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**HIV/AIDS Knowledge and Attitudes among West African Immigrant Women in
Western Australia**

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Running head: HIV/AIDS knowledge in West African Immigrants

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Abstract

Background. Most women who live in sub-Saharan countries have heard of HIV/AIDS, but there is still widespread misunderstanding about how HIV is spread, the consequences of infection, and how to protect against infection. The aim of this study was to investigate knowledge about HIV and attitudes towards condom use in West African refugees who had settled in Perth, Western Australia, within the past five years.

Method. Knowledge about transmission of HIV, myths about how HIV is spread, incorrect beliefs about protective factors, the effectiveness of condoms in protecting against sexually transmitted infections, and attitudes toward condom use were investigated by survey in 51 West African women, and in 100 Australian women for comparison. Where possible, each West African woman was matched for age and level of education with an Australian woman.

Results and conclusions. Knowledge of HIV was poorest in the least educated West African women, but many of the more highly educated women also had misconceptions about how HIV is spread, how to protect against HIV, and the effectiveness of condoms in protecting against HIV. Moreover, most West African women held negative attitudes toward condom use. Within the Australian sample, HIV knowledge was greatest in women with tertiary qualifications, and was greater in younger than older women; in addition, attitudes towards condom use differed across the age span. These findings suggest that educational programmes that focus on knowledge about HIV should be tailored to meet the needs and cultural sensitivities of newly emerging immigrant communities, and should target particular demographic groups within the Australian population.

Introduction

Women in sub-Saharan countries are considered to be one of the most vulnerable populations in the world for HIV (1). Three quarters (76%, or 13.2 million) of all HIV positive women live in sub-Saharan Africa, and women in sub-Saharan Africa also make up 59% of the adults living with HIV (2). Women and girls who live in sub-Saharan countries typically have low access to education and health information, suffer inequality in marriage and sexual relations, are economically dependent on their male partners, and are part of cultural traditions that reinforce gender inequalities (3, 4). Poverty, lack of education and absence of vocational training opportunities are implicated in the poor health of these African women (5), and heighten the risk of contracting HIV and other sexually transmitted infections.

Although awareness of HIV/AIDS is now almost universal in sub-Saharan countries (6, 7), there is still widespread misunderstanding about how HIV is spread, how to protect against infection, and the consequences of infection. For example, in a survey of 1200 women of reproductive age in Bida Emirate of Niger State, Nigeria, only 15% were able to describe HIV/AIDS as a deadly disease (8). Over 90% of these women had no or only rudimentary levels of education. Many African women incorrectly believe that AIDS can be cured (9-13). Misconceptions that HIV can be transmitted by mosquito bites, by sharing food with another person who has HIV, or by supernatural means are common (10, 13, 14). Moreover, many African people still believe that having sex with a virgin can cure AIDS (13, 15). Although most African men and women are aware of the protective benefits of condoms, negative attitudes towards the acceptability and safety of condom use are widespread (13, 16-26).

An exodus of African refugees in recent years has coincided with a high prevalence of HIV in African communities living in Western countries. In a cross-sectional survey and linked anonymous oral fluid sampling of black Africans living in the United Kingdom, 4.8% of respondents had a diagnosed HIV infection; alarmingly, an undiagnosed HIV infection was detected in another 9.2% of cases (27). In a Spanish study of immigrants who attended medical clinics between January 2002 and April 2003, molecular characterization of HIV subtypes identified viral variants from the country of origin in immigrants from sub-Saharan Africa (28). These findings reinforce the notion that immigrant populations may introduce new viral variants into the host country.

Over the past 5 years, Australia has seen an increase in settlement of refugees, particularly from Africa (Fact Sheet 60, Department of Immigration and Citizenship, Australian Government, <http://www.dimia.gov.au/media/fact-sheets/60refugee.htm>). Between 2001 and 2005, the West Australian Department of Health was notified of 55 new cases of women with HIV (The Epidemiology of Notifiable Sexually Transmitted Infections and Blood-Borne Viruses in Western Australia 2006; http://www.public.health.wa.gov.au/3/574/1/epidemiology_of.pm). Of these, 16 (29%) reported that they had acquired HIV in sub-Saharan Africa. There is wide diversity among the refugee population in terms of socioeconomic backgrounds, heritage and culture. Such factors could influence beliefs and understanding concerning health issues, and the extent to which these beliefs and values are retained in the host society. In particular, economically deprived refugees might retain the beliefs and values of their country of origin more strongly than their better-educated middle-class counterparts. For instance, knowledge about modes of HIV transmission generally was high in African

immigrants in Houston, Texas (29), many of whom had tertiary levels of education and had migrated to Houston for academic reasons. However, most Somali and Sudanese immigrants living in Denmark were less knowledgeable about modes of HIV transmission or other aspects of HIV, particularly those with little or no education (30). Misconceptions or lack of knowledge could increase the likelihood of exposure to or transmission of HIV. Length of residence in the host country may also be important, although language barriers could delay acculturation and prevent utilization of available health information (31).

In the study reported below, knowledge about HIV was investigated in West African women who had migrated recently from refugee camps in Africa to Perth, Western Australia. The aim was to determine whether knowledge about HIV transmission, and attitudes towards condom use, differed between less- and more-educated West African immigrants. For comparison, knowledge about HIV was also investigated in a convenience sample of Australian women matched for age and education with the West African immigrants.

Method

Subjects

The West African sample consisted of 51 women aged between 20 and 67 years (mean age \pm S.D. 35.0 \pm 10.6 years) who had lived in Perth for six months to five years (mean duration 2.3 \pm 1.3 years). Most were from Liberia or Sierra Leone, but had lived for up to 10 years in refugee camps before being re-settled in Australia. The sample size was limited by the funds available for this research. However, as deficits in knowledge about HIV/AIDS were identified in a comparable sample (N = 47) of the Sudanese

refugee and immigrant population of Nebraska (32), the present sample was considered adequate. To facilitate the match between cases and controls on key demographic variables, questionnaires were administered to approximately twice as many Australian women (N = 100) as West African women, across a broad age range. The Australian women were aged between 18 and 90 years (mean age 43.0 ± 17.8 years), had lived in Australia for eight to 90 years (mean duration 36.3 ± 16.2 years), and were all of European descent. Each respondent provided written informed consent before participating. The procedures were approved by the Murdoch University Human Research Ethics Committee.

Procedure

The survey was initiated by a group of women from the West African community in Perth who were concerned about the risk of HIV and other diseases spreading within their community. Eight women from the community group reviewed the questionnaire to ensure that the wording of questions was culture-appropriate, and were trained in questionnaire administration. The questionnaire was administered by interview because of low levels of literacy in some members of the West African migrant community and was delivered in English, which is the national language of Sierra Leone and Liberia. Each questionnaire administrator interviewed 6-8 female acquaintances and family members. The majority of those approached agreed to be interviewed. Reasons given for not participating included family or work commitments, or difficulty arranging a time or place with suitable privacy. The first interview by each of the eight interviewers was supervised by the project coordinator to ensure that questions were administered in a standard manner and that answers were recorded correctly.

Comparative data was collected concurrently from 100 Australian women living in inner- and outer-metropolitan regions of Perth. Eight female undergraduate psychology students each recruited 12-15 female adult acquaintances or family members to participate in the survey. The students were asked to recruit Caucasian women across the full age range, from young adult through to old age. The student interviewer explained the nature of items in the questionnaire to the respondent, obtained informed consent, and administered demographic items concerned with age, marital status, occupation, and education. The respondent filled out the remainder of the questionnaire in private, and returned it in a sealed envelope to the student interviewer. Most of those approached agreed to fill out the questionnaire, and the response rate thereafter was 100%.

It is generally assumed that knowledge about HIV transmission and awareness of self-protective behaviours are important determinants of safe sexual practices (33). However, despite HIV-related knowledge, negative attitudes about condom use are associated with HIV risk-taking behaviours (34). Therefore, respondents were questioned not only about modes of HIV transmission but also about what can be done to protect oneself against infection, the effectiveness of condoms in protecting against HIV and other sexually transmitted infections, and attitudes toward condom use. Items concerned with known modes of transmission of HIV (e.g., by sharing a needle or by having oral sex with someone who has HIV); myths about how HIV is spread (e.g., by spirits or supernatural forces, or by sharing kitchen utensils with someone who has HIV); incorrect beliefs about protective factors (e.g., taking antibiotics or a vaccine); the effectiveness of condoms in protecting against infections such as HIV; and attitudes toward condom use

(e.g., condoms spoil sex, or partners dislike condoms) were drawn from various sources (13, 33, 35). Response categories were “true”, “false” or “unsure”.

Data analysis

For the purpose of statistical analysis, responses were dichotomized into “true” and “false or unsure” categories, thus meeting basic criteria for interval data. As might be expected, the distribution of scores on many of these variables was skewed; nevertheless, a parametric statistical approach was employed because violations of the normality assumption generally have little effect on the outcome (36).

To minimize type 1 errors, a multivariate step-down approach was used to investigate differences among the four groups (i.e., West African and Australian samples matched for age and educational background, the unmatched Australian sample, and West Africans with low levels of education). In the first step, differences among groups were investigated in multivariate analyses of variance on variables concerned with (i) HIV knowledge; and (ii) attitudes toward condom use. In the second step, significant multivariate effects were investigated in *a priori* contrasts between (a) the less- and more-educated West African samples; (b) the matched West African and Australian samples; and (c) the matched and unmatched Australian samples for each item. Because these analyses were planned, type 1 errors were not controlled. However, as there were 27 questions concerning HIV knowledge, the criterion of statistical significance was $p < 0.002$ after Bonferroni correction. Similarly, the criterion of statistical significance for the 12 questions concerning attitudes toward condom use was $p < 0.004$ after Bonferroni correction.

Results

Demographic characteristics

The intention was to match each West African woman with an Australian woman of similar age and educational background. However, this was not possible for every West African woman because nine had not attended school at all and another five had attended school for seven years or less. In contrast, all but one of the Australian women had attended school for at least eight years. Therefore, the West African sample was split into those with seven or fewer years of education ($N = 14$) and those with eight or more years of education ($N = 37$). Each member of the more-educated group was then matched with an Australian woman of similar age and educational background.

As shown in Table 1, the more-educated West African women were matched closely for age and educational background with the subset of Australian women. These two groups were similar in marital status and the proportion who spoke English at home, but fewer of the West African women were employed full-time [$\chi^2(2) = 15.2, p < 0.001$]. The less- and more-educated West African women were similar in age, employment and marital status, but a smaller proportion of the less-educated women spoke English at home [$\chi^2(1) = 11.3, p < 0.001$]. The matched Australian sample were younger than the unmatched Australian sample [$t(98) = 4.13, p < 0.001$], and fewer had attended university [$\chi^2(3) = 17.3, p < 0.001$], but they were similar on the other demographic variables.

Knowledge about transmission of HIV

Knowledge about transmission of HIV and awareness of how to protect against infection differed significantly among the four groups [Pillai's trace = 1.28; multivariate $F(81,339) = 3.10, p < 0.001$]. As shown in Table 2, most respondents were aware of

known modes of HIV transmission. In particular, they recognized that sharing an injection needle with someone who has HIV, and having sex with more than one partner, increases the likelihood of being infected with HIV. Having oral or anal sex with a HIV-infected person was recognized less frequently as a risk factor for HIV both by West African and Australian women. Interestingly, a greater percentage of West Africans than matched Australians recognised that other sexually transmitted infections can increase the risk of HIV infection (Table 2).

However, many West African respondents held incorrect beliefs about how HIV is spread (Table 2). The less-educated West Africans were the least-informed group, followed by the more-educated West Africans who, in turn, were less well-informed than the Australians on most items. Nonetheless, it is noteworthy that 36% of the pooled Australian sample thought that HIV could be spread by mosquito bites, and around one quarter thought that they could catch HIV by sharing a glass of water or by kissing someone with HIV.

A greater percentage of West African than Australian women held incorrect beliefs about factors that protect against HIV (Table 2). Even so, a significant minority of the Australian women thought that there is a cure for HIV/AIDS, and only around half of the pooled Australian sample thought that a natural skin condom works better against HIV than a latex condom. Similar proportions of less- and more-educated West African women held incorrect beliefs about factors that protect against HIV.

West African women were also less sure than Australian women about the effectiveness of condoms for protecting against sexually transmitted infections such as

HIV (Table 2). Only a minority of West African and Australian women were aware that a woman's condom use could decrease the likelihood of HIV infection.

Attitudes toward condom use

Attitudes toward condom use differed significantly among the four groups [Pillai's trace = 0.652; multivariate $F(36,399) = 3.08$, $p < 0.001$] (Table 3). Importantly, the majority of West African women (particularly the less-educated group) thought that buying condoms was embarrassing or shameful. In addition, a greater percentage of West African than Australian women thought that most people who carry condoms are just looking for sex; and that they would feel insulted if their husband or partner suggested using a condom. Moreover, more of the West African than Australian women thought that it was difficult to bring up the topic of using condoms, and that if their husband or partner suggested using a condom this would indicate that he was suspicious or concerned about her past sexual behaviour. Although only a minority of respondents thought that condoms spoiled sex, almost half thought that condoms are unnatural, and the majority thought that partners dislike condoms.

Individual differences within the Australian sample

As shown in Table 2, knowledge of HIV transmission differed between the matched and unmatched Australian samples on some of the questionnaire items. As the two samples differed in age and educational background, the association between these characteristics and knowledge of HIV transmission was investigated in the pooled sample of Australian women.

A significant association between age and HIV knowledge was identified in multiple regression analysis [R square = 0.449; $F(27,64) = 1.93$, $p < 0.05$]. As shown in

Table 4, knowledge about transmission of HIV generally was greater in younger than older women. The only exception was a greater awareness by older than younger women that sexually transmitted infections increase the risk of HIV/AIDS. Attitudes toward condom use also differed between younger and older women [R square = 0.235; $F(12,84) = 2.16$, $p < 0.05$]. Interestingly, older women were more likely than younger women to agree that buying condoms is embarrassing or shameful, and that they would feel insulted if their husband or partner suggested using a condom (Table 5). Nevertheless, older women were also more likely to agree that their husband or partner cared about them and was being responsible if he suggested using a condom.

In addition, a significant association between HIV knowledge and tertiary qualifications was identified in Australian women [Pillai's trace = 0.457; multivariate $F(27,64) = 1.99$, $p < 0.05$]. In particular, women with technical college or university qualifications were more aware of how HIV is transmitted than women without tertiary qualifications (Table 4). However, there was no association between tertiary qualifications and attitudes toward condom use.

Discussion

The main findings can be summarized as follows. West African and Australian women were well-informed about true modes of transmission of HIV. However, West African women also held many incorrect beliefs about how HIV is transmitted and how to protect against HIV. In addition, many West African women were unsure about the effectiveness of condoms in protecting against sexually transmitted infections such as HIV, and held negative attitudes toward condom use in general. Knowledge about HIV was poorest in the less-educated West African women, but even the better-educated West

African women had misconceptions about how HIV is spread and how to protect against HIV. Furthermore, irrespective of their educational background, most West African women had negative attitudes toward condom use in protecting against sexually transmitted infections.

A greater proportion of West African than Australian women were aware that other sexually transmitted infections increase physiological vulnerability to HIV. Most respondents knew that a pregnant woman can give HIV to her baby and that HIV can be transmitted by sharing needles or by having sex with multiple partners. However, fewer were aware that HIV can be transmitted to women during oral or anal sex. Such information may need to be included in community-wide educational programmes about safe sexual practices.

Although most West African women knew about true modes of transmission of HIV, many also held incorrect beliefs about how the virus is spread and about how to protect against HIV infection. On the face of it, some of these beliefs may seem reasonable. For example, if HIV is contained in blood, then it could be spread by mosquitoes; or if other illnesses can be spread by contact with a sick person, then why not HIV? A significant minority of the Australian sample also thought that HIV could be transmitted by mosquito bites, and about one quarter thought that HIV could be spread by sharing a glass of water or by kissing someone with HIV. Such beliefs may be amenable to change in simple educational programmes about how HIV is spread. However, other beliefs based on traditional cultural folklore and superstition (e.g., HIV/AIDS is caused by spirits or supernatural forces) may be more difficult to change because beliefs about the veracity of Western medicine would need to be accepted. Presumably superstitious

beliefs survive in vulnerable populations because of a pervasive fear of infection, and a mistrust of government-run health systems. Unfortunately, many of these erroneous beliefs may result in alienation of HIV-infected people from support bases within their community.

Irrespective of their educational background, many of the West African women held false beliefs about how to protect themselves against HIV infection. Alarming, some of the women accepted the widespread belief that a person can get rid of HIV/AIDS by having sex with a virgin (13), thus condoning an extremely dangerous practice. Furthermore, beliefs that there are vaccines or cures for HIV/AIDS may encourage unsafe sexual practices (e.g., sex without a condom), and obviously need to be targeted urgently in culturally-sensitive educational programmes.

As in many other studies (e.g., 13, 23, 24), the majority of the West African and Australian women reported that their partners disliked condoms, and around one third thought that condoms spoilt sex. The West African women were less certain that condoms are effective at protecting against HIV/AIDS than their Australian counterparts, and fewer of the less-educated group believed that sex without a condom increases the risk of sexually transmitted infection. Although not explored in the present study, many Africans believe that using condoms is pointless because they slip or break easily (18, 22, 26), and some hold concerns about the safety of condom use because of the misconception that HIV can slip through tiny holes in the condom (21, 26). These misconceptions need to be corrected. Only a minority of the West African and Australian women were aware of the availability of a female condom. Although more expensive than male condoms, female condoms give women some degree of control over condom

use and should be promoted more widely as an option that provides substantial protection against unwanted pregnancy and sexually transmitted infections. However, cultural sensitivity must be taken into consideration if adopting this approach. For example, as African women typically feel less empowered than men to assert their needs, they might decide not to use a female condom to avoid offending their male partner.

Social and cultural taboos about discussing sex may prevent women from seeking information about HIV/AIDS, sexually transmitted infections, or using condoms (37). For example, in South Africa, many women are too frightened to ask their partner to use a condom as it may suggest that the woman has been unfaithful, that she doubts her partner, or that she is accusing him of having a sexually transmitted infection (38). Insisting on condom use may result in violence from the male partner or even abandonment. In turn, feelings of disempowerment may lead to negative attitudes toward condom use. Less-educated women who depend upon their male partner for economic survival are particularly vulnerable to this negative spiral (38).

Some caveats must be noted when interpreting the present findings. Notably, the convenience samples used in this study may limit generalization of the findings to the wider refugee and Australian populations. The study was initiated by small group of West African women who recruited and interviewed members of their community about their knowledge of HIV and attitudes toward condom use. Thus, it is likely that the data was influenced, at least in part, by selection biases, social desirability constraints, and other inaccuracies of self-report. In addition, data was collected from a small sample of West African women, some of whom could not be matched with an Australian counterpart. Nevertheless, the results replicate those of similar studies (30, 32), resemble findings in

the country of origin (1, 9, 11, 13, 14, 16-26), and provide some insight into issues of HIV-awareness and attitudes toward condom use in the Australian context.

Likewise, findings from the convenience sample of Australian women probably do not reflect the full spectrum of HIV knowledge and attitudes in the Australian community because the majority of respondents were highly educated, most had part- or full-time jobs, and all lived in or close to a major capital city. Nevertheless, even within this restricted sample, HIV knowledge varied across age and educational level, and attitudes towards condom use differed across the age span. Thus, public health campaigns about HIV may need to be tailored to target particular demographic groups within the Australian community.

Knowledge about disease transmission, and awareness of and attitudes towards self-protective behaviours may influence HIV risk-taking behaviours; nonetheless, this does not necessarily translate into safe sexual practices. The present survey should be extended to determine whether deficits in HIV knowledge influence sexual practices or protective behaviours (e.g., past or intended condom use) in high-risk groups.

Myths and misconceptions about HIV are rife throughout sub-Saharan Africa (e.g., 10, 13, 14), and may be difficult to shift even outside the cultural context in which these beliefs arise (39). In the absence of baseline data and a relatively short period of residence, we were unable to investigate whether such beliefs had changed in our West African sample since their arrival in Australia. However, in a survey of HIV/AIDS knowledge in Somali and Sudanese immigrants in Denmark, such beliefs were unrelated to the period of residence in the host nation (generally between 1 and 10 years but in some cases up to 35 years) (30). Thus, acculturation processes alone cannot be relied

upon to improve knowledge about HIV. Our findings imply that messages about HIV need to be adjusted for new and emerging communities to accommodate cultural sensitivities and conceptual differences underpinned by entrenched cultural belief systems (39). Addressing this issue now may help to limit the spread of HIV both within emerging population groups and across the broader host-nation community. One way to disseminate culturally-sensitive information about HIV and AIDS is to train selected members of minority groups about safe sexual practices, and to encourage them to pass this information on through their social networks; this peer-education approach was employed successfully in South African settlements (40), urban workplaces in Botswana (41), and in culturally-diverse groups in Canada (42). A similar strategy may help to promote safe sexual practices in refugee and immigrant groups in a culturally appropriate way.

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References

1. Burgoyne AD, Drummond PD. Knowledge of HIV and AIDS in women in sub-Saharan Africa. *African Journal of Reproductive Health* 2008; in press.
2. UNAIDS. 2006 Report on the Global AIDS Epidemic. Geneva: UNAIDS, 2006.
3. Aniekwu NI. Gender and human rights dimensions of HIV/AIDS in Nigeria. *African Journal of Reproductive Health* 2002;6:30-37.
4. UNAIDS. Keeping the Promise: An agenda for action on women and AIDS. Geneva: UNAIDS, 2006.
5. Kabira WM, Gachukia EW, Matiangi FO. The effect of women's role on health: The paradox. *International Journal of Gynecology & Obstetrics* 1997;58:23-34.
6. Central Statistical Agency (CSA) Ethiopia, & ORC Macro. Ethiopia Demographic and Health Survey 2005. Addis Ababa, Ethiopia and Calverton, Maryland, USA: Central Statistical Agency and ORC Macro, 2006.
7. Ministry of Health (MOH) Uganda, & ORC Macro. Uganda HIV/AIDS Sero-behavioural Survey 2004-2005. Calverton, Maryland, USA: Ministry of Health and ORC Macro, 2006.
8. Yahaya MK. Analysis of women's reproductive health situation in Bida Emirate of Niger State, Nigeria. *African Journal of Reproductive Health* 2002;6:50-64.
9. Araoye MO, Adegoke A. AIDS-related knowledge, attitudes and behavior among selected adolescents in Nigeria. *Journal of Adolescence* 1996;19:179-181.

10. Cherie A, Mitkie G, Ismail S, Berhane Y. Perceived sufficiency and usefulness of IEC materials and methods related to HIV/AIDS among high school youth in Addis Ababa, Ethiopia. *African Journal of Reproductive Health* 2005;9:66-77.
11. Ibe SN. HIV/AIDS awareness study of fresh students in tertiary institutions in Rivers State of Nigeria Department of Nigeria. *Journal of Applied Sciences & Environmental Management* 2005;9:11-13.
12. Kalichman SC, Simbayi L. HIV testing attitudes, AIDS stigma, and voluntary HIV counselling and testing in a black township in Cape Town, South Africa. *Sexually Transmitted Infections* 2003;79:442-447.
13. Simbayi LC, Kalichman SC, Jooste S, Cherry C, Mfecane S, Cain D. Risk factors for HIV-AIDS among youth in Cape Town, South Africa. *AIDS and Behavior* 2005;9:53-61.
14. Yerdaw M, Nedi T, Enquoselassie F. Assessment of awareness of HIV/AIDS among selected target groups in and around Addis Ababa, Ethiopia. *African Journal of Reproductive Health* 2002;6:30-38.
15. UNAIDS. *Step Up the Pace of HIV Prevention in Africa*. Geneva: UNAIDS, 2006.
16. James S, Reddy SP, Taylor M, Jinabhai CC. Young people, HIV/AIDS/STIs and sexuality in South Africa: The gap between awareness and behaviour. *Acta Paediatrica* 2004;93:264-269.

17. Jegede AS, Odumosu O. Gender and health analysis of sexual behaviour in south-western Nigeria. *African Journal of Reproductive Health* 2003;7:63-70.
18. Maharaj P, Cleland J. Condom use within marital and cohabitating partnerships in KwaZulu-Natal, South Africa. *Studies in Family Planning* 2004;35:116-124.
19. Manuel S. Obstacles to condom use among secondary school students in Maputo city, Mozambique. *Culture, Health & Sexuality* 2005;7:293-302.
20. Mufune P. Myths about condoms and HIV/AIDS in rural northern Namibia. *International Social Science Journal* 2003;57:675-686.
21. Nuwaha F, Fanelid E, Neema S, Höjer B. Lay people's perceptions of sexually transmitted infections in Uganda. *International Journal of STD & AIDS*, 1999;10:709-717.
22. Prata N, Vahidnia F, Fraser A. Gender and relationship differences in condom use among 15-24-year-olds in Angola. *International Family Planning Perspectives* 2005;31:192-199.
23. Plummer ML, Wight D, Wamoyi J, Mshana G, Hayes RJ, Ross DA. Farming with your hoe in a sack: Condom attitudes, access, and use in rural Tanzania. *Studies in Family Planning* 2006;37:29-40.
24. Reddy P, Meyer-Weitz A, van den Borne B, Kok G. STD-related knowledge, beliefs and attitudes of Xhosa-speaking patients attending STD primary health-care clinics in South Africa. *International Journal of STD & AIDS* 1999;10:392-400.

25. Sunmola AM. Evaluating the sexual behaviour, barriers to condom use and its actual use by university students in Nigeria. *AIDS Care* 2005;17:457-465.
26. Thomsen S, Stalker M, Toroitich-Ruto C. Fifty ways to leave your rubber: How men in Mombasa rationalise unsafe sex. *Sexually Transmitted Infections*, 2004;80:430-434.
27. Sadler KE, McGarrigle CA, Elam G, Ssanyu-Sseruma W, Davidson O, Nichols T, et al. Sexual behaviour and HIV infection in black-Africans in England: results from the Mayisha II survey of sexual attitudes and lifestyles. *Sexual Transmission and Infection* 2007;83:523-529.
28. Toro C, Jimenez V, Rodriguez C, Del Romero J, Rodes B, Holguin A, et al. Molecular and epidemiological characteristics of blood-borne virus infections among recent immigrants in Spain. *Journal of Medical Virology* 2006;78:1599-1608.
29. Rosenthal L, Scott DP, Kelleta Z, Zikarge A, Momoh M, Lahai-Momoh J, et al. Assessing the HIV/AIDS health services needs of African immigrants to Houston. *AIDS Education and Prevention* 2003;15:570-580.
30. Lazarus JV, Himedan HM, Ostergaard LR, Liljestrand J. HIV/AIDS knowledge and condom use among Somali and Sudanese immigrants in Denmark. *Scandinavian Journal of Public Health* 2006;34:92-99.

31. Miller JE, Guarnaccia PJ, Fasina A. AIDS knowledge among Latinos: the roles of language, culture, and socioeconomic status. *Journal of Immigrant Health* 2002;4:63-72.
32. Tompkins M, Smith L, Jones K, Swindells S. HIV education needs among Sudanese immigrants and refugees in the Midwestern United States. *AIDS and Behavior* 2006;10:319-323.
33. Carey MP, Schroder KE. Development and psychometric evaluation of the brief HIV Knowledge Questionnaire. *AIDS Education and Prevention* 2002;14:172-82.
34. Sacco WP, Levine B, Reed DL, Thompson K. Attitudes about condom use as an AIDS-relevant behavior: their factor structure and relation to condom use. *Psychological Assessment: A Journal of Consulting and Clinical Psychology* 1991;3:265-272.
35. Hoff T, Greene L, Davis J. National survey of adolescents and young adults: sexual health knowledge, attitudes and experiences. Henry J. Kaiser Family Foundation, Meno Park, California, 2003. <http://www.kff.org/youthhivstds/3218-index.cfm>
36. Keppel G. Design and analysis: a researcher's handbook. Prentice-Hall: Englewood Cliffs, New Jersey, 1973.
37. World Health Organisation (WHO). HIV-infected women and their families: Psychosocial support and related issues. A Literature Review. Geneva: World Health Organisation, 2003.

38. Ackermann L, de Klerk GW. Social factors that make South African women vulnerable to HIV infection. *Health Care for Women International* 2002; 23:163-172.
39. Nyagua JQ, Harris AJ. West African refugee health in rural Australia: complex cultural factors that influence mental health. *Rural and Remote Health* 2008; 8:884. <http://www.rrh.org.au>
40. O'Hara Murdock P, Garbharran H, Edwards MJ, Smith MA, Lutchmiah J, Mkhize M. Peer led HIV/AIDS prevention for women in South African informal settlements. *Health Care for Women International* 2003;24:502-512.
41. Norr KF, Norr JL, McElmurry BJ, Tlou S, Moeti MR. Impact of peer group education on HIV prevention among women in Botswana. *Health Care for Women International* 2004; 25: 210-226.
42. Majumdar B, Roberts J. AIDS awareness among women: the benefit of culturally sensitive educational programs. *Health Care for Women International* 1998;19:141-53.

Table 1: Demographic characteristics

	West Africans ($N = 51$)		Australians ($N = 100$)	
	Less-educated ($N = 14$)	More-educated ($N = 37$)	Matched sample ($N = 37$)	Unmatched sample ($N = 63$)
Age (years \pm S.D.)	37.9 \pm 8.4	34.0 \pm 11.2	34.1 \pm 12.4	48.2 \pm 18.5
Years at school:	1.7 \pm 2.7	10.8 \pm 1.6	11.3 \pm 0.8	11.5 \pm 1.1
Educational level:				
8-12 years at school	0%	49%	51%	33%
Technical college	0%	38%	35%	13%
University	0%	13%	13%	52%
Employment:				
Full-time work	7%	19%	54%	41%
Part-time work	14%	32%	35%	38%
Not working	79%	49%	11%	21%
Married or de facto	36%	46%	32%	51%
Speaks English at home	50%	92%	97%	100%

Table 2: Knowledge about transmission of HIV in West African and Australian women

	Percentage of Correct Responses				Significance of Contrasts		
	Group 1: Less educated Africans	Group 2: More educated Africans	Group 3: Matched Australians	Group 4: Unmatched Australians	Group 1 vs. Group 2	Group 2 vs. Group 3	Group 3 vs. Group 4
Transmission of HIV							
Sexually transmitted infections can cause increased risk for HIV/AIDS	93	94	74	84	-	.007	-
A pregnant woman can give HIV/AIDS to her baby	86	91	94	95	-	-	-
A person can get HIV by sharing an injection needle with someone who has HIV	100	97	100	91	-	-	.024
A woman can get HIV if she has anal sex with a man	64	68	71	84	-	-	-
Having sex with more than one partner can increase a person's chance of being infected with HIV	100	94	91	88	-	-	-
A person can get HIV from oral sex	50	40	59	59	-	-	-
Myths about HIV transmission							
HIV/AIDS is caused by spirits or supernatural forces	36	74	100	95	.009	.006	-
You can get HIV/AIDS by touching someone with HIV/AIDS	43	74	91	86	-	-	-
You can get HIV from mosquito bites	14	26	53	72	-	.020	.044
You can get HIV by sharing kitchen utensils	29	34	97	83	-	<0.0005	.049
You can get HIV from toilets	14	51	85	67	.009	.002	.044
Coughing and sneezing spread HIV	29	63	94	88	.024	.004	-

(Table 2 continued)	Percentage of Correct Responses				Significance of Contrasts		
	Group 1: Less educated Africans	Group 2: More educated Africans	Group 3: Matched Australians	Group 4: Unmatched Australians	Group 1 vs. Group 2	Group 2 vs. Group 3	Group 3 vs. Group 4
A person can get HIV by sharing a glass of water with someone who has HIV	29	54	82	64	-	.021	-
People can get HIV by kissing	21	63	76	71	.009	-	-
A person can get HIV by sitting in a hot tub or a swimming pool with a person who has HIV	14	62	94	71	<0.0005	.002	.010
Myths about HIV protection							
A person can get rid of HIV/AIDS by having sex with a virgin	64	60	97	98	-	<0.0005	-
There is a cure for HIV/AIDS	50	37	79	95	-	<0.0005	-
Showering or washing ones private parts after sex keeps a person from getting HIV	71	83	97	91	-	.047	-
There is a vaccine that can stop adults from getting HIV	79	60	88	81	-	.011	-
A woman cannot get HIV if she has sex during her monthly period	64	77	88	88	-	-	-
A natural skin condom works better against HIV than does a latex condom	36	37	62	43	-	.048	-
A person will not get HIV if he or she is taking antibiotics	64	77	88	81	-	-	-
Using vaseline or baby oil with condoms lowers the chance of getting HIV	50	57	82	74	-	.035	-

(Table 2 continued)	Percentage of Correct Responses				Significance of Contrasts		
	Group 1: Less educated Africans	Group 2: More educated Africans	Group 3: Matched Australians	Group 4: Unmatched Australians	Group 1 vs. Group 2	Group 2 vs. Group 3	Group 3 vs. Group 4
Effectiveness of condoms							
There is a women's condom that can help decrease a woman's chance of getting HIV	36	49	41	24	-	-	-
Condoms are effective at protecting against AIDS/HIV	50	54	79	79	-	.012	-
Condoms are effective at protecting against sexually transmitted infections other than AIDS/HIV	64	60	82	88	-	.042	-
Sex without a condom increases the risk of getting a sexually transmitted infection	64	89	94	91	-	-	-

Note: percentages in bold differ significantly between adjacent groups.

Table 3: Attitudes toward condom use in West African and Australian women

	Percentage of Affirmative Responses				Significance of Contrasts		
	Group 1: Less educated Africans	Group 2: More educated Africans	Group 3: Matched Australians	Group 4: Unmatched Australians	Group 1 vs. Group 2	Group 2 vs. Group 3	Group 3 vs. Group 4
Condoms spoil sex	21	36	33	32	-	-	-
Condoms are unnatural	50	58	42	37	-	-	-
Partners dislike condoms	57	67	50	56	-	-	-
Buying condoms is embarrassing or shameful	79	44	17	11	.023	.010	-
Most people who carry condoms are just looking for sex	64	36	8	10	-	.004	-
It is difficult to bring up the topic of using condoms	71	56	19	32	-	.001	-
If your husband or partner suggested using a condom you would feel:							
• Like he cared about me	69	44	53	71	-	-	-
• Relieved	85	75	72	79	-	-	-
• Insulted	69	39	14	13	-	.016	-
• Like he was suspicious or concerned about my past sexual behaviour	38	50	8	10	-	<.0005	-
• Suspicious or concerned about their past sexual behaviour	38	31	28	23	-	-	-
• That he was being responsible	77	47	25	27	-	-	-

Note: percentages in bold differ significantly between adjacent groups.

Table 4: Knowledge about transmission of HIV in relation to age and education in Australian women

	Age		Percentage of Correct Responses		
	Correlation	Significance	No Tertiary Education	Tertiary Education	Significance
Transmission of HIV					
Sexually transmitted infections can cause increased risk for HIV/AIDS	.26	.010	85	77	-
A pregnant woman can give HIV/AIDS to her baby	-.19	-	87	100	.008
A person can get HIV by sharing an injection needle with someone who has HIV	-.15	-	93	96	-
A woman can get HIV if she has anal sex with a man	-.10	-	65	90	.003
Having sex with more than one partner can increase a person's chance of being infected with HIV	-.21	.038	85	92	-
A person can get HIV from oral sex	-.28	.006	43	71	.005
Myths about HIV transmission					
HIV/AIDS is caused by spirits or supernatural forces	-.15	-	95	98	-
You can get HIV/AIDS by touching someone with HIV/AIDS	-.27	.007	88	88	-
You can get HIV from mosquito bites	.07	-	58	71	-
You can get HIV by sharing kitchen utensils	-.10	-	90	87	-
You can get HIV from toilets	-.21	.042	68	79	-
Coughing and sneezing spread HIV	-.17	-	83	96	.029
A person can get HIV by sharing a glass of water with someone who has HIV	-.24	.018	63	77	-
People can get HIV by kissing	-.16	-	75	71	-

(Table 4 continued)	Age		Percentage of Correct Responses		
	Correlation	Significance	No Tertiary Education	Tertiary Education	Significance
A person can get HIV by sitting in a hot tub or a swimming pool with a person who has HIV	-.44	<.0005	75	83	-
Myths about HIV protection					
A person can get rid of HIV/AIDS by having sex with a virgin	-.01	-	95	100	-
There is a cure for HIV/AIDS	.01	-	88	90	-
Showering or washing ones private parts after sex keeps a person from getting HIV	-.21	-	90	96	-
There is a vaccine that can stop adults from getting HIV	-.08	-	80	87	-
A woman cannot get HIV if she has sex during her monthly period	-.09	-	83	92	-
A natural skin condom works better against HIV than does a latex condom	-.20	-	50	50	-
A person will not get HIV if he or she is taking antibiotics	-.17	-	68	96	<.0005
Using vaseline or baby oil with condoms lowers the chance of getting HIV	-.24	.016	68	85	-
Effectiveness of condoms					
There is a women's condom that can help decrease a woman's chance of getting HIV	-.15	-	28	33	-
Condoms are effective at protecting against AIDS/HIV	.08	-	78	81	-
Condoms are effective at protecting against sexually transmitted infections other than AIDS/HIV	.01	-	80	90	-
Sex without a condom increases the risk of getting a sexually transmitted infection	.02	-	93	92	-

Table 5: Attitudes toward condom use in relation to age and education in Australian women

	Age		Percentage of Affirmative Responses		
	Correlation	Significance	No Tertiary Education	Tertiary Education	Significance
Condoms spoil sex	-.11	-	38	28	-
Condoms are unnatural	.11	-	41	36	-
Partners dislike condoms	.00	-	51	55	-
Buying condoms is embarrassing or shameful	.25	.013	21	9	-
Most people who carry condoms are just looking for sex	.19	-	13	7	-
It is difficult to bring up the topic of using condoms	.07	-	26	29	-
If your husband or partner suggested using a condom you would feel:					
• Like he cared about me	.20	.050	59	67	-
• Relieved	.27	-	77	76	-
• Insulted	.22	.029	13	14	-
• Like he was suspicious or concerned about my past sexual behaviour	.02	-	13	7	-
• Suspicious or concerned about their past sexual behaviour	.06	-	15	31	-
• That he was being responsible	.33	<.001	28	24	-