

# Knowledge of HIV/AIDS and Attitude towards Voluntary Counseling and Testing among Adults

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**Background:** Nigeria has the third highest population of people living with human immunodeficiency virus (HIV). Despite this, the knowledge of HIV/AIDS and uptake of voluntary counseling and testing (VCT) is still low, especially in the rural areas. This study assessed knowledge of HIV/AIDS and attitude towards VCT among adults in a rural community in northern Nigeria.

**Methods:** A pretested questionnaire was administered on a cross-section of 210 adults in Danbare village, northern Nigeria. Information about knowledge of HIV/AIDS and attitudes toward VCT was elicited among respondents.

**Results:** The majority of respondents (59%) did not know the causative agent of AIDS; however, knowledge of route of disease transmission was high, with 71% and 64% of study participants mentioning sexual activity and unsterilized blood transfusion, respectively, as possible transmission routes. Respondents listed avoidance of premarital sex, outlawing prostitution, condom use and screening of blood before transfusion as protective measures. Overall, 58 (27.6%), 80 (38.1%) and 72 (34.3%) of the respondents had good, fair and poor knowledge of HIV/AIDS, respectively. After adjusting for confounders, female gender and formal education remained significant predictors of HIV/AIDS knowledge. Reasons for rejection of VCT included fear of stigma, marital disharmony, incurable nature of the disease and cost of treatment. Formal education, female gender and HIV knowledge significantly predicted positive attitude toward VCT for HIV/AIDS among the study population.

**Conclusion:** More than half of the respondents had adequate knowledge of HIV/AIDS, and the majority were willing to have VCT. However, misconceptions, fear, gaps in knowledge and limited access to VCT remain prevalent. Our findings suggest the need to provide health education and scale up VCT services in northern Nigeria by targeting the efforts of international and local development partners to underserved rural areas.

**Key words:** HIV/AIDS ■ voluntary counseling and testing ■ knowledge ■ attitudes ■ Nigeria

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## INTRODUCTION

Acquired immunodeficiency syndrome (AIDS) has killed >25 million people since it was first recognized in 1981, making it one of the most destructive epidemics in recorded history.<sup>1</sup> Despite recent improved access to antiretroviral treatment and care in many regions of the world, the AIDS epidemic claimed 3.1 million lives in 2005.<sup>1</sup> Sub-Saharan Africa remains the hardest hit and is home to two-thirds of all people living with HIV. Nigeria has the third highest population of people living with HIV after South Africa and India.<sup>1</sup> Median HIV prevalence among pregnant women attending antenatal clinics in Nigeria rose from 1.8% in 1991 to 5.4% in 2003.<sup>2</sup>

Despite this, the knowledge of HIV/AIDS in sub-Saharan Africa is still low.<sup>3</sup> Generally, women are less informed about HIV than men in both urban and rural areas. This is the case even in the 10 countries where >1 out of 10 adults is infected.<sup>3</sup> Data from 35 of the 48 countries in sub-Saharan Africa showed that, on average, young men were 20% more likely to have correct knowledge of HIV than young women.<sup>1</sup> Education levels made a huge difference. For example, young women in Rwanda with secondary or higher education were five times as likely to know the main HIV transmission routes than were young women who had no formal education.<sup>4</sup>

In sub-Saharan Africa, the majority of HIV transmission occurs through heterosexual intercourse, mother-to-child transmission and unsafe blood transfusion.<sup>5</sup> In the absence of an effective vaccine and cure, voluntary counseling and testing (VCT), consisting of a minimum of pre- and posttest counseling and testing, has been used as an entry point for behavior change and access to

antiretroviral treatment. Another role of VCT is its potential in the prevention of mother-to-child transmission of HIV through the use of antiretroviral drugs and modification of infant feeding practices. Without these interventions, mother-to-child transmission occurs in 21–32% of HIV positive pregnancies.<sup>6</sup> Although several studies have assessed HIV/AIDS knowledge, attitude and practice in different parts of Nigeria,<sup>7-9</sup> most were conducted in health facilities or in urban areas. There is a dearth of information regarding residents of rural communities, particularly in northern Nigeria. Therefore, the main objective of this study was to assess knowledge of HIV/AIDS and attitude towards VCT among adults in Danbare village, a rural community in northern Nigeria. The study is important because it could guide the introduction of VCT programs and provide baseline information for evaluating the effectiveness of strategies for the prevention of HIV infection among rural dwellers in northern Nigeria.

**SUBJECTS AND METHODS**

**Study Design and Population**

The study was carried out among adults resident in Danbare village, in the Kumbotso local government area of Kano State. The community is located about 10 km from Kano city—the commercial nerve center of northern Nigeria. This typical rural Hausa community is divided into six wards and has 3,932 inhabitants.<sup>10</sup> The majority are Muslims who subsist through farming or petty trading. About 34% of the population is literate. The village has one primary health center and several traditional birth attendants, traditional healers and spiritualists. No

VCT services are available in the community. Referrals from the health center are sent to Murtala Specialist Hospital, Kano, Nigeria (15 km away) and occasionally to Aminu Kano Teaching Hospital, Kano, Nigeria (18 km away), where VCT services are also available.

The survey was descriptive and cross-sectional in design. A sample size of 220 was obtained using the hypothesis testing method<sup>11</sup> and based on the following assumptions: 95% confidence level, an expected knowledge level of 84.0% from a previous study<sup>12</sup> and a 5% margin of error. The calculated minimum sample was inflated by 10% to account for anticipated subject non-response. A multistage sampling technique was used for the selection of respondents. After house numbering, a total of 220 houses were selected from the six wards. The houses sampled from the six wards were proportional to the number of houses in each ward. Therefore, 42, 31, 36, 38, 34 and 39 houses were selected from each ward using the systematic sampling technique with the starting point obtained using a random number table. Where ≥1 household was found in a house, one was selected by a single one-time ballot. Finally, eligible adults in the sampled household were approached to participate in the study. If ≥1 eligible respondent was found in a selected household, one respondent was selected through balloting.

**Instrument Description/  
Data Collection**

Informed consent was obtained from prospective respondents prior to commencement of the interviews. The content of the consent form was translated into local language (Hausa). Literate respondents indicated acceptance by signing the consent form, while illiterate participants used a thumbprint. Approval for the study was obtained from the institutional review board at Aminu Kano Teaching Hospital, Nigeria.

A pretested, structured, interviewer-administered questionnaire containing both open- and closed-ended questions was used. The questionnaire was adapted from the survey tools used in the Ndola HIV/AIDS demonstration project in Zambia.<sup>13</sup> It was divided into four parts. The first section inquired about personal data, including age, occupation, ethnicity, religion and educational level. The second part elicited information about the local name of the disease, the causative agent, symptoms, modes of transmission and misconceptions such as transmission by mosquitoes and through sharing of meals and clothes. The third section asked about methods of prevention, availability of cure and sources of information. The fourth part inquired about awareness of the exist-

**Table 1. Sociodemographic characteristics of 210 residents of Danbare village, Nigeria, 2005**

Characteristic	Males	Females	Total
	N (%)	N (%)	N (%)
Age Group (Years)			
<20	18 (14.6)	11 (12.6)	29 (13.8)
20-29	38 (30.9)	30 (34.5)	68 (32.4)
30-39	31 (25.2)	19 (21.8)	50 (23.8)
40+	36 (29.3)	27 (31.0)	63 (30.0)
Educational Status			
Qur'anic alone	75 (61.0)	61 (70.1)	136 (64.8)
Primary	14 (11.4)	20 (23.0)	34 (16.2)
Secondary	32 (26.0)	5 (5.7)	37 (17.6)
Tertiary	2 (1.6)	1 (1.1)	3 (1.4)
Occupation			
Farmer	22 (17.9)	7 (8.0)	29 (13.8)
Petty trader	36 (29.3)	6 (6.9)	42 (20.0)
Civil servant	18 (14.6)	1 (1.1)	19 (9.0)
Housewife	NA	58 (66.7)	58 (27.6)
Unemployed	24 (19.5)	12 (13.8)	36 (17.1)
Other	23 (18.7)	3 (3.4)	26 (12.4)

NA: not applicable

tence of VCT, what is involved, where one could have VCT, previous VCT, willingness to have a VCT and prevention of mother-to-child transmission. The questionnaire was pretested and revalidated at Jido village (a village with similar characteristics to the study area). Some of the questions were rephrased for clarity based on observations made during the pretest. The questionnaires were administered by 10 Hausa-speaking Nigerian medical students. They worked in teams consisting of two interviewers (male and female). Each team had ≥1 female member so as to facilitate access to female respondents in *purdah* (seclusion). The interviews were conducted in Hausa.

**Data Analysis**

The data was analyzed using the Epi-Info® 6.0 statistical software package (CDC Atlanta, GA).<sup>14</sup> Furthermore, responses to knowledge questions were classified as correct or incorrect. Total scores were converted to percentages. A score of ≥70% was classified as good knowledge, a score of 30–69% was considered fair and <30% was considered poor knowledge as applied in an earlier study.<sup>15</sup> Regarding attitude towards VCT, respondents who had or were willing to have VCT or would recommend it to friends and relatives were considered to have positive attitude. In contrast, those that were unwilling to have VCT or would not recommend it to their friends and relatives were considered to have negative attitude. Chi-squared tests were used to assess significance of differences between categorical variables. Logistic regression analysis was used to identify significant predictors of HIV/AIDS knowledge and attitude towards VCT. The level of significance was set at P<0.05.

**RESULTS**

A total of 210 subjects out of 220 approached (response rate 95.5%) agreed to be interviewed. Their ages ranged from 15–59 years with a mean of 34.2 ± 13.4 years. The majority of respondents were male (59%), of Hausa ethnicity (94%) and Muslim (100%). Their sociodemographic characteristics are shown in Table 1.

**Knowledge of HIV/AIDS**

Most of the respondents (97%) confirmed that they have heard of HIV/AIDS—all of the women (n=87) and 95% (n=117) of the men. The local names for the disease included *Kanjamau*, Hausa for “slimming disease”; *Kabari kusa*, Hausa for “approaching one’s grave”; and *Lahira Assalamu Alaikum*, Hausa for “Heaven, here I come.” Seven percent of the respondents claimed they have seen someone who had the disease; however, none of the respondents reported having a close relative or friend infected with the virus.

Regarding the causative agent of AIDS, the majority (59.0%) said they had no idea, 29.0% said it was due to germs, 1.4% attributed it to evil spirit and the rest (10.6%) mentioned malnutrition and destiny. When asked about the mode of transmission, most respondents (70.9%) mentioned sexual intercourse, while 46.6% commented on sharing needles and unsterilized blades. Similarly, 63.8% of the respondents said HIV could be transmitted through unscreened blood transfusion. In addition, 67.1% of respondents said a pregnant woman infected with HIV could transmit the virus to her unborn child. Only 12.9% of respondents said a mother could transmit the virus during breastfeeding. Regarding misconceptions, 11.0% said mosquitoes could transmit the infection, and 22.8% said one could get HIV

**Table 2. Knowledge of 210 respondents on modes of HIV transmission and methods of prevention in Danbare village, 2005**

HIV/AIDS-Related Questions	Yes	No	Don't Know
	N (%)	N (%)	N (%)
Do you think a healthy looking person can be a carrier of HIV?	88 (42.0)	65 (31.0)	57 (27.0)
Can a person get HIV by sharing a meal with someone who is infected?	48 (22.8)	131 (62.0)	31 (14.8)
Can an infected person transmit the virus to his/her sexual partner(s)?	149 (70.9)	44 (20.9)	17 (8.2)
Does abstaining from sexual intercourse prevent people from contracting HIV/AIDS?	176 (83.8)	15 (7.1)	19 (9.1)
Does limiting sex to one uninfected partner prevent a person from contracting HIV/AIDS?	107 (50.9)	56 (26.7)	47 (22.4)
Does the use of condom protect against HIV transmission?	73 (34.6)	81 (38.4)	56 (26.7)
Can a person get HIV infection by sharing needles and syringes?	98 (46.6)	25 (11.9)	87 (41.4)
Do mosquitoes transmit HIV from an infected individual to an uninfected person?	23 (11.0)	63 (30.0)	124 (59.0)
Can a pregnant woman with HIV/AIDS transmit HIV to her unborn baby?	141 (67.1)	15 (7.2)	54 (25.7)
Can a woman with HIV/AIDS transmit the virus to her baby through breastfeeding?	27 (12.9)	113 (53.8)	69 (32.9)

infection by sharing a meal with an HIV-infected person. Furthermore, 7.0% said sharing of clothes with the infected individual could transmit the virus. With regards to clinical appearance, 42.0% of the respondents said that a healthy-looking person could be infected with the virus (Table 2).

HIV protective measures listed by respondents included avoidance of premarital sex (54.3%), outlawing prostitution (36.2%), fear of God and adherence to Islamic religious tenets (72.0%). Others cited mutual marital fidelity (64.3%); use of new needles and syringes (23.3%), and blades (13.3%); and screening of blood before transfusion (43.3%). Regarding condom use, 34.8% of the respondents said that although condoms may confer protection, they would not promote their use because of the prospect of encouraging sexual promiscuity. Only 5.0% of the respondents (all females) said drugs could be administered to the pregnant mother to prevent mother-to-child transmission of the virus.

With respect to symptoms of AIDS, 59.0% mentioned weight loss, diarrhea and skin rashes. Approximately 38.0% of the respondents said there was no known cure for the disease. Their sources of information regarding the illness include radio (67.3%), television (12.4%), friends (9.1%), Friday prayer sermons (5.6%) and posters (4.8%).

### Predictors of HIV/AIDS Knowledge

Overall, 27.6%, 38.1% and 34.3% of the respondents had good, fair and poor knowledge of HIV/AIDS, respectively. There was a strong positive correlation between educational attainment and knowledge of HIV/AIDS (Spearman's rank correlation coefficient = +0.90, P<0.001). Table 3 shows that formal education and being female are significant predictors of adequate knowledge about HIV/AIDS. Although younger respondents appeared to be more likely to be knowledgeable about HIV/AIDS, age was not a significant predictor of HIV/AIDS knowledge.

**Table 3. Predictors of HIV/AIDS knowledge among 210 residents of Danbare village, Nigeria, 2005**

Predictor	Crude OR	Adjusted OR (95% CI)	P Value
Age			
<20	1.0	Referent	–
20–29	0.7	0.8 (0.2–1.8)	0.49
≥30	0.6	0.9 (0.4–2.4)	0.31
Sex			
Male	1.0	Referent	–
Female	2.4	1.7 (1.0–3.0)	0.02
Education			
Qur'anic only	1.0	Referent	–
Primary	5.0	3.4 (1.6–5.4)	0.01
Secondary/tertiary	6.2	4.8 (1.9–6.3)	0.03

### Awareness of VCT

More than half (55.0%) of respondents were aware of a test that identifies persons with HIV. A higher proportion of respondents who had formal education were aware of VCT compared to those who had no formal education (71.6% vs. 22.8%, p<0.01). However, of those aware of VCT, only 26% knew where they could have the test. None of the respondents were able to describe the steps involved in undergoing VCT (pretest counselling, testing and posttest counselling), including those that had VCT previously. Regarding their preferences, 58.0% preferred government hospitals, while 26.0% chose private hospitals and clinics citing confidentiality as the main reason for their choice.

### Attitude towards VCT

The majority of respondents (72.3%) said they were willing to be tested and would recommend it to friends and relatives. The remainder said they would only consent to the test if a cure were available. Three respondents said they had to do the test during a job recruitment process. Almost 99% of the respondents have not had VCT previously. Reasons indicated for willingness to do VCT include enabling early commencement of treatment, protecting others from getting infected and preventing mother-to-child transmission. Reasons indicated for avoiding VCT include “afraid of stigma and discrimination in case of a positive test result” (48%), “fear of the unknown” (34%), “marital disharmony” (9%), “because it has no cure anyway” (3%), and “the treatment is costly and not readily available” (6%). Only 57.7% of male respondents were willing to have VCT compared to 82.8% of the female respondents. Significant predictors of positive attitude towards VCT include: formal education, knowledge of HIV/AIDS and being female (Table 4). Although older respondents appeared to have positive attitude towards VCT, this difference was not statistically significant.

### DISCUSSION

The level of awareness of HIV/AIDS reported in this study is higher than the findings of the National HIV/AIDS and Reproductive Health Survey (NARHS)<sup>12</sup> but similar to a report from a rural community in Ethiopia.<sup>16</sup> The higher level of awareness in the present study could be due to the additional health information obtained by women from antenatal clinics. It has been reported that 69% of women in this community received antenatal care during their last pregnancy.<sup>17</sup> The antenatal clinic provides an appropriate opportunity for educating women about HIV/AIDS and other health-related issues.

Most of the residents in this community were either ignorant of the causative agent of

AIDS or attributed it to germs, evil spirit or malnutrition. Similarly, knowledge of prevention of AIDS was not as widespread as the awareness of the disease itself. Although a high proportion of our respondents were familiar with HIV transmission through sexual activity and unscreened blood transfusion, our numbers are lower than those reported by the 2003 NARHS survey.<sup>12</sup> The NARHS survey showed that 83.8%, 76.3% and 75% of respondents were aware of transmission through sexual intercourse, sharing of sharp objects and blood transfusion, respectively. Respondents in the present study were also less informed than study participants in a rural Ethiopian community,<sup>15</sup> where it was reported that 96.4% and 92.2% of respondents were aware of transmission through sexual intercourse and sharing of needles and blades. This could be due to differences in literacy levels of the two communities<sup>18</sup> and possible differences in intensity of health education interventions in the two countries.

Only two-thirds of the study population were aware of the possibility of mother-to-child transmission during pregnancy and childbirth. This is lower than figures of 95%, 93.3% and 94.2%, respectively, reported among antenatal clients in Kano, Nigeria;<sup>15</sup> Lagos, Nigeria;<sup>19</sup> and among adults in rural Ethiopia.<sup>16</sup> In contrast, only 12.9% of our respondents were aware of the fact that HIV could be transmitted through breast milk compared to 57%, 58.3% and 94.0%, respectively, reported from the aforementioned studies. This gap in knowledge of transmission through breast milk needs to be adequately addressed for a successful implementation of a prevention-of-mother-to-child transmission program.

Respondents with formal education were more likely to have adequate knowledge of HIV/AIDS. This finding is similar to previous reports from studies conducted in Kano<sup>15</sup> and Lagos, Nigeria.<sup>19</sup> The study conducted in Lagos by Ekanem and colleagues<sup>19</sup> reported a significant association between the educational level of respondents and their knowledge of HIV/AIDS. They noted that although HIV/AIDS education was yet to be officially integrated into the school curriculum, the better-educated respondents had more access to health messages and could better comprehend messages compared to their less-educated counterparts.

Most of the respondents in this community mentioned abstinence, limiting the number of sexual partners and the use of condoms as effective means of prevention of HIV/AIDS. These are considered programmatically important because AIDS-prevention programs focus their messages on these behaviors as ways of preventing HIV transmission. The additional challenge in this Muslim community is finding ways of effectively prevent-

ing HIV transmission in polygamous unions. A possible option could be to encourage premarital VCT. The low proportion of respondents identifying condom use as a method of preventing HIV transmission may be related to unsubstantiated claims that condom use among youths encourages sexual promiscuity.<sup>20,21</sup>

There were several misconceptions about AIDS and HIV transmission among our study subjects: e.g., transmission by mosquitoes and through sharing of food and clothes. These misconceptions have been reported elsewhere.<sup>22</sup> These serious gaps in knowledge regarding modes of transmission could fuel stigma and discrimination. Hence, there is room for intensifying targeted health education about the modes of transmission of the virus in this population. The lowest levels of knowledge are among persons who had no access to formal education. Fortunately, almost all men and women in the study population attend local Qur'anic schools. This provides an opportunity for health programmers to form partnerships with faith-based organizations to facilitate access to the people with health messages, including HIV/AIDS prevention.

Almost all of our respondents (98.6%) have not had VCT previously. This finding is not surprising considering the social implications of a positive HIV test. People who are HIV positive may face considerable stigma and discrimination from employers, friends and even family. The number reported here (98.6%) is higher than the figures obtained from the 2003 NDHS,<sup>17</sup> which found that >80% of Nigerians have not been tested. Elsewhere, the uptake of VCT has been higher, for example 39.2%, 15% and 47% of study subjects in Lagos, Nigeria,<sup>19</sup> Kenya,<sup>23</sup> and South Africa,<sup>24</sup> respectively, were found to have had VCT done already. Nevertheless, 72.3% of our respondents were willing to undergo VCT. This is comparable with the findings from rural Ethiopia (70.0%)<sup>16</sup> but lower than the figures of 81.0% and 96.1% reported among

**Table 4. Predictors of positive attitude towards VCT for HIV/AIDS among 210 residents of Danbare village, Nigeria, 2005**

Predictor	Crude OR	Adjusted OR (95% CI)	P Value
Age			
<20	1.0	Referent	-
20-29	2.7	2.4 (0.6-4.7)	0.37
≥30	2.3	1.9 (0.9-3.8)	0.14
Sex			
Male	1.0	Referent	-
Female	3.5	2.3 (1.4-8.2)	0.02
Education			
Qur'anic only	1.0	Referent	-
Primary	3.4	2.3 (1.3-5.4)	0.01
Secondary/tertiary	4.1	3.1 (1.8-6.3)	0.03
HIV/AIDS Knowledge			
Poor	1.0	Referent	-
Good/fair	3.9	3.6 (1.7-5.2)	0.02

antenatal clients in Kano<sup>15</sup> and Lagos,<sup>19</sup> respectively. This potential demand for VCT services provides an opportunity for scaling up services in the rural areas and would also serve as an entry point to the prevention and care continuum. For individuals who test negative, VCT could enhance risk reduction through behavioral change.

The finding that female respondents were more willing to have VCT compared to males even after adjusting for confounders could be due to several factors. Firstly, it has been reported that women are more willing to have VCT, especially if knowledge of their status would assist in preventing HIV transmission to their babies.<sup>19</sup> Secondly, the fear of testing positive among sexually more-adventurous males could discourage their participation in VCT. The reasons provided by the participants in this study for disliking VCT, including fear of the unknown, stigma and discrimination, absence of cure, cost and availability of treatment, are similar to previous reports from East Africa.<sup>25</sup>

There are several limitations to this study. The first is the selection of a single rural community from northern Nigeria. Although villages in northwest Nigeria tend to have similar sociocultural characteristics, other parts of northern Nigeria are not as homogenous. Secondly, a gender bias in sampling may result from the increased likelihood of meeting women at home during certain times of the day. We therefore scheduled the interviews in the evenings to ensure that most of the men were back from their farms and businesses. Finally, questions relating to HIV/AIDS may elicit only socially desirable responses in view of the stigma associated with this disease. However, our interviewers assured respondents of confidentiality prior to the conduct of the interview.

In conclusion, this study found that more than half of the adults in this rural Nigerian community had adequate knowledge of HIV/AIDS, and a majority were willing to have VCT. However, misconceptions, fear and gaps in knowledge regarding HIV/AIDS coupled with restricted access to VCT services are still prevalent. Most non-governmental organizations concentrate their enlightenment activities in urban areas. Our findings suggest the need to redirect the efforts of international and local development partners to underserved rural areas. These areas are disadvantaged by their low literacy level, limited access to communication media and to health facilities. Fortunately, listening to foreign and local radio broadcasts is a popular pastime with the inhabitants of northern Nigeria. Such media can therefore be used to effectively convey HIV/AIDS prevention messages to this population. VCT services and antiretroviral treatment should also be made accessible to rural areas by establishing grassroots referral linkages. Universal basic education should also be provided regardless of area of residence and gender since it is the major predictor of good knowledge and positive attitude towards VCT.

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