. Acceptability of voluntary HIV testing with counseling in a rural village in Kagara, Tanzania. AIDS Care. 1998;10(4): 431-9.
20. Etiebet MA, Fansma D, Forsyth B, Coetzee N, Hussey G. Integrating prevention of Mother-To-Child transmission of HIV into antenatal care: Learning from experience of women in South Africa. AIDS Care. 2004;1691:37-46.
21. Shetty AK. The feasibility of voluntary counseling and HIV testing in pregnant women using community volunteers in Zimbabwe. Int. J. STD/AIDS. 2005;16(11): 755-9.
22. Peltzer. Factors influencing the utilization of PMTCT services by pregnant women in the Eastern Cape, South Africa. High Beam Research. 2009;17-19.

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