World Journal of Preventive Medicine, 2015, Vol. 3, No. 3, 73-83
Available online at http://pubs.sciepub.com/jpm/3/3/4

DOI:10.12691/jpm-3-3-4

Knowledge on HIV/AIDS and Sexual Risk Behaviour among Pregnant Women in Gwagwalada Area Council of Abuja, Nigeria

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Received May 31, 2015; Revised July 15, 2015; Accepted July 31, 2015

Abstract **Background**: HIV/AIDS sexual risk taking is often related to lack of knowledge about HIV and its modes of transmission. We obtained information on the level of HIV knowledge and sexual risk behaviour from women in Gwagwalada Area Council (GAC) of Abuja in order to assess the influence of HIV knowledge, or lack of it, on their sexual behaviour. **Methods**: Four hundred and twenty women attending ante-natal clinics in GAC were selected and interviewed from the three levels of health care, using total sampling approach. Data was collected on their level of HIV knowledge and sexual risk behavior using semi-structured pretested questionnaire. The respondents HIV status was obtained from ante-natal record where available, or tested for HIV where not available. Data was analysed using Epi-info version 6.04. **Findings:** Majority of the women were aged between 20- 34 years and most (96.2%) were married. Over 84% had some form of formal education with 64.1% attaining post-primary education. General awareness about HIV was high (94.8%). Knowledge on modes of HIV transmission was also high with 82.8% aware that transmission could occur through unprotected sexual intercourse. About 56.1% and 82.4% were aware that homosexuality and multiple sexual partnerships respectively were risky behaviours. The earliest age at first sexual intercourse was 9 years and 9% had experienced sex by age 14, but majority (66.7%) first experienced sex between 15 and 20 years. Nearly half (49.5%) had premarital sex and 4.8% had sex outside marriage (extramarital sex). Sex before marriage was significantly more common among women with higher level of education ($X^2 = 14.61$, $p = 0.000$), who married late (≥30 years) and who had ever used condom ($X^2 = 28.64$, $p = 0.000$). Only 37% had ever used the condom while 38.6% had multiple sexual partners. About 45% were aware that HIV-infected persons may look and feel quite healthy while 36% believed that they always look and feel ill. Respondents who knew that HIV infected persons may feel and look healthy were significantly more likely to use condom ($X^2 = 10.03$, $p = 0.007$). The high HIV/AIDS knowledge level did not translate to low involvement in premarital sex or high condom use, nor did it result to reduced HIV prevalence among this group. **Conclusion/recommendation:** Knowledge on HIV/AIDS was high but sexual risk behaviours persisted in spite of the high knowledge. Control programs should redirect efforts at sexual behaviours that put women at greater risk of infection and also target young adolescents before sexual debut. Formal and HIV education are key to such efforts.

Keywords: *antenatal, HIV knowledge, sexual risk behavior, HIV/AIDS, pregnant women*

Cite This Article: Aboh O. Otokpa, Taiwo. O. Lawoyin, and Michael C. Asuzu, "Knowledge on HIV/AIDS and Sexual Risk Behaviour among Pregnant Women in Gwagwalada Area Council of Abuja, Nigeria." *World Journal of Preventive Medicine*, vol. 3, no. 3 (2015): 73-83. doi: 10.12691/jpm-3-3-4.

1. Introduction

Since Acquired Immune Deficiency Syndrome (AIDS) was first recognized in 1981 in the United States of America (USA) among homosexual men [1], the spread of Human Immunodeficiency Virus (HIV) has continued to be strongly associated with sexual intercourse. Sexual transmission is by far the most common mode of transmission accounting for approximately 70-80% of transmissions globally, and heterosexual intercourse is the primary mode of infection worldwide. However, the probability of becoming infected via sexual intercourse depends on the likelihood of unprotected sex with an infected partner; therefore sexual behaviour patterns and the background prevalence of HIV are of major importance [2,3,4].

Sexual intercourse may be defined as any activity that involves causing or experiencing pleasurable feelings in the body, usually centred on the penis or vagina, especially the activity of a man putting his penis into a woman's vagina. It may occur between individuals of the same sex (homosexuality), or of opposite sexes (heterosexuality) or with both sexes (bisexuality). Sexual contact may be through the vagina, anus or mouth (oral) [5].

HIV is more likely to be acquired or transmitted by unprotected (i.e. without condom use) anal intercourse (penis in anus) than other sexual activities. It is also more likely to be transmitted to the receptive partner than the insertive partner in both vaginal (8/10,000 exposures) and anal (138/10,000 exposures) intercourse [6,7,8]. Thus, women are more vulnerable to HIV infection because they are more often the receptive partners, especially in sub-Saharan Africa.

The risk of acquiring HIV by performing oral sex (oral-genital contact) on a man (fellatio) is lower than the risk of acquiring it through vaginal and anal sex. Similarly, the risk of acquiring HIV by performing oral sex on a woman (cunnilingus) is lower than the risk of acquiring it through vaginal or anal sex. Therefore for both men and women the risk of acquiring HIV after oral sex is extremely low. There is little or no chance of acquiring or transmitting HIV through sexual activities that do not involve direct contact with semen, pre-ejaculatory fluids, vaginal or cervical secretions or blood with mucous membrane or open wounds. Dry kissing, touching, stroking, massage (body rub), and masturbation (alone or with a partner) do not transmit HIV. Also, all sexual activities when both partners are monogamous and known (by testing) to be uninfected with HIV are safe [2,5].

In sub-Saharan Africa heterosexual intercourse remains the predominant mode of HIV transmission, accounting for between 80-90% of total transmissions [9]. However, in Mauritius, Kenya, Zanzibar and Tanzania injecting drug use (IDU) is now a significant factor in the HIV epidemics. Also recent studies have shown high levels of HIV infection (40%) among men who have sex with men in Kenya and South Africa [4,10]. Other means of transmission of HIV include direct exposure to infected blood or blood products (e.g. blood transfusion, injection with contaminated needles and syringes, injecting drug use, needle-stick injury, scarification, tattoo marks, etc) and mother-to-child transmission (MTCT) during pregnancy, delivery and breastfeeding [3].

Different preventive measures can decrease transmission risk. For example, taking antiretroviral drugs can reduce the risk of an HIV-infected person transmitting the infection to another by as much as 96% and it is believed that consistent preventive use of condoms can reduce the risk of getting or transmitting HIV by about 80%. It has also been observed that using both condoms and antiretroviral therapy reduces the risk of HIV acquisition from sexual exposure by 99.2%. Conversely, having a sexually transmitted infection or a high level of HIV virus in the blood (which happens in early and late-stage infection) may increase transmission risk [2,6,7].

Awareness of HIV and AIDS is generally high in Nigeria (93.8%) but correct knowledge of all the routes of transmission and two methods of prevention have remained low (54% and 52.5% respectively) [11]. Also, there is relative dearth of literature on pregnant women and HIV/AIDS in relation to sexual behaviour in Nigeria. Very few studies have tried to identify the socio-demographic and sexual behavioural factors that place women at increased risk of acquiring HIV/AIDS. This study thus seeks to identify gaps in the knowledge of HIV/AIDS among pregnant women in the study area which could be explored to educate women on preventive measures, add to information available and provide the quality of data needed for informed decision making and planning by local and national authorities for intervention. We will also seek to determine the influence of HIV knowledge on risky sexual behaviour.

2. Methods and Materials

2.1. The Study Area

The study was carried out in five health facilities spread across Gwagwalada Area Council (GAC), which is one of the six area councils in Abuja, the Federal Capital Territory (FCT) of Nigeria.

GAC is located along Lokoja – Kaduna express road and is accessible by road from any direction of the federation. It has a land area of 1,043 km^2 and an estimated population of 157,770 people (population census 2006). It is the second largest area council in FCT after Abuja Municipal Area Council (AMAC). GAC consists of Gwagwalada town and five traditional communities namely Paiko, Zuba, Gwako, Ibwa and Dobi. The main resident ethnic groups are Gwari, Gbagi, Bassa, Gade and Hausa. A cross section of Nigerians now resides in the area council which has experienced a very rapid population growth over the years; most of them are seeking employment opportunities and greener pastures in business and other economic ventures. GAC currently has 18 Primary Health Centres, one secondary health facility and one tertiary hospital.

2.2. The Study Population

The study participants consisted of pregnant women attending selected government-owned health institutions in GAC, namely University of Abuja Teaching Hospital (UATH), the Township Clinic in Gwagwalada and three primary healthcare clinics (PHC) located at Kutunku, Tunga-maje and Zuba. The criteria for selection of participants were (1) that the respondent was pregnant (2) registered in antenatal clinic (ANC) of one of the designated health facilities, (3) resident in GAC and (4) has given informed consent to participate. Pregnant women who did not meet these criteria were considered ineligible for the study.

2.3. Study Design

The study was a descriptive cross-sectional survey to assess HIV knowledge and sexual risk behaviour of pregnant women attending antenatal clinics in Gwagwalada Area Council of Abuja.

2.4. Sample Size

All antenatal clients attending the designated health facilities during the study period made up the sample size. Using the Kish and Leslie formula [12] the maximum required sample size was determined using a prevalence of 50% (since the prevalence of the various sexual risk behaviours was not known) and a precision of 0.05.

$$\mathbf{N} = \frac{Z^2 P(1-P)}{\mathbf{d^2}}$$

Where: N = sample size**;** Z = standard normal deviate for the required level of confidence (using 1.96 for 95% confidence); P = proportion in the target population of the characteristics being measured; since proportion was unknown, let p = 0.5 (for largest sample size); d = precision (0.05).

Substituting: $N = (1.96)^2 \times 0.5 \times 0.5 / (0.05)^2 = 382.2$, but increased to 420 to compensate for non-response.

2.5. Sampling Procedure

Government owned health facilities in Gwagwalada Area Council were grouped into tertiary, secondary and primary health facilities. The University of Abuja Teaching Hospital, the only tertiary facility in GAC was selected, together with the Township Clinic, a comprehensive health centre whose function was very close to that of a secondary health facility as there was no government owned secondary health facility in GAC. Three primary health clinics were randomly selected from a list of 18 PHC clinics in GAC. The total sampling method was used. The number of respondents obtained from each health facility was proportional to the annual attendance recorded the previous year.

2.6. Data Collection Method

In each antenatal clinic, a careful explanation of the purpose, content and implications of the research (study) was given to the attendees (individually or in a group) and informed consent obtained. Subsequently, self-administered questionnaires were distributed to the clients for response. If the client was illiterate, she was assisted by a trained assistant who was vast in her local language. The HIV status of the respondent was obtained (from her antenatal card or folder) and recorded on the corresponding questionnaire. Where HIV screening was not routinely required as part of the antenatal care, as was the case in all the PHC clinics, blood samples were obtained with sterile needles/syringes and the screening test (ELISA) performed and paid for by the researcher. Routine HIV testing was part of the antenatal care in the UATH and the Township clinic. The process of data collection was confidential as the questionnaires bore no names and the HIV results were extracted by the researcher, the attending medical doctors (UATH) and the responsible nurse/midwives.

2.7. Validity

In order to ensure valid responses the questionnaire contained mainly structured questions with a few carefully selected open-ended questions. To reduce interviewer bias and errors research assistants were adequately trained on the meaning and mode of administering the questions. Client selection from all three levels of health care helped to minimize selection bias. The questionnaire was pretested in Kubwa General Hospital, which served a women population that was similar in relevant characteristics to the women population in GAC, and necessary adjustments made.

2.8. Ethical Considerations

Permission for the study was formally sought and obtained from the Medical Research Ethics Committee of UATH and the PHC Coordinator (a medical officer) of Gwagwalada Area Council. Informal permission was also obtained from the heads of the various health facilities used for the study. Informed consent was routinely sought and obtained from all respondents.

2.9. Data Analysis

Data clearing and editing was done manually and using the computer. Identified errors and omissions were checked against the original questionnaire and corrected. Data analysis was done using Epi Info version 6.04.

Data summaries (frequencies, proportions, percentages, and means) of relevant variables were generated. The Chi-Square test was used to test associations between variables at the 5% level of significance.

3. Results

All four hundred and twenty questionnaires were carefully checked, edited and data analysed. No mother declined participation. Majority of the respondents (66.4%) attended the University Teaching Hospital, while 25.2% were interviewed at the FCDA Town Clinic. The rest (8.4%) were from the three PHC Clinics.

Table 1. Distribution of Respondents According to Personal Characteristics (n = 420)

Characteristic	*No. of respondents and (%)*
Age (yrs)	
≤ 19	24 (5.7)
20-34	353 (84.1)
≥35	43 (10.2)
Marital status	
Married	404 (96.2)
Single	10 (2.4)
Divorced	6 (1.4)
No. of wives in household	
One	353 (84.1)
Two	50 (11.9)
Three	14 (3.3)
Four	3 (0.7)
Education	
Secondary or more	269 (64.1)
Primary	85 (20.2)
No formal education	66 (15.7)
Religion	
Christianity	275 (65.5)
Islam	143 (34.0)
Others	2 (0.5)

The socio-demographic characteristics of the respondents are as shown in Table 1. Majority of the respondents were between the ages of 20 and 34 years, representing 84.1%. The youngest respondent was thirteen years and the oldest was forty-six years. Almost all the respondents were married (96.2%), with majority (38.1%) marrying between 20 and 24 years. Four respondents married as early as twelve years. About 96.8% of the respondents were living with the owners of their

pregnancies at the time of the study. Only 3.2% lived alone.

About eighty-four percent of respondents were the only wives of their husbands (monogamous family), while 16.4% were married to husbands who had two to four wives (polygamous families). Most of the polygamous homes (74.6%) had two wives. About 15.7% of all respondents had no formal education at all. Nearly two-thirds (64.1%) had at least secondary level education with 26.9% attaining tertiary education. Majority of the mothers (65.5%) were Christians and at least one mother was an atheist.

Table 2. Awareness about HIV/AIDS (n = 420)

Awareness level	Yes	No	Does not know
Know about or has heard about HIV/AIDS	398 (94.8%)	20 (4.8%)	2 (0.4%)
Perceived cause of AIDS			
Virus	219 (52.1)	130 (31.0)	71 (16.9)
Bacteria	15 (3.6)	270 (64.3)	135 (32.1)
Worms	7 (1.7)	297 (70.7)	116 (27.6)
Is there a cure for HIV/AIDS	63 (15.0%)	246 (58.6%)	111 (26.4%)
HIV infected person may look and feel healthy	140 (33.3)	225 (53.6)	55 (13.1)

General awareness about the existence of HIV/AIDS was high (Table 2). Three hundred and ninety eight (94.8%) respondents said they knew or had heard about HIV/AIDS. More than half of them (52.1%) said AIDS was caused by a virus while 3.6% and 1.7% believed that the disease could be caused by bacteria and worm respectively. About 58.6% of respondents believed there was no cure for HIV/AIDS. However, as many as 111 (26.4%) did not know whether or not there was a cure. Sixty-three (15.0%) respondents felt that AIDS could be cured. Nearly half of the respondents (53.6%) believed that a person infected with HIV invariably looks and feels sick but one-third (33.3%) believed he/she could look and feel healthy. Further analysis showed that women who had higher educational level (secondary or higher education) were more likely to have higher knowledge level on HIV/AIDS than those with low education (primary or none), 64.0% and 36.0% respectively.

Table 3. Knowledge about HIV Transmission and Prevention (n = 420)

Modes of transmission/Prevention	Yes	No	I Don't Know
Unprotected sexual intercourse	348 (82.8%)	25 (6.0%)	47 (11.2%)
Blood transfusion	374 (89.0%)	14 (3.4%)	32 (7.6%)
Breastfeeding	261 (62.2%)	82 (19.5%)	77 (18.3%)
Contaminated needles/syringes	344 (81.9%)	24 (5.7%)	52 (12.4%)
Via cutleries used by AIDS patient*	79 (19.1%)	231 (55.8%)	104 (25.1%)
Casual kissing	105 (25.0%)	198 (47.1%)	117 (27.9%)
Homosexual contact**	230 (56.1%)	53 (12.9%)	127 (31.0%)
Mother to child in the womb	318 (75.7%)	39(9.3%)	63 (15.0%)
Barber's clippers	332 (79.0%)	24 (5.7%)	64 (15.3%)
Sharing razor blade	346 (82.4%)	21 (5.0%)	53 (12.6%)
Multiple sexual partners	346 (82.4%)	22 (5.2%)	12.4%)
Prevention methods:			
Use of condom during sex	277 (66.0%)	73 (17.4%)	70 (16.6)
Abstinence from sex	283 (67.4)	78 (18.6%)	59 (14.0%)
Faithfulness to one sexual partner	355 (84.5%)	52 (12.4%)	13 (3.1%)

*6 (1.4%) did not respond
**10 (2.4%) did not respond

Knowledge on modes of HIV transmission was high (Table 3). Majority of the respondents knew that HIV transmission could occur through unprotected sexual intercourse (82.8%), blood transfusion (89.0%), breast-feeding (62.2%), contaminated needles and syringes (81.9%), homosexuality (56.1%), many sexual partnerships (82.4%) and from a mother to her unborn child (75.7%). Most respondents also believed that HIV could be acquired through shared instruments like the barber's clippers (79.0%) and razor blade (82.4%). Over sixty percent of respondents said that the use of condom (66.0%) and abstinence from sex (67.4%) could protect against HIV transmission. Faithfulness to one uninfected sexual partner was identified as a means of preventing transmission by 84.5% of the respondents.

The earliest age at first intercourse was nine years and the earliest age at first marriage was twelve years (Table 4). Thirty-eight respondents (9.0%) had experienced sex by the age of fourteen while three-quarters had experienced sex by the age of 20 years. The mean age at first sexual intercourse was 18.8 $\pm$ 4.0 (median age 18 years) and the mean age at first marriage was 22.2 $\pm$ 4.3 (median age 22 years). Majority of the respondents (89.0%) got married between the ages of fifteen and twenty-nine, with more than half of these marrying between eighteen and twenty-three. Only 23 (5.5%) married after attaining the age of

thirty. The mean age at first marriage was significantly higher than the mean age at first sexual intercourse (F-statistics 140.77, p = 0.001).

Table 4. Distribution of Sexual (risk) Behaviour (n = 420)

Risk behaviour	Number of Respondents (%)	
Age at first intercourse		
9 - 14	38 (9.0)	
15 - 20	280 (66.7)	
21 - 26	80 (19.1)	
27 - 33	22 (5.2)	
Age at first marriage		
≤ 14	23 (5.5)	
15 - 19	106 (25.2)	
20 - 24	161 (38.3)	
25 - 29	107 (25.5)	
≥ 30	23 (5.5)	
Risk behaviour	Number of respondents and percent	
	Yes	No
Pre-marital sex	208 (49.5)	212 (50.5)
Extra-marital sex*	20 (4.8)	398 (95.2)
Multiple sex partners	162 (38.6)	258 (61.4)
Condom (ever use)	157 (37.4)	263 (62.6)
Has married more than once*	36 (8.6)	382 (91.4)

*2 mothers did not respond

Two hundred and eight (49.5%) respondents were sexually experienced before marriage, while 212 (50.5%) reportedly married as virgins. When data was stratified by age, mothers who married late (≥30 years) were more likely to have had premarital sex (x^2 = 37.45, df = 4, p = 0.001)); and when further stratified by religion, Christian mothers were significantly more likely to have experienced sex before marriage (x^2 = 20.4, df = 3, p = 0.001). Twenty (4.8%) respondents had sex outside matrimonial home, while 398 (95.2%) did not and two gave no response. Eight (40%) of those who had sex outside marriage did so only once, the rest (60%) did so more than once. Over seventy-four percent of them never used condom anytime during the extramarital affair. Two hundred and fifty-eight (61.4%) respondents had only one sexual partner in their life so far, while 162 (38.6%) had more than one. Of the 162 respondents who had more than one, 15 (9.2%) had over four partners. Over sixty-two percent of women interviewed had never used a condom before while thirty-seven percent had used. Majority of the respondents (91.4%) married only once so far, while 36 (8.6%) had married more than once in their lifetime. Of the respondents who married more than once 29 (6.9%) married twice, 6 (1.4%) married thrice while one had married more than three times. Two women gave no response to this question.

Table 5. Sexual Risk Behavior and Educational Level

Risk behaviour	*Educational level*			*Total*	*Statistic*
	No formal education	**Low (primary) educationn**	**High (secondary or more)**		
Age at First Marriage (years)*					
11-20	52 (82.5%)	58 (70.7%)	69 (26.0%)	179	X^2 = 96.98 Df = 4 P = 0.000
21-30	11 (17.5%)	24 (29.3%)	185 (69.8%)	220	
≥ 31	0 (0.0%)	0 (0.0%)	11 (4.2%)	11	
Total	63	82	265	410	
Premarital sex					
Yes	24 (36.4%)	32 (37.6%)	152 (56.5%)	208	X^2 = 14.61 Df = 2 P = 0.000
No	42 (63.6%)	53 (62.4%)	177 (43.5%)	212	
Total	66	85	269	420	
Extramarital sex**					
Yes	3 (4.5%)	6 (7.1%)	11 (4.1%)	20	Df = 2 P-value = 0.520
No	63 (95.5%)	78 (92.9 %)	257 (95.9%)	398	
Total	66	84	268	418	
Number of wives in the household					
Monogamous	49 (74.2%)	63 (74.1%)	241 (89.6%)	353	X^2 = 16.18 Df = 2 P = 0.000
Polygamous	17 (25.8%)	22 (25.9%)	28 (10.4%)	67	
Total	66	85	269	420	
Ever used condom					
Yes	13 (19.7%)	18 (21.2%)	126 (46.8%)	157	X^2=28.64 Df = 2 P-value = 0.000
No	53 (80.3%)	67 (78.8%)	143 (53.2%)	263	
Total	66	85	269	420	

*10 mothers did not respond

** Two mothers did not respond

Table 5 shows that the higher the educational status of respondents the greater the likelihood of delaying marriage till later in life. Fifty-two (82.5%) out of 63 respondents who had no education at all and 58 (70.7%) out of 82 respondents with only primary level education married early, between 11 and 20 years. None was unmarried by 31 years. However, only 69 (26.0%) out of 265 respondents with higher education (at least secondary level education) married early while 4.2% of them married after 30 years. Sex before marriage was highest amongst respondents with high education. While 56.5% of respondents with at least secondary level education experienced sex before marriage, only 36.4% without formal education and 37.6% with low (primary level) education did so. However attainment of high level of education was not significantly associated with involvement in extra-marital affairs (P=0.520). The higher the educational level the less likely to marry into polygamous home. Seventeen (25.8%) of 66 respondents who had no formal education married into polygamous

homes, while only 10.4% of 269 respondents with a high level of education also married into polygamous homes. Lack of education and polygamous marriage were statistically associated, with X^2 = 16.18, p = 0.000. Condom use increased as the level of education increased. Only 13 (19.7%) out of 66 respondents without formal education used condom while 126 (46.8%) out of 269 respondents with high education used condom.

Table 6. Assessment of How the Respondent Would React if Her Sexual Partner Was Found to Have STI (n=420)

Respondent's reaction to partner with STI	Number of respondents and %	
	Yes	No
Can propose the use of condom	248 (59.0)	172 (41.0)
Can refuse to have sex with him	268 (63.8)	152 (36.2)

A good number of the respondents seem to be empowered enough to take independent decisions on health issues affecting them (Table 6). Fifty-nine percent said they could propose the use of condom to their partners if they had STI, while 41.0% said they could not. Similarly, 63.8% of the respondents said they could refuse sex altogether if their sexual partners were discovered to have sexually transmitted infection (STI), while 36.2% said they could not.

Table 7 on condom use shows that mothers who indulged in sex before marriage were more likely to have ever used the condom. One hundred and nineteen (57.2%) out of 208 women who had sex before marriage had used the condom as against only 38 (17.9%) of 212 women who did not engage in sex before marriage. There was a statistical significance between premarital sex and condom use. Mothers who married late were more likely to have ever used the condom. Sixteen (66.6%) out of 24 mothers who married in their thirties compared to only two (12.5%) who married before the age of 15 years had used the condom. Only 26.4% of mothers who had one lifetime partner had ever used the condom compared with 54.9% of mothers who had more than one partners. Multiple sexual partnership was significantly associated with the use of condom. Respondents who believed in the efficacy of the condom were more likely to use it. Ninety-five (41.9%) of the respondents who reported that condom could protect against HIV used condom, while only 36.8% of those who did not and 25.0% of those who had no opinion on the issue used condom. There was a statistical association between belief in condom efficacy and its use.

Table 7. Condom Use

Sexual behavior/other variables	Ever use of condom		Total	Statistic
	Yes	No		
Premarital sex				
Yes	119 (57.2%)	89 (42.8%)	208	X^2 = 69.23 Df = 1 P = 0.000
No	38 (17.9%)	174 (82.1%)	212	
Total	157	263	420	
Age at first marriage (years).				
< 15	3 (12.5%)	21 (87.5%)	24	X^2 = 15.03 Df = 2 P= 0.000
15 – 29	140 (37.6%)	232 (62.4%)	372	
≥ 30	16 (66.6%)	8 (33.4%)	24	
Total	159	261	420	
Number of lifetime sexual partners.				
One	68 (26.4%)	190 (73.6%)	258	X^2 = 34.73 Df = 1 P = 0.000
More than one	89 (54.9%)	73 (45.1%)	162	
Total	157	263	420	
Condom can protect against HIV infection				
Yes	95 (41.9%)	132(58.1%)	227	X^2 = 7.7 Df = 2 P = 0.020
No	43 (36.8%)	72(63.2%)	117	
I don't know	19 (25.0%)	57 ((75.0%)	76	
	157	263	420	
Religion*				
Christianity	133 (48.4%)	142 (51.6%)	275	X^2 = 45.47 Df = 2 P = 0.000
Islam	22 (15.4%)	121 (84.6%)	143	
Traditional	1 (100%)	0	1	
Total	156	263	419	
HIV infected person can look and feel healthy				
Yes	64 (45.7%)	76 (54.3%)	140	X^2 =10.03 Df = 2 P-value = 0.007
No	81(36.0%)	144 (64.0%)	225	
I don't know	12 (21.8%)	43 (78.2%)	55	
Total	157	263	420	

*One atheist.

Christians were significantly more likely to use condom than Moslems and traditionalists. One hundred and thirty-three (48.4%) out of 275 Christians used condom as against 22(15.4%) out of 143 Moslems. Relationship between religion and the use of condom was statistically significant (p = 0.000). Respondents who knew that an HIV infected person can look and feel healthy were significantly more likely to use condom (p = 0.007). Sixty-four (45.7%) respondents who said an HIV infected person could look and feel healthy used condom as against 36.0% of those who felt otherwise and 21.8% of those who had no opinion on the issue.

Table 8. HIV Status by Health Institution

Health Institution	Number of Respondents				Prevalence (%)
	Total no. of Respondents	Number positive	Number negative	Not determined	
UATH	279	5	190	84	2.6
G. T. Clinic	106	0	71	35	0.0
PHC Kutunku	21	2	14	5	12.5
PHC T/maje	8	3	5	0	37.5
PHC Zuba	6	2	4	0	33.4
Total	**420**	**12**	**284**	**124**	**100%**

In all, twelve respondents (2.8%) were HIV positive, while 284 (67.6%) were negative. The status of one hundred and twenty-four (29.5%) had not yet been determined during the time of the study. Since twelve were found positive out of 296 determined cases, the HIV prevalence in this study was 4.1% (Table 8).

Table 9. Relationship between sexual behaviour and HIV Status

Sexual behaviour	HIV status		Total	Statistic
	Positive	Negative		
Premarital sex				
Yes	4 (2.7%)	142 (97.3%)	146	Yates corrected p = 0.40
No	8 (5.3%)	142 (94.7%)	150	
Total	12	284	296	
Extramarital Sex				
Yes	1 (9.1%)	10 (90.9%)	11	Fisher exact p = 0.37
No	11 (3.9%)	274 (96.1%)	285	
Total	12	284	296	
Age at sexual debut (years)				
9 – 14	5 (20.0%)	20 (80.0%)	25	P-value = 0.00
15 – 19	3 (1.8%)	166 (98.2%)	169	
20 – 24	2 (3.0%)	65 (97.0%)	67	
≥25	2 (5.7%)	33 (94.3%)	35	
Total	12	284	420	
Number of life-time sexual partners				
One	7 (3.8%)	177 (96.2%)	184	P-value = 0.78
More than one	5 (4.5%)	107 (95.5%)	112	
Total	12	284	296	
Number of wives in family				
One	9 (3.6%)	239 (96.4%)	248	P = 0.66 (Yates corrected)
More than one	3 (6.3%)	45 (93.7%)	48	
Total	12	284	296	
Have you Ever used a Condom				
Yes	0 (0.0%)	110 (100%)	110	Fisher exact p-value = 0.03
No	12 (6.5%)	174 (93.5%)	186	
Total	12	284	296	

Statistical analysis in relation to HIV status was based on the number of respondents whose HIV status was determined only (Table 9). Four respondents (2.7%) who had premarital sex were HIV positive and eight respondents who did not experience sex before marriage were also HIV positive. There was no statistically significant relationship, in this study, between premarital sex and HIV infection (p = 0.4, Yates corrected).

One out of eleven (9.1%) respondents who engaged in extramarital sex was HIV positive and eleven out of 285 respondents (3.9%) who did not engage in extramarital sex were also positive. Women who indulged in

extramarital sex had a higher relative prevalence of HIV infection. However, there was no statistically significant association (p = 0.37) between extramarital activities and HIV infection. Mothers who reported having sexual experience early in life (9-14 years) were more likely to be HIV positive. Five (41.7%) of the 12 seropositive respondents were sexually active very early in life, before the age of 15. In contrast, only four (3.9%) out of 102 mothers who had sex between the ages of 15 to 20 years were seropositive. The relationship was statistically significant, indicating that early sexual debut is associated with high HIV risk. Seven (3.8%) out of one hundred and eighty-four women who had only one life-time sexual partner were HIV positive while only five (4.5%) out of one hundred and twelve respondents who had two or more partners were positive. Multiple sexual partnership was not, curiously, associated with increased HIV infection in this study. Nine out of 248 respondents from monogamous families, representing 3.6%, were HIV positive while 3 (6.3%) out of 48 from polygamous families were also positive. There was however no statistically significant association between the number of wives in a family and HIV status in this study.

None of the 110 respondents who used condom was HIV positive. All 12 mothers who were HIV positive had never used a condom. This result showed a statistically significant association between non-use of condom and HIV acquisition, and the protective effect of condom.

4. Discussion

This study was carried out over a reasonable time period and the data collection was spread across the length and breadth of the area council using both urban and rural settlers attending ante-natal clinics in tertiary, secondary and primary health institutions. The results obtained are therefore generaliseable to the Gwagwalada Area Council and by extension the whole of the FCT. The results presented represent the level of knowledge about HIV/AIDS and the sexual behaviour of female residents of the area council. The results are also comparable with findings from other studies in Nigeria and some African countries.

4.1. Sociodemographic Characteristics

The ages of the respondents ranged between 13 and 46 years. Majority of the respondents in this study were married. Most of the respondents married early, at about the age of 20 years. However, four respondents married as early as twelve years, while two married as late as 35 years, which was the oldest age at marriage in this study. Majority of the marriages (83.6%) were monogamous. The rest were in polygamous marriages with four respondents married to polygamous families of four wives each.

About 84.3% of the women had some form of education with 64.1% attaining post-primary education. This was close to the findings of the Federal Ministry of Health (FMOH) of Nigeria in 2010 which reported a literacy level (any form of education) of 87.9% among women in Nigeria [11]. However, attainment of higher education (at least secondary level) in the northern part of Nigeria, where this study was conducted, was much lower than in the south. In this study, two-thirds of the respondents were clearly literate, having attained either a secondary or post-secondary education. This literacy level was much lower than observed by Olayinka and Osho in a study conducted to assess change in attitude, sexual behaviour and risk of HIV/AIDS in south western Nigeria where 90% of the women reportedly attained secondary or tertiary education [9,11]. Majority of the uneducated respondents were FCT indigenes interviewed at the rural PHC clinics. It has been observed that none or low education is a risk factor for HIV infection because poorly educated women have lower knowledge on HIV/AIDS, are less likely to use condom and marry early in life. They are also more likely to marry into polygamous homes and are not empowered enough to decide on sexual issues (like family planning/condom use when necessary); and therefore have higher HIV infection rates [13-18]. Education is believed to be the most effective social intervention against HIV [19]. These assertions were corroborated by the findings of this study which showed that respondents with little (primary) or no education had higher HIV prevalence (7.8%) than well educated respondents (2.1%).

4.2. Knowledge about HIV/AIDS

Knowledge on HIV/AIDS is believed to be an important step in HIV-related behaviour change, while low knowledge and misconceptions can prevent individuals from making informed choices and taking appropriate actions aimed at preventing the infection [13,19,20].

In this study, awareness on the existence of HIV/AIDS was, expectedly, high (94.8%) due to the intense awareness campaigns carried out in the country over the years. Many other studies in Nigeria and Africa have reported similarly high HIV/AIDS knowledge among respondents [11,13,21,22]. More than half of the respondents knew that AIDS was caused by a virus, but Unuigbe and Evelyn in Benin City, Nigeria reported a lower knowledge level on this item among adolescent girls [21]. Nearly three-fifths of the respondents were aware that AIDS had no cure while as many as 15.0% believed otherwise. This erroneous belief is potentially dangerous as fifteen percent of the women population may not do enough to avoid HIV infection in the belief that a cure is available.

Knowledge about the various modes of transmission of HIV was generally high among mothers, with many correctly identifying unprotected sexual intercourse, blood transfusion, contaminated needles/syringes, mother-to-child transmission in the womb, breastfeeding and homosexuality as possible transmission modes. The study in Benin City [21] reported a much lower knowledge level on these modes of transmission than this study, but Olayinka and Osho in the study in southwest Nigeria among urban dwellers reported higher rates [9]. Many respondents were quite knowledgeable about the various means of protection against HIV infection such as condom use, abstinence and faithfulness to uninfected partner. However, a good number of misconceptions (myths) about the cause, transmission and prevention of HIV/AIDS were identified. Some respondents believed that it could be caused by witchcraft, angry gods and as a

punishment for evil done in the past, while others attributed AIDS to God's will for the individuals affected. A few also thought that orthodox medicines, herbs and sacrifice to the 'gods' were effective methods of preventing transmission. Seth, Daniel and Eva reported similar misconceptions in Ghana [13]. Improvement in access to formal and HIV education can eliminate these false perceptions and beliefs and therefore reduce HIV risk.

Over half of the respondents believed, erroneously, that HIV infected persons always look and feel sick. Such erroneous belief among women suggests that many women could be indulging in unsafe intercourse with deceptively healthy-looking but HIV-infected men. However, over thirty percent of them were aware that an HIV positive individual may look and feel quite healthy. In contrast, the report from Ghana showed that majority of the respondents knew that a person can be infected with HIV and still look healthy [13]. Our finding underscores the need to further educate women on the risk of indulging in unsafe sex based on the physical appearance of the would-be sexual partner who looks very healthy.

Interesting in this study were the findings that a high knowledge level on HIVAIDS had no significant effect on respondents' involvement in premarital sex and condom use, nor did it translate to reduced HIV prevalence among this group ($p > 0.05$). This was similar to findings by Lema and Katapa among youths in Tanzania but contrary to the findings of Anarfi and Appiah who reported that HIV knowledge had positive influence on sexual behaviour [19,22]. However, respondents with high knowledge on HIV/AIDS were more likely to reject sex or propose the use of condom to partners who have STI.

4.3. Sexual Behaviour

The average age at sexual debut in this study was 18.96 $\pm$ 5.7 (with the earliest age of 9 years) which was consistent with other studies in Nigeria, Tanzania, and Zimbabwe [23,24,25]. Although 18 years is regarded as the age of maturity, about nine percent of the respondents had experienced sex by the age of 14 years. Similarly, a study on premarital sexual activities among urban dwellers in southwest Nigeria found that 14.24% had sex before age 14, and 84% had sex before the age of 20 [26]. This is potentially dangerous and should be a source of concern to health administrators because of the attendant public health and social implications. Early sexual debut, defined as involvement in sexual intercourse before the age of 15 years, together with early pregnancy and delivery, may result in high susceptibility to HIV/STIs (due to physiologically and immunologically immature genital tract), and high risk of obstetric complications [24,27,28]. Preventive measures should therefore also target young adolescents before sexual debut.

About half of the respondents had no premarital sex and reportedly had their first sexual experience with their spouses. About two-thirds of the women reportedly had only one (ever) lifetime sexual partner with the rest reporting two or more partners. These results may not be very reliable as the question of the 'number of sexual partners ever had' is culturally a closely guarded secret, particularly among the female folk in this society. It is likely that many, in spite of the known anonymity of the questionnaire, did not answer sincerely. It was found that premarital sex experience was significantly more likely among educated women than women without education ($p < 0.05$). On the contrary, extramarital sex was fairly well distributed among all the educational classes. It was also found, curiously, that premarital sex, extramarital sex, and multiple sexual partnership were not associated with increased HIV infection. One possible explanation for these findings is the fact that condom use was more likely among the women who indulged in pre and extra marital affairs, in which case condom use confounded the outcome. Also, extramarital sexual activity among the currently married respondents was found to be low (4.8%), although no previous study in Nigeria was available for comparison. However, the result was consistent with findings obtained in Zimbabwe (4%) and among women married to fishermen along the Lake Victoria in Kenya (6.2%) [29,30]; but in the United States, an annual prevalence of 1-1.5% was reported while 21-38% of women were reported to have had at least one lifetime occurrence of extramarital affair [31]. Again, our finding may be an underestimation as most women in this culture are unlikely to respond sincerely to this question. We also observed that women married in polygamous homes were more likely to indulge in extramarital affairs, which is corroborated by the findings of Orubuloye and Caldwell who, in Ekiti District Nigeria, also added that the practice is more common among higher order wives in polygynous marriages [32].

HIV is known to spread faster in conditions of poverty, powerlessness (socio-economic) and lack of information. This is the condition most women find themselves in sub-Saharan Africa. Empowerment of women educationally and economically places them in a better position to negotiate safer sex [27,33,34]. Majority of the respondents in this study said they would refuse to have sex if they knew their partners had sexually transmitted infection(s), and still many (59.0 %) said they could propose the use of condom in a similar situation. This was an indication of the reasonable level of educational empowerment found among the respondents: it could be recalled that sixty-four percent of them had at least secondary level education, nearly all knew about HIV/AIDS and as many as eighty-three percent were aware of transmission through sexual intercourse. Lack of efficacy (protective ability) of the condom and dislike for it were reported as the main reasons why forty-two percent said they would not propose condom use, but would rather abstain until their partners got cured of the STI. However, a small proportion of the respondents would neither reject sex nor propose condom use for fear of their husbands. The ability to refuse sex or propose condom use was found to be significantly associated with educational status and knowledge about HIV/AIDS.

4.4. Condom Use

Promotion of safer sexual behaviour is critical for reducing HIV prevalence and transmission. It is generally believed that correct and consistent use of condom, especially with non-regular and/or unfaithful partners, is effective in protecting against sexual transmission of HIV, and studies have shown that correct and consistent use of condom reduces the risk of acquiring or transmitting HIV

by as much as 80% [2,7]. Our study revealed that only about half of the respondents believed that condom could prevent HIV transmission. This meant that as many as forty-six percent of sexually active women were at risk of indulging in unsafe sexual intercourse, assuming that those who testified to the efficacy of condom (54%) also used it.

Even though an overwhelming number of respondents (82.9%) knew about the sexual mode of HIV transmission and more than half knew that HIV/AIDS had no cure, only 37.4% of them had ever used a condom. Some studies outside Nigeria showed even lower prevalence of condom use. It was reported that only 3% of women ever used condom in a study in northwestern Tanzania in 1997, while in the Arusha region of Tanzania, a prevalence of 14.1% was reported [35,36].

This study revealed a positive association between condom use and higher education, late marriage and lower HIV infection risk. It was also found that respondents who attained higher level of education were more likely to have married late and therefore more likely to have used condom, probably due to indulgence in premarital sex.

Unfortunately, more than sixty percent of respondents who had high knowledge on HIV/AIDS had never used condom, therefore high knowledge on HIV/AIDS was not necessarily an inducement for condom use. But majority of the women who experienced sex before marriage used condom and therefore premarital sex was found to be significantly associated with condom use ($p < 0.05$). Condom use is a habit this community has not really come to terms with (or accepted), therefore more vigorous campaign(s) will be needed to change this attitude.

4.5. HIV Prevalence

This study gave an HIV prevalence of 4.1% in GAC, which was the same as the national prevalence reported by the National AIDS/STI Control Programme in its technical report on the 2010 HIV/AIDS/Syphilis Sentinel Seroprevalence Survey; but much lower than the FCT prevalence of 8.6% [11].

In contrast to reports from most other studies and general belief, this study showed that there was no positive association between HIV infection rate and the number of life-time sexual partners the respondent had [37,38], the knowledge score on HIV/AIDS, and polygamous marriage ($p> 0.05$). However, our finding in respect of polygynous marriage is corroborated by findings from a few studies, which also suggested that polygynous marriage systems seem to impede the spread of HIV [39,40]. Most of the HIV positive respondents (75.0%), in our study, came from monogamous marriages. In many cultures in Africa, it is tolerable for married men to keep concubines outside while the women are heavily sanctioned for the same offence [20]. Therefore in most marriages, especially monogamous marriages, the husband is shared with many other women; a practice that puts the partners at high risk of HIV infection, as revealed by our results. Expectedly, women of low educational attainment who indulged in sexual intercourse at a younger age without the use of condom had a higher rate of HIV infection ($p < 0.05$).

4.6. Conclusion and Recommendations

Generally, the knowledge level about HIV/AIDS among female residents of GAC was high. But this high level of knowledge did not translate to improved or less risky sexual behaviour. For example, a large number of the women were aware of the various modes of transmission of the virus and the means of protection against infection, few reported ever using condom. This was in spite of the fact that majority of the respondents knew that AIDS had no cure.

Majority of the respondents felt empowered enough to reject sex and to propose the use of condom during sex if their husbands contracted sexually transmitted infection (STI). A few however would not because of dislike or distrust for condom, and fear of husband by the educationally and/or economically underpowered. And the wrong belief that HIV infected persons always look and feel sick by many women portends danger.

Although the women with higher education also had higher knowledge level on HIV/AIDS, they tended to indulge more on risk behaviours such as premarital sex and high numbers of sexual partners; but they had less exposure to HIV due to increased use of condom.

It is recommended that women should be empowered economically by providing them with employment, small-scale investment opportunities and micro-credit facilities. This will reduce dependence on men and the tendency towards indulging in sex for money, especially younger unmarried women. Sex education should be included in school curriculum and in-school and out-of-school youths should be equipped with adequate HIV information to enable them take informed decisions on sexual issues. Governments and families should ensure proper and adequate education for the female child, and avoid discrimination against them. Early marriage should be discouraged by implementing and ensuring compliance with existing marriage laws**.** Religious organizations should join forces with governments and families to achieve the goals spelt out above.

4.7. Limitations of the Study

Distribution of respondents was skewed in favour of the tertiary and secondary facilities due to much lower attendance at the PHC clinics. Culturally, sexual issues are treated as private and an individual's secret which should not be discussed, especially among women. Consequently, it is possible that a good proportion of the responses given to the sex-related questions were incorrect or insincere. These may have had some effects on the reliability of some results obtained.

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