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HIV-related knowledge and practices: a cross-sectional study among adults aged 50 years and above in Botswana

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Background: Older adults in Botswana have been shown to be sexually active and engage in risky sexual activities that make them vulnerable to HIV infection. In order to implement meaningful interventions to address older adults' HIV and AIDS concerns it is important to understand how much knowledge they have concerning HIV and AIDS and practices. This study explored the knowledge of HIV and AIDS and sexual practices of 609 older adults in Botswana.

Methods: The study was cross-sectional and used a survey design. A total of 609 older adults were recruited using respondent-driven sampling (RDS) from four purposively selected health districts and interviewed on their individual HIV and AIDS-related knowledge and practices. Data were analysed using descriptive statistics and multivariate logistic regression.

Results: Although knowledge of HIV and AIDS was high (95.7%), knowledge of HIV infection through blood transfusion, transmission from mother to child, or sharing needles or syringes was lacking. Only 72% of males and 23.2% of females know that having fewer partners and avoiding blood transfusions (71% of males and 44.3% of females) can minimise risks of HIV infection. Age, marital status and employment status significantly predicted knowledge of transmission ($p < 0.05$), while sex significantly predicted knowledge of prevention and control methods.

Conclusion: The study concludes that age-appropriate and culturally relevant education and training of older adults are necessary for the prevention and control of HIV infection.

Keywords: Botswana, HIV, knowledge, older adults, practices

Introduction

Older adults in Botswana

The 2013 Botswana AIDS Impact Study (BAIS IV)¹ gives the HIV prevalence rate for older adults (50 years and over) as 26.3% for those aged 50–54; 22.8% for those aged 55–59; 20.9% for 60–64; and 10.4% for those aged 65 and over. The gender differentials show that females have a lower prevalence rate than males (males 31.8% and females 22.8%, for age 50–54; males 33.5% and females 16.2% for age 55–59 years). For older age groups, 60 years and above, the prevalence rate is higher for females than males. Of those in the age group who tested for HIV and declared their results, 23.2% were HIV positive (25.5% of males, 21.5% of females) and this number is likely to increase because of new entrants into this cohort as a result of the use of antiretroviral therapy (ART).² These results for the older adults are comparable to those in the age groups 30–34 (33.9%), 35–39 (43.7%) and 40–44 (41.8%), yet there are no interventions specifically targeting the older adults while every intervention to curb the prevalence and incidence of HIV targets only those in the population below 50 years of age.

Older adults are sexually active and consider sex an important part of life.^{3–5} Results from national surveys examining the sexual activity among persons over the age of 60 indicate that more than 92% of the respondents consider sex an important part of life and that 75% of those between 65 and 74 considered themselves sexually active.⁶ Yet, they often consider themselves not only at low risk for HIV infection, but also generally lack up-to-date information concerning disease prevention and transmission.⁷ Most HIV prevention efforts largely target younger

people below 50 years of age and little is known about the knowledge of HIV and AIDS and sexual practices of the older adults that make them vulnerable to HIV infection. Normal ageing changes such as a decrease in vaginal lubrication and thinning of vaginal walls can put older women at higher risk for HIV infection during intercourse.⁸

A study by Negin and Cumming⁹ estimated that there are three million HIV-positive people in sub-Saharan Africa (SSA) aged 50 and older, representing more than 14% of those over the age of 15 infected with HIV and suggesting that increased attention is needed for older age groups. HelpAge International¹⁰ analysed the 25 core indicators identified at the 2001 Declaration of Commitment on HIV and AIDS and the 2006 Political Declaration on HIV/AIDS and found that no one specifically monitors the impact of the epidemic on older people. This impacts negatively on strategic healthcare planning for this age group. If the gap in knowledge on HIV in mature adults is not addressed, it may hinder UNAIDS's vision of zero discrimination, zero new HIV infections and zero AIDS-related deaths through universal access to effective HIV prevention, treatment, care and support.^{11,12} It is, therefore, of urgent need to focus on older adults in the face of an ageing HIV-infected cohort.

HIV-related knowledge and practices among people over 50 in Botswana is important for a number of reasons. Older adults are sexually active, and may engage in risky sexual activities such as not using a condom during sexual intercourse and having sex with older and younger adults who might be HIV infected.^{1,2,13} Ama et al.² showed that 99.4% of older adults sex with between 1 and 4 partners in the past 12 months at the time of the study.

They are, therefore, at risk of HIV infection since the main means of HIV infection is through heterosexuality.¹

Older adults in Botswana play a critical role as educators and caregivers, and they are influential community members and leaders. Many of them are involved in taking care of young adults and children and act as gatekeepers of information, playing a major role in reinforcing attitudes and normative behaviour.¹⁴ Some studies have noted that caregivers perceive that they lack skills to provide information to and care for dependents.¹⁵ A better understanding of the knowledge levels of HIV and AIDS among older adults and the risks associated with HIV is of utmost importance to inform appropriate interventions in the health services that will improve their quality of life and make them more serviceable to families and the community as caregivers. Individuals' knowledge of HIV transmission and accurate assessment of their own risk are among the key factors in adoption of safer sexual practices.¹⁶

This paper, which is part of a larger study,² explores older adults' knowledge of HIV and AIDS and their sexual practices (risks) that could make them vulnerable to HIV infection.

Methods

Study area and design

The main study was a cross-sectional study and used a survey design, interviewing older adults to collect data on individual, social network and organisation-level factors, including HIV and AIDS-related knowledge, attitude and practices for older adults. The study was conducted between June 2014 and December 2014. Four health districts, Gaborone and Selibe Phikwe (urban), Central Serowe and Kgatleng (rural) were purposively selected for the study because of (i) high HIV and AIDS incidence/prevalence and (ii) reflecting the rural and urban status of the districts and (iii) having large hospital and multiple clinics.

Study population and sampling procedure

The study population was all people 50 years and above living in Botswana. The 2011 Botswana Population Census gave the number as 258 905. Raosoft™ (Raosoft Inc, Seattle, WA, USA),¹⁷ a sample size calculator, was used to determine the minimum statistically adequate sample size at 95% confidence level, with an error margin of 4%, as 599. To allow for potential dropouts, a 10% oversample was added, yielding a total of 659. G*Power 3.1.5 (Heinrich-Heine-Universität, Düsseldorf, Germany) confirms that this sample size will provide adequate statistical power for subgroup and total sample analyses. The sample size of 659 was allocated to the four districts using proportional allocation to size where the sizes are the number of older adults in the district. The study used respondent-driven sampling (RDS)^{18,19} to recruit older adults in each study district. RDS is a relatively new method for data collection and statistical inference with 'hidden' populations. RDS is an effective way to sample most-at-risk populations in HIV biological and behavioural surveys. In RDS, investigators recruit a small number of participants ('seeds') who participate in the study and invite a small number of people (usually less than or equal to three) from their network to enrol. Each subsequent participant then recruits from his/her network until the target number is reached. All participants received a dual incentive for participation. The study was piloted at Ramotswa, a close village, about 30 kilometres from Gaborone, the capital city of Botswana.

Data collection

The instrument used for the study was a questionnaire, which was administered in person at a time and place of the respondent's choosing. Interviewers explained the study purpose, reviewed the informed consent document, and determined their level of understanding (competency) and response to questions they had before starting the interview. Persons deemed not competent to provide consent were thanked for their time, provided with a brochure and/or verbal information on HIV/AIDS prevention and excused from participation. At the end of the data collection, 609 completed questionnaires were returned giving a response rate of 92.4%.

Ethics

The study was approved by the Institutional Review Boards of the University of Botswana, and the Botswana Ministry of Health Research and Ethics. Research Boards at the different districts also approved the study before data were collected.

Data analysis

Descriptive analysis using percentages and means was used. Multivariate logistic regression analysis was carried out on the knowledge variable with socio-demographic characteristics as independent variables.

Results

Socio-demographic characteristics of the older adults

Table 1 gives the socio-demographic characteristics of the older adults studied, cross-classified by the sex of the respondents. The table reveals that 51.7% of the males and 59.6% of the females were 50–59 years old. The majority of the males (54.2%) and females (56.1%) were employed. The percentages of males and females that had completed secondary education and above were, respectively, 48.2% and 56.8%. The greatest proportion of the males (49.2%) and females (66.8%) earned between P1000 and P9999 while 28.6% of the males and 27.2% of the females earned below P1000 monthly from all sources. The mean monthly income earned from all sources by the older adults is P6939.79 ± 1509.28. The majority of the males (59.7%) were married and a little over half of the females (53.1%) were cohabiting, widowed or divorced. Most of the males (59.2%) live in the city while most of the females (54.2%) live in the rural area.

Furthermore, the table shows that there are significant differences in the proportion of males and females by age, marital status, total income from all sources, and type of residence ($p < 0.05$).

General knowledge of HIV and AIDS

The general knowledge about HIV and AIDS was measured by a combination of ratings obtained from four-item variables, namely: Have you heard about the disease known as HIV and AIDS? HIV and AIDS is a communicable disease; HIV is the infection that causes AIDS; and AIDS affects the immune system. The responses were: 1 = yes, 2 = no and 3 = don't know. A summary score on the outcome variable 'General knowledge of HIV' was obtained by summing the item scores, 1 = yes and was rated as very high for a score of 4 points (that is 'yes' on all items), high for a score of 3 points ('yes' on any 3 items), medium for 2 points and low for a score of 1 point.²⁰ The results show that 95.7% ($n = 580$) of the older adults have very high knowledge of HIV and AIDS, 4.1% ($n = 25$) have high knowledge while 0.2% ($n = 1$) have low knowledge.

Table 1: Socio-demographic characteristics of older adults ($n = 609$; males = 238, females = 371)

Sociodemographic characteristics of older adults		Sex of respondent				Mann-Whitney test	
		Male		Female		Z	p-value
		No.	%	No.	%		
Age of respondents	50–59	123	51.7	221	59.6	-2.115	0.03
	60–69	69	29.0	97	26.1		
	70–79	25	10.5	34	9.2		
	80 and above	21	8.8	19	5.1		
Employment Status	Employed	129	54.2	208	56.1	-0.451	0.65
	Unemployed	109	45.8	163	43.9		
Highest educational level	Never attended school	30	12.6	28	7.5	-0.568	0.57
	Less than primary school	49	20.6	63	17.0		
	Primary school completed	44	18.5	69	18.6		
	Secondary school completed	46	19.3	140	37.7		
	High school completed	27	11.3	39	10.5		
	Tertiary education completed	42	17.6	32	8.6		
Marital status	Single (never married)	25	10.5	63	17.0	-3.701	0.00
	Married	142	59.7	111	29.9		
	Others (co-habiting, widowed, divorced)	71	29.8	197	53.1		
Total income from all sources, BWP	0–999	68	28.6	101	27.2	-2.572	0.01
	1 000–9 999	117	49.2	248	66.8		
	10 000–19 999	28	11.8	13	3.5		
	20 000–29 999	8	3.4	6	1.6		
	30 000–39 999	3	1.3	0	0.0		
	40 000–49 999	5	2.1	1	0.3		
	50 000 and over	9	3.8	2	0.5		
Type of residence	City/town	141	59.2	170	45.8	-3.23	0.001
	Rural	97	40.8	201	54.2		
Study area	Gaborone	91	38.2	119	32.1	-0.899	0.37
	Selibe Phikwe	50	21.0	52	14.0		
	Central Serowe	26	10.9	123	33.2		
	Kgatlang	71	29.8	77	20.8		

Knowledge of HIV transmission, prevention and control, and associated risk factors by older adults

The questionnaire contained knowledge-related items, which again were subdivided into three sections, with questions relating to transmission, prevention and control, and perception of risks associated with HIV and AIDS. Positively and negatively framed questions to assess their knowledge, as well as their misperceptions regarding HIV/AIDS, were included. The responses to the questions were: 1 = yes, 2 = no and 3 = don't know. Correct knowledge of the variable was determined as scoring a 'yes' for positive statements and 'no' for negative statements.

Knowledge of HIV transmission

Twelve-item response variables were used to assess knowledge of HIV transmission by older adults (Table 2). The table shows that the overwhelming majority of the older adults have correct knowledge regarding transmission of HIV through sexual intercourse (99.2% of males and 100% of females), and the misconceptions that HIV is transmitted through witchcraft (93.3% of males and 94.6% of females), shaking hands (95.8% of males, 96.2% of females), eating from the same plate or drinking

from the same glass as a person with HIV (92.9% of males and 92.5% of females), or through contact with a doctor, dentist or other health care professional (92.4% of males, 95.4% of females), or through a curse (92.9% of males and 91.9% of females). They have poor knowledge of transmission by blood transfusion (65.5% of males and 58.2% of females), mother to child (72.7% of males and 66% of females) and sharing a needle or syringe (74.8% of males and 87.6% of females). The study shows that there are no significant differences in the proportion of males and females that have correct knowledge of transmission methods ($p > 0.05$).

Knowledge of prevention and control methods

The knowledge of prevention and control of HIV infection was measured using nine-item variables and the results are given in Table 3. The results show that older adults overwhelmingly know that HIV can be prevented by not sharing needles, syringes, or apparatus to inject drugs, vitamins, hormones, steroids, or medicine (91.7% of males and 90.4% of females); HIV can be prevented by properly using condoms during sexual intercourse (96.6% of males and 96% of females); HIV transmission can be avoided by remaining faithful to a single partner (95.7% of males

Table 2: Correct knowledge of HIV transmission by older adults

Correct knowledge of HIV transmission		Sex of respondent			
		Male (n = 238)		Female (n = 371)	
		Number	%	Number	%
By sexual intercourse	Yes	236	99.2	371	100
Through witchcraft or other supernatural means	No	222	93.3	351	94.6
From mother to child	Yes	173	72.7	245	66.0
By sharing needle or syringe	Yes	178	74.8	325	87.6
By blood transfusion	Yes	156	65.5	216	58.2
By shaking hands	No	228	95.8	357	96.2
By eating from same plate or drinking from same glass as a person with HIV	No	221	92.9	343	92.5
By wearing the same clothes as a person with HIV	No	209	87.8	319	86.0
By a bite from a mosquito or other insect	No	206	86.6	324	87.3
Through contact with a doctor, dentist, or other health care professional	No	220	92.4	354	95.4
Through a curse	No	221	92.9	341	91.9
As a punishment from God	No	209	87.8	317	85.4

Table 3: Correct knowledge of HIV prevention and control by older adults

Correct knowledge of prevention and control		Sex of respondent			
		Male		Female	
		No.	%	No.	%
HIV can be prevented by not sharing needles, syringes, or apparatus to inject drugs, vitamins, hormones, steroids, or medicine	Yes	211 (230)	91.7	331 (366)	90.4
HIV can be prevented by using condoms properly during sexual intercourse	Yes	226 (234)	96.6	356 (371)	96.0
HIV transmission can be avoided by remaining faithful to a single partner	Yes	223 (233)	95.7	326 (371)	87.9
HIV transmission can be avoided by having a blood test before marriage	No	100 (211)	47.4	292 (330)	88.5
HIV can be prevented by avoiding blood transfusions	Yes	154 (217)	71.0	159 (359)	44.3
HIV can be prevented by abstinence (no sex at all)	Yes	222 (233)	95.3	333 (371)	89.8
HIV can be prevented by no casual sex	Yes	202 (227)	89.0	229 (368)	62.2
HIV can be prevented by no commercial sex	Yes	210 (231)	90.9	235 (363)	64.7
HIV can be prevented by having fewer partners	Yes	166 (230)	72.2	86 (371)	23.2

Note: The numbers in parentheses represent total males and females responding to each question.

and 87.9% of females) and HIV can be prevented by abstinence (no sex at all) (95.3% of males and 89.8% of females). Only 72.2% of males and 23.2% of females think that HIV can be avoided by having fewer partners and avoiding blood transfusions (71% of males and 44.3% of females).

Perception of risks associated with HIV

Having correct perceptions of risks associated with HIV was measured by six-item variables (Table 4). The results show that the older adults have the correct perception that it is easy to acquire HIV infection (91.6% of males and 96.2% of females) and that the potential for a person who is on treatment for HIV infection to pass the virus to others is high (90.8% of the males and 96.0% of the females). But very few of the males (46.6%) and females (45.6%) know that a person who has not been formally diagnosed with HIV can give the virus to others. However, only 58.4% of males and 92.2% of females know that everyone who is exposed to HIV can get infected.

Source of knowledge about HIV and AIDS

The source of knowledge of HIV and AIDS is critical for interventions to ameliorate the prevalence of HIV and AIDS. The older adults were asked to indicate where they obtained information concerning HIV and AIDS. The results, shown in Figure 1, reveal that 98% of the older adults obtained their information about HIV from hospitals/clinics. Radio and television programmes constituted the next preferable source (77%). Others were print media (73%), Kgotla (68%), Community health centres (67%) and health care professionals (doctors and nurses) (66%).

(A **kgotla** is a public meeting, community council or traditional law court, especially in villages of Botswana, usually referred to as a customary court. It is usually headed by the village chief or headman, and community decisions are always arrived at by

Table 4: Correct perception of risks associated with HIV by older adults

Correct perception of risks		Sex of respondent			
		Male (n = 238)		Female (n = 371)	
		No.	%	No.	%
It is easy to get HIV infection	Yes	218	91.6	357	96.2
Everyone who is exposed to HIV gets infected	Yes	139	58.4	342	92.2
A healthy-looking person can have the HIV virus	Yes	207	87.0	310	83.6
A person who has not been diagnosed with HIV can give the virus to others	Yes	111	46.6	169	45.6
A person who has the HIV virus but is not sick and has no symptoms can give the virus to others	Yes	196	82.4	293	79.0
A person who is on treatment for HIV infection can pass the virus to others	Yes	216	90.8	356	96.0

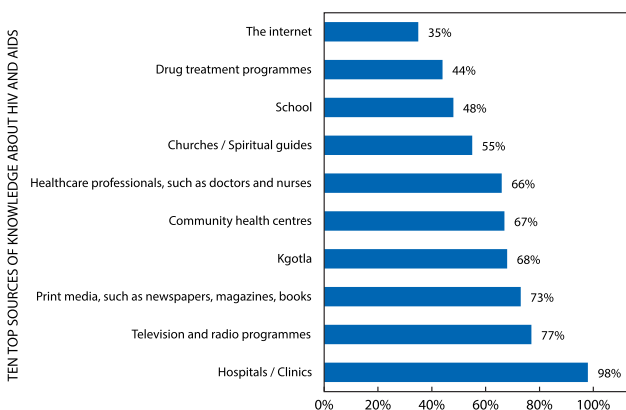


Figure 1: Ten top sources of knowledge about HIV and AIDS (n = 608).

consensus. Anyone at all is allowed to speak, and no one may interrupt while someone is having their say.)

Practices associated with HIV by older adults

The older adults were asked on a two-point scale of 1 = yes and 2 = no to indicate some practices that have been known to make people vulnerable to HIV infection (Figure 2). The results show that 97% of the older adults have had sexual intercourse; only 47% used a condom during their last intercourse; 19% have engaged in sexual activity with someone whose HIV status they did not know, 13% have engaged in sexual activity with someone 10 years younger (intergenerational sex) and 9% have had sex under the influence of alcohol. Some 95% of the older adults know where to get an HIV test while 77% have been tested to see if they have the virus.

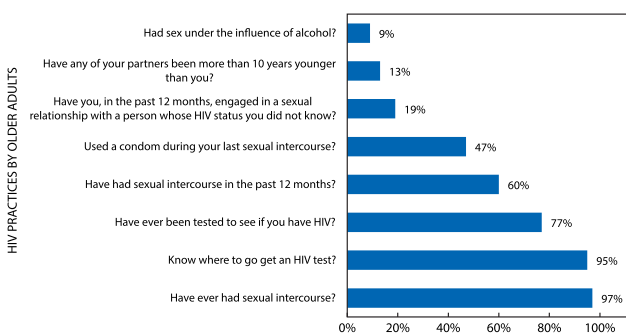


Figure 2: HIV practices by older adults.

Determinants of knowledge of HIV transmission, prevention and control methods, and risks associated with HIV infection

Determinants of knowledge of transmission methods

Many older adults are sexually active and have many of the same risk factors for HIV infection as younger ones, including a lack of knowledge about HIV transmission, prevention and control. This, to a large extent, affects the HIV health-seeking behaviour of older adults. In order to determine the factors that influence this knowledge, prevention and control and the risks associated with HIV infection, multivariate logistic regression models were fitted with a logarithm of the odds of knowing a transmission method, knowledge of prevention and control methods and knowledge of risks associated with HIV as the dependent variable and some sociodemographic variables: age, employment status, highest educational level, marital status, total income from all sources and sex as independent variables (Table 5).

Determinants of knowledge of transmission methods

The results in Table 5 show that age, marital status and employment status were significant factors ($p < 0.05$) in predicting knowledge of HIV transmission methods by older adults. Particularly, the older they were, the higher the knowledge of HIV transmission methods. Older adults who were aged 60–69 years were 1.34 times more likely to know the transmission methods while those 70–79 and 80 years and over were 6.8 times and 9.9 times more likely to know the transmission methods. The unemployed were 1.84 times more likely to know the transmission methods than the employed. Education was not a significant predictor of knowledge ($p > 0.05$). For instance, those older adults with primary education were as likely to have knowledge of transmission methods as those who had no education whereas the higher the education the lower the likelihood of having knowledge of transmission methods. The married older adults were 1.25 times more likely to know the transmission methods than the single (never married). Income was not a predictor of knowledge of transmission methods. However, older adults whose income from all sources was between P30 000.00 and P39 999.00 were 11.24 times more likely to know the transmission methods than those whose income was less than P1 000.00. The females were 1.45 times more likely to know the transmission methods than the males.

Determinants of knowledge of prevention and control methods

The study shows that only gender of the participants significantly predicts knowledge ($p < 0.05$) with the females being significantly (8.99 times) more likely to know prevention and control methods

Table 5: Logistic regressions of log odds of knowledge of transmission methods, prevention and control methods and risks associated with HIV infection by older adults

Variables in the equation		Transmission			Prevention and control			Risks associated with HIV		
		B	Sig.	Exp(B)	B	Sig.	Exp(B)	B	Sig.	Exp(B)
Reference category										
	Age		0			0.11			0	
50–59	60–69	0.29	0.26	1.34	–0.47	0.05	0.63	–0.65	0.01	0.52
	70–79	1.92	0.00	6.79	0.20	0.62	1.22	–1.25	0.00	0.29
	80 and over	2.30	0.00	9.93	–0.53	0.22	0.59	–1.50	0.00	0.22
Employed	Unemployed	0.61	0.02	1.84	0.89	0.00	2.44	–0.18	0.49	0.84
	Highest educational level		0.07			0.07			0.00	
None	Less than primary	0.06	0.88	1.06	0.43	0.29	1.53	–0.37	0.32	0.69
	Primary completed	–0.10	0.81	0.91	0.36	0.41	1.43	–0.20	0.62	0.82
	Secondary school completed	–0.83	0.05	0.44	0.35	0.43	1.41	0.98	0.02	2.66
	High school completed	–0.70	0.17	0.50	1.16	0.02	3.18	–0.19	0.68	0.83
	Tertiary completed	–0.81	0.12	0.45	1.20	0.02	3.33	0.79	0.12	2.19
Single	Marital status		0.00			0.51			0.00	
	Married	0.22	0.48	1.25	0.12	0.71	1.13	0.85	0.00	2.34
	Other	–0.88	0.01	0.42	0.32	0.31	1.37	1.99	0.00	7.31
	Total monthly income from all sources		0.39			0.63			0.02	
0–999	1 000–9 999	–0.23	0.39	0.80	–0.47	0.09	0.63	0.69	0.01	1.98
	10 000–19 999	0.13	0.78	1.14	–0.02	0.96	0.98	–0.31	0.48	0.74
	20 000–29 999	–0.69	0.42	0.50	–0.04	0.96	0.96	0.49	0.51	1.63
	30 000–39 999	2.42	0.07	11.24	0.76	0.56	2.15	–2.37	0.07	0.09
	40 000–49 000	0.52	0.60	1.68	0.29	0.77	1.34	0.69	0.55	2.00
	50 000 and over	–0.58	0.61	0.56	0.23	0.77	1.26	–0.11	0.90	0.89
Male	Female	0.37	0.11	1.45	2.20	0.00	8.99	–0.96	0.00	0.38
	Constant	–1.24	0.01	0.29	–1.23	0.01	0.29	0.24	0.61	1.27

for HIV infection than the males. Older adults who have primary education, high school completed and tertiary education completed are respectively 1.53, 3.18 and 3.33 times more likely to know prevention and control methods than those with no education. The married older adults and others (cohabiting, divorced, widowed and separated) are 1.13 and 1.37 times, respectively, more likely to know the prevention methods than the single older adults.

Knowledge of risks associated with HIV infection

The results show that age, highest educational level, marital status and gender of older adult were all significant predictors of knowledge of risks associated with HIV infection ($p < 0.05$). However, older adults 60 years and over were less likely to know the risks associated with HIV infection than the 50- to 59-year-olds. Those who had completed secondary schools and those who had completed tertiary education were, respectively, 2.66 and 2.19 times more likely to know the risks than those with no education. Being married or in a relationship increased knowledge of the risks. For instance, the older adults who were married or belonged to other relationship category were respectively 2.34 and 7.31 times more likely to know the risks associated with HIV infection. The females were 0.38 times less likely to know the risks associated with HIV infection than the males.

Discussion of results and conclusion

The study explored older adults' knowledge of HIV and AIDS and their sexual practices that could make them vulnerable to HIV infection.

Prior to screening the national blood supply for HIV/AIDS, blood transfusion was the primary mode of transmission for this age group. However, other modes, such as mother to child, through sharing of needles and syringes — especially by injecting drug users — have been identified. The lack of knowledge of the transmission, prevention and control methods for HIV infection and risks associated with the infection are an indication that older adults need education on all possible modes of transmission and the specific ones that are high risks for the age group. Older African Americans were also reported to have general knowledge of HIV, but lacked understanding about how HIV was transmitted, were not inclined to use condoms and believed they were not at risk of contracting HIV.²¹ This lack of HIV preventive behaviour among older adults may be accounted for by the relative lack of HIV and AIDS-related knowledge among older adults.^{22,23} The results are consistent with those of Rose,²⁴ who showed that the 458 older people surveyed were fairly knowledgeable about HIV but generally did not believe themselves to be susceptible to the disease. Specifically, they felt that HIV was a disease of younger

people that did not affect older adults. Ninety-two people (20%) in the sample had a blood transfusion during the years when blood was not HIV-antibody screened. However, those people who received a transfusion did not show a significantly higher perceived susceptibility to HIV than those who had not had blood transfusions and few (less than 5%) had been HIV tested.

The findings call for further education of older adults to improve their general knowledge of HIV and AIDS, change the perception that older adults are not susceptible to HIV and AIDS, and increase their understanding that multiple sex partners can act as a risk factor for HIV infection. Simoni et al.²⁵ showed that we can have some confidence in peer education interventions, although more data are needed to demonstrate an effect in the most rigorous study designs and with outcomes that are not potentially affected by respondent bias. Meta-analysis by Medley et al.²⁶ revealed that peer education interventions were significantly associated with increased HIV knowledge, reduced equipment sharing among injection drug users, and increased condom use. The authors concluded that peer education programmes in developing countries had moderate effects on behavioural outcomes but no demonstrated significant impact on biological outcomes. Peer education in this context would be culturally appropriate as issues of sexuality are not discussed. Earlier studies by Rose²⁴ and Dargan²⁷ also recommended HIV and AIDS education for older adults while Feldman²⁸ stated that AIDS education programmes designed for older adults would serve a dual purpose of preventing HIV infection among older adults themselves and sending a prevention message that would trickle down to younger people, who may conclude that if older people are at risk, they surely must also be at greater risk. The authors (Rose²⁴ and Dargan²⁷) are of the view that when the HIV and AIDS educational information is placed in the context of facts about HIV in the older adult and when it is suggested that the information can be shared with younger people in their lives, it is often perceived as more acceptable.²⁴

On the determinants of knowledge of transmission methods, prevention and control of HIV infection and risks associated with HIV infection, the study shows that age of respondents, marital status and employment status significantly predicts knowledge of transmission methods ($p < 0.05$), while only sex significantly predicts knowledge of prevention and control methods. Age, educational level, marital status and sex of respondents significantly predicts knowledge of risks associated with HIV. The higher the educational level the higher will be the likelihood of having appropriate knowledge. Similarly older adults, 60 years and above, have more knowledge than those aged 50 to 59 years. These findings are supported by several previous studies. Colemann and Ball²⁹ stated, 'Because middle-aged and older adults are not receiving information from healthcare providers or being targeted in prevention campaigns, they may be less knowledgeable about HIV transmission or disease progression to AIDS compared with their younger counterparts'. Wright et al.³⁰ reported that a third of their sample of older adults lacked knowledge about the factors associated with HIV transmission while Maes and Louis³¹ found that a decrease in AIDS knowledge is correlated with an increase in age.

In terms of sexual practices that make older adults vulnerable to HIV, this study revealed that an overwhelming majority of older adults have had sex in the past while only a small percentage of older adults used a condom during their last intercourse. They also engaged in sexual activity with someone whose HIV status

was not known, and with someone 10 years younger (intergenerational sex). These findings are consistent with other studies that report continued high rates of unprotected intercourse among people with HIV, approximating 33%.^{20,32,33} The authors showed that interventions to reduce risk of HIV transmission resulted in significantly less unprotected intercourse and greater condom use at follow-up. Transmission-risk behaviours with non-HIV-positive sexual partners and estimated HIV transmission rates over a one-year horizon were also significantly lower for the behavioural risk-reduction intervention group.

Limitations

The data were collected from only four districts and therefore the findings may not be easily generalisable to other settings in Botswana. Second, all data were collected through self-report and participants may have given socially desirable responses. However, given that all ethical procedures were observed and sampling procedures were adequate, there is great confidence in the data and results of the study.

Recommendation

In the light of the findings from this study, it is recommended that:

- (1) Appropriate interventions be put in place by the public health department of the Ministry of Health and NACA Botswana to reach out to older adults with education and training programmes on the modes of transmission of HIV, prevention and control and risks associated with HIV infection.
- (2) Such training should be age specific and culturally relevant to older adults. The use of peer education where some older adults are trained to train others is highly recommended. Such training should also emphasise condom use during every sexual act irrespective of the fact that many of the women may be menopausal and beyond child bearing.
- (3) Health workers should be encouraged to include a sexual assessment when doing health assessments of older people to identify risky behaviours and address them.

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