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Full Length Research Paper

Predictors of knowledge about HIV/AIDS among young people: Lessons from Botswana

Thabo T. Fako[1]*, Lucy W. Kangara[1] and Ntonghanwah Forcheh[2]

[1]Department of Sociology, University of Botswana, Private Bag UB00705, Gaborone, Botswana.
[2]Department of Statistics, University of Botswana, Private Bag UB00705, Gaborone, Botswana.

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This study sought to identify factors that can predict knowledge about HIV/AIDS among adolescents in Botswana. The data were collected through a self administered questionnaire from a sample of 1294 students from schools around the capital city of Botswana, Gaborone. The research instrument consisted of 76 items that solicited information on background characteristics of respondents, indicators of family cohesiveness and bonding of children with their parents, indicators of personal adjustment, evidence of sex life, and knowledge about HIV/AIDS. Most respondents (63.1%) displayed adequate knowledge about HIV/AIDS. The 'type of job that mothers did' was the most important single factor that distinguished between students who had "adequate knowledge" from those who did not. Other factors, which could be used to predict knowledge about HIV/AIDS, were, in order of importance: type of family of socialisation, level of education, extent of common residence among parents, level of conflict in the family of socialisation, extent of disagreement with mother and extent to which sexual issues were discussed with members of the family. The study concludes that intervention policies should target students whose mothers do jobs of a low status and should promote family bonding and cohesion.

Key words: Botswana, adolescence, discussion of sexual issues, family cohesion, HIV/AIDS, knowledge, mothers' occupation, socio-economic status.

INTRODUCTION

The spread of the Human Immunodeficiency Virus (HIV), which causes the Acquired Immunodeficiency Syndrome (AIDS) (Tagoe and Aggor, 2009) that threatens the world population (Dadkha et al., 2008), is one of the challenges facing sub-Sahara Africa, where overall mortality has continued to rise significantly (Setlhare et al., 2009). While sub- Sahara Africa contains only 10% of the world's population, it accounts for more than two thirds of the world's HIV infected people; and, of the more than 25 million people who have died from AIDS worldwide; more than 14 million are from Africa (Adam and Mutungi, 2007). The HIV epidemic has been most severe in many African countries where young people form a significant number in the population (UNAIDS, 2004). Of the estimated 11.8 million people who were living with HIV/AIDS a few years ago, an estimated one-third were aged between 15 and 24 years (UNAIDS, 2004). And, in the last few years, half or more of all HIV infections (almost 7,000 daily) worldwide, occurred among young people (Bisol et al., 2008; Ferrer et al., 2007; Rogers, 2001). A recent estimate indicates that out of the 40 million individuals in the world who are living with HIV, 10 million are young people (Bisol et al., 2008). The adolescent high-risk group (ages 15 – 24 years) comprises about 20% of the world's population and accounts for 60% of all new infections each year in many countries (Odu et al., 2008; Tagoe and Aggor, 2009). Young people are not only at the centre of the HIV/AIDS epidemic, they are also the most vulnerable and the most affected section of the global population (World Health Organization, 1995). Young people's vulnerability is associated with several potentially risky situations, including experimental behaviour, initiation into sex, going beyond family traditions, alcohol and drug use and getting

*Corresponding author. E-mail: fakott@mopipi.ub.bw.

involved with different social groups (Bisol et al., 2008). Adolescent egocentrism, belief in their invincibility, the need for self expression and sensation seeking, which reaches its peak in late adolescence and the early twenties, make young people prone to engage in physical, social, financial and legal risk taking behaviours (Plattner, 2010). These behaviours are often part of the transition from childhood to adulthood that is characterised by getting to know oneself, while usually lacking the information, will and skills that would enable young people to avoid high risk behaviours (Odu et al., 2008).

In Botswana, the majority of young people begin sexual intercourse when they are between the ages of 15 and 17 years (Ball, 1996; Botswana Family Welfare Association, 1996; Rakgoasi and Campbell, 2004; Seboni, 1993; Seloilwe et al., 2001; United Nations Development Program, 2000). By 23 years of age, 96.5% of the males and 94% of the females will have had penetrative sexual intercourse in an environment in which having several partners is common and where the use of condoms is infrequent (Campbell and Ntsabane, 1996; Campbell and Rakgoasi, 2002; Meekers et al., 2001; Oucho, 2000; Seloilwe et al., 2001; SIAPAC-Africa, 1996).

In spite of their high-risk behaviours and vulnerability to HIV infection, research from around the world has indicated gaps in young peoples' knowledge about HIV transmission and treatment availability (Ahmed et al., 2009). Furthermore, while much effort has been invested towards improving young people's knowledge about HIV/AIDS in Botswana, not as much effort has been spent identifying the class of factors that promote knowledge about HIV/AIDS (Gasennelwe, 1992). This study was undertaken to identify and document factors that can predict knowledge about HIV/AIDS among young people in Botswana. The study should contribute to an understanding of factors that are relevant to the acquisition of knowledge about HIV/AIDS among young people.

Several studies have shown that health related knowledge has power to change people's attitudes and health care behaviours in different health contexts, including, oral and dental health (Al-Ansari et al., 2003; Freeman et al., 1993; Kinirons and Stewart, 1998), the prevention and control of malaria (Hamel et al., 2001), smoking (UN Convention on the Rights of the Child, 2002), and maternal health care (Huffman and Combest, 1990). Widespread evidence shows that knowledge about HIV/AIDS/STIs and reproductive health are key strategies for empowering young people to delay the onset of sexual activity and to make their sexual behaviours safer (Jackson, 2002). Knowledge of pregnancy risks and knowledge about HIV/AIDS has been associated with consistent use of condoms and a reduction in the number of sexual partners among Zambian adolescents (Magnani et al., 2000). In Nigeria, students who received 6 weekly health education sessions and a demonstration on the correct use of condoms showed an increase in condom use, a reduction in the mean number of sexual partners and increased tolerance for people with HIV and AIDS (Fawole et al., 1999). Knowledge about HIV transmission among urban and rural students from Delhi University reduced high risk behaviours and practices (Kumar et al., 1996).

Since young people are at the centre of the epidemic, it is important to document, not only how much they know about HIV/AIDS but to identify factors that are associated with their knowledge or ignorance about HIV/AIDS (Tawil et al., 1995). Documentation of the factors that can predict young people's knowledge about HIV/AIDS should be useful to policy makers, organisations, parents and groups with the wherewithal to make a difference in the fight against HIV infection. Knowledge about HIV/AIDS is among the most important tools for fighting the epidemic (Kiragu, 2001) especially among young people who have been identified as a key group for HIV related prevention activities. Until people are knowledgeable about HIV/AIDS and its devastating consequences, all efforts to curb its rapid spread will be in vain (Aggleton, 1996).

METHODS

The data were collected through a self administered questionnaire from among students in eight purposively selected schools around Gaborone, the capital city of Botswana. The schools consisted of two community junior secondary schools that teach the first three levels of secondary school (Form One, Form Two and Form Three), two public senior secondary schools that teach the last two years of secondary school (Form Four and Form Five), two private secondary schools, one remedial secondary school that is run by an non-governmental organization and the University of Botswana. Permission to interview students was obtained from authorities in each school. A predetermined number of students were approached randomly for interview. Only students who willingly agreed to participate and complete all questions were included in the study.

The research instrument consisted of 76 items that solicited information on demographic and socio-economic background characteristics of respondents, indicators of family cohesiveness and bonding of children with their parents, indicators of personal adjustment, evidence of sex life and the extent to which sex was discussed within the family. Knowledge about HIV/AIDS was measured using 19 items developed from literature reviews and validated by independent experts on HIV/AIDS research. Sample items included:

1. A mosquito can transmit HIV from one person to another
2. Some traditional doctors can cure AIDS
3. AIDS is Gods punishment against homosexuals
4. The immigrants from Northern Africa brought HIV/AIDS to Botswana
5. AIDS is a crime that deserves punishment by death
6. AIDS is due to not observing a one-year period of abstinence after being widowed

Possible responses to items were "yes, no and don't know". Questions to measure knowledge about condoms, sexually transmitted diseases and willingness to test for HIV infection were also designed in consultation with experts on HIV/AIDS research. The extent of cohesion and psychological bonding among members

of the family was measured by items that asked respondents to rate the level of their attachment to each of their parents and relatives and the amount of emotional support that they got from their families. The nature of interpersonal relations and personal adjustment was indicated by items that asked respondents about the level of conflict in their families, the frequency of disagreements with each of their parents, the level of happiness in their lives, and the extent to which they fought with other children as they grew up.

The instrument included items that requested respondents to indicate their sex life and opportunities to discuss sex with family members. Responses to items took the format (1) very often, (2) sometimes, (3) rarely and (4) never. Permission to interview students was obtained from authorities in each school. A predetermined number of students were approached randomly for interview. Only students who willingly agreed to participate and complete all questions were included in the study: "adequate knowledge vs. inadequate knowledge". The panel of experts and the researchers agreed that adequate knowledge about HIV/AIDS should be reflected by a relatively high score representing at least two-thirds of correct responses. Thus, respondents who answered 13 out of the 19 items (68.42%) correctly were regarded as having "adequate knowledge" about HIV/AIDS. Respondents who correctly answered 12 or fewer items were regarded as having "inadequate knowledge' about HIV/AIDS. All other variables analysed were categorical or converted into categorical format. Thus, respondents were categorised as "attached or not attached" to their parents; "happy or not happy" with life in general; grew up in a "rural or urban" environment, etc. This approach enabled cross tabulation and the use of Chi-square tests of association and independence to establish the nature and strength of associations between knowledge about HIV/AIDS and independent variables. The level of significance was set at $\alpha = 0.05$.

Bivariate analyses were done to determine the nature of the relationship between knowledge about HIV/AIDS and variables in each of the following sets of factors: (1) demographic and socio-economic background variables, (2) variables that represented the extent of cohesion and psychological bonding among members of the family, (3) measures of personal adjustment (4) indicators of a sex life and opportunities to discuss sex with family members. Multiple logistic regression models fitted to determine the extent to which variables in each set of factors explained the likelihood that a student would have adequate knowledge about HIV/ADIS. A final multiple logistic regression model was fitted to determine the most important factors that predict the probability that a student would have adequate knowledge about HIV/AIDS. Variables that did not have a significant association with knowledge about HIV/AIDS were excluded using conditional forward stepwise variable addition.

RESULTS

The majority of the respondents (63.1%) answered 13 out of 19 questions correctly, and were thus regarded as having adequate knowledge about HIV/AIDS. Only 36.9% of the respondents answered 12 or fewer items correctly, and were regarded as having inadequate knowledge about HIV/AIDS. Table 1 shows the distribution of the sample by selected background characteristics. There were 1294 respondents; 54.6%of whom were female and 45.4% male. Just over half (53.9%) were sexually active. Most respondents (66.1%) were highly attached to their mothers, while only 37.6% were highly attached to their fathers.

Table 2 shows results of chi-squared tests of association between adequate knowledge about HIV/AIDS and groups of independent variables. Further analyses were done to determine the source of association.

Respondents in older age groups were more likely to have adequate knowledge about HIV/AIDS than their younger counterparts (Chi-square =12.319, p = 0.015). Those who were enrolled in higher levels of schooling were more likely to have adequate knowledge about HIVAIDS than those who were enrolled in the lower classes in school (Chi-square = 30.096, p = 0.000). Figure 1 shows that secondary school students were more likely to have inadequate knowledge about HIV/AIDS than university students. Respondents who had attended private English medium primary schools were more likely to have adequate knowledge about HIV/AIDS than those who had attended government primary schools (Chi-square = 11.921, p = 0.001). Similarly, those who attended private secondary schools were more likely to have adequate knowledge about HIV/AIDS than those who attended a remedial school (Chi-square = 7.514, p = 0.023). Respondents whose mothers worked in high ranking jobs were more likely (Chi-square = 42.016, p-value = 0.000) to have adequate knowledge about HIV/AIDS than those whose mothers worked in low ranking jobs (Figure 2). It was also found that respondents whose fathers worked in high ranking jobs were more likely to have adequate knowledge about HIV/AIDS than those whose fathers worked in low ranking jobs (Chi-Square = 18.561, p-value = 0.001). Similarly, those from high cost residential areas were more likely to have adequate knowledge about HIV/AIDS than their counterparts from medium and low cost housing areas (Chi-square = 30.096, p = 0.000). Gender had no influence on adequacy of knowledge about HIV/AIDS (Chi-square = 0.523, p = 0.470). Similarly, there was no significant relationship (Chi-Square = 0.173, p = 0.677) between growing up in an urban or rural area and adequacy of knowledge about HIV/AIDS.

Respondents whose parents were married were more likely to have adequate knowledge about HIV/AIDS than those who had never met their fathers (Chi-square = 22.340, p < 0.001). Respondents who came from families that were "only a little religious" or "moderately religious" were more likely to have adequate knowledge about HIV/AIDS than those who came from families that were highly religious (Chi-square = 10.019, p = 0.018). There was no significant relationship (Chi-square = 6.878, p-value = 0.076) between respondents level of religiosity and adequacy of knowledge about HIV/AIDS. Similarly, there was no relationship between the amount of emotional support respondents received from their families and adequacy of knowledge about HIV/AIDS (Chi-square = 0.668, p-value = 0.716). There was also no association between the type of guardian that students had during their primary school days and adequacy of knowledge about HIV/AIDS (Chi-square = 7.318, p = 0.062).

Table 1. Distribution of respondents by selected background characteristics.

Background characteristics	Frequency	Percentage
Sexual activity		
Sexually Active	691	53.9
Not sexually Active	590	46.1
Total	1294	100
Gender		
Male	588	45.4
Female	706	54.6
Age – group of student		
12 - 15	283	22
16 - 17	234	18.2
18 - 19	263	20.4
20 – 21	269	20.9
22 and Over	238	18.5
Educational level		
Junior secondary	552	42.7
Senior secondary	216	16.7
Junior tertiary	296	22.9
Senior tertiary	229	17.7
Type of school attended		
Correspondence/evening school	32	2.5
Private school	193	15
Public/government school	1060	82.9
Type of primary school attended		
Private school	254	19.7
Public/government school	1035	80.3
Urban vs rural residence		
Urban area	729	56.7
Rural area	557	43.3
Type of residential area		
High cost area	217	16.9
Medium cost area	730	57
Low Cost Area	334	26.1
Common residence among parents		
Most of the time	740	57.8
Sometimes	325	25.4
Never	215	16.8

There was a significant relationship between level of happiness with life in general and knowledge about HIV/AIDS (Chi-square 19.970, p = 0.001). Respondents who were very happy with life in general were more likely to have adequate knowledge about HIV/AIDS than those who were not happy with life in general. Similarly, those who were satisfied with their life as students were more likely to have adequate knowledge about HIV/AIDS than

Table 2. Association between Knowledge about HIV/AIDS and independent factors.

Factor	Variable	Chi-sq	df	p-value
Background factors				
	Gender	0.523	1	0.470
	Age – group	12.319	4	0.015
	Level of schooling	30.096	3	0.000
	Type of primary school attended	11.921	1	0.001
	Type of Secondary school attended	7.514	2	0.023
	Urban vs. rural residence	0.173	1	0.677
	Mother's type of job	42.27	4	0.000
	Father's type of job	18.561	4	0.001
Family Coherence and psychological bonding among members of the family				
	Common residence among parents	6.732	2	0.004
	Emotional support from family	0.668	2	0.716
	Guardian during primary school	7.318	3	0.062
	Guardian during secondary school	3.749	3	0.290
	Attachment to father	0.377	1	0.539
	Attachment to mother	0.066	1	0.798
	Attachment to aunts and uncles	0.041	2	0.980
	Attachment to grandparents	1.664	2	0.435
	Religiosity of student	6.878	3	0.076
	Religiosity of family	10.019	3	0.018
Interpersonal relations and personal adjustment				
	Level of conflict in the family	23.060	3	0.000
	Disagreements with mother	10.685	1	0.001
	Disagreements with father	7.371	1	0.007
	Physical fights with other children	16.002	3	0.001
	Level of happiness with life in general	19.970	2	0.000
	Level of satisfaction with life as a student	9.340	2	0.009
	Relationship with peers	2.177	1	0.140
Sex life				
	Type of love life	12.123	1	0.001
	Discussion of Sex with family	26.254	3	0.000
	Persons easiest to discuss sex with	10.939	3	0.012
	Willingness to test for HIV	0.125	1	0.724

those who were not satisfied with their life as students (Chi-square = 9.340, p = 0.009). Respondents who were rarely involved in physical fights with other children when they were growing up were more likely to have adequate knowledge about HIV/AIDS than those who were sometimes involved in physical fights (Chi-square = 16.002, p = 0.001). There was, however, no significant association between getting along with peers and knowledge about HIV/AIDS (Chi-square = 2.177, p-value = 0.140).

Interestingly, conflict in the family was associated with knowledge about HIV/AIDS (Chi-square = 23.060, p < 0.001). Respondents who came from families that experienced some level of conflict were more likely to have adequate knowledge about HIV/AIDS than those who came from families that never experienced conflict. Those who had frequent disagreements with their mothers were more likely to have adequate knowledge about HIV/AIDS than those who never had disagreements with their mothers (Chi-square = 10.685, p = 0.001). Similarly, those who had frequent disagreements with their fathers were more likely to have adequate knowledge about HIV/AIDS than those who never had disagreements with their fathers (Chi-square = 7.371, p = 0.007).

Respondents who ever had a partner were more likely to have adequate knowledge about HIV/AIDS than those who never had a partner (Chi-Square = 12.123, p =

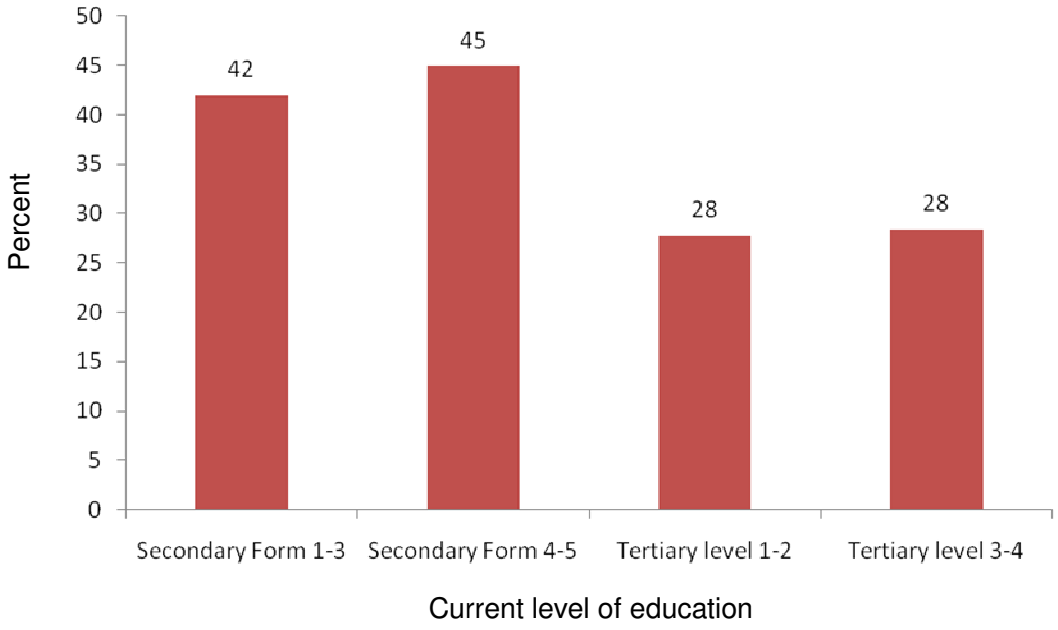

Figure 1. Percentage of respondents at different levels of education with inadequate knowledge.

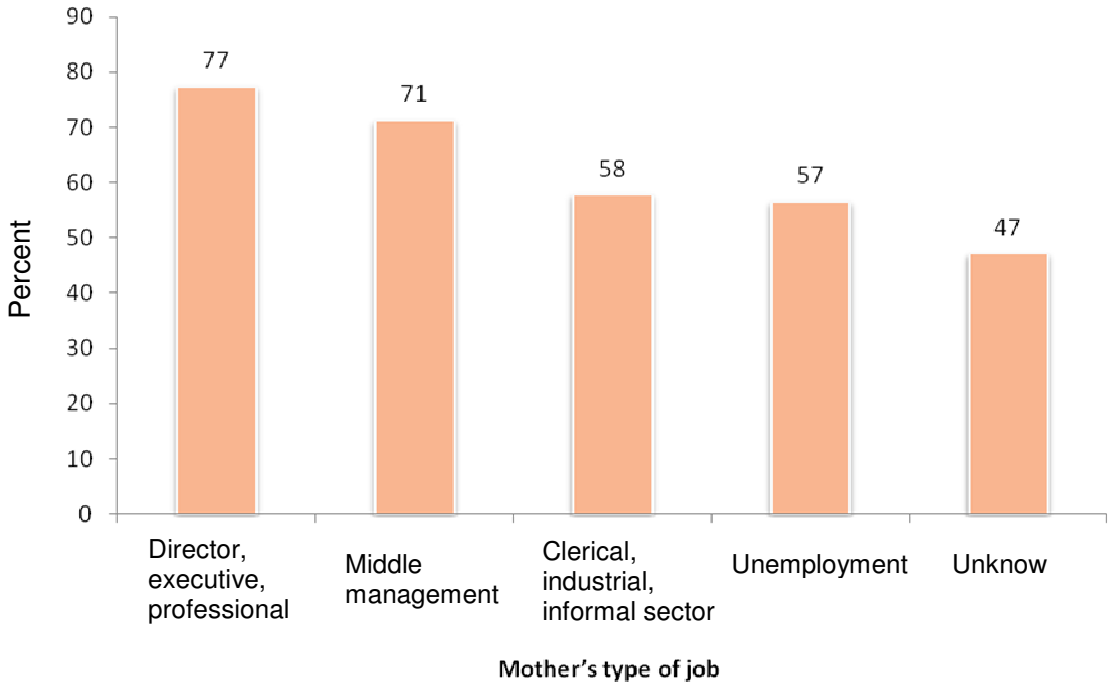

Figure 2. Percentage of respondents with adequate knowledge by mother's type of job.

0.001). And, those who came from families where sexual issues were discussed (with parents, siblings, or relatives) were more likely to have adequate knowledge about HIV/AIDS than those who came from families where sexual issues were never discussed (Chi-Square = 26.254, p = 0.000). Interestingly, there was no relationship between sexual activity and knowledge about HIV/AIDS (Chi-square = 0.023, p = 0.879). There was also no relationship between willingness to test for HIV infection and adequacy of knowledge about HIV/AIDS (Chi-square = 0.125, p - value = 0.724).

The variables found to be significantly associated with knowledge about HIV/AIDS during bivariate analyses were included in multiple logistic regression analyses

Table 3. Parameter estimates for background factors model (Model 1).

	B	S.E.	Wald	df	Sig.	Odds ratio	95.0% C0.I.for EXP(B)	
Factor							**Lower**	**Upper**
Age group			12.231	4	0.016			
12-15	0.598	0.336	3.170	1	0.075	1.819	0.941	3.514
16-17	0.997	0.322	9.598	1	0.002	2.709	1.442	5.090
18-19	0.696	0.285	5.970	1	0.015	2.006	1.148	3.508
20-21	0.511	0.229	4.963	1	0.026	1.667	1.063	2.614
22 and Over	0					1		
Education level			24.098	3	0.000			
Junior Secondary	-1.173	0.325	13.060	1	0.000	0.309	0.164	0.584
Senior Secondary	-1.335	0.308	18.809	1	0.000	0.263	0.144	0.481
Junior Tertiary	-0.181	0.235	0.591	1	0.442	0.834	0.526	1.324
Senior Tertiary	0					1		
Mother's type of job			39.579	4	0.000			
Director, executive or professional	1.358	0.328	17.112	1	0.000	3.887	2.043	7.396
Middle Management, officer worker, etc	0.906	0.260	12.156	1	0.000	2.474	1.487	4.116
Other	0.306	0.261	1.371	1	0.242	1.357	0.814	2.264
Unemployed	0.168	0.275	0.372	1	0.542	1.183	0.690	2.028
Unknown	0					1		
Family of socialisation			9.278	2	0.010			
Both parents	0.344	0.173	3.944	1	0.047	1.410	1.005	1.980
Single parent	-0.066	0.176	0.142	1	0.706	0.936	0.663	1.321
Other	0					1		
Constant	0.123	0.303	0.166	1	0.684	1.131		

Knowledge about HIV/AIDS: 0 = Inadequate knowledge; 1 = Adequate knowledge.

using conditional forward stepwise variable addition (Tables 3 to 6). Separate models were fitted for the following sets of factors: (1) demographic and socio-economic background variables, (2) variables that represented the extent of cohesion and psychological bonding among members of the family, (3) measures of personal adjustment (4) indicators of a sex life and opportunities to discuss sex with family members. The model for background variables (Table 3) revealed that the most knowledgeable students were likely to be 16 - 19 years of age, attending secondary school, having mothers in middle management or higher-level professional jobs, and would have lived with both parents as they grew up. Students aged 16 -17 years old were almost three times (OR = 2.709) as likely to have adequate knowledge about HIV/AIDS as compared to students who were 22 years of age or older.

The family coherence model (Table 4) revealed that those who grew up in homes full of conflict, those whose parents lived together, as well as those who had frequent disagreements with their mothers, were more likely to have adequate knowledge about HIV/AIDS than those who grew up in conflict-free homes and rarely disagreed with their mothers. The results for the interpersonal relations model (Table 5) revealed that those who rarely had physical fights with other children when growing up as well as those who were happy with life in general were more likely to have adequate knowledge about HIV/AIDS than those who never had physical fights with peers and those who were not happy with life in general. In the sexual activity model (Table 6), those who had a partner and very often discussed sexual issues with family members were up to 1.7 times more likely to have adequate knowledge about HIV/AIDS than those who had never had a partner and never discussed sexual issues with parents.

The final predictive model (Table 7) identified seven factors that could be used to differentiate between respondents with adequate knowledge about HIV/AIDS from those with inadequate knowledge. The type of job that mothers did was the single most important factor that discriminated between respondents with adequate knowledge about HIV/AIDS from those with inadequate knowledge. Respondents whose mothers held

Table 4. Parameter estimates for family coherence factors model (Model 2).

							95% C.I. for odds ratio	
Factor	**B**	**S.E.**	**Wald**	**df**	**Sig.**	**Odds ratio**	**Lower**	**Upper**
Conflict in the family			18.237	3	0.000			
Very high	0.537	0.221	5.920	1	0.015	1.710	1.110	2.635
Moderate	0.655	0.177	13.624	1	0.000	1.925	1.360	2.725
Very low	0.520	0.146	12.737	1	0.000	1.682	1.264	2.237
None	0.00					1.00		
Parents live together			9.557	2	0.008			
Most of the Time	-0.303	0.176	2.955	1	0.086	0.738	0.523	1.043
Sometimes	-0.593	0.196	9.140	1	0.003	0.553	0.376	0.812
Never	0.00					1.00		
Disagreements with mother								
In Conflict	0.337	0.121	7.775	1	0.005	1.400	1.105	1.774
Not in Conflict	0.00					1.00		
Constant	0.342	0.188	3.317	1	0.069	1.408		

Table 5. Parameter estimates for interpersonal relationships model (Model 3).

							95% C.I. for odds ratio	
Factor	**B**	**S.E.**	**Wald**	**df**	**Sig.**	**Odds ratio**	**Lower**	**Upper**
Physical fights with peers			15.279	3	0.002			
Very often	0.153	0.205	0.560	1	0.454	1.166	0.780	1.742
Sometimes	-0.154	0.156	0.983	1	0.322	0.857	0.632	1.163
Rarely	0.423	0.156	7.303	1	0.007	1.526	1.123	2.074
Never	0.0				1.0			
Happiness with life in general			19.657	2	0.000			
Very happy	0.290	0.165	3.073	1	0.080	1.336	0.966	1.848
Happy	0.686	0.164	17.475	1	0.000	1.986	10.440	2.739
Not happy	0.0				1.0			
Constant	0.046	0.170	0.074	1	0.785	1.047		

Table 6. Parameter estimates for love life model (Model 4).

							95% C.I. for odds ratio	
Factor	**B**	**S.E.**	**Wald**	**df**	**Sig.**	**Odds ratio**	**Lower**	**Upper**
Type of love live			10.440	2	0.005			
Ever had a partner	0.347	0.138	6.315	1	0.012	1.414	1.079	0.854
Currently has no partner	0.522	0.172	9.206	1	0.002	1.685	1.203	2.360
Never had a partner	0.0				1.0			
Discussion of sex with family			23.914	3	0.000			
Very often	0.583	0.222	6.918	1	0.009	1.791	1.160	2.765
Sometimes	0.345	0.138	6.281	1	0.012	1.412	1.078	1.849
Rarely	0.787	0.170	21.321	1	0.000	2.196	1.573	3.067
Never	0.0				1.0			
Constant	-0.079	0.131	0.362	1	0.547	0.924		

Table 7. Parameter estimates for the final predictive model (Model 5).

	B	S.E.	Wald	df	Sig.	Odds ratio	950.0% C.I. for EXP(B)	
Factor							**Lower**	**Upper**
Mother's type of job			34.972	4	0.000			
Director, executive or professional	1.234	0.334	13.621	1	0.000	3.436	1.784	6.617
Middle management, officer worker, etc	0.826	0.269	9.421	1	0.002	2.283	1.348	3.868
Other	0.173	0.270	0.409	1	0.522	1.189	0.700	2.018
Unemployed	0.211	0.284	0.551	1	0.458	1.235	0.708	2.154
Unknown	0					1		
Family of socialisation			10.943	2	0.004			
Both parents	0.523	0.192	7.452	1	0.006	1.687	1.159	2.456
Single parent	0.015	0.179	0.007	1	0.933	1.015	0.715	1.441
Other	0					1		
Level of schooling			22.048	3	0.000			
Junior secondary	-0.034	0.181	0.035	1	0.851	0.967	0.678	1.378
Senior secondary	0.674	0.174	15.072	1	0.000	1.962	1.396	2.758
Junior tertiary	0.586	0.185	10.050	1	0.002	1.797	1.251	2.581
Senior tertiary	0					1		
Common residence among parents			12.465	2	0.002			
Most of the time	-0.690	0.211	10.710	1	0.001	0.502	0.332	0.758
Sometimes	-0.653	0.206	10.095	1	0.001	0.520	0.348	0.779
Never	0.00					1.00		
Level of conflict in the family of socialisation			9.986	3	0.019			
Very high	0.413	0.231	3.190	1	0.074	1.511	0.961	2.377
Moderate	0.552	0.189	8.506	1	0.004	1.737	1.199	2.518
Very low	0.375	0.157	5.726	1	0.017	1.456	1.070	1.979
None	0.00					1.00		
Disagreements with mother								
In conflict	0.457	0.130	12.347	1	0.000	10.580	1.224	2.039
Not in conflict	0.00					1.00		
Discussion of sexual issues with family			14.568	3	0.002			
Very often	0.461	0.238	3.748	1	0.053	1.585	0.994	2.527
Sometimes	0.312	0.150	4.317	1	0.038	1.366	1.018	1.832
Rarely	0.662	0.182	13.304	1	0.000	1.939	1.359	2.769
Never	0.00					1.00		
Constant	-0.615	0.327	3.525	1	0.060	0.541		

high-ranking professional or executive positions were more than three times (OR = 3.436) as likely to have adequate knowledge about HIV/AIDS as those who did not know the type of job their mothers did. Those whose mothers held middle management positions were more than twice as likely (OR = 2.283) to have adequate knowledge about HIV/AIDS as those who did not know the type of job their mothers did. The other six factors in order of importance were (1) type of family of socialisation, (2) level of education, (3) common residence among parents, (4) level of conflict in the family of socialisation, (5) disagreements with mother, and (6) discussion of sexual issues with family members. A student whose mother had a professional or managerial level job, who grew up with both parents, who was currently in a secondary school and who discussed

sexual issues with family members was more likely to have adequate knowledge about HIV/AIDS than other students.

DISCUSSION

This study was undertaken to identify and document factors that can predict knowledge about HIV/AIDS among young people in Botswana. An understanding of the factors that can predict young people's knowledge about HIV/AIDS should be useful to policy makers, organisations, parents and groups with the wherewithal to make a difference in the fight against HIV infection. Knowledge about HIV/AIDS can result in a reduction in risk behaviours and attitudes, including a reduction in the number of sexual partners, an increase in and consistent use of condoms, and increased tolerance for people living with HIV and AIDS (Fawole et al., 1999; Kumar et al., 1996; Magnani et al., 2000).

The study has shown that the most important single factor that distinguished between students who had "adequate knowledge" and those who had "inadequate knowledge" about HIV/AIDS was the type of job mothers did. Students whose mothers were in professional and managerial jobs were more likely to have adequate knowledge than those whose mothers were unemployed. The type of job mothers do is an important indicator of socio-economic status that has implications for other factors such as the type of residence in which a child grows up. Mothers in high-ranking professional jobs are most likely to live in houses with adequate number of rooms per person and adequate amenities that contribute to leading a relatively good quality of life. Each additional room per person is an indication of improvement in socio-economic status. A positive relationship between the number of rooms in the house and HIV/AIDS awareness has been documented in India (Balk and Lahiri, 1997). Each additional room per person increased the odds of being knowledgeable about AIDS by 58% in some Indian states, and by 200% or more in other states (Balk and Lahiri, 1997). This suggests that the odds of being knowledgeable about HIV/AIDS increased as socio-economic status improved. In addition to the size of house and number of rooms per person, the neighbourhood in which the house is located is an important indicator of socio-economic status which has implications for knowledge of HIV/AIDS. In Kenya, 90% of non-slum dwellers identified one of the protective measures against HIV/AIDS compared to only 68% of slum dwellers (Hollander, 2003).

The type of job mothers do is an important socio-economic precondition for the type of school that a child will most probably attend. Although, not in the final predictive model, bivariate analysis found that students who attended private schools were more likely to have adequate knowledge about HIV/AIDS compared to those who attended public schools. Similar results have been found in Turkey where students in private high schools had higher scores on knowledge about AIDS than those in public high schools (Savaser, 2003). Such students would have come from families that could afford the relatively high fees that private schools, throughout Botswana, charge per student.

It should be noted that private schools in Botswana usually cater for children of expatriate parents from different countries and must use English as a medium of everyday communication among students, teachers and other staff from a variety of cultures and language backgrounds. While both casual conversation and formal instruction in private schools are in English, this is not always the case in public schools. While the language of instruction in public schools is also English, casual conversation is often in the national language, 'Setswana' or other languages spoken in different regions of the country. Some teachers may resort to vernacular when they deem it convenient to convey messages that may have a 'cultural' content or connotation.

Since educational messages about HIV/AIDS are conceptualised and written, first in English, and later translated into 'Setswana' they should be easier to understand and internalize in English. Students in private schools, who interact in an international 'delocalised culture' where messages about HIV/AIDS are communicated only in English, should have a relatively clear sense of what HIV and AIDS are. Messages about HIV/AIDS can be communicated in a detached, affectively neutral professional or scientific manner. Messages about HIV/AIDS in English can be direct and unambiguous, and therefore, clear. 'Setswana' translations of messages about HIV/AIDS are less clear, less direct and more ambiguous. For instance, condoms may be translated as 'dikausu' (socks). Sex may be translated as 'dikobo' (blankets), 'thobalo' (sleep) or 'tirisanyo' (working together). As a result, there are hilarious stories of young children refusing to sleep in the same bed with their parents for fear of contracting HIV. There are also disturbing stories of adults who go to bed with their socks on in order to avoid HIV infection. A child who learns many things (including HIV/AIDS) in English at school, and is able to communicate what he/she learnt at school with his/her parents in English, lives in a consistent cultural environment between school and home. The home reinforces the school and vice versa. What the child learns in school can be discussed with mom or both parents at home, and in the same language as at school. In addition, cultural nuances can be further explored and explained in the local language when necessary to compliment what was initially communicated by teachers and parents in English. But, when the home environment is substantially incompatible with the school environment, some confusion is bound to prevail in the mind of the child. When a child learns about HIV/AIDS in English at school and, as a result of his/her less privileged background, can only speak 'Setswana' or other local

language at home with parents who have limited or no schooling, he/she lives in an inconsistent cultural environment between school and home. The home does not reinforce the school. What the child learns in school may not be discussed with mom or both parents. When it is discussed, the language spoken at school must be translated, by the child, into the language spoken at home. In the process, much information and meaning may be lost. The way of life, material culture and the language that the child experiences at home must be compatible with the material culture and language of the school in order for messages about delicate subjects to be properly understood. An adolescent or young person whose mother works in a professional or managerial job will typically be exposed to a home environment with material culture and language that are compatible with the culture and environment of the school. Such a young person is more likely to learn and know about HIV/AIDS more easily than one who comes from a less privileged home and school environment.

In addition to speaking and thinking in English, private school students usually come from home environments where parents can afford television services, a regular supply of newspapers and access to radio in the house and in the car. Such students often have portable electronic devices such as Walkman, iPod or cellular phone with Internet access. Mothers of private school students will typically have access to information and education about HIV/AIDS, which they may share with their children, using English, a language that can help African parents to overcome and transcend cultural inhibitions and taboos regarding conversations about sex between parents and their children. By using a “foreign language”, and thereby adopting a “foreign culture”, African parents can, at least momentarily, escape from, avoid or ignore the inhibiting grip of local custom and tradition. Middle class parents can brave certain delicate subjects in English much easier than in ‘Setswana’.

In Botswana, many young people are typically raised by mothers who earn very low incomes and live in poor home environments. Two decades ago, some 80% of female headed households earned incomes that were less than $45 per month from informal sector activities that had very low returns to labour. Many female heads of households were employed in elementary occupations as labourers and domestic servants (Gaisie, 2000), did not plough because they lacked draught power and implements, and found it difficult to support their families. Although, impressive economic growth rates have been recorded since Independence, issues of poverty, inequality and the relative lack of participation by citizens in mainstream economic activities have been noted (Oommen, 1983; Botswana Institute of Development Policy Analysis, 1997). Over the years, the Gini-coefficient exceeded 0.50, which is regarded as reflecting a highly unequal income distribution (Botswana Institute of Development Policy Analysis, 1997).

Growing up in a poor home environment has significant negative implications for children’s psychological and cognitive development (Dearing, 2008). The environment of poverty limits children’s access to developmental stimulation and heightens their exposure to adverse physical and social stressors, elevated family turmoil, greater child-family separation, and higher levels of violence (Evans and English, 2002). In addition to developmental disarray, early chaotic living conditions and experiences of unsuccessful coping with overwhelming environmental demands may result in maladaptive coping strategies, and difficulties with self regulatory behaviour or delayed gratification (Evans and English, 2002). Developmental dysfunction and delay are most likely to occur and are most sever when youth live in extremely poor conditions for relatively long periods. Furthermore, poor families often engage in punitive parenting practices, which combined with deviant peers in poor neighbourhoods and schools, as well as more general neighbourhood problems, help explain heightened social-emotional problems among poor youth (Dearing, 2008). Poverty is also associated with a negative perception of subjective well-being; passive evasive coping strategies, external locus of control, lack of orientation towards competitiveness and mastery, personal rejection, low self esteem and depression (Lever et al., 2005). These factors can in no small measure contribute to inadequate knowledge about HIV/AIDS.

Bivariate analysis in this study found that those who came from families where sexual issues were discussed with parents, siblings, or relatives were more likely to have adequate knowledge about HIV/AIDS than those who came from families where sexual issues were never discussed. Knowledge about HIV has been positively correlated with the ease with which issues about sex were discussed at home (Savaser, 2003). Itshekeng (2002) found that 42.2% of respondents who had communicated with either mother, father or with both parents about sex were aware of HIV/AIDS compared to 26.3% of those who did not communicate with an adult resident family member about sex. Fluency in English and the local language should make it easier for middle class families in Botswana to discuss sex with their children and to provide sex education through a variety of media. In addition to being able to talk to their children in the language of the school, English, middle class ‘Batswana’ parents can use both English and ‘Setswana’ judiciously to navigate sensitive topics, hard facts, tradition and culture effectively.

It has been shown that exposure to television and written materials were more strongly related to knowledge about HIV/AIDS than conversations with individuals (Shrotri et al., 2003). Exposure to mass media was positively correlated with high levels of AIDS awareness in Botswana (Norr et al., 1996). High school students who identified television as their most important

source of information about AIDS had high knowledge about AIDS in Iran (Tavoosi et al., 2004). Mothers in professional and managerial jobs have the relative prosperity that should make various types of mass media available in their homes. Less privileged mothers may not have as much access to television and print media. As a result, their children may not derive the benefits of living in an information and technological age.

This study found that students who currently had a partner were more likely to have adequate knowledge about HIV/AIDS than those who did not have a partner. This is consistent with results of a study that found a positive correlation between sexual activity and knowledge about AIDS among University of Botswana students (Seloilwe et al., 2001). It is also consistent with results of a study of 1716 women in Nairobi, which found that the number of lifetime sexual partners a woman had was positively associated with level of knowledge about gonorrhoea and syphilis (Garland et al, 1993). This suggests that those who are sexually active are more likely to know about sexually transmitted illnesses than those who are not. However, this is sometimes not the case. For example, in a study of 14 to17 year old school children and similarly aged shelter children, Goodwin et al. (2004) found that shelter children were more sexually active but less knowledgeable about means of HIV transmission. It would seem that, for adolescents who have a partner, being in school has beneficial effects.

This study also found that students from homes with high levels of conflict had adequate knowledge about HIV/AIDS compared to those who came from homes that enjoyed relatively no conflict. Follow-up discussions suggest that homes with high levels of conflict, and where children often disagree with parents may result in a “liberal atmosphere” that could encourage young people to get their own information about HIV/AIDS from news-papers, magazines, radio, television, video films, health workers, teachers and their friends. Disagreements with parents may also suggest an “intellectual atmosphere” where children are not subjugated and silenced by repressive conservative adults. Relatively educated mothers with managerial or executive positions should have the cultural wherewithal to more readily create a liberal home environment. In conservative homes, where children are “to be seen and not heard”, cultural taboos, uneasiness about the appropriate choice of words for discussing sex with children, and lack of knowledge and skills in sex education may prevail and result in a good measure of ignorance about sex and HIV/AIDS. Further research is required to explore different home environments and how they may affect acquisition of useful health related knowledge.

The study found an inverse relationship between religiosity of the family and knowledge about HIV/AIDS. In many religious homes, sex is a taboo subject that is rarely discussed. Only a small proportion of students who came from religious families had adequate knowledge about HIV/AIDS. A study among secondary school students in in Selebi Phikwe, Botswana, found that the odds of being aware of HIV/AIDS were significantly reduced among religious household heads compared with household heads that were not religious (Itshekeng, 2002).

This study found the relationship between knowledge about HIV/AIDS and age to be significant. This is consistent with results of a study among secondary school students in Selebi Phikwe, which found that HIV/AIDS awareness increased with age (Itshekeng, 2002). It could be argued that teachers and parents may discuss sex more freely with older students whom they regard as mature and at an age when sexual activity is most likely to occur. The study also found an association between level of education and knowledge about HIV/AIDS. The proportion of students with adequate knowledge about HIV/AIDS was higher in upper level classes than in lower level classes. This is consistent with findings of several previous studies (Balk and Lahiri, 1997; Caprara et al., 1993; Mbanya et al., 2001; Middleton, 1998; Shisana and Simbayi, 2002; Yelibi et al., 1993). In Canada, for example, the Ministry of Education (2002) found that students in Grade 11 were more likely to answer questions about HIV/AIDS correctly than those in Grade 9.

Studies in out-of school settings have also obtained similar results. Knowledge about AIDS was positively associated with education of female adolescents and their husbands in Bangladesh (Khan, 2002). In Nairobi, Kenya, Garland et al. (1993) found that knowledge of symptoms about AIDS and routes of HIV transmission was positively associated with level of education among women attending family planning clinics. In India, educated women were more aware of HIV/ AIDS than uneducated women (Balk and Lahiri, 1997). In Nepal, those with a higher educational attainment were more likely to be aware of STIs and HIV/AIDS than those with lower educational attainment Neupane et al. (2003).

This study found no association between knowledge about HIV/AIDS and gender. This is consistent with findings of other studies conducted among student popu-lations. For example, Middleton (1998) found no significant differences in health related knowledge between 172 boys and girls at Ledumang Senior Secondary School in Gaborone, Botswana. Similarly, Odirile (2000) and Seloilwe et al. (2001) found no difference in the level of knowledge about HIV/AIDS between male and female students at the University of Botswana.

In virtually all schools in Botswana, male and female students attend classes together and interact freely with each other. Boys receive largely the same information about HIV/AIDS as do girls. As a result, boys and girls should have equivalent information about HIV/AIDS. It has been shown that even where female students demonstrated a slightly higher level of knowledge than male students, the difference in knowledge levels was small and practically insignificant (Tavoosi et al., 2004). In contrast to findings of studies among students, research

conducted among out of school youth and samples of the general population have shown differences in knowledge levels between males and famales (Anarfi, 1997; Gwatkin and Deveshwar-Bahl, 2001; Yelibi et al., 1993). In such studies, men were found to have a higher level of knowledge about HIV/AIDS than women. A study of developing countries found that about 75% of the men compared to 65% of the women had knowledge about HIV/AIDS prevention (Gwatkin and Deveshwar-Bahl, 2001). In Abidjan, Yelibi et al. (1993) found that men responded correctly to more questions related to HIV/AIDS than women. In Ghana, Anarfi (1997) found that the level of awareness of sexually transmitted diseases among street children was significantly higher among males than among females. Agrawal et al. (1999) found that boys felt freer than girls to talk about matters relating to sex and HIV/AIDS; as a result of which, boys had better knowledge about HIV/ AIDS than girls.

The study shows that there was no relationship between urban-rural residence and knowledge about HIV/AIDS. This result should not be surprising. The classification of people in Botswana as urban or rural is largely academic due to the fact that the average individual will have a home in town, in the village and a third one at the cattle post (Zaffiro, 1994). As a result, family members live in a constant state of semi-migration between multiple residences at the home village, agricultural lands, the cattle post and the town (Fako et al., 2003). The constant sew-saw of activities between urban and rural areas is facilitated by good tarred roads in both urban and rural areas. Due to good infrastructure, messages about HIV/AIDS are transported between urban and rural areas with relative ease. While many people may live, work or study in a town, their minds and hearts are in a tribal rural area with which they socially and psychologically identify. The movement of young people between urban and rural areas should result in similar levels of knowledge about HIV/AIDS between students who lived in or identified with urban areas and those who lived in or identified with rural areas.

The lack of difference in knowledge between respondents from rural areas and those from urban areas is in contrast with findings of other studies. In South Africa, Shisana and Simbayi (2002) found that urban residents were more knowledgeable about HIV/AIDS issues than their rural counterparts. In South East Asia Vazquez-Alvarez (2004) found that living in an urban setting was a major determinant of knowledge about HIV/AIDS. In Bangladesh, Khan (2002) found that knowledge about HIV/AIDS was higher among urban residents than rural residents. Balk and Lahiri (1997) found that urban women answered more questions on HIV/AIDS correctly than village women. Alene (2002) found that rural women were not as knowledgeable about condoms as those who had grown up in urban areas. These studies however, involved adult populations who are much less mobile than the students sampled in this study.

This study was based on a survey using a convenient sample of schools around the capital city, Gaborone. A more representative sample is required in order to generalise the findings to other settings in Botswana with some confidence. Longitudinal research is required to establish causal associations between the independent variables and knowledge about HIV/AIDS. Another limitation of this study is that beliefs, attitudes and behaviours that are relevant for HIV and AIDS are difficult to study because of the private, intimate and sensitive nature of the subject. This may result in doubts about the reliability of self reported attitudes and behaviours. In spite of these limitations, the data gathering and analyses were subjected to rigorous processes expected in survey research.

Conclusion

Knowledge remains one of the most important weapons to fight the HIV/AIDS epidemic. Until people are knowledge-able about HIV/AIDS and its devastating consequences, all efforts to curb its rapid spread will be in vain (Aggleton, 1996). Our findings suggest that intervention policies to educate students about HIV/AIDS should primarily identify and target students whose mothers are of a low socio-economic status. Students from poor families with mothers who work in lowly jobs live in an environment which is not conducive for their academic and health education. By contrast, children of educated mothers who work in managerial and higher level professional jobs live in an environment that is conducive for their academic and health education. As a result, they know more about HIV and AIDS.

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