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AIDS-related knowledge, attitudes and behavior among urban youths in Zambia

Results from a pilot study

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The impact of HIV in sub-Saharan Africa is immense: 24.5 million people are estimated to be living with HIV/AIDS as of the end of 1999 (71% of all people living with HIV/AIDS in the world). In this region, 14.8 million died of HIV/AIDS from the beginning of the epidemic to the end of 1999 (79% of all deaths due to HIV/AIDS in the world) (UNAIDS, 2001). The infection rates are higher among urban populations, commercial sex workers, Sexually Transmitted Diseases (STD) patients and pregnant women (Mann et al., 1992). Three main factors put adolescents and young adults in this area at risk of HIV infection. First, AIDS in sub-Saharan Africa is primarily a heterosexual problem (Mann and Tarantola, 1996). Studies have shown that the majority of the adolescents in this geographical region are sexually active and that they tend to initiate sexual activity at a young age. Moreover, sexually active youths may engage in risky sexual behaviors including trading sex for food, shelter, money and gifts; multiple partners; unprotected sex; and cultural practices related to sexual activity (e.g. drying and tightening of the vagina) (Brown et al., 1993; Feldman et al.,

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1997; Helitzer-Allen and Makhambera, 1993; Konings et al., 1994; McGrath et al., 1993; Ndeki et al., 1994).

Second, youths in this region have no easy access to condoms. If they can obtain them, they may prefer not to use them (Abdool Karim et al., 1992; Ajayi et al., 1991; Feldman et al., 1997; Helitzer-Allen and Makhambera, 1993). Third, some men in sub-Saharan Africa choose adolescents as wives and sexual partners, believing that their young age will protect them from HIV infection, thus putting these adolescent women at risk of contracting STDs and AIDS (Ulin, 1992). Therefore, studies assessing the AIDS-related knowledge, attitudes and behaviors among adolescent and young adults in sub-Saharan Africa are needed so that culturally sensitive preventive programs for this high-risk population may be developed.

In this article we report the results of a pilot study conducted among in-school and out-of-school youths in Lusaka, the capital of Zambia, in February 1997. Specifically, we describe the adolescents' AIDS-related knowledge, attitudes and behavior. Studies in the West indicate that adolescents who have dropped out of school (e.g. homeless, delinquents, those who are in residential centers) are more likely to be at risk of HIV infection because of their tendency to engage in AIDS-related high-risk activities (DiClemente, 1991; Nader et al., 1989; Rotheram-Borus et al., 1991a; Slonim-Nevo et al., 1996). In order to examine whether a similar situation is occurring in Zambia, we included participants who had dropped out of school and were learning a technical profession (e.g. sewing and carpentry) in the community. The method of this pilot study is described in the Appendix.

Results

The participants

The sample consisted of 89 youths, all residing in Lusaka. Of those, 52 were 12th grade students from an all-boys public community high school, and they composed the in-school group. Thirty-seven participants were 'out-of-school' youths who attended a job-training program in the community (15 participants were female and 22 were male). These participants had dropped out of high school at grades 9–11 and were recruited by social workers and community street professionals to join the public job-training facilities. The mean age of the entire sample was 20 years (SD = 0.4). Of the 89 participants, 92 percent (N = 82) were

Table 1 Socio-demographic characteristics of the sample

Variable	In-school $N = 52$	Out-of-school $N = 37$	Total $N = 89$
Sex**			
Males	100%	58%	83%
Females	0%	42%	17%
Age**			
Mean	18.4	23.3	20.4
(SD)	(1.3)	(2.9)	(3.2)
Respondent's marital status**			
Married	2%	16%	8%
Unmarried	98%	84%	92%
Religion*			
Catholic	38%	19%	30%
Protestant	28%	57%	40%
Other	34%	24%	30%
Parents' marital status			
Married	56%	49%	53%
Divorced	18%	27%	21%
Mother widowed	14%	16%	15%
Father widowed	6%	5%	6%
Both dead	6%	3%	5%
Father's education*			
Mean	13.3	12.2	12.9
(SD)	(3.8)	(5.8)	(4.8)
Mother's education**			
Mean	11.8	10.8	11.4
(SD)	(3.6)	(6.3)	(4.9)
Family owns housing?			
Yes	42%	61%	50%
No	58%	39%	50%
Have you been circumcised?			
Yes	4%	6%	5%
No	96%	94%	95%
When sick, how often family goes to a clinic/hospital			
Rarely or never	19%	31%	24%
A little of the time	6%	14%	9%
Sometimes	37%	25%	32%
Mostly	38%	30%	35%
When sick, how often family goes to a traditional healer*			
Rarely or never	96%	82%	91%
A little of the time	4%	9%	6%
Sometimes	0%	9%	3%
Mostly	0%	0%	0%
When sick, how often family uses leaves or plants			
Rarely or never	63%	53%	59%
A little of the time	23%	26%	25%
Sometimes	10%	21%	14%
Mostly	4%	0%	2%

Differences between the groups: *$p \leq 0.05$, **$p \leq 0.01$, ***$p \leq 0.005$, ****$p \leq 0.000$

re-interviewed a week later, in order to test the reliability of the study's scales using test-re-test analysis (47 from the in-school group and 35 from the out-of-school group). Seven participants were not followed up due to illness or absence related to torrential rains. It should be emphasized that this was a convenient sample and thus it does not represent Zambian youths in Lusaka. Results, therefore, are exploratory in nature.

The out-of-school participants differed from their in-school counterparts in a number of ways: they were older, more likely to be married, less likely to be Catholics, their parents were less educated and they were more likely to visit a traditional healer when sick. Otherwise, the two groups were similar in their socio-demographic traits (Table 1). Because of these differences, factors such as sex, age, marital status and religion were statistically controlled at the multivariate statistical analysis stage.

Lifetime engagement in risky behaviors and other risk factors

Table 2 presents the participants' level of engagement in various activities, during all their lives, that may put them at risk of HIV infection. The vast majority (84%) of the participants are sexually active, and had started their sexual lives early (mean = 12.8 years). The majority of them (65%) did not use birth control devices (pills, IUD, condom, foam) at their first intercourse; many of them (42%) did not use them at last intercourse. Only 19 percent reported using condoms on a regular basis (that is, every time in which they had sex).

These are the main activities that put the youths at a great risk of infection, and in a country where the majority of the population is young (below the age of 21), the same activities also contribute to the country's high incidence of HIV/AIDS. Indeed, 6 percent of the out-of-school participants have already been told that they are HIV-positive. In addition, AIDS is a well-known disease to the participants: 24 percent of them have relatives who are HIV-positive, and 35 percent have relatives who have died of AIDS.

AIDS-related knowledge, attitude and self-efficacy

Table 3 (on p. 493) presents the participants' level of knowledge about AIDS, their attitudes towards AIDS prevention and perceived self-efficacy about prevention. In addition, scores of adolescents from the USA and Israel living in residential centers due to juvenile delinquency, abuse and neglect, and who are also at

Table 2 Lifetime engagement in risky behaviors and other risk factors

Variable	In-school $N = 52$	Out-of-school $N = 37$	Total $N = 89$
Ever had sex**			
Yes	100%	58%	84%
No	0%	42%	16%
Age at first sex**			
Mean	10.2	16.0	12.8
(SD)	(6.5)	(4.1)	(6.4)
Lifetime no. of sexual partners**			
Mean	2.2	4.1	3.0
(SD)	(1.9)	(3.7)	(3.0)
Ever had anal sex			
Yes	4%	3%	3.5%
No	96%	97%	96.5%
Ever combined sex with drugs			
Yes	2%	6%	4%
No	98%	94%	96%
Ever combined sex with alcohol**			
Yes	6%	27%	15%
No	94%	73%	85%
Ever was raped			
Yes	4%	8%	6%
No	96%	92%	94%
Ever traded sex for food, money, etc			
Yes	0%	3%	1%
No	100%	97%	99%
Ever used 'dagga' or other drugs**	4%	22%	12%
Yes	96%	78%	88%
No			
Used birth control at first sex**			
Yes	21%	51%	35%
No	79%	49%	65%
Used birth control at last sex			
Yes	55%	61%	58%
No	45%	39%	42%
Ever had STD			
Yes	0%	6%	2%
No	100%	94%	98%

Table 2 continued

Variable	In-school $N = 52$	Out-of-school $N = 37$	Total $N = 89$
Ever was told that parents or relatives have AIDS			
Yes	26%	22%	24%
No	74%	78%	76%
Ever was told that you are HIV +			
Yes	0%	6%	2%
No	100%	94%	98%
Have any of relatives died of AIDS?			
Yes	33%	36%	35%
No	67%	64%	65%
Was told by a doctor that had STD (last 3 months)			
Yes	0%	3%	1%
No	100%	97%	99%
Was told by a doctor that had pneumonia (last 3 months)			
Yes	0%	6%	12%
No	100%	94%	88%
Was told by a doctor that had malaria (last 3 months)			
Yes	36%	25%	31%
No	64%	75%	69%
How often respondent use condoms?			
Rarely	48%	30%	39%
A little of the time	30%	15%	23%
Sometimes	9%	30%	19%
A good part of the time	13%	25%	19%
Knows of any anti-AIDS program that is run by the church			
Yes	16%	29%	21%
No	84%	71%	79%

Differences between in- and out-of-school youths:
*$p \leq 0.05$, **$p \leq 0.01$, ***$p \leq 0.005$, ****$p \leq 0.000$

a high risk of HIV infection due to their life style, are presented as a comparison.

Table 3 AIDS-related knowledge, attitude and self-efficacy about prevention[1,2]

Variable	In-school $N = 52$	Out-of-school $N = 37$	Total $N = 89$	USA's sample[3] $N = 358$	Israel's sample[4] $N = 139$
Knowledge about AIDS**	Mean = 0.92	Mean = 0.86	Mean = 0.89	Mean = 0.88	Mean = 0.81
	SD = 0.06	SD = 0.09	SD = 0.08	SD = 0.11	SD = 0.12
Attitudes towards prevention*	Mean = 3.19	Mean = 3.0	Mean = 3.09	Mean = 2.88	Mean = 2.99
	SD = 0.4	SD = 0.3	SD = 0.3	SD = 0.4	SD = 0.3
Self-efficacy about prevention	Mean = 3.16	Mean = 3.13	Mean = 3.15	Not available	Not available
	SD = 0.4	SD = 0.4	SD = 0.4		

Notes
[1]Higher numbers indicate greater knowledge about AIDS, more positive attitudes towards AIDS prevention and greater perceived ability to perform HIV-preventive behaviors. The knowledge scale ranges from 0 to 1; the attitude scale ranges from 1 to 4; and the self-efficacy scale ranges from 1 to 4.
[2]Differences between in- and out-of-school youths (t-test analysis): $*p \leq 0.05$, $**p \leq 0.01$, $***p \leq 0.005$, $****p \leq 0.000$
[3]Delinquent and abused adolescents aged 11–18 years in Mid-western cities (Slonim-Nevo et al., 1995).
[4]Delinquent adolescents aged 13–17 years in Israel (Slonim-Nevo, 1998).

The results show that the majority of the participants in Zambia tend to know the basic facts about AIDS and how to prevent infection. Moreover, they tend to hold positive attitudes towards AIDS prevention, such as endorsing the use of condoms or avoiding having sex with prostitutes, and seem to perceive themselves as capable of engaging in AIDS-preventive behaviors. In fact, compared with adolescents in the USA and in Israel, the Zambian participants showed a higher level of knowledge about AIDS and more positive attitudes towards prevention (Table 3).

Engagement in risky behaviors in recent months

Table 4 displays the youths' activities in the previous two months. The unsafe activities among the participants were related to sex: 34 percent of them were sexually active and 15 percent had sex with no condom. The out-of-school participants put themselves at higher risk of contracting AIDS because they were significantly more likely to engage in unprotected intercourse and to use the services of female prostitutes (Table 4).

Table 4 Engagement in AIDS-related unsafe activities in the previous two months (percentage who did engage in each behavior at least once during this period)

Variable *N = 52*	In-school *N = 37*	Out-of-school *N = 89*	Total
Injected drugs with unclean needles	4%	0%	2%
Had sex with an unknown partner	6%	11%	8%
Had sex with a known partner	31%	38%	34%
Traded sex for food, money or a place to stay	4%	6%	5%
Combined sex with alcohol	4%	6%	5%
Combined sex with drugs	2%	0%	1%
Had vaginal sex with a condom	18%	31%	24%
Had vaginal sex without a condom*	8%	25%	15%
Had anal sex with a condom	2%	3%	2%
Had anal sex without a condom	2%	3%	2%
Had sex with a prostitute* (males only)	0%	9%	3%

Differences between in- and out-of-school youths (Chi-square analyses): $*p \leq 0.05$

Factors influencing knowledge, attitude and self-efficacy

A series of step-wise multiple regression analyses was performed in order to examine which factors could best predict the participants' level of knowledge, attitude and self-efficacy related to AIDS prevention. The results show that the independent factors included in the analysis explained only a small proportion, 14–23 percent, of the variance of the three dependent variables. Regarding knowledge about AIDS, the best predictors were gender and marital status: male participants and those who were married tended to know more about the disease than female and unmarried participants. None of the socio-demographic factors could predict attitudes towards prevention and perceived self-efficacy about prevention. Both, however, appear to predict each other: attitudes towards prevention were best predicted by self-efficacy, and vice versa, self-efficacy about prevention was best predicted by attitudes (Table 5).

Factors influencing the engagement in high-risk behaviors

A series of logistic regression analyses was performed in order to examine which factors might predict the engagement of the participants in the different AIDS related high-risk behaviors. Socio-demographic factors (age, gender, marital status, schooling status and religion), as well as AIDS-related knowledge, attitude and self-efficacy were entered into the analysis. All the dependent

Table 5 Factors influencing knowledge, attitude and self-efficacy: results of step-wise multiple regression analyses

Predictors	Beta	t-score	R^2
Dependent variable:			
Knowledge about AIDS[1]			0.23
Gender	−.395	−4.0****	
Marital status	−.297	−2.84**	
Dependent variable:			
Attitudes towards prevention[2]			0.15
Self-efficacy about prevention	0.39	3.96****	
Dependent variables:			
Self-efficacy about prevention[3]			0.14
Attitudes towards prevention	.391	3.95****	

Notes
[1]Variables included in the analysis: in-school/out-of-school, age, marital status, gender, religion, attitudes towards prevention, self-efficacy about prevention.
[2]Variables included in the analysis: in-school/out-of-school, age, marital status, gender, religion, knowledge about AIDS, self-efficacy about prevention.
[3]Variables included in the analysis: in-school/out-of-school, age, marital status, gender, religion, knowledge about AIDS, attitudes towards prevention.
*$p \leq 0.05$, **$p \leq 0.01$, ***$p \leq 0.005$, ****$p \leq 0.000$

variables were coded as 0 and 1 (0 = the behavior did not occur at all in the previous 2 months, 1 = the behavior occurred at least once during the previous 2 months). The results show that only a few factors explained some of the participants' activities. Regarding having sex with an unknown partner, those who had more positive attitudes towards prevention were less likely to engage in such an activity, controlling for the other variables in the model. Trading sex for food, money or a place to stay was more likely among those who demonstrated less knowledge about AIDS. Unprotected vaginal sex was more likely among male participants and among the older participants. But having vaginal sex with a condom was more likely among those who perceived themselves to have a higher level of self-efficacy (Table 6).

Discussion

This exploratory study examines AIDS-related knowledge, attitude and behavior among 89 young adults residing in Lusaka. The results show that AIDS is a well-known disease in the lives of the participants. Indeed, about one-third of them have relatives who died of AIDS. As expected, the main behavior that puts Zambian

Table 6 Factors influencing engagement in high-risk behaviors: results of logistic regression analyses

Predictors[1]	Beta	SE
Dependent variable:		
Sex with an unknown partner		
Attitudes towards prevention	−.4.00*	1.9
Dependent variable:		
Trading sex		
Knowledge about AIDS	−.18*	.09
Dependent variable:		
Unprotected vaginal sex		
Gender	−2.47*	1.36
Age	.34*	.166
Dependent variable:		
Protected vaginal sex		
Self-efficacy	2.29**	.87

Note

[1]Variables included in the analysis: in-school/out-of-school, age, marital status, gender, religion, knowledge about AIDS, attitudes towards prevention, and self-efficacy about prevention.

*$p \leq 0.05$, **$p \leq 0.01$, ***$p \leq 0.005$, ****$p \leq 0.000$

youths at risk of infection is sexual intercourse: the majority of the youths are sexually active, had started their sexual lives at an early age and tend not to use condoms on a regular basis. Overall, however, Zambian youths demonstrated a relatively high level of knowledge about the disease and how it could be prevented. They tended to hold positive attitudes towards prevention, and to perceive themselves as capable of preventing HIV infection. In fact, compared with adolescents in the West living in residential centers, who are at a high risk of HIV infection due to their life style, the Zambian participants demonstrated a higher level of AIDS-related knowledge and attitudes towards prevention.

Based on the above results, an initial conclusion might be that AIDS prevention for Zambian youths should not focus on knowledge provision, changing attitudes and increasing self-efficacy. Such a conclusion would, however, be hasty. Firstly, multivariate analysis indicated that engaging in some of the high-risk activities among the participants (e.g. having sex with an unknown partner and having sex with a condom) were related to attitudes and self-efficacy. Secondly, this study is exploratory in nature and its sample does not represent youths in Zambia. Specifically, it includes only residents of Lusaka. Results obtained

from other places of the country, including rural areas, might be quite different. Thus, preventive efforts for adolescents and young adults in Zambia should address attitudes and self-efficacy related to prevention.

What type of intervention models may be appropriate for the young people of Zambia? Unfortunately, to the best of our knowledge, no intervention studies have been conducted that address this question. Some ideas may be taken from studies conducted in the West. It has already been demonstrated that intervention that provides only information about AIDS is ineffective in reducing the engagement in high-risk behavior among adolescents (Morrison et al., 1994; Slonim-Nevo et al., 1991). Therefore, such programs should not receive high priority for implementation in sub-Saharan Africa. There are, however, some empirical indications that cognitive-behavioral intervention that emphasizes attitudinal changes, coping skills and assertiveness, in addition to information, could be effective in changing the engagement in AIDS-related high-risk behaviors among adolescents who manifest difficulties (see, for example, Rotheram-Borus et al., 1991; Slonim-Nevo, 2001). Clearly, such programs, which are suited to the Zambian context and the social norms that are prevalent in this culture, should be evaluated for their effectiveness in reducing the engagement in high-risk activities and increasing the use of condoms.

Another direction may be community-level interventions using opinion leaders as means of changing social norms and behaviors in the targeted population (Rogers and Chanced, 1981). One community approach, based on the theory of diffusion innovations, was effective for reducing high-risk sexual behavior practices among homosexual men in the USA (Kelly et al., 1992, 1997). In this model, natural opinion leaders in the community are identified and trained to affect the norms and the behaviors related to HIV-risk behavior change of the members of the community through everyday conversations. Although this model was implemented neither among Western adolescents nor among Zambian participants, it could be particularly appropriate to the Zambian context because of two main reasons. First, the model is not delivered in groups, and therefore, there is no need to discuss personal behaviors outside family or friendship networks. Discussing sexual matters in a group may be counter to the norms of values of Zambian youths. Second, the intervention is cost-effective because few resources are needed to reach large numbers of people and no

sophisticated systems delivery capability is required. This is important in a country like Zambia where AIDS is widely spread and public resources are very limited.

Future studies could determine which type of intervention is most effective in changing norms and behaviors related to HIV infection among Zambian youths. Since, however, it is unlikely that adolescents and young adults abstain from sex, any preventive program should teach the Zambian participants how to use condoms, provide them with free condoms and encourage them to use them on a regular basis. Also, special preventive efforts should be directed towards adolescents and young adults who are not attending school. This is because this population is more likely than their in-school counterparts to be engaged in unprotected sex and to use the services of sex workers.

Finally, the role of social workers in planning, developing and implementing preventive programs should be discussed as well. Diaz and Kelly (1991: 42), when writing about AIDS-related training in schools of social work, concluded: 'As more social work programs introduce AIDS-specific training into their curricula, counselors can be better prepared to meet the many future challenges of practice in an era of AIDS'. Following these authors, we believe that social work students and active social workers should be trained to become AIDS educators. Under the framework of the cognitive-behavioral model described above, they could lead groups for children and adolescents aimed at increasing AIDS-related knowledge, attitude and practice. They can also train others, including volunteers and high-school students, to lead such groups. Results from a study evaluating a training program aimed at preparing social work students to teach AIDS prevention to adolescents suggest that such training is beneficial to the students themselves. In fact, the majority of the students perceived this training not only as helpful in preparing them for the task at hand, but also in improving their overall social work skills and their chances to get a social work job in the future (Slonim-Nevo et al., 1993).

Social workers should also have an important role under the framework of community-level interventions. They can identify key leaders in the community and train them to become AIDS educators. They can form community boards which will develop and implement AIDS prevention projects that are sensitive to the needs and culture of the community. They can organize workshops, fun-days and community affairs that will raise the awareness of

people to the danger of HIV infection and help spread positive attitudes towards prevention. They can fight for a free distribution of condoms for adolescents, women and those who cannot obtain them on their own. Such activities would best be developed and implemented with the cooperation of volunteers, natural leaders in the community and other social practitioners, such as school principals, teachers, nurses, physicians and religious experts. If social workers take upon themselves to fight against the spread of AIDS – they indeed could become the leaders in such a venture.

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Appendix

Method

Data collection The self-report questionnaires were collected in February 1997. Among the in-school group, data were collected in the classroom. The classes are conducted in English and the students filled out the questionnaires in English, the official language in Zambia. The researchers were available for clarifications, but in general this was unnecessary. Among the out-of-school group, the participants were divided into small groups and both a researcher and a staff member of the agency were present at the time of data collection. Because of difficulties in reading comprehension, each question was read to the participants and the researcher verified that it was clearly understood. Special assistance was given when needed.

Measures 1. **Knowledge about AIDS** is a modified version of the AIDS Information Survey (DiClemente et al., 1988). The 23-items scale assesses the degree to which the adolescent knows basic facts about the disease and how to prevent infection. The respondent has to answer 'True' or 'False' to each statement, and the number of correct answers are then summed up and divided by 23. The scale ranges from 0 to 1, with higher numbers indicating greater knowledge about AIDS.

The scale was standardized on a group of delinquent and abused adolescents, aged 11–18 years, living in residential centers in Missouri, USA. The psychometric properties of the modified scale were found to be satisfactory, with internal consistency = 0.71; a test-re-test reliability coefficient after a two-week interval was $r = 0.56$ ($p < 0.0001$, $N = 93$), and $r = 0.54$ ($p < 0.0001$, $N = 67$) after a four-week interval. The concurrent validity of the scale was also assessed and was found to be satisfactory (Slonim-Nevo et al., 1995, 1996). The scale was used among Israeli juvenile delinquents as well. In the Israeli study, it had a moderate level of internal consistency (Cronbach's alpha = 0.55, $N = 126$) (Slonim-Nevo,

1998). In this study among Zambian youths, the level of internal consistency was also moderate (Cronbach's alpha = 0.62, $N = 89$); and a test-re-test reliability coefficient after a one-week interval was $r = 0.55$ ($p < 0.0001$, $N = 89$). The face validity of the scale and its applicability to the Zambian context was assessed by two experts from the University of Zambia in the field of AIDS prevention. Minor modifications were made according to the experts' suggestions.

2. The attitudes for AIDS prevention scale was designed to assess adolescents' attitudes across the following areas: condom use, IV drug use, multiple sexual partners, self-efficacy and personal susceptibility. It consists of 23 items to which the participants respond using a 4-point scale ranging from 'strongly agree' to 'strongly disagree'. The scale is scored by summing adolescents' responses across the 23 items and then dividing by 23. The scale ranges from 1 to 4, with higher scores reflecting greater attitudes for AIDS prevention (Slonim-Nevo et al., 1995, 1996).

The scale was standardized on a group of delinquent and abused adolescents living in residential centers in the USA. The psychometric properties of the modified scale were found to be very satisfactory, with internal consistency = 0.84; a test-re-test reliability coefficient after a four-week interval was $r = 0.82$ ($p < 0.0001$, $N = 65$). Evidence of construct validity was provided in that responses on the questionnaire were related to predicted variables such as knowledge and intentions to engage in AIDS-related risky behaviors (Slonim-Nevo et al., 1996). A satisfactory level of internal consistency (Cronbach's alpha = 0.67, $N = 115$) was also observed among Israeli youths (Slonim-Nevo, 1998). In this study among Zambian youths, the level of internal consistency was satisfactory as well (Cronbach's alpha = 0.71, $N = 89$); and a test-re-test reliability coefficient after a one-week interval was $r = 0.73$ ($p < 0.0001$, $N = 89$). The face validity of the scale and its applicability to the Zambian context was assessed by two experts from the University of Zambia in the area of AIDS prevention. Minor modifications were made according to the experts' suggestions.

3. Self-Efficacy about preventing AIDS is a scale that was designed to assess the respondent's perception about his or her ability to perform HIV-preventive behaviors. The scale, developed by Koopman et al. (1990), consists of 20 items with a 4-point response choice ranging from 'strongly agree' to 'strongly disagree'. The possible range of scores is 20 to 80 (or 1–4 when divided by the

number of items in the scale). The scale has been previously used with adolescents in the USA with a satisfactory level of internal consistency (Cronbach's alpha ranged from 0.78 to 0.89), and a satisfactory level of reliability assessed by a test-re-test method ($r = 0.55$, $p \leq 0.001$) (Rotheram-Borus et al., 1992). In this study, the level of internal consistency was satisfactory (Cronbach's alpha = 0.76, $N = 89$); and a test-re-test reliability coefficient after a one-week interval was $r = 0.54$ ($p < 0.0001$, $N = 89$). The face validity of the scale and its applicability to the Zambian context was assessed by two experts from the University of Zambia in the field of AIDS prevention. Minor modifications were made according to the experts' suggestions.

4. Engagement in AIDS-related unsafe behaviors was assessed using questions that examine whether or not the respondent has ever engaged in a specific behavior, such as anal sex (Yes, No); sex with alcohol (Yes, No); sex with drugs (Yes, No) and trading sex (for food, drugs, money, or a place to stay, Yes, No). In addition, respondents were asked to report how many times in the previous two months (from 0 to 10) they had engaged in various risky activities, including vaginal sex with a condom, vaginal sex without a condom, anal sex, trading sex, combining sex with drugs or alcohol, and more. These items were not combined into a scale, but rather each behavior was separately analyzed. Because the distributions of the variables related to recent activities tended to be dichotomous, they were re-coded into 0 and 1 (0 = the behavior did not occur at all during the previous two months; 1 = the behavior occurred at least once during the previous two months).