

Predictors of condom use among sexually active persons involved in compulsory national service in Ibadan, Nigeria

Adegbenga M. Sunmola^{1*}, Benjamin O. Olley¹ and Grace E. Oso²

Abstract

Migration is known to increase the risk of heterosexual transmission of human immunodeficiency virus (HIV) in sub-Saharan Africa, but little attention has been paid to fresh graduates of tertiary institutions who are on migration for compulsory national assignment in Nigeria. In July and August 2004, a survey was conducted on sexually active men ($n = 344$) and women ($n = 373$) to investigate determinants of condom use during national service. Sixty-eight percent of men and 41% of women reported condom use at last intercourse before the survey. For both men and women, condom use was common if they had one or more regular sex partners and if they were purchasing condoms. In addition, women's condom use was predicted by being single and having intention to use condoms in next intercourse. The findings further showed that there was high risk of HIV transmission in the sample population as consistent condom use was 15% for men and 4% for women. Twelve percent of men and 8% of women reported STI diagnoses in the last 12 months before the survey. Four percent of men and 2% of women reported they already had HIV diagnoses. Only 1% of men and 2% of women reported they would receive voluntary HIV test if offered free by

the government. The study findings suggest the need to extend the existing condom social marketing services in the country to the youth on national service and promote condom education messages among them prior to commencing national service.

Introduction

In Nigeria, human immunodeficiency virus (HIV) epidemic is established in the sexually active population. The seroprevalence among young women attending antenatal clinics in the country was 5% in 2003. There is however a wide disparity in the state distribution of the virus, ranging between 1.2 and 12% [1]. Prevention efforts that target young adults, especially those in migrant or mobile population groups, may be useful to reduce HIV transmission as some states of the country have high seroprevalence and others low.

Studies in sub-Saharan Africa have shown a link between migration and HIV infection. In a study of rural–urban migration in South Africa, migration was associated with HIV infection. Twenty-six percent of migrant men and 13% of non-migrant men were HIV infected [2]. In rural communities of West Africa, short-term mobility was found to be a risk factor for HIV infection among men; however, women in the communities who reported casual sex in a city within the past 12 months were likely to be infected with HIV [3]. In a study of prevalence of HIV infection among women in urban South African setting, 46% of migrant women were HIV infected compared with 35% of non-migrant women [4].

¹Department of Psychology, Faculty of the Social Sciences, University of Ibadan, Ibadan, Nigeria and ²National Youth Service Corps, Oyo State, Secretariat, Ibadan, Nigeria

*Correspondence to: A. M. Sunmola.

E-mail: gsunmola@skannet.com

One major reason why members of migrant populations are likely to contract HIV is lack or erratic use of the male condom despite high-risk sexual encounters [5]. Research on condom use is limited among circular migrants who travel from their home environments to reside in other distant communities and still maintain close links with their homes where they occasionally return. Existing research has mostly focused on migrants with little or no formal education especially long-distance truck drivers [5], bar and hotel workers [6], mining workers [7] and commercial motorbike riders [8], with more attention on men and the risks their own migration have on their non-migrating female partners [4]. The research identified factors associated with likelihood of condom use among migrants (such as long-distance truck drivers) as being unmarried, had some education, report of STIs and perceived oneself at risk of HIV [9]. There is dearth of research on sexual practices of highly educated young adult migrants. Circular migration, whereby young adults are expected to travel from their rural or urban homes (most cases urban) to certain rural or urban communities for at least 1 year and intermittently visit their homes are common in Nigeria and legally mandatory for fresh polytechnic and university graduates in the country. Their condom use practices may be different from those with little or no education, especially as education is a determinant of increased condom use in non-marital partnerships [10]. Studies in Nigeria have shown that the potential to have consistent condom use in educated youth populations is hindered by several barriers as observed among university students who reported 59–61% condom use at last intercourse [11]. The major barriers are that a condom does not give desired sexual satisfaction, makes intercourse to be boring, reduces enjoyment of sexual foreplay, produces health problems such as itching and reduces sexual urge. The purpose of the study was to investigate the influence of demographic characteristics, substance use, HIV/acquired immune deficiency syndrome (AIDS)-related preventive knowledge, HIV/AIDS attitudes and sexual practices on the male condom use of fresh graduates on compulsory national service. The fresh graduates

on national service have been classified in the present study as migrants consistent with the definition of migrants as movement of people from one location to another on temporary, seasonal or permanent basis for various voluntary or involuntary reasons [12, 13]. Migrants are particularly relevant for HIV and AIDS transmission when they return home to their families on a regular basis [14] as practiced by most of the fresh graduates on national service.

Materials and methods

Setting and study population

The study was conducted in Ibadan municipality, the capital of Oyo State, a fast expanding urban municipality with ~3 million inhabitants. The municipality is statutorily demarcated into six local government areas (LGAs). Each is administered by a democratically elected chairman.

The study population consisted of fresh graduates, part of those who recently finished their university and polytechnic education in the country. All new graduates in the country, who are ≤ 30 years, are statutorily required to participate in a compulsory national service program. They are randomly posted to certain rural or urban communities for 1 year. In almost all cases, postings take the graduates to distant communities from their homes. At the time of the present study, 7000 fresh graduates were posted in this way countrywide. Ibadan municipality had a share of ~750 graduates. The primary aim of the national service was to avail fresh graduates the opportunity to have firsthand knowledge about the culture of people from other ethnic groups within the country, in ways that would not allow the graduates perpetrate negative stereotypes associated with such people. All graduates are provided with orientation programs during first month of the year of service to learn about the culture and language of ethnic groups where they are posted to serve. In the following 11 months, they are expected to provide community services related to their course of study in places they are posted. During the year, they are paid monthly stipends by the government. To ensure

that they eventually return home, they are given annual contracts with no guarantee of continued employment. At the end of the period, they are awarded certificates of completion, which enable them to proceed in their academic pursuits or to obtain a job.

Recruitment

In July and August 2004, we conducted a survey on the sexual practices of graduates on national assignment in Ibadan. Sampling was conducted in two stages. In the first stage, sites were selected. They were all the six sites in Ibadan municipality where community services were taking place at the time of the study, one in each of the six LGAs in the municipality. The sites were officially designated by national service authority for graduates deployed to Ibadan to participate in various collective community development services 1 day in a week. All the sites are community locations with similar level of commercial and infrastructural development. The nature of work schedule of the graduates is decentralized for the rest of the week. During other weekdays, an individual graduate is permanently assigned to work in particular places such as schools, hospitals, prisons and industrial organizations within the city.

The graduates (potential respondents) were selected during the second stage. All the graduates who turned up for community development services in each of the sites were collectively addressed about the goals of the research by two research officers in the presence of two managers in charge of the community service shortly before the commencement of work. The graduates were informed that they were free not to participate in the study, as it was not part of national service requirement. They were also informed that the goal of the research was entirely for research purposes and their responses would be kept anonymous. For the survey, a site was covered a day in a week; all the sites were consequently covered in 6 days over a period of 6 weeks. In this way, the possibility of an individual completing the questionnaire twice was eliminated since a graduate was officially assigned to one community site for service. Survey was self-

administered unless clarifications were sought from research officers on any items or questions. Questionnaires were administered simultaneously to the participants by the research officers. The participants were instructed to complete the questionnaires independently. The research officers monitored the participants that they complied. It took ~20 min to complete a questionnaire. Out of 762 individuals that were approached, 754 agreed to participate. The eight that did not participate indicated either reasons of lack of interest or time. Consent to participate was given orally by each graduate at the time they were to respond to the questionnaire.

Measures

Participants indicated their age, ethnicity, religion, marital status, school of graduation, period of national service and other related characteristics. Participants reported if they had received STIs (last 1 year) and HIV/AIDS diagnosis from a physician or voluntary counseling and testing (VCT) centers. In addition, if positive diagnosis, participants provided information about the infection name as given by health personnel, their health-seeking behavior, what they did to prevent infection of their sex partners and if they disclosed their status to their partners.

Participants indicated if they had used alcohol, marijuana, cocaine, herbal remedies and synthetic tablets to facilitate sex. They were asked whether they had used each of these in the past 2 months (yes/no format) and if they had used each of the substances prior to sex (yes/no).

Participants reported their sexual practices while on national service. They indicated whether they used male condoms with a partner or the partner used the condom with them in last intercourse (yes/no), how frequent they used the condom with a partner or the partner used the condom with them (always, frequently, sometimes, rarely, never), how frequently they had unplanned sex (always, occasionally, frequently, none) and how frequent they were buying the condom (always, occasionally, frequently, none). Participants indicated the number of sexual partners they regularly met at the period of survey (none, 1, 2, 3, 4 or >4). Participants also

reported if they had received or paid money for sex (yes/no), participants were also asked to indicate where they usually got the condom from, if they have had sex with a partner they met for <1 day (yes/no) and whether they had been pressured to have unwanted sex (yes/no). Intention to use the male condom was assessed by asking participants if they intended to use the condom in their next intercourse (yes/no). Self-efficacy for condom negotiation was assessed by asking participants if they held the belief that they were capable of making a partner to use male condoms in sexual relationships (yes/no). Perceived susceptibility to contract HIV/AIDS was measured by asking participants if they thought it was possible for AIDS virus to be passed on to them in sexual intercourse with someone who had the virus (yes/no). Participants were asked about their knowledge of prevention of HIV infection. There were five items: Any person with AIDS virus can pass it to another person through sexual intercourse (true/false), A person can get AIDS through sex with a female sex worker who has AIDS virus (true/false), A pregnant woman who has AIDS can pass it to her unborn child (true/false), A person can get AIDS through receiving injection with non-sterilized needles used for someone with AIDS virus (true/false) and AIDS cannot be cured (true/false). An item given a true response attracted one point, while a false response attracted zero point. Each participant thus obtained an individual knowledge score based on summation of numerical responses, with maximum true response score of 5. The items were internally consistent with Cronbach alpha of 0.82. Participants were also asked about how long they had been on national service, and which location they were posted from (the number of participants who reported they were posted from Ibadan, two females and one male, was found insufficient for statistical analysis). (They were retained as study participants as they could not statistically contribute to make spurious, the relationship between condom use at last intercourse and each of sexual, demographic and attitudinal variables considered.)

The questionnaire was pre-tested on a small sample of fresh graduates (40) who did not par-

ticipate in the main study. They were randomly selected from a contingent of 140 graduates on national service from various communities in other parts of the country, who had been invited to Ibadan by the authority of national service for a workshop. The aim was to ascertain the feasibility and reliability of the questionnaire, especially on assessment of adequacy of the questionnaire and logistic arrangement for its administration. In addition to correct any possible gaps and redundancies in the questionnaire in the light of cultural sensitivities of graduates and to check if the language was appropriate. The questionnaire was thereafter amended accordingly and administered in ways that no identifying information was collected to allow for completely anonymous responses.

Data analysis

Data were analyzed using the Statistical Package for Social Sciences, version 10.0 (SPSS Inc., Chicago, IL, USA). Participants who were sexually active were categorized on the basis of sex category since sexual practices and condom use may differ for men and women. Two groups were thus included for separate analysis. Differences for categorical variables were tested using contingency table chi-square tests. To test whether there were sex differences in HIV-related knowledge scores, *t*-test statistic was used to compare knowledge between participants who used the male condom and who did not use at last intercourse. In the analysis, knowledge was treated as a continuous variable. Participants were selected from six different sites, although within the same Ibadan municipality, it was therefore appropriate to statistically assess the impact of site on demographic and sexual behavior variables of the present study. (No site differences were found for each of the variables. The results are reported in the Results section. If there were differences on the characteristics, it would therefore indicate a need to control for the effect of site in the study data analyses and stepwise logistic regression.) One-way analysis of variance was used to examine possible site differences if characteristics were continuous variables and differences for categorical variables were examined

using chi-square tests. Bivariate analyses were conducted to identify all the variables associated with condom use at last intercourse. Only variables associated with the outcome at $P < 0.15$ in bivariate analyses were included in a regression model, based on the recommendation that a criterion for the inclusion of variables into stepwise logistic regression should be less stringent than 0.05, but range between 0.15 and 0.20 [15]. All P values reported were two-sided and considered significant at $P < 0.05$. The stepwise logistic regression analysis was used to measure the net effect of independent variables on condom use in last intercourse (outcome variable). The analysis was conducted to examine sexual behavioral and attitudinal variables that predict condom use among migrant fresh graduates on compulsory national service. There is no existing knowledge of relationship among the variables in a population of fresh graduates on migration. Specifically, variables associated with the outcomes at $P = 0.001$ – 0.15 were included in the model. These were frequency of alcohol use before sex, condom self-efficacy, first source of information about condoms, intention to use condoms next intercourse, knew someone with HIV/AIDS, knew someone who died of AIDS, ability to be friendly with someone with HIV/AIDS, perceived condoms useful to prevent HIV, number of regular partners, frequency of condom purchase, frequency of unplanned sex and demographic characteristics (see Table III).

Results

Demographic and site characteristics

A total of 751 participants adequately completed the study questionnaire out of 754 that agreed to participate in the survey. The three questionnaires consisted of many missing responses, so they were removed from data analyses. In addition, because we were particularly interested in condom experiences of participants, 34 participants who had never had sexual experience were also omitted. Thus, the final sample was comprised of sexually active men ($n = 344$) and women ($n = 373$). Table I shows

Table I. Demographic characteristics of study participants

Variables	Men, <i>n</i> (%)	Women, <i>n</i> (%)
Total ^a	344 (100)	373 (100)
Age		
18–22	14 (4)	41 (11)
23–27	225 (66)	265 (71)
28–32	102 (30)	67 (18)
Marital status		
Single	313 (91)	276 (74)
Married	31 (9)	97 (26)
Religion		
Catholic	107 (31)	145 (39)
Protestant	110 (32)	112 (30)
Other Christian	72 (21)	75 (20)
Islam	41 (12)	34 (9)
Traditional	14 (4)	7 (2)
Ethnic origin		
Yoruba	69 (20)	104 (28)
Igbo	62 (18)	71 (19)
Hausa	86 (25)	112 (30)
Edo/Delta/Ibibio and related	127 (37)	86 (23)
Education		
University graduate	229 (67)	239 (64)
Polytechnic graduate	98 (28)	127 (34)
Postgraduate	17 (5)	7 (2)
Period of migration (months)		
≤3	14 (4)	15 (4)
4–6	168 (49)	173 (47)
7–9	38 (11)	41 (11)
10–12	124 (36)	140 (38)

^aSome variables do not add to total due to missing data.

demographic characteristics of participants. Most men (66%) and women (71%) were between ages 23 and 27 years. The mean age for men was 26.4 years ($SD = 3.4$) and mean age for women was 25.3 years ($SD = 2.3$), not shown. Ninety-one percent of men were single, while 74% of women were single. Majority of the men (84%) and women (89%) was Christian. Men were from diverse ethnic groups with 20% Yoruba, 18% Igbo, 25% Hausa, 37% Edo, Itsekiri, Ibibio and others. For women, 29% were Yoruba, 19% Igbo, 30% Hausa, 22% Edo, Itsekiri, Ibibio and others. Majority of men (67%) and women (64%) was university graduate who had finished first degree. Most men (96%) and women (96%) were on national service for between 4 and 12 months.

Data were separated for each of the six sites to investigate the influence of site on each of the demographic characteristics and sexual behavior variables that were studied. No statistical significant differences were found for each of the variables of age, sex, marital status, ethnicity, length of service and education. Similarly no statistical significant differences were found for sexual behavior variables and HIV knowledge.

STD/HIV history and related health behavior

Participants were asked if they had received STI diagnosis in the past 1 year in a hospital or medical laboratory. Twelve percent of men and 9% of

women reported they had been diagnosed with STIs (Table II). The most frequently reported STI treatment for men were clinics (62%), self-medication (23%) and private nurses (12%). Women mostly reported clinics (82%), self-medication (6%) and private nurses (6%). When participants were asked about what they did to prevent their sex partners from being infected, most men reported they used condoms (32%), had no intercourse (30%) and 25% did not do anything specific. Most women reported they used condoms (22%), 19% had no intercourse and 37% did not do anything specific (not shown). On whether those infected with STIs disclosed to their sex partner during the infection period, 44% of men and 27% of women reported they disclosed (not shown).

Table II. Sexual attitudes, practices and condom use (men, n = 344 and women, n = 373)

Variables	Men, n (%)	Women, n (%)
Diagnosed with STIs in the past 12 months (yes)	41/344 (12)	30/373 (8)
Reported health-seeking practice for STIs		
Clinic	25/41 (62)	6/8 (82)
Self-medication	9/41 (23)	1/8 (6)
Private nurses	5/41 (12)	1/8 (6)
Other	1/41 (3)	–
Diagnosed with HIV in the past	14/344 (4)	7/373 (2)
Ever used alcohol prior to sex during national service (yes)	93/344 (27)	67/373 (19)
Ever used drugs prior to sex during national service (yes)	27/344 (8)	19/373 (5)
Ever heard of condoms (yes)	313/344 (91)	343/373 (92)
Thought condoms were useful to prevent HIV (yes)	34/311 (11)	45/343 (13)
First source of information about condoms (radio)	141/313 (45)	141/343 (41)
First source of information about condoms (friends)	82/313 (26)	72/343 (21)
Knew someone having HIV/AIDS (yes)	89/344 (26)	89/373 (24)
Knew someone who died of HIV/AIDS-related cases (yes)	144/344 (42)	166/373 (44)
Would take a free HIV test if offered by government (yes)	3/344 (1)	7/373 (2)
Had self-efficacy for condom negotiation	257/313 (82)	258/343 (75)
Perceived susceptibility to contract HIV/AIDS (no)	238/309 (77)	278/371 (75)
Intended to use condoms in next intercourse (yes)	263/313 (84)	209/343 (61)
Could work with someone with HIV/AIDS (yes)	185/344 (54)	171/373 (46)
Could be friendly with someone with HIV/AIDS (yes)	230/344 (67)	227/373 (61)
Had one regular sexual partner (yes)	96/344 (28)	67/373 (18)
Had two or more regular sexual partners (yes)	89/344 (26)	86/373 (23)
Condom use at last sex during service (yes)	234/344 (68)	153/369 (41)
Consistent condom use during service (yes)	51/341 (15)	15/372 (4)
Always purchased condoms during service (yes)	89/344 (26)	34/373 (9)
Received or paid money for sex during service (yes)	21/344 (6)	26/373 (7)
Had sex with someone met for <1 day (yes)	31/344 (9)	19/373 (5)
Was pressured into unwanted sex during service (yes)	24/344 (7)	19/373 (5)
Had unplanned sex occasionally (yes)	141/344 (41)	101/373 (27)

Participants were also asked if they had been diagnosed with HIV/AIDS. Four percent of men and 2% of women reported that they received the diagnosis. None of the women reported they disclosed their HIV status to their sex partners, while 20% of men reported they disclosed to their partners (not shown). Further analyses showed that all the diagnoses of both STIs and HIV were reported among non-married participants.

Substance use

Table II shows substance use practices of participants. Only 27% of men and 19% of women had ever used alcohol prior to sex since they started national service. Of those who had used it, only 24% of men and 14% of women used it occasionally (not shown). Similarly, few men (8%) and women (5%) had use a drug prior to sex since they started national service. Among those who had taken drugs, 27% of men and 17% of women used marijuana, 21% of men and 42% of women occasionally took cocaine, 23% of men and 13% of women occasionally took herbal remedies, while 18% of men and 14% of women occasionally used synthetic tablets (not shown).

HIV/AIDS-related attitude

Table II shows HIV/AIDS-related attitudes of participants. The majority of men (91%) and women (92%) had ever heard of the male condom. Twenty-six percent of men and 21% of women reported a friend as first source of knowledge. In addition, 45% of men and 41% of women reported that the radio was the first source of knowledge. Only 11% of men and 13% of women thought condoms were useful for HIV prevention. Majority of men (69%) and women (62%) was not sure if condoms were useful for HIV/AIDS prevention, the remaining 20% of men and 25% of women clearly reported that condoms were not useful for the prevention (not shown). About one-quarter of men (26%) and women (24%) participants knew someone who was having HIV/AIDS. More men (42%) and women (44%) however knew someone who died of HIV/AIDS-related cases in the past. Only a small minority of men (1%) and women

(2%) reported they would take HIV test if freely offered by government. Most men (76%) and women (78%) were not certain if they would take the test. On self-efficacy for condom negotiation, 82% of men and 75% of women reported that they believed they were capable of making a partner use condoms. Majority of men (77%) and women (75%) reported that they were not susceptible to contract HIV in sexual encounters without condom use. Similarly a large proportion of men (84%) intended to use condoms in next intercourse, while 61% of women intended to use condoms in next intercourse. About one-half of men (54%) and 46% of women reported that they could work with someone with HIV/AIDS. More men (67%) and women (61%) however reported that they could be friendly with someone with HIV/AIDS.

HIV/AIDS-related knowledge

Most men (96%) and women (95%) had ever heard of HIV/AIDS. Participants were asked about their knowledge of HIV/AIDS. The mean of 3.59 (SD = 1.71) was obtained for men and 3.56 (SD = 1.81) was obtained for women on the five-item knowledge scale. There was no significant sex difference on HIV/AIDS-related knowledge when the scale items were analyzed as a composite variable ($P > 0.1$), and even when they were analyzed on the basis of individual items. Participants who reported condom use had elevated mean of 3.94 (SD = 1.52) compared with participants who reported non-use (mean = 3.24, SD = 1.73), $P > 0.1$.

Sexual practices and condom use

Table II shows sexual and condom use practices of participants. The mean number of regular sex partners was 2.4 (SD = 2.1) for men and 1.3 (SD = 1.6) for women (not shown). The mean number of casual sex partners was 1.1 (SD = 0.9) for men and 0.9 (SD = 0.7) for women (not shown). Approximately 45% of men and 58% of women reported they had no regular sex partners during the period of service. Twenty-eight percent of men and 18% of women reported one sex partner. Another 26% of men and 23% of women reported

they had two or more regular partners. Only 12% of men reported they had casual partners (range 1–6) and 7% of women made similar report (range 1–3), not shown. Sixty-eight percent of men and 41% of women used a condom at last intercourse. Consistent or always condom use was low for men (15%) and extremely low for women (4%). About one-quarter (26%) of men reported they always purchased condoms and another one-quarter (25%) reported they never purchased condoms. Only 9% of women reported they always purchased condoms and a larger proportion of women (62%) reported they never bought condoms. Only 6% of men and 7% of women reported they had received or paid money for sex. Nine percent of men and 5% of women reported they had sex with someone met <1 day. Seven percent of men and 5% of women reported that they had actually been pressured into unwanted sex. [In view of previous studies [16] that showed that women are more likely to report than men that they were pressured to have intercourse through violence or other forms of assaults, a sex difference analysis (7 versus 5%) using chi-square statistics was further performed. The result showed a non-significant difference $P > 0.18$.] Forty-one percent of men and 27% of women occasionally had unplanned sex.

Factors associated with condom use (bivariate analyses)

Bivariate analyses on association between demographic characteristics, substance use, HIV/AIDS-related preventive knowledge, HIV/AIDS attitudes and sexual practices on the male condom use at last sex were conducted (Table III). On the association between demographic characteristics and condom use, marital status was associated with condom use for both men and women, 63% of men who were single reported condom use compared with 37% of men who were married ($P < 0.001$). Similarly, 50% of women who were single reported condom use at last intercourse compared with 18% of married women ($P < 0.001$). Ethnicity was associated with condom use only for women, 68% of women from Igbo ethnic group reported condom use compared with 17% of women from other ethnic groups ($P <$

0.05). For men, rate of condom use increased as length of time spent during national service increased. Seventeen percent of men who had spent ≤ 3 months reported they used condoms compared with 68% who had spent between 4 and 12 months ($P < 0.05$).

Having STIs or HIV/AIDS was not associated with condom use for both ($P > 0.18$) men and women ($P > 0.20$). Majority of men (63%) and women (52%) who had STIs in the past 1 year reported condom use at last intercourse. About one-half of men (50%) and women (50%) with HIV/AIDS diagnosis reported condom use (not shown). Alcohol use was associated with condom use only for men. Sixty-nine percent of men who never took alcohol prior to sex reported condom use compared with 44% of men who took alcohol before sex ($P < 0.05$).

On the bivariate association between attitudes and condom use, men who had condom self-efficacy (67%) were more likely to use condoms than men (38%) who did not have condom self-efficacy or did not know whether they had condom self-efficacy ($P < 0.001$). Similarly, women who had condom self-efficacy (46%) were more likely to use condoms than women (22%) who did not have condom self-efficacy or did not know whether they had condom self-efficacy ($P < 0.01$). First source of information about condoms was associated with condom use for both men and women. Men who first had information through the radio reported more condom use (63%) than men (28%) who perceived information from all other sources ($P < 0.05$). Women who first had the information through the radio (68%) were more likely to report condom use than women (27%) who had information from all other sources ($P < 0.05$). Perception of condoms as useful for preventing HIV transmission was not associated with condom use for men ($P > 0.14$) and women ($P > 0.11$). Intention to use condoms in future was associated with condom use for both men and women. Eighty percent of men who intended to use condoms in next intercourse reported condom use compared with 50% of men who did not intend to use condoms ($P < 0.001$). The majority of women (64%) who intended to use

Table III. Factors associated with condom use at last sex—bivariate analysis

Variables	Men, n (%)	P	Women, n (%)	P		
Marital status						
Single	197/313 (63)	0.001	138/276 (50)	0.001		
Married	11/31 (37)		17/97 (18)			
Ethnicity						
Yoruba	12/69 (17)	0.17	22/145 (15)	0.05		
Igbo	27/62 (43)		48/71 (68)			
Hausa	17/86 (20)		16/112 (14)			
Edo/Delta/ Ibibio and related	23/127 (18)		18/86 (21)			
Length of service (months)						
≤3	2/14 (17)	0.05	8/15 (50)	0.13		
4–6	101/168 (60)		61/173 (35)			
7–9	22/38 (59)		15/41 (36)			
10–12	106/124 (85)		69/140 (41)			
Diagnosed with STIs in the past 12 months						
Yes	26/41 (63)	0.18	16/30 (52)	0.20		
No	179/303 (59)		151/343 (44)			
Frequency of alcohol use before sex						
Never	172/251 (69)	0.05	134/306 (37)	0.13		
Sometimes	58/82 (71)		15/56 (27)			
Frequently	3/7 (44)		1/4 (25)			
Always	1/3 (17)		3/7 (42)			
Condom self-efficacy						
Yes	189/282 (67)	0.001	130/280 (46)	0.01		
No	14/46 (30)		19/70 (27)			
Don't know	7/16 (46)		4/23 (17)			
First source of information about condoms						
Friend	34/82 (42)	0.05	34/72 (48)	0.05		
Sexual partner	2/12 (19)		4/38 (12)			
Nurse/Doctor	4/25 (17)		8/42 (19)			
Relative	5/12 (43)		4/10 (38)			
Newspaper/ magazine	8/25 (31)		7/20 (37)			
Radio	89/141 (63)		96/141 (68)			
Didn't know	3/16 (18)		2/20 (11)			
Intention to use condoms next intercourse						
Yes	209/263 (80)		0.001		134/209 (64)	0.001
No	25/50 (50)				12/134 (9)	
Knew someone with AIDS						
Yes	47/89 (55)	0.13	35/89 (39)	0.19		
No	148/255 (58)		122/284 (43)			
Knew someone who died of AIDS						
Yes	86/144 (60)	0.17	73/166 (44)	0.15		
No	104/200 (52)		81/207 (39)			
Ability to be friendly with someone with HIV/AIDS						
Yes	39/67 (58)	0.17	26/61 (43)	0.15		
No	141/277 (51)		118/312 (38)			

Table III. Continued

Variables	Men, n (%)	P	Women, n (%)	P
Perceived condoms useful to prevent HIV				
Yes	18/34 (52)	0.14	22/45 (48)	0.11
No	148/310 (47)		111/328 (34)	
Number of regular sex partners				
0	71/157 (45)	0.001	86/214 (40)	0.01
1	89/95 (93)		34/66 (52)	
2	39/48 (81)		15/52 (29)	
3	13/20 (66)		7/19 (77)	
4	6/10 (60)		7/11 (66)	
>4	6/10 (60)		4/7 (57)	
Frequency of condom purchase				
Never	20/86 (23)	0.001	51/231 (22)	0.001
Sometimes	56/93 (60)		36/74 (48)	
Frequently	57/76 (75)		22/34 (64)	
Always	81/89 (91)		32/34 (94)	
Frequency of unplanned sex				
Never	155/186 (83)	0.001	124/250 (52)	0.001
Sometimes	77/141 (55)		21/101 (21)	
Frequently	1/10 (4)		2/15 (10)	
Always	1/3 (1)		1/7 (4)	

condoms in next intercourse reported condom use compared with 9% of women who did not intend to use condoms in next intercourse ($P < 0.001$). Knowing someone with HIV/AIDS was not associated with condom use for men ($P > 0.13$) and women ($P > 0.19$). Similarly, knowing someone who had died of AIDS was not associated with condom use for men ($P > 0.17$) and women ($P > 0.15$). Report of ability to be friendly was not associated with condom use for men ($P > 0.17$) and women ($P > 0.15$) and belief about usefulness of condoms for HIV infection was not associated with condom use for men ($P > 0.14$) and women ($P > 0.11$). For both men and women, knowledge about HIV/AIDS did not predict condom use ($P > 0.19$), not shown.

On bivariate association between sexual practices and condom use, number of sex partners was associated with condom use for both men and women. Forty-five percent of men who never had regular sex partners during national service reported condom use compared with 72% of men who had one or more partners. Forty percent of women who never had regular sex partners reported condom use

compared with 56% who had one or more partners ($P < 0.01$). Rate of condom use increased with frequency of condom purchase for both men and women. This is from 23% of men who did not purchase condoms during service period to 75% among men who purchased occasionally, frequently or always ($P < 0.001$). Similarly for women, 22% of women did not purchase condoms during service compared with 69% of women who bought occasionally, frequently or always ($P < 0.001$). Rates of condom use increased among men and women who never had unplanned sex during service period. Eighty-three percent of men who never had unplanned sex reported condom use compared with 20% of men who had unplanned sex occasionally, frequently or always ($P < 0.001$). Similarly 52% of women who never had unplanned sex reported condom use compared with 12% of women who had occasionally, frequently or always ($P < 0.001$).

Logistic regression

Table IV reports findings from a stepwise logistic regression analysis. For men, condom use at last intercourse was common if participants had one or more sex partners [odds ratio (OR) 10.62, 95% confidence interval (CI) 5.51–14.11] and was purchasing condoms (OR 11.39, 95% CI 10.2–16.78). For women, condom use at last intercourse was predicted by being single (OR 3.68, 95% CI 1.96–13.9), if participants had one or more sex partners (OR 5.08, 95% CI 1.20–11.73), was purchasing condoms (OR 11.94, 95% CI 9.68–15.42) and had intention to use condoms at next intercourse (OR 13.57, 95% CI 12.31–19.80).

Discussion

Behavior change models [17, 18] suggest that adoption of condoms to prevent HIV infection is influenced by an individual's awareness that the method is effective and a tendency for the individual to feel personally at risk of contracting the virus and to perceive the infection to have severe outcomes. Relevant data obtained in this study support the

Table IV. Stepwise logistic regression analysis of factors associated with condom use at last sex

Variables	Adjusted OR (95% CI)	P value
Men ($n = 344$)		
Has one or more regular partners (versus no regular partner)	10.62 (8.51–14.11)	0.001
Had purchased a condom (versus did not purchase a condom)	11.39 (10.20–16.78)	0.001
Women ($n = 373$)		
Married (versus single)	3.68 (1.96–13.91)	0.05
Has one or more regular partners (versus no regular partner)	5.08 (1.20–11.73)	0.02
Had purchased a condom (versus did not purchase a condom)	11.94 (9.68–15.42)	0.001
Intended to use condoms next intercourse (versus did not intend)	13.57 (12.31–19.80)	0.0001

propositions of the models and can explain the findings on why awareness of condoms was high for both men and women, but actual use at last intercourse was relatively low for both sexes. Consistent use which was 15% for men and 4% for women was particularly low. In accordance with the propositions of the models, the disparity between condom awareness and use was likely to arise as majority of men and women did not feel personally at risk of contracting HIV without condom use and as fewer men and women thought condoms were useful to prevent HIV transmission. Previous studies suggest that feelings that one is not susceptible to contract HIV and thoughts that condoms are not effective for HIV prevention may occur when individuals do not perceive social or peer norms to reinforce condom use [19]. Condoms are available to the public and promoted through numerous social marketing strategies in the country, there are however various social norms in the country that associate condoms with unfaithfulness,

sex workers, infidelity and disease [20]. A key issue relevant to HIV prevention in the youth population is therefore to make condoms risk reduction socially normative in ways that perceptions of peer norms regarding acceptability of condoms is improved. Expectedly, this will facilitate the belief in the efficacy of condoms and that the method is socially valued. Theoretically when these take place, one can anticipate significant increases in condom utilization, particularly as majority of men and women already reported that they had capacity to negotiate condom use and with high rates of intentions to use the method. Relevant non-governmental organizations involved with community HIV prevention and authorities of National Youth Service Corps may utilize peer education approaches on condoms risk reduction potentials in members of the national service youth populations in ways that create expectations that condom use practices are socially appropriate.

The findings of the study also showed that 12% of men and 8% of women were diagnosed with STIs in the past 1 year preceding the study. All the STIs were reported among single participants, some (23% of men and 6% of women) who have relied on self-medication for treatment. Previous studies have reported high rates of STIs ranging between 11 and 82% in various female populations in the country [21–23]. Several factors have been shown to increase the spread of STIs among adolescents and adults in the country. These include inconsistent use of contraceptives, beliefs that contracting STIs are inevitable and beliefs that it is heroic for young men to have STIs at a point during their sexual experiences. There is a need for participants in the national service to be educated about the link between STIs and HIV infection. When individuals have the knowledge, it is likely to increase their concern for prevention of risky sexual relationships [23].

Similarly, understanding the predictors of condom use can shed light on effective interventions to elevate the use. In this study, the determinants of condom use for both men and women overlap, the latter however had additional predictors. For both, having one or more regular sex partners and purchasing of condoms were predictors of use.

In addition, for women being single and having intention to use condoms in next intercourse were predictors of use.

The present finding that condom use was more likely with one or more regular partners is consistent with existing studies [20]. It appears that a sense of risk of contracting HIV increases as an individual has one or multiple sexual partners. Previous studies have not directly assessed the impact of condom purchase on actual use. Our study finding that condom use increased among those that purchased it however appears to be implicitly corroborated by a study of patterns of condom use in Lusaka, which found that the use increased with improved social economic status [24]. The finding that condom use was more common among women who were single than among married women is consistent with existing findings. Condom use is more common in non-marital relationships than in marital contexts in Nigeria [20]. In Lusaka, condom use is about eight times as more likely in non-marital relationships than marital relationships [24]. The present finding also showed that women's intention to use condoms in next intercourse was a predictor of condom use. The finding conforms with the theoretical principle that one of the most immediate causes of actions are behavioral intentions [25]. One is likely to take an action after being aware of the choice of the action, its consequences and after contemplating the action.

Other findings showed that only 1% of men and 2% of women were willing to take up free HIV test. Previous studies in Nigeria have noted that there are numerous stigma reactions associated with HIV and AIDS [23] and the reactions may explain the lack of readiness of many of the study participants to take up free HIV test. There is a need to provide attitude change messages to the youths as a voluntary HIV test marks an important entry point to the control of HIV and AIDS. The present findings also showed that women reported lower condom use rates both at last intercourse (68 versus 41%) and for consistent use (15 versus 4%). Previous findings have expressed that women may have lower condom use rates compared with men since African men mostly control decision making regarding male condom

use and are willing to exercise control over women on other sexual matters [27]. The implication for the present study is that most women during national service may have difficulty to protect themselves from STIs and HIV in sexual relationships, even when they have adequate knowledge of infection transmission. It is important that HIV and AIDS service providers and other relevant organizations develop specific messages for youths in national service that facilitate sexual partners to perceive that male and female partners should make joint decisions regarding condom use and other sexual measures. Such messages are appropriate to facilitate condom negotiation and use, especially as majority of men and women already have condom self-efficacy. The findings of the present study did not find a relationship between knowing either someone with HIV or someone who had died of AIDS and condom use. Although some studies have shown such associations [28], the findings of the present study is however consistent with previous studies on South African women that found no such relationships [29]. One explanation as provided by earlier studies is that the relationships may not be evident as in the present study if HIV mortality is generally not high enough to influence public perception and affect widespread condom use [29]. The present findings also showed that ~4% of men and 2% of women who were all single reported that they have received HIV diagnoses. An implication of the finding is the possibility of occurrence of HIV serodiscordant sexual relationships that involve members in national service particularly among non-marital or cohabitating couples. It is appropriate for service providers to develop effective messages to encourage youths on national service to receive VCT as discordant couples who have received VCT have lower seroconversion rates [30].

The study findings are relevant for health education and policy as they concern predictors of male condom use by fresh graduates on compulsory national service. The findings provide a basis to formulate interventions that will be suited for needs of the graduates. The finding that condom use was predicted by condom purchase suggests that au-

thorities of the national youth service should improve access of the youths to exiting social marketing of condoms in place in the country. Already male condoms are those predominantly sold, provided at affordable subsidized rates through various social marketing programs. Previous studies have shown that in populations where condom use intentions and self-efficacy are high as in the present study, messages on condom buying when made simultaneously will help to increase condom use [31]. It is important to promote the message for men and women prior to migration or as soon as they arrive for service. This is consistent with the study finding that intention for condom use and condom purchase enhanced actual condom use. When the message is careful disseminated in the context of HIV prevention, the audience will be able to realize the relevance of condoms, their potentials and usefulness. In turn, the message will likely create both awareness and intention about condoms for them in ways that will readily dispose them to the use while on national service.

The analyses reported in the present study have a number of limitations. The study sample consisted of fresh graduates on national service in Ibadan. Although fresh graduates were assigned to various communities in the country on the basis of a computerized random procedure, one should however still be cautious in generalizing the findings to all the graduates on service within Nigeria; especially as local cultural practices in communities may differentially moderate sexual practices of fresh graduates. Future study should focus on investigating the generalization of the present study findings. Such studies should also provide more information by assessing impact of barriers to condom use and migration variables such as frequency of return home to families on actual condom use. Similarly, it is difficult from the present study to make any causal inference about the relationship between the service migration experience and high-risk sexual practices of the service participants. The present study has been able to shed light on the sexual practices during national service; future studies need to closely examine the causal direction. It is also appropriate to indicate the limitations of

self-reports, especially for sensitive topics such as sexual practices and identification for disease diagnosis. Participants were asked about certain personal information without requesting for names (such as age and school of graduation), this is however not considered strong enough to jeopardize the reliability of responses. Several aspects (such as instructions on anonymity of respondents, confidentiality of responses and ensuring that respondents independently responded to the questionnaires) of the present study were used to reduce the possibility of socially desirable responses. In addition, majority of the sample population has participated in various surveys as respondents from their university or polytechnic school periods and would have realized their responses were purely for research purposes.

Conflict of interest statement

None declared.

References

1. Federal Ministry of Health. *HIV/AIDS in Nigeria: Overview of the Epidemic*. The Federal Ministry of Health, Department of Public Health, National AIDS/STIS Control Program, 2004.
2. Lurie MN, Williams BG, Zuma K *et al*. Who infects whom? HIV-1 concordance and discordance among migrant and non-migrant couples in South Africa. *AIDS* 2003; **17**: 2245–52.
3. Lagarde E, Schim van der Loeff M, Enel C *et al*. Mobility and the spread of human immunodeficiency virus into rural areas of West Africa. *Int J Epidemiol* 2003; **32**: 744–52.
4. Zuma K, Gouws E, Williams B *et al*. Risk factors for HIV infection among women in Carletonville, South Africa: migration, demography and sexually transmitted diseases. *Int J STD AIDS* 2003; **14**: 814–7.
5. Sunmola AM. Sexual practices barriers to condom use and its consistent use among long distance truck drivers in Nigeria. *AIDS Care* 2005; **17**: 208–21.
6. Ao T, Sam N, Manongi R *et al*. Social and behavioural determinants of consistent condom use among hotel and bar workers in northern Tanzania. *Int J STD AIDS* 2003; **14**: 688–96.
7. Gebrekristos H, Lurie M. The impact of family housing on HIV transmission among mining communities in South Africa. *Sex Health Exch* 2003. Available at: http://www.kit.nl/ils/exchange_content/html/2003-2-south-africa-2.asp.
8. Nyanzi S, Nyanzi B, Kalina B *et al*. Mobility, sexual networks and exchange among bodabodamen in southwest Uganda. *Cult Health Sex* 2004; **6**: 239–54.
9. Laukamm-Josten U, Mwizarubi BK, Outwatwer A *et al*. Preventing HIV infection through peer education and condom promotion among truck drivers and their sexual partners in Tanzania, 1990–1993. *AIDS Care* 2000; **12**: 27–40.
10. Lagarde E, Carael M, Glynn JR *et al*. Educational level is associated with condom use within non-spousal partnerships in four cities of sub-Saharan Africa. *AIDS* 2001; **15**: 1399–408.
11. Sunmola AM. Evaluating the sexual behaviour, barriers to condom use and its actual use by university students in Nigeria. *AIDS Care* 2005; **17**: 208–21.
12. UNAIDS. *Migrants' Right to Health*. Geneva: UNAIDS, 2001.
13. Fages V. *Migration and AIDS in South Africa: A Public Health Issue*. Pretoria: UNAIDS, 1999.
14. Brummer D. *Labour Migration and HIV/AIDS in Southern Africa*. International Organization for Migration Regional Office for Southern Africa, International Organization for Migration, 2002.
15. Hosmer DW, Lemeshow S. *Applied Logistic Regression*. New York: Wiley, 1989.
16. Kalichman SC, Simbayi LC. Sexual assault history and risks for sexually transmitted infections among in an African township in Cape Town, South Africa. *AIDS Care* 2004; **16**: 681–9.
17. Ajzen I, Fishbein M. *Understanding Attitudes and Predicting Social Behavior*. Englewood Cliffs, NJ: Prentice Hall, 1980.
18. Bandura A. Social cognitive theory and exercise of control over HIV infection. In: Diclemente R, Peterson J (eds). *Preventing AIDS: Theories and Methods of Behavioral Interventions*. New York: Plenum Press, 1994, 25–9.
19. Fisher JD, Misovich SJ. Social influence and AIDS preventive behavior. In: Edwards J, Tindall RS, Health L, Posavac EJ (eds). *Social Influence Processes and Prevention*. New York: Plenum Press, 39–70.
20. Messersmith LJ, Kane T, Odebiyi IA *et al*. Who's at risk? Men's STD experience and condom use in southwest Nigeria. *Stud Fam Plan* 2000; **31**: 203–16.
21. Brabin L. Reproductive tract infections and abortion among adolescent girls in rural Nigeria. *Lancet* 1995; **345**: 300–4.
22. Nwabueze RN, Onyia GOC, Adaelu IL. Incidence of acquired immune deficiency syndrome (AIDS) and other sexually transmitted diseases in Abia State, Nigeria. *Int J Env Health Res* 2000; **10**: 263–70.
23. Temin MJ, Okonofua FE, Omoridion FO *et al*. Perceptions of sexual behavior and knowledge about sexually transmitted diseases among adolescents in Benin City, Nigeria. *Int Fam Plan Perspect* 1999; **24**: 186–90, 195.
24. Agha S. Patterns of use of the female condoms after one year of mass marketing. *AIDS Educ Prev* 2001; **13**: 55–64.
25. Ajzen I. From intentions to actions: a theory of planned behavior. In: Kuhl J, Beckmann J (eds). *Action Control: from Cognition to Behavior*. New York: Springer-Verlag, 1985, 11.
26. Akpede GO, Lawal RS, Momoh SO. Perception of voluntary screening for paediatric HIV and response to post-test counselling by Nigerian parents. *AIDS Care* 2002; **14**: 683–97.
27. Zellner SL. Condom use and the accuracy of AIDS knowledge in Cote D' Ivoire. *Int Fam Plan Perspect* 2003; **29**: 41–7.

28. Macintyre K, Brown L *et al.* It's not what you know, but who you knew: examining the relationship between behavior change and AIDS mortality in Africa. *AIDS Educ Prev* 2001; **13**: 160–74.
29. Camlin CS, Chimbwete CE. Does knowing someone with AIDS affect condom use? An analysis from South Africa. *AIDS Educ Prev* 2003; **15**: 231–44.
30. Ryder RW, Kamenga C, Jingu M *et al.* Pregnancy and HIV-1 incidence in 178 married couples with discordant HIV-1 serostatus: additional experience at an HIV-1 counselling centre in the Democratic Republic of the Congo. *Trop Med Int Health* 2000; **5**: 482–7.
31. Meekers D, Klein M. Understanding gender differences in condom use self efficacy among youth in urban Cameroun. *AIDS Educ Prev* 2002; **14**: 62–72.

Received on September 4, 2005; accepted on August 7, 2006

UNIVERSITY OF IBADAN LIBRARY