



Prevention of Mother to Child Transmission of HIV; Knowledge, Attitude, Practice and Determinants among Pregnant Women in Abia State, Nigeria

Angela Uche Eze¹ and Elias Chikee Aniwada^{2*}

¹National Agency for Control of AIDS (NACA/SURE-P HIV Programme), PMTCT/HCT, Umuahia, Nigeria.

²Department of Community Medicine, College of Medicine, University of Nigeria, Enugu Campus, Nigeria.

Authors' contributions

This work was carried out in collaboration between both authors. Authors AUE and ECA designed the study, wrote the protocol and wrote the first draft of the manuscript. Author AUE managed the literature searches. Author ECA did data analysis. Both authors read and approved the final manuscript.

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ABSTRACT

Aim: This was to ascertain the knowledge, attitude, practice and determinants of Prevention of Mother-to-child-transmission (PMTCT) of HIV among pregnant women in Abia State, Nigeria.

Study Design: Comparative cross sectional study was used.

Place and Duration of Study: Selected Primary Health Centres (PHCs) in the state between January and June 2015.

Methodology: Pregnant women attending antenatal care clinic eligible for voluntary participation were selected and studied using pre-tested, semi-structured, interviewer administered questionnaire. Multistage sampling technique was used.

Results: It was based on 350 pregnant women (175 each for urban and rural). Their mean ages were 32.46±10.12 for urban and 33.24±9.31 for rural. Majority had at least secondary education,

*Corresponding author: Email: eaniwada@gmail.com;

95.5% for urban and 96.4% for rural. There were good knowledge, positive attitude and good practice of HIV and PMTCT services in both groups though higher in urban areas. Mean knowledge and attitude showed significant difference between the groups $p < 0.001$ but not significant for practice $p=0.45$. For knowledge; occupation ($\chi^2=8.044$, $p=0.045$) and monthly income ($\chi^2=7.126$, $p=0.008$) were significant for urban, monthly income ($\chi^2=4.996$, $p=0.025$) was for rural. Occupation was significantly associated with practice for rural ($\chi^2=8.717$, $p=0.03$). Civil/public servants (OR =9.6, 95% CI: 1.13-80.82) in urban (OR =1.1, 95% CI: 0.46-2.77) in rural group. Those earning >15000 (OR = 4.5, 95% CI: 1.75-13.71) in urban (OR =5.4 95% CI: 1.28-22.63) in rural for knowledge. Equally Civil/public servants 2.1 times (OR = 2.1, 95% CI: 0.99-4.59) in urban, (OR =2.1, 95% CI: 1.01-4.19) in rural group for practice.

Conclusion: Knowledge attitude and practice on PMTCT were good among pregnant women. Occupation and monthly income influences knowledge and practice of PMTCT and as well were predictors of good knowledge and practice of PMTCT. This needs to be improved on and sustained to curb the scourging menace of HIV.

Keywords: Prevention of mother-to-child-transmission; knowledge; attitude; practice; pregnant women.

1. INTRODUCTION

Motherhood is often a positive and fulfilling experience for too many women though it is associated with ill-health and even death especially in developing countries [1]. Mothers and children are among the vulnerable group and at highest risk for disease and death. The death of a woman during pregnancy, labour or puerperium is a tragedy that carries a huge burden of grief and pain, and has been described as a major public health problem in developing countries [1].

Mother-to-child-transmission (MTCT) is the second commonest mode of Human-immunodeficiency Virus (HIV) infection in most African countries [2]. It is equally the largest source of HIV infection in children below the age of 15 years [2] and globally affects approximately 390,000 infants yearly, mainly in developing countries [3]. The risk of HIV transmission from mother to child was estimated at 5-10% during pregnancy; 10-20% during labour and delivery, and 10-20% in the post-partum period [2]. The high burden of MTCT in sub-Saharan Africa is due to higher rates of heterosexual transmission, higher prevalence of HIV in women of reproductive age, high total fertility rate, characteristically prolonged breastfeeding culture, as well as poor access to PMTCT interventions [4]. Apart from posing the burden of HIV positive children on the society, MTCT is causing great social problems by producing orphans after the death of one or both parents due to HIV/AIDS [1]. Transmission of HIV in children has become a critical health problem

that threatens to undermine the positive impact of child survival strategies in the African continent [4].

Globally, HIV is the leading cause of death in women of reproductive age [2]. Since nearly all HIV infections in children are acquired from their mothers, the global epidemiology of HIV in children reflects that of HIV in women [2]. It has been estimated that, in 2009, there were 370,000 new paediatric infections with sub-Saharan Africa accounting for about 90% of this [4]. Sub-Saharan Africa has continued to bear the greatest burden of the HIV and AIDS epidemic, with approximately 67.6% of the total number of people living with HIV, 69.2% of the 2.6 million of total new infections and 72.2% of the 1.8 million deaths in 2009 [4]. Over the decades, the epidemic, once dominated by infected males has become progressively feminized and in sub-Saharan Africa, approximately 60% of adults living with HIV are women [4]. Nigeria has the second largest HIV burden in the world. While HIV prevalence is on the decline, with 4.1% of the adult population infected, there are more than three million people living with HIV and AIDS in Nigeria [2].

Without treatment, one third of children living with HIV die before they reach one year of age and over 50% die by the second year of life [2]. In 2008, an estimated 1.4 million pregnant women living with HIV in low- and middle-income countries gave birth, 91% of whom reside in sub-Saharan Africa [2]. Without intervention, 25-40% of infants born to HIV-positive mothers will become infected but with current interventions, this risk can be reduced to less than 5% [2,6].

Therefore, transmission of HIV from a pregnant woman to her infant is preventable by PMTCT programmes through provision of highly effective Antiretroviral Therapy (ART) and ARV prophylaxis interventions [2,6]. Effective provision of Prevention of Mother-to-Child Transmission of HIV (PMTCT) interventions improves maternal health and infant HIV-free survival [6]. PMTCT is a key component of overall HIV prevention efforts and represents a critical opportunity for stemming the tide of the HIV epidemic [2,6].

To successfully reduce mother-to-child transmission of HIV, population-level efforts to prevent HIV infection among women of childbearing age must be realized. For the individual woman, a comprehensive, coordinated continuum of services must be provided beginning with increased access to counseling, testing, and primary prevention services, as well as reproductive health choices enabling either the prevention of unintended pregnancies or appropriate planning for intended future pregnancies for women living with HIV. For HIV-positive women who become pregnant, access to and follow through on effective interventions to prevent transmission to the infant and to provide treatment for the woman herself and her child if infected must be provided [6].

The Government of Nigeria has been committed to HIV prevention, which is guided by the National HIV/AIDS Strategic Plan 2010-2015 that emphasizes on behaviour change and prevention of new infections while sustaining advances in HIV and AIDS treatment, care, and support. Despite these efforts, deficiencies in the response to HIV still remain [2].

While HIV prevalence is on the decline, with 4.1% of the adult population infected, there are more than three million people living with HIV and AIDS in Nigeria [3]. Furthermore, HIV prevalence in Nigeria is highly variable geographically [5]. Antenatal data by state shows a range in HIV prevalence from a high of 12.7% in Benue to a low of 1% in Kebbi [5]. Urban areas have higher prevalence than rural areas [2]. On average, about 4.1% of women attending Antenatal Care (ANC) are infected with HIV, resulting in mother-to-child transmission accounting for 10% of all HIV infections in the country [2]. This translates to about 57,000 HIV-infected infants born each year [2]. Nigeria contributes up to 30% of the global PMTCT gap and coverage of PMTCT services has however

remained low at less than 19% - falling short of both the universal access and National Strategic Plan targets [2]. Abia State in Nigeria's South Eastern geopolitical zone is an important state to target for eliminating mother-to-child transmission of HIV in Nigeria. The HIV prevalence in the state has shown an upward trend from surveillance reports and now stands at 7.3% which is higher than the regional and national average [2,6]. It is one of the "12 + 1" states accounting for 70% of the national burden of mother to child transmission of HIV (MTCT) ranking the 8th in the country and 2nd in the South-East zone of the country [2,6].

Some of the targets of the PMTCT programme in Nigeria were to provide access to at least 90% of all pregnant women to quality HIV counselling and testing as well as more efficacious ARV prophylaxis by 2015 [2,4]. The overall goal was to contribute to improved maternal health and child survival through accelerated provision of comprehensive PMTCT services [2,4]. To achieve this, it is critical to identify factors that influence a woman's choice to accept PMTCT activities since low uptake of PMTCT and knowledge on how to reduce the risk of MTCT were observed in Abia state where HIV prevalence rate is about 7.3% [2,4]. The current study intends to identify socio-economic factors influencing knowledge, attitude and practice of Prevention of Mother-to-child-transmission (PMTCT) of HIV among pregnant women in Abia State, Nigeria. The ultimate goal is to generate results that will inform the decision making process in designing interventions.

2. MATERIALS AND METHODS

2.1 Setting

The study was conducted in ten out of seventy four Primary Healthcare Centres [PHCs] that offered antenatal as well as routine HIV Counselling and Testing services in the selected Local Government Areas (LGAs) of Abia state (five out of thirty PHCs in Aba south LGA serving as urban and five out of forty four PHCs in Obingwa LGA serving as rural). Abia state is located in the southeast geopolitical zone of Nigeria. Politically, the state is divided into seventeen Local Government Areas (LGAs). The state has a total population of about 2,845,380 as reported in 2006 census figures [7]. Aba South LGA has many commercial centres such as Cemetery market, Ahia Ohuru market, School road market, Tenant road market, shopping

centre, Ala Ojii spare parts market, St. Michael's electronics market. Mgboko is the head-quarter of Obingwa Local Government of Nigeria. The inhabitants of the state are predominantly of Igbo ethnicity and Christians. The major occupation includes; trading, tailoring, shoe making, civil/public servants and farming. There are presently thirty eight Health institutions providing comprehensive HIV care and treatment in Abia State and 430 PMTCT stand-alone health facilities (including private owned, faith-based and public) providing PMTCT services [8].

2.2 Study Design

This was a comparative cross-sectional study using interviewer administered questionnaire to ascertain the socio-economic factors influencing knowledge, attitude and practice of Prevention of Mother-to-child-transmission (PMTCT) of HIV among pregnant women in Abia State, Nigeria.

2.3 Study Participants

All pregnant women attending antenatal care clinic at the study sites who were willing to participate in the study and able to understand Igbo or English were studied. Women coming for booking (first visit) were excluded.

2.4 Sample Size Determination

This was determined using minimum sample size formula for comparative cross-sectional study in population < 10,000 [9].

$$n = \frac{(u + v)^2 (P_1(100 - P_1) + P_2(100 - P_2))}{(P_2 - P_1)^2}$$

Where P_1 and P_2 were proportions of patients with adequate knowledge of PMTCT services in urban (58.3%) [10] and rural (68%) [11] areas. u is the power of the study taken as 0.84 and v is the two sided significance level taken as 1.96. A total of 350 were studied in both urban and rural population.

Using correction formula of $n_f = n / (1 + n/N)$

Urban settings has a average of 10 new ANC attendees in all 5 selected facilities in a week (520 annually) while rural setting has 4 weekly (208 annually) giving an average of 364. Substituting in the formula n is 350 and N is 356, the final n_f of 175 was arrived at.

2.5 Sampling Technique

A multistage sampling technique was used. *Stage 1*; from a list of urban LGAs and a list of rural LGAs, Aba south LGA and Obingwa LGA were selected respectively by balloting. *Stage 2*; From a list of 30 health facilities in the selected urban LGA and a list of 44 health facilities in the selected rural LGA, 5 health facilities were selected each by balloting *Stage 3*; All pregnant mothers assessing Antenatal Care (ANC) services that met the inclusion and eligibility criteria were recruited consecutively until the required sample size was attained.

2.6 Study Instruments

Questionnaires: Pre-tested, semi-structured, interviewer administered questionnaire. This was used to obtain data on socio-economic variables, knowledge, attitude and practice on PMTCT. The questionnaire was validated by pretesting it in another LGA not selected for study.

2.7 Data Analysis

Data was analyzed using Statistical Packages for Social Sciences (SPSS) version 20. Chi square test was used for associations between socio-economic variables and means of knowledge, attitude and practice of PMTCT among pregnant women attending antenatal care. logistic regression was used to identify predictors of good knowledge, attitude and practice of PMTCT. Significance level was at $p \leq 0.05$. Grading used for knowledge, attitude and practice was; <50 poor and ≥ 50 good. There were 22 knowledge questions, 5 attitude questions and 5 practice questions with correct answers coded as 1 and wrong answers coded as 0. The total scores of 1 for knowledge, attitude and practice were then added up respectively. The mean was then calculated based on number of questions from questionnaires to know if good or poor These scores were recoded into 2 categories of < ½ as poor; ½ and above as good.

2.8 Ethical Considerations

Approval for this study was given by the Health Research and Ethical Clearance Committee of University of Nigeria Enugu Campus. Authorization was obtained from the Abia State Ministry of Health and each of the LGA's Health Office. Written informed consent was obtained from each participant. Confidentiality was assured and maintained throughout the study.

3. RESULTS

Table 1 shows socio-economic characteristics of respondents. About 70% of respondents were aged <35 years in both urban (68.6%) and rural (71.4%) groups. Their mean ages were 32.46±10.12 for urban and 33.24±9.31 for rural. Over 90% of respondents were currently married. Majority of them had at least secondary education, 95.5% for urban and 96.4% for rural. The respondents were predominantly traders 46.9% for urban and 44.4% for rural. There was a similar distribution of religious denomination among respondents. Higher proportion of respondents in both urban and rural area earned ≤15000 (urban 62.9% and rural 55.4%). There were statistically significant differences in socio-demographic characteristics between the groups for marital status ($\chi^2=8.428$, $p<0.05$), educational level ($\chi^2=11.506$, $p<0.05$), and employment status ($\chi^2=35.935$, $p<0.05$).

Table 2 shows knowledge on HIV/PMTCT by groups. Over 90% in both groups had a good knowledge on ways HIV can be transmitted. However there were no significant difference between urban and rural for this ($\chi^2=3.030$, $p=0.082$). High proportion >90% in urban knew

that it can be transmitted during pregnancy, labour & delivery and breastfeeding however, about 57-86% knew of it in rural ($p < 0.05$ for all). About 92% urban and 65% rural knew that MTCT can be prevented by using ARV during pregnancy while about 80% urban and 57% rural knew that MTCT can be prevented by giving ARV to new born ($p < 0.001$ for both). Respondents that wanted to exclusively breastfeed were about 90% urban settings and 62% rural settings ($p<0.001$) while exclusive breast milk substitute was similar 39% urban settings and 33% rural settings ($p=0.265$). For conditions of positive mothers that promote MTCT and conditions in infant that promote acquiring HIV ($p<0.05$).

Table 3 shows attitude of respondents to HIV/PMTCT by groups. Over 95% in both urban and rural said that it is important to test for HIV when pregnant. The difference was significant ($p<0.05$). While 92% urban and 73% rural said that HIV positive mothers should breast their babies, their major reason was; for adequate nourishment for baby (41.6%) urban and (28.3%) rural. Of those that accepted that there is need to support the positive mothers even if she decides not to breast were: husband, (50.3%) urban and

Table 1. Socio-economic characteristics of respondents

Socio-demographic variable	Urban n=175	Rural n =175	Test statistics χ^2	p value
	Freq (%)	Freq (%)		
Age(years)				
<35	120(68.6)	125(71.4)	0.339	0.560
≥35	55(31.4)	50(28.6)		
Mean±SD	32.46±10.12	33.24±9.31		
Marital status				
Currently married	162(92.6)	173(98.9)	8.428	0.004
Others*	13(7.4)	2(1.1)		
Educational level				
Primary and below	8(4.6)	6(3.4)	11.506	0.003
Secondary	89(50.9)	120(68.6)		
Higher	78(44.6)	49(28.0)		
Employment status				
Housewife/unemployed	40(22.9)	35(20.0)		
Farming	3(1.7)	36(20.6)		
Trading	82(46.9)	78(44.6)	35.935	0.000
Civil/public servant	50(28.6)	26(14.9)		
Religion				
Roman catholic	69(39.4)	50(28.6)		
Protestant	46(26.3)	55(31.4)	4.605	0.100
Others	60(34.3)	70(40.0)		
Monthly income				
≤15000	110(62.9)	97(55.4)	1.998	0.157
>15000	65(37.1)	78(44.6)		

Others* - single, widow, divorced, separated

Table 2. Knowledge on HIV/PMTCT

	Urban n=175	Rural n=175	Test statistics χ^2	p value
	Yes	Yes		
	Freq (%)	Freq (%)		
Knowledge on ways HIV can be transmitted				
Unsafe blood transfusion	174(99.4)	164(93.7)	8.629	0.003
Sharing sharps with infected person	174(99.4)	168(96.0)	4.605	0.032
Infected mother to child	174(99.4)	159(90.9)	13.911	0.000
Unprotected sexual intercourse	175(100.0)	168(96.0)	7.143	0.008
Ever heard of PMTCT	163(93.1)	127(72.6)	26.069	0.000
Infected mother can transmit HIV to child	167(95.4)	149(85.1)	10.555	0.001
If Yes, it can be during	n = 174	n = 159		
Pregnancy	151(90.4)	86(57.7)	44.909	0.000
Labour and delivery	159(94.6)	128(86.5)	6.280	0.012
Breast feeding	156(92.9)	111(75.0)	19.150	0.000
MTCT can be prevented by				
Using ARV during pregnancy	162(92.6)	113(64.6)	40.744	0.000
Delivery by caesarean section	142(81.1)	99(56.6)	24.636	0.000
Giving ARV to new-born	141(80.6)	99(56.6)	23.386	0.000
Awareness of any drug given during pregnancy to reduce MTCT	163(93.1)	144(82.3)	9.571	0.002
HIV mothers feeding options in first 6 months				
Exclusive breast feeding(EBF)	157(89.7)	109(62.3)	36.090	0.000
Exclusive breast milk substitute(BMS)	68(38.9)	58(33.1)	1.240	0.265
Mixed(EBF+BMS)	61(34.9)	34(19.4)	10.533	0.001
Conditions of positive mothers that promote MTCT				
Low CD4 cell count	117(66.9)	67(38.3)	28.647	0.000
Cracked nipples	140(80.0)	94(53.7)	27.284	0.000
Mastitis	72(41.1)	50(28.6)	6.090	0.014
Conditions in infant that promote acquiring HIV				
Oral Ulcers	131(74.9)	75(42.9)	37.001	0.000
Mixed feeding	106(60.6)	58(33.1)	26.436	0.000

(45.1%) rural; family, (53.7%) urban and (40.0%) rural; community, (40.6%) urban and (36.6%) rural. The differences were significant for family ($p < 0.05$) but not significant for husband ($p = 0.489$) and community ($p = 0.603$). About 99% urban and 77% rural said that use of condom during pregnancy and breast feeding reduces MTCT, 99% urban and 86% rural accepted that they support strategies for PMTCT. Both were statistically significant $p < 0.001$ each.

Table 4 shows practice of respondents to HIV/PMTCT by groups. Over 92% in both groups have discussed HIV with their partner and tested for HIV. There were no significant differences. All those that have not tested in urban were willing to do the test while only 46.2% in rural were willing ($p < 0.05$). Major reason for doing HIV test was medical check-up in urban 46.1% and rural 37.0% ($p < 0.05$). About 3% urban and 15% rural tested positive for HIV. ($p < 0.001$). Out of those that tested positive; 60% urban and 92.3% rural enrolled for PMTCT, 83.3% urban and 88.0% rural willing to take ARV, 83.3% urban and

84.0% rural willing to give child ARV, 83.3% urban and 88.0% rural share result with partner. About 98% urban and 89% rural respondents are of the opinion that HIV infected mothers should bear children ($p < 0.001$).

Table 5 shows responses on possibility of telling husband to use condom. On possibility of telling husband to use condom, 81.7% urban and 67.4% rural stated that it is possible ($p < 0.05$) of which out of them 66.4% urban and 78.8% have done it before ($p < 0.05$).

NB; the mean score of knowledge, attitude and practice on PMTCT. The findings were significant for knowledge $p < 0.001$ and attitude $p < 0.001$ but not significant for practice $p = 0.451$.

Table 6 shows relationship between the respondents' socio-economic characteristics and mean knowledge of PMTCT by groups. Occupation ($\chi^2 = 8.044$, $p < 0.05$) and monthly income ($\chi^2 = 7.126$, $p < 0.05$) showed statistically significant association for urban while monthly

income ($\chi^2 = 4.996$, $p < 0.05$) was statistically significant for rural.

Table 7 shows relationship between the respondents' socio-economic status with mean attitude of PMTCT by groups. None of the variables showed a statistically significant association with respondents' socio-economic status in both groups.

Table 8 showed relationship between the respondents' socio-economic status and mean practice of PMTCT by groups. Occupation was significantly associated for rural ($\chi^2 = 8.717$, $p < 0.05$). None of the variables showed a statistically significant association with respondents' socio-economic status for urban.

Table 9 showed predictors of good knowledge, positive attitude and good practice of PMTCT by groups. Civil/public servants were 9.6 times (95% CI: 1.13-80.82) in urban group significantly and 1.1 times (95% CI: 0.46-2.77) in rural group non-significantly more likely to have good knowledge than unemployed/housewives. Those earning >15000 were 4.5 times (95% CI: 1.75-13.71) in urban and 5.4 times (95% CI: 1.28-22.63) in rural significantly more likely to have good knowledge than those earning ≤ 15000 . Equally Civil/public servants were not significantly 2.1 times (95% CI: 0.99-4.59) in urban group and significantly 2.1 times (95% CI: 1.01-4.19) in rural group more likely to have good practice than unemployed/housewives.

Table 3. Attitude on HIV/PMTCT

	Urban n=175	Rural n=175	Test	p value
	Yes	Yes	statistics	
	Freq (%)	Freq (%)	χ^2	
It is important to test for HIV when pregnant	174(99.4)	168(96.0)	4.605	0.032
HIV +ve mothers should have baby	165(94.5)	159(90.9)	1.496	0.221
HIV +ve mothers should breastfeed babies	161(92.0)	127(72.6)	22.659	0.000
If Yes to breastfeed, reason				
Obligated	3(1.9)	4(3.1)		
Cannot afford formula milk	16(9.9)	9(7.1)		
Fear of disclosure	19(11.8)	7(5.5)	25.385	0.000
Adequate nourishment for baby	67(41.6)	36(28.3)		
Fear of rejection/Stigma	23(14.3)	11(8.7)		
All of the above	33(20.5)	60(47.2)		
Reaction of Husband if +ve mother decides not to breastfeed				
Reject her	21(12.0)	19(10.9)		
Support her	88(50.3)	79(45.1)	1.431	0.489
Don't know	66(37.7)	77(44.0)		
Reaction of family if +ve mother decides not to breastfeed				
Reject her	21(12.0)	19(10.9)		
Support her	94(53.7)	70(40.0)	8.242	0.016
Don't know	60(34.3)	86(49.1)		
Reaction of community if +ve mother decides not to breastfeed				
Reject her	25(14.3)	31(17.7)		
Support her	71(40.6)	64(36.6)	1.012	0.603
Don't know	79(45.1)	80(45.7)		
Risk of mixed feeding on HIV exposed baby				
Malnourished	53(30.3)	37(21.1)		
Infected with HIV	23(13.1)	27(15.40)		
More illness	43(24.6)	35(20.0)	17.944	0.001
HIV & more illness	12(6.9)	38(21.7)		
Don't know	44(25.1)	38(21.7)		
Use of condom during pregnancy and breast feeding reduces MTCT	173(98.9)	135(77.1)	39.069	0.000
Your support for strategies for PMTCT	172(98.9)	150(85.7)	18.789	0.000

Table 4. Practice on HIV/PMTCT

	Urban n=175		Rural n=175		Test statistics	p value
	Yes	No	Yes	No		
	Freq (%)	Freq (%)	Freq (%)	Freq (%)	χ^2	
Ever discussed having HIV test with your partner	166(94.9)		166(94.9)		0.000	1.000
Ever tested for HIV	165(94.3)		162(92.6)		0.419	0.518
Willingness to be tested for those that never tested	10(100.0)		6(46.2)		FT	0.007
Reason for doing HIV test						
Pre-marital test	12(7.3)		15(9.3)			
Medical checkup	76(46.1)		60(37.0)		9.751	0.021
Routine ANC test	46(27.9)		34(21.0)			
Voluntary counseling test	31(18.8)		53(32.7)			
Received result of HIV test	165(100.0)		156(96.3)		FT	0.014
Those that shared their result with someone	46(26.3)		73(41.7)		9.282	0.002
Result of HIV result						
	n=165		n=162			
+ve	5(3.0)		26(16.0)		16.15	0.000
-ve	160(97.0)		136(84.0)			
-ve result, but believe that that they can contact it in future	136(80.0)		73(49.0)		33.791	0.000
+ve result						
Enrolled for PMTCT	3(60.0)		24(92.3)		FT	0.112
Willingness to take ARV	5(83.3)		22(88.0)		FT	1.000
Willingness to give child ARV	5(83.3)		21(84.0)		FT	1.000
willingness to EBF for 6 months	5(83.3)		24(96.0)		FT	0.355
Shared result with partner	5(83.3)		22(88.0)		FT	1.000
Shared with someone(not partner)	61(34.9)		54(30.9)		0.635	0.426
Willingness to accept home visit by service provider	70(40.0)		83(47.4)		1.962	0.161
HIV infected couple should bear children	172(98.3)		155(88.6)		13.449	0.000
Intention to have child after current pregnancy	109(62.3)		128(73.1)		4.718	0.30

Table 5. Possibility of telling your husband to use condom

Practice on HIV/PMTCT	Urban n=175		Rural n=175		Test statistics	p value
	Yes	No	Yes	No		
	Freq (%)	Freq (%)	Freq (%)	Freq (%)		
	Possible	Not possible	Possible	Not possible	χ^2	
Possibility of telling your husband to use condom	143(81.7)	32(18.3)	118(67.4)	57(32.6)	9.417	0.002
	n=143		n=118			
Possible, and have done it	95(66.4)	48(33.6)	93(78.8)	25(21.2)	4.918	0.027

4. DISCUSSION

Respondents were in the age group <35 years in both urban and rural groups with their mean ages 32.46±10.12 in urban and 33.24±9.31 in rural. This is expected as it represents the safest reproductive period for women. Most were currently married in both groups. The implication of this is that they are exposed to the risk of HIV infection if their partners/spouses were infected. In Nigeria, as in many settings, simply being married can contribute to the risk of contracting

HIV The high proportion attending secondary education and above is in contrast to other findings in Nigeria (45.0%) [12] and but in line with Zimbabwe (83%) [13]. Majority of them were working in both groups which is good as it empowers them and no matter how little, it would help them take better care of themselves, give them a level of financial autonomy and empowerment to take care of their condition. This is expected to positively influence their PMTCT services as seen in this study.

Table 6. Relationship between socio- economic status variables of respondents with mean Knowledge of PMTCT by group

Socio-demographic characteristics	Urban n=175		Test statistic χ^2 (p value)	Rural n=175		Test statistic χ^2 (p value)
	Freq (%)			Freq (%)		
	Good	Poor		Good	Poor	
Age (years)						
<35	98(81.7)	22(18.3)		119(95.2)	6(4.8)	
≥35	46(83.6)	9(16.4)	0.100(0.751)	50(100.0)	0(0.0)	2.485(0.115)
Marital status						
Currently married	131(80.9)	31(19.1)		167(96.5)	6(3.5)	
Others*	13(100.0)	0(0.0)	3.023(0.082)	2(100.0)	0(0.0)	0.072(0.789)
Educational level						
Primary and below	7(87.5)	1(12.5)		5(83.3)	1(16.7)	
Secondary	68(76.4)	21(23.6)	4.302(0.116)	115(95.8)	5(4.2)	5.113(0.078)
Higher	69(88.5)	9(11.5)		49(100.0)	0(0.0)	
Employment status						
Housewife/unemployed	28(70.0)	12(30.0)		35(100.0)	0(0.0)	
Farming	3(100.0)	0(0.0)	8.044(0.045)	35(97.2)	1(2.8)	4.306(0.230)
Trading	67(81.7)	15(18.3)		73(93.6)	5(6.4)	
Civil/public servant	46(92.0)	4(8.0)		26(100.0)	0(0.0)	
Religion						
Roman Catholic	59(85.5)	10(14.5)		50(100.0)	0(0.0)	
Protestant	41(89.1)	5(10.9)	5.269(0.072)	51(92.7)	4(7.3)	4.299(0.117)
Others	44(73.3)	16(26.7)		68(97.1)	2(2.9)	
Monthly income						
≤15000	84(76.4)	26(23.6)		91(93.8)	6(6.2)	
>15000	60(92.3)	5(7.7)	7.126(0.008)	78(100.0)	0(0.0)	4.996(0.025)

Table 7. Relationship between socio-economic status variables of respondents with mean attitude to PMTCT by group

Socio-demographic characteristics	Urban n=175		Test statistic χ^2 (p value)	Rural n=175		Test statistic χ^2 (p value)
	Freq (%)			Freq (%)		
	Positive	Negative		Positive	Negative	
Age (years)						
<35	29(24.2)	91(75.8)		32(25.6)	93(74.4)	
≥35	9(16.4)	46(83.6)	1.351(0.245)	14(28.0)	36(72.0)	0.106(0.745)
Marital status						
Currently married	37(22.8)	125(77.2)		46(26.6)	127(73.4)	
Others*	1(7.7)	12(92.3)	1.624(0.202)	0(0.0)	2(100.0)	0.721(0.396)
Educational level						
Primary and below	3(37.5)	5(62.5)		0(0.0)	6(100.0)	
Secondary	24(27.0)	65(73.0)	5.275(0.072)	36(30.0)	84(70.0)	3.868(0.145)
Higher	11(14.1)	67(85.9)		10(20.4)	39(79.6)	
Employment status						
Housewife/unemployed	9(22.5)	31(77.5)		6(17.1)	29(82.9)	
Farming	0(0.0)	3(100.0)		14(38.9)	22(61.1)	
Trading	20(24.4)	62(75.6)	1.598(0.660)	22(28.2)	56(71.8)	6.204(0.102)
Civil/public servant	9(18.0)	41(82.0)		4(15.4)	22(84.6)	
Religion						
Roman Catholic	15(21.7)	54(78.3)		18(36.0)	32(64.0)	
Protestant	10(21.7)	36(78.3)	0.000(1.000)	11(20.0)	44(80.0)	3.701(0.157)
Others	13(21.7)	47(78.3)		17(24.3)	53(75.7)	
Monthly income						
≤15000	27(24.5)	83(75.5)		27(27.8)	70(72.2)	
>15000	11(16.9)	54(83.1)	1.396(0.237)	19(24.4)	59(75.6)	0.270(0.604)

Table 8. Relationship between socio-economic status variables of respondents with mean practice of PMTCT by group

Socio-demographic characteristics	Urban n=175		Test statistic χ^2 (p value)	Rural n=175		Test statistic χ^2 (p value)
	Freq (%)			Freq (n%)		
	Good	Poor	Good	Poor		
Age (years)						
<35	50(41.7)	70(58.3)		47(37.6)	78(62.4)	
≥35	16(29.1)	39(70.9)	2.539(0.111)	17(34.0)	33(66.0)	0.200(0.655)
Marital status						
Currently married	64(39.5)	98(60.5)		64(37.0)	109(63.0)	
Others*	2(15.4)	11(84.6)	2.981(0.084)	0(0.0)	2(100.0)	1.166(0.280)
Educational level						
Primary and below	5(62.5)	3(37.5)		1(16.7)	5(83.3)	
Secondary	38(42.7)	51(57.3)	5.280(0.071)	51(42.5)	69(57.5)	5.926(0.052)
Higher	23(29.5)	55(70.5)		12(24.5)	37(75.5)	
Employment status						
Housewife/unemployed	16(40.0)	24(60.0)		7(20.0)	28(80.0)	
Farming	2(66.7)	1(33.3)		19(52.8)	17(47.2)	
Trading	28(34.1)	54(65.9)	1.715(0.634)	30(38.5)	48(61.5)	8.717(0.033)
Civil/public servant	20(40.0)	30(60.0)		8(30.8)	18(69.2)	
Religion						
Roman Catholic	25(36.2)	44(63.8)		25(50.0)	25(50.0)	
Protestant	22(47.8)	24(52.2)	3.001(0.223)	17(30.9)	38(69.1)	5.445(0.066)
Others	19(31.7)	41(68.3)		22(31.4)	48(68.6)	
Monthly income						
≤15000	44(40.0)	66(60.0)		38(39.2)	59(60.8)	
>15000	22(33.8)	43(66.2)	0.659(0.417)	26(33.3)	52(66.7)	0.636(0.425)

Table 9. Predictors of good knowledge, positive attitude and good practice of PMTCT by groups

Variables	Urban	Rural
	Multivariate analysis	Multivariate analysis
	OR (95% C.I. for OR)	OR (95% C.I. for OR)
Knowledge		
Employment status		
Housewife/unemployed		
Farming	1.38(0.38-5.00)	1.90(0.76-4.77)
Trading	1.57(0.66-3.73)	1.27(0.63-2.57)
Civil/public servant	9.57(1.13-80.82)	1.13(0.46-2.77)
Monthly income		
≤15000		
>15000	4.89(1.75-13.71)	5.39(1.28-22.63)
Attitude		
	NA	NA
Practice		
Employment status		
Housewife/unemployed		
Farming	1.99(0.85-4.65)	0.98 (0.45-2.16)
Trading	1.09(0.59-2.05)	0.63 (0.25-1.56)
Civil/public servant	2.13(0.99-4.59)	2.06 (1.01-4.19)

There was a very high good knowledge on ways HIV can be transmitted. Majority have heard of PMTCT, knew that infected mothers can transmit to their children, stages it can be transmitted as well as that giving ARV to mother and child can prevent Mother to child transmission, in both group though higher in urban. This is encouraging. For sustenance of the achievements on Millennium Development Goals (MDGs), creating awareness and enhancing PMTCT practice is of great importance particularly in the reduction of childhood and maternal morbidity and mortality which in turn has enormous impact on socio-economic development of the country. The high level of knowledge on ways of transmission may be partly due to lectures/talks they were given during ANC as multivariate analysis showed that it was not due to their level of education. Previous study on Voluntary counselling and testing (VCT) for human immunodeficiency virus: A study on acceptability by Nigerian women attending antenatal clinics found that the majority of women (89.9%) had a good knowledge of the modes of transmission but poor knowledge on specific aspects of PMTCT [14]. The survey done by FMOH found that 91.2% mentioned sexual intercourse as a mode of transmission, while 85.1% mentioned infected sharps whereas only 23% knew all the major modes of transmission [15]. Another study done in Onitsha, Nigeria has similar finding [16]. The finding of high proportion of those that have heard of mother to child transmission in both groups is similar to that on knowledge and perception of HIV/AIDS among pregnant women attending antenatal clinics in Osogbo, Nigeria in which the proportion that were aware of mother to child transmission was 90% [17] and also 92.2% in a study in Onitsha [18]. This is encouraging as if effectively maintained and built it on, it would impact positively on PMTCT services.

Knowledge of conditions of HIV positive mothers that promote MTCT and conditions in infant that promote acquiring HIV was good for urban but poor for rural areas. Awareness that use of anti-retroviral drugs can Prevent MTCT of HIV was high in both groups (>80%) just like the study in Onitsha, Nigeria where 71.6% indicated that there were interventions that can prevent MTCT of HIV [18]. This was in contrasts with finding in Lagos where only 37% of the respondents knew that anti-retroviral therapy (ART) could be used for PMTCT [19]. The high knowledge that all pregnant women should know their HIV status as observed from the study among both groups is

good as knowledge of one's HIV status is the entry point for access to prevention, treatment, care and support services. For pregnant women to benefit from interventions aimed at PMTCT of HIV, they have to know their HIV status. This would enable those who test positive to access those services. Studies in Lagos [20] and Tanzania [21] were in line with the finding.

There was a high support by both groups that positive mothers should breast their babies, with their major reason being; for urban adequate nourishment for baby. This was supported by finding from other studies in Nigeria and Malawi that the majority of the women would still prefer breastfeeding even if they were found to be HIV positive [14,22,23]. This most of the time was due to fear or respect for culture and tradition [22,23]. This was in line with the 2013 WHO recommendation that HIV Exposed Infants should be exclusively breastfed for the first six months of life after which they should receive nutritionally adequate and safe complementary foods while breastfeeding continues up to 12 months to achieve optimal growth, development and health [24]. However, to reduce the risk of HIV transmission to infants while also minimizing the risk of other causes of morbidity and mortality, HIV-positive mothers are recommended to continue taking Anti-retroviral drugs throughout the breastfeeding period either as prophylaxis for prevention of mother to child transmission of HIV or for the mother's health for those eligible life-long ART. Breastfeeding has been confirmed to be safer viable option as the benefits outweighs the disadvantages even though it increases the risk of HIV transmission to the baby [25].

Findings showed a high proportion of acceptance that use of condom during pregnancy and breast feeding reduces MTCT. HIV infection has been found to be transmissible within couples thus putting the women in danger of acquiring the infection if the partner is infected and do not accept to use condom. Condom is the most effective barrier method (both male and female condom), which protects against both pregnancy and STIs including HIV. Other studies reported that wives in order not to refuse sex from their husband even if their husband is infected with HIV-1 use condom for protection [26,27]. Majority of respondents in both groups have discussed HIV with their partner and tested for HIV. On possibility of telling husband to use condom, majority stated that it is possible of which, a high proportion of respondents have done it before.

This is good as transmission of HIV is both way and protection requires cooperation of the two partners. Most reason for doing HIV test in both groups was medical check-up. This finding contrasts that done in Onitsha where majority of the respondents did test to know their HIV status in order to protect their baby from being infected [18].

This study showed that about 3% urban and 15% rural tested positive for HIV. The difference may be due to higher awareness in urban, higher access to contraceptives (condom) or possibly that those in urban may know their status and move to higher level of care (secondary/ tertiary) as such services are more accessible to them than those in rural areas. The finding in rural area is similar to finding in Ilesa, south-west Nigeria where 9.5% of the women had a positive result [16] while that of urban is similar to that in Osogbo, Nigeria where prevalence of HIV among antenatal clients was 4.6% [16]. In a study carried out in Botswana, 37.4% of women attending antenatal clinics were HIV positive [28].

Finding that high proportion of respondents accepted that infected mothers should bear children is expected. The implication of this is that if not well managed it may fuel MTCT. Wanting to have children is a legitimate desire of men and women in Africa, irrespective of their religious beliefs, to give meaning to life. It is seen as a social norm and this desire cannot be suppressed by HIV infection. In Nigeria, married couples are expected to bear children as family members usually express concern if couples fail to give birth after a year or two of their married life. HIV-positive women's desire to have babies are in order to fulfil societal expectations even when they know that it puts the baby at risk of becoming infected by the mother during pregnancy, labour/delivery and breastfeeding which may undermine the purposes of PMTCT services.

Occupation and monthly income were associated with mean knowledge for urban while monthly income was for rural areas. Employment status was equally associated with good practice for rural. The identified predictors from the study for good knowledge were monthly income for both urban and rural as well as being a civil/public servant for urban. Equally being a civil/public servant was a predictor of good practice in rural. However in Tanzania, being married, increasing age, increasing duration of infection were independently associated with access to care

and ARVs while residence in roadside areas was an independent predictor of access to PMTCT services [29]. Similarly study in Ethiopia found the way health workers treat the mothers (mistreatment), the time taken to get ANC service (long waiting time, long time to get laboratory tests and obtain results), and client load to the health facilities were among the barriers that contributed to the low utilization of PMTCT services [30].

5. LIMITATIONS OF THE STUDY

1. Failure to establish all existing gaps from previous studies which would have added to the quality of the work.
2. Using correction formula to limit the study sample as generalization would have been better if larger number were studied.

6. CONCLUSION

The study revealed that there was good knowledge, positive attitude and good practice of HIV and PMTCT services in both groups though higher in urban areas. This was equally supported by mean scores of knowledge, attitude and practice. It was also observed that there were concerns regarding disclosure of one's status and that these included fear of reappraisals from the partner's reaction especially in rural areas. Occupation and monthly income influenced knowledge for urban while monthly income influenced knowledge for rural. Employment status was associated with practice for rural. The identified predictors from the study for good knowledge were monthly income for both urban and rural as well as being a civil/public servant for urban. Equally being a civil/public servant was a predictor of good practice in rural.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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