

## Original Research Article

### KNOWLEDGE, PREVENTIVE PRACTICES AND RISK PERCEPTION OF HIV INFECTION AMONG PREGNANT WOMEN IN A RURAL COMMUNITY OF IGBAGU, IZZI LGA, EBONYI STATE NIGERIA

#### ABSTRACT

**Aims:** To determine the knowledge, risk and the risk perception predictors of HIV infection among pregnant women in a rural community in Ebonyi State, Nigeria.

**Study design:** A descriptive cross-sectional study of rural pregnant women.

**Place and Duration of Study:** The study was conducted over 11 months (August 2016 – June 2017), in Igbagu community, Izzi Local Government Area of Ebonyi State Nigeria

**Methodology:** A total of 443 pregnant women on antenatal clinic booking visit were consecutively recruited. A semi structured questionnaire adapted from a validated WHO generic questionnaire on HIV/PMTCT was administered by the interviewer.

Data analysis was done using SPSS for window version 22 and p-value was set at  $P < 0.05$

**Results:** HIV awareness level was 68.2% among the pregnant women without prompting. Less than a quarter (20.3%) reported that they were not at risk of HIV infection. About half of the pregnant womens' spouses had been counseled for HIV while 36.1% were reported to have received the test. Only 14.2% of the pregnant women had adequate knowledge of HIV/AIDS. None of the women had ever received blood transfusion nor engaged in injection drug use. Age, occupation, educational status, having discussed HIV with someone, awareness of HIV Counseling and Testing and sex partner's HIV test status had statistical significant association with appropriate HIV infection risk perception. Being a seamstress, above 30 years of age, having discussed HIV with someone and being aware of HIV were significant predictors of appropriate HIV infection risk perception

**Conclusion:** HIV/AIDS knowledge and appropriate risk perception were low among the rural women. This emphasizes the need for strengthening and prioritizing community-wide engagement and enlightenment on transmission, prevention and treatment of HIV with increased focus on PMTCT especially in rural areas.

**Key words:** HIV infection, awareness, sex partner, spouses, rural, pregnant

#### 1. INTRODUCTION

Mother-to-child transmission (MTCT) of human immunodeficiency virus (HIV) infection remains a major public health problem and constitutes the most important cause of HIV infection in children less than 15 years old in the globe. [1] New infections among children less than 15 years in Nigeria was 36, 000 in 2017 while 86,000 women aged 15 years and above acquired new infection. [2] In 2012, 260,000 children acquired HIV infection in low and middle-income countries and more than 90% of the newly HIV infected children lived in Sub-Saharan Africa, home to 92% of pregnant women living with HIV.[3] Nigeria accounts for about 10% of all HIV/AIDS cases in the world.[4] Sixty percent of new infections occur in the 15 - 25-year-old age group but the prevalence is highest among productive young people between the ages of 20 - 29 years.[5,6] According to 2014 National HIV sero-prevalence sentinel survey among pregnant women

attending antenatal clinics in Nigeria, the country has a prevalence of 3.0%.[7] UNAIDS/AIDSinfo Country fact sheet documented a prevalence of 2.8% in 2017.[8] This, of course, showed a decline from the prevalence of 3.4% reported by National HIV/AIDS and Reproductive Health Survey (NARHS) 2012 and previous estimates of 3.6% prevalence in 2007.[9,10] AID related death in 2014 was 174,253; which was lower than 210, 031 AID related death reported in 2013.[9,11]

The most effective intervention to reducing transmission from mother-to-child depends on a woman's knowledge of her HIV status.[10,12] Studies have recorded good level of general knowledge of HIV/AIDS but knowledge on the modes of vertical transmission have been discouraging.[12,13] Individuals' knowledge of HIV transmission and accurate assessment of their own risk seem to be among the key factors in adoption of safer sexual practices.[13]

The perceived susceptibility to HIV infection among individuals compared to the actual risk is a major challenge in HIV prevention campaigns.[12] HIV risk perception has been identified as an important antecedent for one's adoption of protective behaviour against contracting the disease.[14] A study done among pregnant women in Abakaliki urban, Ebonyi State revealed a low risk perception of HIV infection among the respondents, only 2% of respondents believed they were at high risk for HIV/AIDS.[15] One begins to wonder what is obtainable in the rural community as regards knowledge and risk perception of HIV among pregnant women.

## OBJECTIVES

This study was therefore designed to determine the awareness and knowledge of HIV/AIDS, HIV infection risk perception and predictors among pregnant women of rural a community in Ebonyi State.

## METHODOLOGY

### Study Area

The study was carried out in the rural community of Igbagu in Izzi Local Government Area of Ebonyi State, South East Nigeria. The community is made up of 4 villages with a combined population of 22,855.[16] Two health facilities in the community were used for this study. Comprehensive HIV services including Prevention of Mother to Child Transmission (PMTCT) and antenatal care (ANC), for pregnant women are among the health care services available at these health facilities. The choice of the centers for the study was because they were the only primary health care facilities in the state with manpower and infrastructural capacity to offer comprehensive HIV services in a rural setting at the time of the study.

Comment [o1]: These centres were chosen

### Study design

The study was a descriptive cross sectional study. Participants in the study were pregnant women who came for ANC booking at two selected health facilities in a rural community. The study lasted for 11 months

Comment [o2]: delete

### Sampling technique

The minimum sample size was determined using the formula for single proportion for infinite population [17] with predetermined adequate knowledge of HIV vertical transmission (during pregnancy) prevalence of approximately 60%. [18] An estimated sample size of 369 was obtained and making for non-response of 20% (74), a total sample size of 443 was arrived at. Pregnant women recruited for the study were those who came for ANC booking visit in either facility in order to avoid duplication of respondents since the study extends for over a period of time within which a respondent could repeat routine ANC visits

Comment [o3]: taking the non response rate of 20%

The two facilities ran two ANC days per week; one for booking and the other for routine ANC visits. Proportional sampling technique was used to select the sample. With the assistance of nurse-midwives pretrained on the data collection for the study, the participants were recruited consecutively into the study as they come for ANC booking after obtaining their informed consent in the respective health facilities until the desired sample size was attained. A semi structured questionnaire adapted from a validated WHO generic questionnaire on HIV/PMTCT was administered by the interviewer.[19,20] The questionnaire comprised of 3 parts: A, B and C. Session A contained questions for sociodemographic data; session B had questions on awareness and general knowledge of HIV/AIDS as well as HIV infection risk perception while session C was concerned with HIV infection preventive practices. In determining the pregnant women's HIV knowledge, 10 questions comprising of 37 responses and constructed to meet their understanding were used. These questions centred on the modes of HIV transmission including timing of MTCT, risk reduction strategies including PMTCT as well as advantages of taking ART. They were used to compute a composite score for each respondent. This was converted to percentages and using the mid-point mark, the score were categorized broadly into two namely: "Inadequate" and "Adequate" HIV knowledge (corresponding to score < 50% and ≥ 50% respectively). HIV risk perception was evaluated using questions meant to elicit the

perception of HIV infection risk from the pregnant women. Reasons for the pregnant women's perception of such risk levels were also obtained.

**Comment [o4]:** HIV risk perception was evaluated using specific questions.

### Statistical analysis

SPSS for window version 22 was used for the data analysis.[21] Descriptive statistics of the variables were done and presented in frequency tables and proportions. Cross tabulations were used to obtain the Chi-square and *P*-values in statistical tests of associations and the level of significance respectively for relevant variables. Multivariate binary logistic regression analysis was conducted to examine the predictors of appropriate HIV infection risk perception by the pregnant women. Variables that were fitted into the regression model were those that come out with *P*-value  $\leq 0.1$  on bivariate analysis. Inferences were drawn using 95% confidence intervals at *P*-value  $< 0.05$  level of significance for the respective test statistics.

## RESULTS

Over 60% of the 443 pregnant women knew the modes of transmission of HIV except for transmission through unsafe blood transfusion which was known to 162 (36.6%). Two hundred and seventy six (62.8%) pregnant women, gave correct response to being faithful to ones partner as a preventive measure for HIV transmission. Less than 50% knew about other preventive measures especially safe blood transfusion 7 (1.6%) and access to good PMTCT services 4 (1.0%). Also, less than 30% had knowledge of PMTCT services. The periods of occurrence of MTCT were known to less than half of the pregnant women. Furthermore, less than 30% of them gave correct responses to questions on MTCT risk reduction measure. (See table 1).

**Table 1: Responses to questions for HIV knowledge assessment of pregnant women**

Variable		Responses N = 443	
		Correct N (%)	Wrong N (%)
<b>Mode of HIV transmission</b>	Having unprotected sexual intercourse	356 (80.4)	87 (19.6)
	From mother to child	336 (75.8)	87 (19.6)
	Sharing of contaminated sharp instruments	282 (63.7)	161 (36.3)
	Through unsafe blood transfusion	162 (36.6)	281 (63.4)
<b>Prevention of HIV transmission</b>	Be faithful to one's partner	278 (62.8)	165 (37.2)
	Avoid sharing of sharp instruments	201 (45.4)	242 (54.6)
	Abstinence from sexual intercourse	141 (31.8)	302 (68.1)
	Correct condom use	108 (24.4)	335 (75.6)
	Safe blood transfusion	7 (1.6)	436 (98.4)
	Access to good PMTCT services	4 (1.0)	439 (99.1)
<b>It is possible that a healthy looking person may have HIV infection</b>		257 (58.0)	186 (42.0)
<b>HIV cannot be cured</b>		280 (63.2)	163 (36.8)
<b>HIV infection can be confirmed by getting tested</b>		299 (76.5)	144 (32.5)
<b>Knowledge of</b>	HCT	160 (36.1)	284 (76.1)
<b>PMTCT services</b>	Infant feeding options	121 (27.3)	322 (72.7)
	Treatment for HIV infected pregnant mothers	119 (26.9)	324 73.1()

	ARV prophylaxis for exposed infants	80 (18.1)	363 (81.9)
	Family planning	45 (10.2)	398 (89.8)
<b>Occurrence of MTCT</b>	MTCT can occur in pregnancy	224 (50.6)	219 (49.4)
	MTCT can occur during labour	172 (38.8)	271 (61.2)
	MTCT can occur during breastfeeding	219 (49.4)	224 (50.6)
<b>Risk reduction of MTCT during pregnancy</b>	Take ART as prescribed by health workers	121 (27.3)	322 (72.7)
	Seek good ANC and PMTCT services	114 (25.7)	329 (74.3)
	Good nutrition for mother	44 (9.9)	399 (90.1)
	Use of condom (safe sex)	17 (3.8)	426 (96.2)
	Abstinence from unprotected sex	9 (2.0)	434 (98.0)
<b>Risk reduction of MTCT during labour and delivery</b>	Delivery in health facility by skilled birth attendants	94 (21.2)	349 (78.8)
	Take ART as prescribed in the health facility	86 (19.4)	357 (80.6)
	Seeking good management during labour	65 (14.7)	358 (85.3)
	Avoid prolonged labour	33 (7.4)	410 (72.6)
	Elective Caesarean section	28 (6.3)	415 (93.7)
	Avoid pushing unless instructed to by skilled birth attendant	19 (4.3)	424 (95.7)
<b>Risk reduction of MTCT during breastfeeding</b>	Continue ART uninterrupted	102 (23.0)	341 (77.0)
	Give baby ART as	91 (20.5)	352 (79.5)
	Give breast milk only	58 (13.1)	385 (86.9)
	Keep post natal appointments	56 (12.6)	385 (87.4)
	Avoid mixed feeding	45 (10.2)	398 (89.8)

Out of the 443 pregnant women, 302 (68.2%) were aware of HIV infection without prompting. Only 63 (14.2%) of them had adequate knowledge of HIV infection, whereas less than a quarter 90 (20.3%) had appropriate HIV infection risk perception. They gave various reasons for such perception, commonest of which was fear of partner's infidelity or male partner having multiple sex partners 33 (36.7%). The least reasons given by 9 (10.0%) pregnant women respectively were that they have multiple sex partner and those whose partners were already infected with HIV. Among those who believed that they cannot contact the infection, 126 (35.7%) do not have multiple sex partners followed by those who claimed that they had faithful partners 114 (32.2%). Eighty eight (19.9%) pregnant women had ever discussed risk of contacting the infection with someone else. (Table 2)

**Table 2. HIV infection awareness, knowledge and risk perception**

Variables/responses	Frequencies	Percentage
<b>Respondent has heard about HIV without prompting</b>		
Yes	302	68.2

No	141	31.8
<b>HIV knowledge</b>		
Adequate	63	14.2%
Inadequate	380	85.8%
<b>At risk of contacting HIV (N = 443)</b>		
Yes	90	20.3
No	353	79.7
<b>HIV infection is possible because respondent N = 90</b>		
Have multiple sex partners	9	10.0
Do have unprotected sexual intercourse	12	13.3
Partner is infected	9	10.0
Do not trust sex partner	33	36.7
Partner has multiple sex partner	17	18.7
Do share sharps with other persons	10	11.1
<b>Reasons why respondent cannot contact HIV infection N = (353)</b>		
Abstinence	60	17.0
Have only one partner	126	35.7
Use condom always	6	1.7
Partner is faithful	114	32.3
It can't happen to me	47	13.3

Statistical significant relationship existed between HIV infection risk perception and the pregnant women's age groupings, occupation and educational status ( $P < 0.05$ ). The proportion of women who had appropriate risk perception of HIV infection was greatest among those aged 31 – 40 years. Highest proportion of respondent who did not believe that they were at risk of the infection was found among those who were less than 21 years 41 (80.4%). Similarly, women who practice traditional religion reported that they were at less risk of contacting HIV infection 15 (93.8%) compared to the Christians 338 (79.2%) among them. Within the occupational group, hairdressers had the highest proportion 42 (87.5%), of pregnant women who do not believe they could get infected with HIV compared to other groups. However, there was no statistical significant relationship between HIV risk perception and the pregnant women's religion and marital status ( $P > 0.05$ ). (These are shown on table 3).

**Table 3. Relationship between respondent's sociodemographic characteristics and HIV risk perception**

Variable	HIV infection risk perception [Frequency (%)]
----------	---

	At risk of infection	Not at risk of infection	Total (N = 443)	$\chi^2$ (P--value)
<b>Age groups (years)</b>				
<21	10 (19.6)	41 (80.4)	51	12.78 (0.006)
21 -30	50 (23.1)	166 (76.9)	216	
31 – 40	17 (31.5)	37 (68.5)	54	
>40	53 (43.4)	69 (56.6)	122	
<b>Respondent's religion</b>				
Christianity	89 (20.8)	338 (79.2)	427	2.03 (0.13)
Traditionalist	1 (6.2)	15 (93.8)	16	
<b>Occupation</b>				
Trader	34 (16.3)	174 (83.7)	208	10.13 (0.04)
Farmer	22 (23.2)	73 (76.8)	95	
Civil servnat	15 (30.6)	34 (69.4)	49	
Seamstress	13 (30.2)	30 (79.7)	43	
Hairdresser	6 (12.5)	42 (87.5)	48	
<b>Marital status</b>				
Married	81 (19.6)	332 (84.4)	413	2.92 (0.36)
Single	8 (29.6)	19 (70.4)	27	
Divorced/Separated	1 (33.3)	2 (66.7)	3	
<b>Highest educational attainment</b>				
Graduate/ post graduate	12 (52.2)	11 (47.6)	23	18.58 (< 0.001)
Secondary school	36 (21.2)	134 (78.8)	170	
Primary school	34 (19.2)	143 (80.8)	177	
No formal education	8 (11.0)	65 (89.0)	73	

Greater proportion of pregnant women who had adequate knowledge of HIV 18 (28,6%) had appropriate perception of risk of HIV infection compared to those with inadequate knowledge 72 (18.9%). Proportions of pregnant women with appropriate risk perception were greater among those who had attended ANC at formal health facility 77 (21.5%); those who were aware of HIV 37 (27.6%); discussed risk of HIV with someone else 31 (42.0%); had heard about HCT 79 (26.2%); had been screened for HIV 60 (27.0%); received HCT in a public hospital 54 (28.6%); sex partner had been screened 41 (28.6%) and those who shared their HIV screening result with their sex partner 37 (27.6%). There were very strong statistical significant association between the pregnant women's HIV risk perception and having discussed their risk of HIV infection with someone else, having heard of HCT and having been screened for HIV infection, ( $P < 0.001$ ).

149 Statistical significant relationship was also found between risk perception and the HIV screening  
 150 status of the pregnant women's sex partner ( $P = 0.03$ ). (See table 4)  
 151

152 **Table 4. Relationship between pregnant women's HIV infection risk perception and HIV**

153 **knowledge/other HIV related issues**

Variable	Perception of risk of HIV infection [Frequency (%)]			
	At risk of infection	Not at risk of infection	Total (N = 443)	$\chi^2$ (P--value)
<b>Knowledge of HIV</b>				
Adequate knowledge	18 (28.6)	45 (71.4)	63	3.09 (0.08)
Inadequate knowledge	72 (18.9)	308 (81.1)	380	
<b>Place of ANC attendance</b>				
Formal health facility	77 (21.5)	281 (78.5)	358	1.53 (0.13)
Traditional birth attendance	13 (15.3)	72 (84.7)	85	
<b>Awareness of HIV</b>				
Yes	37 (27.6)	97 (72.4)	134	0.79 (0.27)
No	5 (19.2)	21 (80.8)	309	
<b>Discussed risk of HIV with someone else</b>				
Yes	31 (42.0)	51 (58.0)	88	32.03 (< 0.001)
No	53 (14.9)	302 (85.1)	355	
<b>Respondent had heard of HCT</b>				
Yes	79 (26.2)	223 (73.8)	302	29.01 (< 0.001)
No	11 (7.8)	130 (92.2)	141	
<b>Respondent had been screened for HIV</b>				
Yes	60 (27.0)	162 (73.0)	222	12.38 (< 0.001)
No	30 (13.6)	191 (66.4)	221	
<b>Place respondent was screened for HIV</b>				
During health workers community mobilization visit	5 (17.9)	23 (82.1)	28	1.55 (0.53)
In a public hospital	54 (28.6)	135 (71.4)	189	
In private hospital	1 (20)	4 (80.0)	5	
<b>Pregnant women's sex partner had been screened for HIV infection</b>				
Yes	41 (25.6)	119 (74.4)	160	4.36 (0.03)

No	90 (20.3)	353 (79.7)	283	
<b>Pregnant women's sex partner shares screening result with her</b>				
Yes	37 (27.6)	97 (72.4)	134	0.79 (0.27)
No	5 (19.2)	21 (80.8)	26	

The research revealed the pregnant women had never received blood transfusion nor ever indulged in injection (illicit) drug use. Majority 278 (62.8%) were faithful to their partners while 201 (45.4%) did not share sharp objects. Only 141 (31.7%) of the women abstained from premarital sex while 108 (24.4%) practiced safe sex by using condom. (See table 5)

**Table 5: Pregnant women's practice of HIV prevention**

Variable	Frequency	Percentage
	<b>N = 443</b>	
Had never had blood transfusion	443	100
Did not engage in injection drug use	443	100
Had only one sex partner	278	62.8
Did not share sharp objects (needle, syringe, razor, etc)	201	45.4
Abstained from premarital sexual intercourse	141	31.7
Engaged in safe sex (used condom)	108	24.4

A binary logistic regression model showed statistical significant prediction/explanation of HIV infection risk perception by some age groups, an occupational group, pregnant women who discussed HIV risk with someone else, being aware of HCT and partner testing. Within the age groups, women aged between 30 -40 years were twice as likely as those below 21 years to know that every pregnant woman is a risk of HIV infection (AOR = 2.1; CI = 1.00 – 4.87;  $P = 0.05$ ), while those above 40 years of age were 3 times more likely to hold such perception (AOR = 3.3; CI = 1.35 – 8.13;  $P = 0.009$ ). Within the occupational group, being a seamstress had a 3 fold likelihood of appropriate HIV infection risk perception compared to being a hairdresser, (AOR = 3.35; CI = 1.06 – 10.57). Pregnant women who had discussed risk of HIV infection with someone else were about 4 times more likely to know that they are at risk of getting HIV infection (AOR = 3.78; CI 2.18 – 6.64). Those who were aware of HCT and others whose partners had been screened of HIV were about 4 and 2 times more likely to have such an appropriate perception respectively. Educational status and having had HCT as well as some other age and occupational groups were not significant at predicting HIV risk perception among the pregnant women. (See table 6)

**Table 6: Binary logistic regression model for predictors of appropriate HIV infection risk perception among the pregnant women.**

Variable	Wald statistics	df	P-value
----------	-----------------	----	---------



	(X <sup>2</sup> )			AOR (CI)
Age group (< 21years)	Constant			
Age group (21 – 30years)	1.43	1	0.23	1.96 (0.65 – 5.92)
Age group (31 – 40 years)	3.70	1	0.05	2.1 (1.00 – 4.87)
Age group (> 40years)	6.79	1	0.009	3.3 (1.35 – 8.13)
Occupation (Hairdresser)	Constant			
Occupation (Seamstress)	4.23	1	0.04	3.35 (1.06 – 10.57)
Occupation (Farmer)	1.92	1	0.17	2.08 (0.73 – 5.87)
Occupation (Trader)	0.95	1	0.33	1.67 (0.60 – 4.70)
Occupation (Civil servant)	0.83	1	0.36	1.77 (0.52 – 6.05)
No formal education	Constant			
Education (Post secondary)	2.26	1	0.13	0.29 (0.07 – 12.03)
Education (Secondary)	0.09	1	.077	1.15 (0.44 – 3.01)
Education (Primary)	0.40	1	0.53	1.34 (0.54 – 3.33)
Discussed HIV with someone (Yes)	21.50	1	<0.001	3.78 (2.16 – 6.64)
Aware of HCT (Yes)	9.16	1	0.002	3.61 (1.57 – 8.29)
Having ever had HCT (Yes)	0.96	1	0.33	1.44 (0.70 – 2.98)
Partner has had HCT (Yes)	3.86	1	0.05	1.98 1.00 – 3.90)

179

## 180 DISCUSSION

181 The findings from this study revealed that 302 (68.2%) respondents were aware or had heard of HIV  
182 without being prompted. This is in contrast to studies conducted in different parts of Nigeria and Ethiopia  
183 which found that 100% of the pregnant and non-pregnant women surveyed were aware of HIV.[22-25] The  
184 difference in awareness and knowledge could be because the other studies were conducted in urban areas  
185 where the people are more likely to be educated and exposed to information on HIV than in the rural areas.  
186 Additionally, this study surveyed only booking clients many of whom may not have been exposed to ANC  
187 health talks, 56.5% of whom had no formal or only primary education. This is in contrast to the other  
188 studies that surveyed more educated pregnant women who were on routine ANC visits and hence may  
189 have been more exposed to information on HIV via ANC health education. The sexual route was the most  
190 commonly known route of HIV infection mentioned by 80.4% of the women similar to that seen in other  
191 studies.[22-30] It was however disturbing to find that 42% and 63.4% of the respondents did not know that  
192 a healthy looking person could be HIV infected and that HIV can be transmitted by unsafe blood transfusion  
193 respectively. In contrast, a similar study conducted in Ogun State Nigeria.[31] showed that 85% of the  
194 respondents believed a healthy looking person could be HIV-infected. Other studies carried out in Nigerian  
195 cities of Osogbo, Sagamu Abakaliki and Awka as well as in Iran showed higher awareness of blood  
196 transfusion as a route of HIV infection.[15,23-25,27] Faithfulness to one's partner and non-sharing of sharp  
197 instruments were the most commonly identified ways of preventing HIV infection while safe blood  
198 transfusion and access to good PMTCT services were the least identified strategy. Although 75.8% of the  
199 respondents knew that HIV could be transmitted from mother to child, there was poor knowledge on the  
200 periods of occurrence of MTCT, MTCT reduction strategies and PMTCT services among the respondents.  
201 This could be because of poor general knowledge of HIV as seen in this study and lack of ANC health talk  
202 information on HIV by these booking clients as non-access to ANC health talks have been found to be  
203 associated with reduced knowledge on MTCT of HIV.[22,32] Therefore, there is need to sensitize the rural

women of child bearing age on reproductive issues including HIV prevention using other platforms such as community based women organization, town hall meeting and religious organization. MTCT during pregnancy was the most identified (50.8% of respondents), in contrast to other studies that found MTCT during delivery to be the most commonly identified period of MTCT.[22,24,30] Only 27.4% of the respondents knew that ART use during pregnancy, labour/delivery and breastfeeding could reduce MTCT of HIV. However, other similar studies in Ibadan and Sagamu in western region in Nigeria, showed that more respondents knew of ART use in PMTCT than that seen in our study.[32,33] Some studies have also shown poor pregnant women's knowledge of MTCT and PMTCT [1,9,10,12], while some others have shown good knowledge. [23,25,32,34]. This emphasizes the need to strengthen information dissemination and education activities on HIV and prevention of mother to child transmission among women in rural communities.

Ninety (20.3%) respondents in our study perceived themselves to be at risk of contracting HIV. Similar proportions were found in an Indian study where 19.4% of women perceived themselves to be at risk of HIV infection.[35] The finding in this study is higher than that found in another study conducted in Abakaliki (the state capital and an urban area about 20 km away from Igbagu where this study was carried out) in which only 2% of respondents believed they were at high risk of contracting HIV infection.[15] The lower proportion in the Abakaliki study could be because it assessed perception of high or low risk of HIV infection and not the non-categorized risk perception determined from our study. Most of the respondents perceived themselves to be at risk because of distrust for their partner and because their partner had multiple sex partners. On the contrary, the study found out that having only one faithful partner was generally cited as reason for the low risk perception similar to another study conducted in Ebonyi State.[15]. The imperative of antenatal clinic attendance in formal health facilities where health talks can be given to the pregnant women is evident in this study as majority of those who had appropriate infection risk perception were women who received antenatal care from suitably qualified health workers in formal health facilities. It is particularly bothersome that 13.3% of the respondents believe that they can never contract HIV probably due to the low awareness and poor knowledge of HIV transmission and prevention. This re-emphasizes the need for community-wide sensitization on HIV prevention and treatment with male partner involvement in order to promote PMTCT and reduce HIV prevalence in Nigeria.

Self-perceived risk for HIV infection was significantly associated with age groupings occupation, educational status, having discussed risk of HIV infection with someone else, having heard of HCT, having been screened for HIV infection and the HIV screening status of the pregnant women's sex partner. Greater majority of respondents who perceived themselves to be at high risk of HIV infection was found among those more than 40 years old similar to findings from another study carried out in Abakaliki.[15]. As seen in this study, the same study in Abakaliki also found out that women with low educational status see themselves as being at low risk of infection. Women aged 31-40 and above 40 years were more likely to perceive themselves to be at risk of HIV infection, hence giving credence to the growing prevalence of HIV among older age groups of women.[36] Being a seamstress had a 3 fold likelihood of believing that a pregnant woman is at risk of contracting HIV infection. This higher likelihood of risk perception could be because of the use of sharps such as needles, razors and scissors in the course of their work. Studies have also reported on the increased vulnerability of apprentice seamstresses to HIV risk-related behaviours. [37] Pregnant women who had discussed risk of HIV with someone else were about 4 times more likely to know that they were at risk of getting HIV infection. Those whose partners had been screened for HIV were about 4 folds more likely to have such a positive perception of being at risk. Male partner involvement is a priority area for PMTCT of HIV as male partners are significant in women's risk of contracting HIV infection. Women in developing countries often require partner support and consent to access HIV prevention and treatment services. [38] Spousal discussion following partner HIV screening could explain the positive risk perception in women whose partners had screened for HIV.

## CONCLUSION

The findings in this report demonstrate that there were low level of awareness and knowledge on HIV transmission, mother to child transmission and its prevention among pregnant women booking for antenatal care in a rural area of Ebonyi state. Additionally, the perception of being at risk for HIV infection was equally poor and was predicted by age, occupation, and partner's screening status and discussion of risk with someone else. Community-wide engagement and enlightenment on transmission, prevention and treatment of HIV with increased focus on PMTCT should be strengthened and prioritized especially in rural areas. There should be close collaboration with existing community structures/platforms such as religious groups, age grade associations, social and occupational associations to which many of these women belong in order to also reach pregnant women who may not access antenatal care in formal health settings. Advocacy to community men leaders and associations is also important given the role of male partners in women's risk perception and screening for HIV.

## COMPETING INTERESTS

There is no existing competing interest.

## CONSENT

All authors declare that 'written informed consent was obtained from the pregnant women and the health facilities used for this study.

## ETHICAL APPROVAL

Ethical approval to carry conduct this research was sought and obtained from the Research and Ethics Committee of the Federal Teaching Hospital Abakaliki Ebonyi State.

## REFERENCES

1. UNAIDS. Report on the Global AIDS Epidemic. Geneva: Joint United Nations Programme on HIV/AIDS; 2012
2. HIV and AIDS in Nigeria., (Accessed September 3, 2018) Available from: <https://www.avert.org/node/403/pdf>
3. UNAIDS. Report on the Global AIDS Epidemic. Geneva: Joint United Nations Programme on HIV/AIDS; 2013.
4. Joint United Nations Programme on HIV/AIDS (UN- AIDS) (2006) Report on the global AIDS epidemic. [www.unaids.org/en/HIV\\_data/2006GlobalReport/default.asp](http://www.unaids.org/en/HIV_data/2006GlobalReport/default.asp)
5. Federal Ministry of Health of Nigeria (FMOH)/National HIV/AIDS and STI Control Programme (HAST) (2006). The 2005 national HIV seroprevalence sentinel survey. Abuja: FMOH/HAST.
6. USAID. Nigeria country profile (HIV/AIDS). 2003. [www.gov/location/sub-Saharan\\_africa/countries/Nigeria](http://www.gov/location/sub-Saharan_africa/countries/Nigeria)
7. Department of Public Health, National AIDS /STIs Control Programme 2015 FACT SHEET, Federal Ministry of Health, Nigeria. 2014 National HIV Sero-prevalence Sentinel Survey among Pregnant Women Attending Antenatal Clinics in Nigeria.
8. UNAIDS AIDSinfo. Country Fact Sheet, Nigeria 2017
9. UNAIDS, Federal Republic of Nigeria, Global AIDS Response: Country progress report [Online]. Available from [http://www.unaids.org/sites/default/files/country/documents/NGA\\_narrative\\_report\\_2015.pdf](http://www.unaids.org/sites/default/files/country/documents/NGA_narrative_report_2015.pdf) [Accessed 23<sup>rd</sup> June, 2016].
10. Federal Ministry of Health, Nigeria. National HIV/AIDS and Reproductive Health Survey; 2012 NARHS Plus II; June 2013, pp 355-356
11. Nigeria - Demographic and Health Survey [Online] 2013: Pp 223-224. Available from <https://www.dhsprogram.com/pubs/pdf/FR293/FR293.pdf>. [Accessed 5<sup>th</sup> April, 2016].
12. 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.
13. Joint United Nations Programme on AIDS (UNAIDS) HIV Prevention Needs and Successes: A Tale of Three Countries. An Update on HIV Prevention Success in Senegal, Thailand and Uganda, Geneva: 2001.
14. Killewo JZ. Acceptability of voluntary HIV testing with counseling in a rural village in Kagara, Tanzania. AIDS Care. 1998; 10(4): 431-9.
15. Eze NC, Onwasigwe CN. Knowledge of HIV/AIDS Transmission and Risk Perception among Antenatal Care Attendees in Abakaliki, Southeast Nigeria. International STD Research & Reviews 5(1): 1-8, 2017; ISSN: 2347-5196
16. Ebonyi State Government, Nigeria. 2014 Diary. Ministry of Information and State Orientation. 2014.
17. Daniel WW, Chad LE. Biostatistics: a foundation for analysis in the health sciences. 10<sup>th</sup> edition. USA. John Wiley & Sons Inc 2013; 189-190
18. Ojieabu WA, Femi-Oyewo MN, Eze U I. HIV / AIDS. Knowledge , attitude and risk perception among pregnant women in a Teaching Hospital , Southwestern Nigeria
19. Linkage. Questionnaires for Tanzania Integrated PMTCT; baseline community survey. Household adults. Tanzania: Linkages project publications, 2005. <http://www.linkagesproject.org/publications/index.php?series=12>. (Accessed on October 29, 2017).

20. United Nations Population Fund. Country programme of assistance to Nigeria; End line/baseline survey: Questionnaire for health facilities. UNFPA 2008.
21. IBM Corp. IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp 2013
22. Asefa A, Beyene H. Awareness and knowledge on timing of mother-to-child transmission of HIV among antenatal care attending women in Southern Ethiopia : a cross sectional study. 2013;1–8.
23. Umeobika JC, Ezebialu IU, Ezenyeaku CT, Ikeako LC. Knowledge and perception of mother to child transmission of human immunodeficiency virus among South Eastern Nigerian pregnant women. 2013;1(1).
24. Olugbenga-Bello Abakaliki, Adebimpe WO, Osundina FF, Abdulsalam ST. Perception on prevention of mother-to-child- transmission ( PMTCT ) of HIV among women of reproductive age group in Osogbo , Southwestern Nigeria. *International Journal of Women's Health* 2013;5 399–405
25. Adelaja Lamina M. A survey of awareness and knowledge of mother-to-child transmission of HIV in pregnant women attending Olabisi Onabanjo University Teaching Hospital, Sagamu, Nigeria. *Open J Obstet Gynecol.* 2012;2(2):98–105.
26. Ibrahim U, Mohammed M, Farouk Umar I. Assessment of PMTCT knowledge and utilization among pregnant mothers attending Abubakar Tafawa Balewa University Teaching Hospital (ATBUTH) Bauchi, Nigeria. *Sky J Med Med Sci* [Internet]. 2016 [cited 2017 Dec 15];4(1):1–6. Available from: <http://www.skyjournals.org/SJMMS>
27. Majid MD, Farhad MD, Sorour MD, Sc SM. Preventing Mother-to-Child Transmission of HIV / AIDS : Do Iranian Pregnant Mothers Know about it ? 2010;11(1):53–7.
28. Adeniyi K Adeneye, Mafe M, Adejuwon A Adeneye, Kabiru K Salam, William R Brieger, Musbau A Titiloye, et al. Knowledge and perception of HIV / AIDS among pregnant women attending antenatal clinics in Ogun State , Nigeria. *African J AIDS Res.* 2006;5(3):273–9.
29. Abiodun M, Ijaiya MA, Peter A. Awareness and Knowledge of Mother-to-Child Transmission of HIV among Pregnant Women. 2007;99(7):0–5.
30. Harms G, Schulze K, Moneta I, Baryomunsi C, Mbezi P, Poggensee G. Mother-to-child transmission of HIV and its prevention : awareness and knowledge in Uganda and Tanzania Uganda and Tanzania. 2005;2(2):258–66. .
31. Abtew S, Worku Awoke, Anemaw Asrat. Knowledge of pregnant women on mother-to-child transmission of HIV , its prevention , and associated factors in Assosa town , Northwest Ethiopia. *HIV/AIDS - Res Palliat Care.* 2016;8:101–7.
32. Owoaje ET, Omidokun AD, Ige OK, Program MA, States U, Owoaje E. Knowledge and perception of Prevention of Mother to Child services amongst pregnant women accessing antenatal clinic in a Primary Health Care centre in Nigeria. 2012;1–7.
33. Deressa W, Seme A, Asefa A, Teshome G, Enqusellassie F. Utilization of PMTCT services and associated factors among pregnant women attending antenatal clinics in Addis Ababa, Ethiopia. [cited 2017 Dec 15]; Available from: <http://www.biomedcentral.com/1471-2393/14/328>
34. Darak S, Mukta Gadgil, Balestre E, Maitreyee Kulkarni, Kulkarni S, Joanna Orne-Gliemann. HIV risk perception among pregnant women in western India Need for reducing vulnerabilities rather than improving knowledge. *AIDS Care.* 2014;26(6).
35. JefferyW Eaton, Rehle TM, Jooste S, Nkambule R, Kim andrea a, Mahy M, et al. Recent HIV prevalence trends among pregnant women and all women in sub-Saharan africa: implications for HIV estimates. *AIDS.* 2014;28(Suppl 4):S507–14.
36. Ajuwon AJ, Willi McFarland, Hudes ES, Sam Adedapo, Toyin Okikiolu, Peter Lurie. HIV risk-related behavior, sexual coercion, and implications for prevention strategies among female apprentice tailors, Ibadan, Nigeria. *AIDS Behav.* 2002;6(3).
37. World Health Organization. Towards universal access for women, infants and young children and eliminating HIV and AIDS among children. Geneva; 2007.
38. Bajunirwe F, Muzoora M. Barriers to the implementation of programs for the prevention of mother-to-child transmission of HIV: a cross-sectional survey in rural and urban Uganda. [Internet]. Vol. 2, *AIDS research and therapy.* 2005. p. 10. Available from: <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1277814&tool=pmcentrez&rendertype=abstract>