

# Original Research Article

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## 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 perception 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 ~~descriptive~~ study of rural pregnant women.

**Place and Duration of Study:** The study was conducted over 11 months in St Vincent's Mission Hospital and Community Health Practice Centre Nwezenyi, of Igbagu community in 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 interviewer administered questionnaire was used to obtain information from the respondents for the assessment of their knowledge and risk perception of HIV infection as well as predictors of such perceptions. Data analysis was done using SPSS for window version 22 and p-value was set at  $P < 0.05$ .

**Results:** HIV awareness level was 60% among the pregnant women. Less than a quarter (20.3%) claimed that there were not at risk of HIV infection. About half and 36.1% of their spouses had been counseled and tested for HIV respectively. Only 14.2% of the pregnant women had adequate general 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 underscores 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

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a) Brief introduction...  
b) Objective...  
c) Method and Setting  
d) Results  
e) Conclusion

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### 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 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 pregnant women living with HIV. [3] Nigeria accounts for about 10% of all HIV/AIDS cases in the world. [4] Sixty

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

## 2. METHODOLOGY

### 2.1 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 bounded by Cross River State in the East, Abakaliki the Ebonyi State capital in the west, Ikwo Local Government Area in the south and Nnodo community in the north. The community is made up of 4 villages; Ndubia, Ndieta, Amuzu and Ndunkwuda with a combined population of 22,855.[16] People of the community are mainly farmers who grow root and tuber crops as well as grains especially rice, in subsistence capacities. Two health facilities in the community; Community Health Practice Centre Nwezenyi (CHPCN) and St Vincent Hospital Ndubia (SCHN), located in Ndieta and Ndubia respectively, were used for this study. The former facility serves as a Community Health Practice Centre for the training of undergraduate medical student of the State owned Medical School. Resident doctors in Community Medicine of Federal Teaching Hospital Abakaliki (FETHA), undertake their rural postings under the supervision of their consultants in the health facility. The health centre is run and managed by the FETHA where these medical students and resident doctors are trained. St Vincent Hospital Ndubia on the other hand has an ongoing understanding with FETHA such that specialists in different medical subspecialties visit the facility for patient care. Resident doctors of paediatrics as well as obstetrics and gynaecology also undertake some of their postings in the facility under these specialists/consultants. 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 facilities in that category of health care in the state with manpower and infrastructural capacity to offer comprehensive HIV services in a rural community at the time of the study.

### 2.2 Study design

The study was descriptive and of the cross sectional variety. Pregnant women who attended ANC at the health facilities were the participants in the study which lasted for 11 months

### 2.3 Sampling technique

The minimum sample size was determined using the formula for single proportion for infinite population [17] with predetermined adequate knowledge of HIV prevalence of 60%. A total sample size of 443 was obtained after making allowance of 20% non-response/non-response. 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

The two facilities ran two ANC days per week; one for booking and the other for routine ANC visits. From the ANC registers of the respective health facilities, it was ascertained that CHPCN had a monthly booking average of 15 pregnant women while SVHN had an average of 27 per month. Considering these ANC load, 11 months period was planned for recruitment and data collection from the pregnant women. On the average, 165 and 297 (a total of 462), pregnant women were to be booked in CHPCN and SVHN respectively over the period of 11 month. With the assistance of nurse-midwives, 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 proportionately attained (36% : 64% of the calculated sample size for CHPCN and SVHN respectively).

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An interviewer administered structured questionnaire was employed in the collection of information from the recruited pregnant women by trained research assistants which was administered on recruitment of each participant. 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 bothered 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 question meant to elicit their perception of risk HIV infection. Reasons for the pregnant women's perception of such risk levels were also obtained.

#### 2.4 Statistical analysis

SPSS for window version 22 was used for the data analysis.[18] 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 ≤ 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.

### 3. RESULTS AND DISCUSSION

#### 2.1 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%). Greater proportion (62.8%) 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)	

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<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>	<b>HCT</b>	160 (36.1)	337 (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</b>	Take ART as prescribed by health workers	121 (27.3)	322 (72.7)
<b>MTCT during pregnancy</b>	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</b>	Delivery in health facility by skilled birth attendants	94 (21.2)	349 (78.8)
<b>MTCT during labour and delivery</b>	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</b>	Continue ART uninterrupted	102 (23.0)	341 (77.0)
<b>MTCT during breastfeeding</b>	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)

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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%). Less than one fifth (19.9%) of the 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

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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. Among the pregnant women, those in marriage had the greatest proportion 332 (84.4%), of women with inappropriate HIV infection risk perception. The mothers, who never had any form of formal education 65 (89.0%), also contributed the

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139 greatest proportion of those who do not believe they could get infected. However, there was no statistical  
 140 significant relationship between HIV risk perception and the pregnant women's religion and marital status  
 141 ( $P > 0.05$ ). (These are shown on table 3).  
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**Table 3. Relationship between respondent's sociodemographic characteristics and HIV risk perception**

Variable	HIV infection risk perception [Frequency (%)]			$\chi^2(P\text{-value})$
	At risk of infection	Not at risk of infection	Total (N = 443)	
<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	

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 145 Greater proportion of pregnant women who had adequate knowledge of HIV 18 (28,6%) had appropriate  
 146 perception of risk of HIV infection compared to those with inadequate knowledge 72 (18.9%). Conversely,  
 147 those who had inadequate knowledge had a higher proportion of women who were of the view that they

were not at risk of the infection 308 (81.1%). 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%). Similarly, pregnant women whose sex partners never got screened for HIV and those whose partners never shared their screening status had inappropriate HIV infection risk perception. 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, ( $P < 0.001$ ). Statistical significant relationship was also found between risk perception and the HIV screening status of the pregnant women's sex partner ( $P = 0.03$ ). (See table 4)

**Table 4. Relationship between pregnant women's HIV infection risk perception and HIV knowledge/other HIV related issues**

Variable	Perception of risk of HIV infection [Frequency (%)]			$\chi^2$ (P-value)
	At risk of infection	Not at risk of infection	Total (N = 443)	
<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)	13	0.79 (0.27)
No	5 (19.2)	21 (80.8)	26	
<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>				

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**Comment [SO31]:** Please check again

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**Comment [SO33]:**

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	49 (17.3)	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	

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None of the pregnant women had ever 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)

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**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

Comment [SO36]: Repetition

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)



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

Variable	Wald statistics ( $\chi^2$ )	df	P-value	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)

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### 3.2 Discussion

The findings from this study revealed that 302 (68.2%) respondents were aware or had heard of HIV without being prompted. This is in contrast to studies conducted in different parts of Nigeria and Ethiopia which found that 100% of the pregnant and non-pregnant women surveyed were aware of HIV.[19-22] The difference in awareness and knowledge could be because the other studies were conducted in urban areas where the people are more likely to be educated and exposed to information on HIV than in the rural areas. Additionally, this study surveyed only booking clients many of whom may not have been exposed to ANC health talks, 56.5% of whom had no formal or only primary education. This is in contrast to the other studies that surveyed more educated pregnant women who were on routine ANC visits and hence may have been more exposed to information on HIV via ANC health education. The sexual route was the most commonly known route of HIV infection mentioned by 80.4% of the women similar to that seen in other studies.[19-27] It was however disturbing to find that 42% and 63.4% of the respondents did not know that a healthy looking person could be HIV infected and that HIV can be transmitted by unsafe blood transfusion respectively. In contrast, a similar study conducted in Ogun State Nigeria,[28] showed that 85% of the respondents believed a healthy looking person could be HIV-infected. Other studies carried out in Nigerian cities of Osogbo, Sagamu Abakaliki and Awka as well as in Iran showed higher awareness of blood transfusion as a route of HIV infection.[15,20-22,24] Faithfulness to one's partner and non-sharing of sharp instruments were the most commonly identified ways of preventing HIV infection while safe blood transfusion and access to good PMTCT services were the

202 least identified strategy. Although 75.8% of the respondents knew that HIV could be transmitted from mother to child,  
203 there was poor knowledge on the periods of occurrence of MTCT, MTCT reduction strategies and PMTCT services  
204 among the respondents. This could be because of poor general knowledge of HIV as seen in this study and lack of  
205 ANC health talk information on HIV by these booking clients as non-access to ANC health talks have been found to be  
206 associated with reduced knowledge on MTCT of HIV.[19,29] MTCT during pregnancy was the most identified (50.8%  
207 of respondents), in contrast to other studies that found MTCT during delivery to be the most commonly identified  
208 period of MTCT.[19,21,27] Only 27.4% of the respondents knew that ART use during pregnancy, labour/delivery and  
209 breastfeeding could reduce MTCT of HIV. However, other similar studies in Ibadan and Sagamu in western region in  
210 Nigeria, showed that more respondents knew of ART use in PMTCT than that seen in our study.[29,30] Some studies  
211 have also shown poor knowledge of pregnant women of MTCT and PMTCT [1,9,10,12], while some others have  
212 shown good knowledge. [20, 22, 29, 31]. This underscores the need to strengthen information dissemination and  
213 education activities on HIV and prevention of mother to child transmission among women in rural communities.  
214 Ninety (20.3%) respondents in our study perceived themselves to be at risk of contracting HIV. Similar proportions  
215 were found in an Indian study where 19.4% of women perceived themselves to be at risk of HIV infection.[32] The  
216 finding in this study is higher than that found in another study conducted in Abakaliki (The state capital and an urban  
217 area about 20 km away from Igbagu where this study was carried out) in which only 2% of respondents believed they  
218 were at high risk of contracting HIV infection.[15] The lower proportion in the Abakaliki study could be because it  
219 assessed perception of high or low risk of HIV infection and not the non-categorized risk perception determined from  
220 our study. Most of the respondents perceived themselves to be at risk because of distrust for their partner and  
221 because their partner had multiple sex partners while having only one faithful partner was generally cited as reason for  
222 the low risk perception similar to another study conducted in Ebonyi State.[15]. The imperative of antenatal clinic  
223 attendance in formal health facilities where health talks can be given to the pregnant women is evident in this study as  
224 majority of those who had appropriate infection risk perception were women who received antenatal care from suitably  
225 qualified health workers in formal health facilities. It is particularly bothersome that 13.3% of the respondents believe  
226 that they can never contract HIV probably due to the low awareness and poor knowledge of HIV transmission and  
227 prevention. This re-emphasizes the need for community-wide sensitization on HIV prevention and treatment with male  
228 partner involvement in order to promote PMTCT and reduce HIV prevalence in Nigeria.

229 Self-perceived risk for HIV infection was significantly associated with age groupings occupation, educational status,  
230 having discussed risk of HIV infection with someone else, having heard of HCT, having been screened for HIV  
231 infection and the HIV screening status of the pregnant women's sex partner. Greater majority of respondents who  
232 perceived themselves to be at high risk of HIV infection was found among those more than 40 years old similar to  
233 findings from another study carried out in Abakaliki.[15]. As seen in this study, the same study in Abakaliki also found  
234 out that women with low educational status see themselves as being at low risk of infection. Women aged [31-40] and  
235 above 40 years were more likely to perceive themselves to be at risk of HIV infection, hence giving credence to the  
236 growing prevalence of HIV among older age groups of women.[33] Being a seamstress had a 3 fold likelihood of  
237 believing that a pregnant woman is at risk of contracting HIV infection. This higher likelihood of risk perception could  
238 be because of the use of sharps such as needles, razors and scissors in the course of their work. Studies have also  
239 reported on the increased vulnerability of apprentice seamstresses to HIV risk-related behaviours. [34] Pregnant  
240 women who had discussed risk of HIV with someone else were about 4 times more likely to know that they were at  
241 risk of getting HIV infection. Those whose partners had been screened to HIV were about 4 folds more likely to have  
242 such a positive perception of being at risk. Male partner involvement is a priority area for PMTCT of HIV as male  
243 partners are significant in women's risk of contracting HIV infection. Women in developing countries often require  
244 partner support and consent to access HIV prevention and treatment services. [35,36] Spousal discussion following  
245 partner HIV screening could explain the positive risk perception in women whose partners had screened for HIV.

#### 246 247 4. CONCLUSION

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

**Comment [SO38]:** The discussion was too long  
It is better to take only the paitnent and important  
finding and talk about it HOW THIS STUDY WILL  
IMPROVE UPON THE AWARENESS OF HIV IN  
THE RURAL SETTING . Please stop talking about  
some of the answer provided by your participant that  
cannot be verify.. such as blood transfussion in  
nigeria where Malaria is very common before the  
advent of HIV blood transfussion were very common  
just because they are HIV nagative does not mean  
there were no blood transfussion in the past.

## 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 (WHERE EVER APPLICABLE)

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.

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