An Assessment of Comprehensive HIV/AIDS Knowledge Levels among Young People: A Comparative Study of State and Private University Students in Zimbabwe.

Nkomazana, N
Department of Banking & Finance
Midlands State University
Gweru, Zimbabwe

Abstract

This study sought to assess the level of comprehensive HIV/AIDS knowledge among state and private university students in Zimbabwe. It was prompted by widespread reports of risky sexual behaviours by university students and the paucity of information on their comprehensive HIV/AIDS knowledge in Zimbabwe. A survey methodology was employed, with the stratified random sampling technique used to draw the respondents for the study. A self-administered questionnaire was used to gather the data. Results revealed that comprehensive HIV/AIDS knowledge among university students from the two universities were fairly high, averaging about 81.25% (SD=15.06). Whilst the majority of the respondents scored highly in the comprehensive knowledge scale, there was a small section of respondents who exhibited limited comprehensive HIV/AIDS knowledge, clearly showing that, in spite of basic knowledge being almost universal, comprehensive HIV/AIDS knowledge still needs to improve in some sections of the university student population. It also emerged that comprehensive HIV/AIDS knowledge varied by place of study, gender, place of childhood residence, marital status and semester living arrangements. Other socio-demographics such as year of study and faculty of study had limited influence in comprehensive knowledge among university students. It is apparent from the aforementioned results that universal comprehensive HIV/AIDS knowledge is yet to be achieved. It is therefore paramount that HIV/AIDS awareness programmes among university students move from mere awareness to the provision of comprehensive HIV/AIDS knowledge about various transmission modes of HIV/AIDS. The generally high comprehensive HIV/AIDS knowledge is quite recommendable but the prevalence of risky sexual practices at these institutions of higher learning calls for concerted efforts to translate high comprehensive HIV/AIDS knowledge to safe sexual behaviours.

Keywords: Comprehensive HIV/AIDS knowledge, University students, Zimbabwe.

Introduction

Young people[1] have for some time been identified as a high reproductive health risk sub-population, affected by both sexually transmitted infections (STIs) and unwanted

[1]*Young people refer to all those aged 15-24 years.*

pregnancies (UNAIDS, 1998). The problem has since been exacerbated by the advent of Human Immune Deficiency Virus (HIV) and Acquired Immune Deficiency Syndrome (AIDS). Prior to the advent of HIV, young people had lower burden of diseases than other age groups (Madise et al., 2007). Today, they have the fastest growing HIV infection (incidence) rates. For instance, in 2007, young adults accounted for 45% of all the new HIV infections among the adult population[1], in spite that they are only one quarter of the world's total population (UNAIDS, 2008). Their disproportionate exposure to HIV infections has attracted considerable research concern, not only from the global perspective, but also from national and local levels; motivated by the need to design intervention programmes that can reduce new infections.

Whilst the entire spectrum of young people is affected by the HIV scourge, the degree of the severity of this problem vary from one group to another depending on cultural, socio-demographic, political and economic environments that these young people find themselves in. This study focuses on one special class of young people at high risk of HIV, the university students. Worldwide, this section of young people has of late deservedly received increased attention due to the different circumstantial risks that they face. Masvaure *et al*. (2009) argued that although the majority of university students are part of the 15-24 age group, their life circumstances and vulnerability to HIV while at university is uniquely high. Generally, the environment in universities is sexually permissive, since it is where students from different backgrounds and sexual orientations meet and live together, often with little or no parental and administrative prohibitions (Omungo, 2008, Sabone et al., 2007). In fact, the university environment, if not well managed, can provide a very fertile ground for risky sexual practices that may expose students to HIV infections (Adefuye et al., 2009). Research suggests that universities are high risk institutions for the transmission of HIV infections because of the predominance of risky sexual activities among students (Njagi and Maharaj, 2006).

In the early stages of the AIDS epidemic (1980s and early 1990s), prevention efforts were mainly directed towards increasing accurate knowledge about the modes of transmission and health effects of HIV, under the Knowledge, Attitude, Practice and Behaviour (KAPB) intervention approach (Barnett and Whiteside, 2006). Such an intervention approach was premised on the belief that the spread of HIV in many settings was fuelled by ignorance, as such; filling the ignorance gap was envisaged to reduce the spread of HIV. As a result, the basic knowledge about HIV transmission modes and preventative strategies among various at risk groups,

[1] Adult population refers to all those aged 15-49 years.

including university students, grew to fairly high levels across the globe, yet risky sexual practices are still prevalent among the adult population, including university students (Lacson et al., 1997, Njikam nee Savage, 2005, Aluede et al., 2005, Omoteso, 2006, Ferrer et al., 2007, Odu and Akanle, 2008, Ntata et al., 2008, Hansson et al., 2008, Masvaure et al., 2009). The failure to convert knowledge into behaviour change has been and continues to be the worry of many HIV/AIDS programmers and scholars. It has increasingly become apparent that HIV knowledge alone is not sufficient to change one's sexual behaviour, with the call to move beyond individual awareness of HIV to appreciation of the importance of HIV risk environments (Barnett and Whiteside, 2006). Since HIV/AIDS knowledge does not always translate into sexual behaviour change, there is need for HIV prevention programmes to move people across the "awareness education – behaviour change" continuum (Sowell et al., 1996).

This paper presents a comparative analysis of comprehensive HIV/AIDS knowledge of university students at state and private universities in Zimbabwe, in relation to a set of selected socio-demographic characteristics. Whilst the basic HIV/AIDS knowledge is almost universal in Zimbabwe's adult population (CSO and Macro International, 2007), this paper seeks to measure the level of comprehensive HIV/AIDS knowledge among state and private university students and to ascertain the role played by socio-demographic factors such as gender, place of study, semester living arrangements, place of childhood residence, year of study etc, in explaining comprehensive knowledge levels among the two groups of university students. The rest of the paper is organised into the following sections: Firstly a review of literature on HIV/AIDS knowledge among university students is provided. This is followed by methods of collecting data, which in turn is followed by the results and their discussion. The last section of the paper outlines the conclusions drawn from the study and recommendations for moving university students along the "awareness education – behaviour change continuum".

Although basic HIV/AIDS knowledge alone is not sufficient to eliminate risky sexual behaviours among any group of people, it is undisputable that comprehensive knowledge, especially about HIV transmission modes is very essential in enabling people to avoid activities that may put their lives at increased risk of HIV infection (Dinkelman et al., 2006, HSRC, 2005, CSO and Macro International, 2007, Barnett and Whiteside, 2006, Conjoh and Zhou, 2011, Van Rossem et al., 2010, Koksal et al., 2005). Interestingly, some studies document the efficacy of comprehensive HIV/AIDS knowledge in improving people's perceptions, including university students, on various issues exposing them to the risk of HIV infection, such as their attitudes towards women, intentions to conduct voluntary counselling and testing (VCT), condom use and participating in safe sexual activities (Sowell et al., 1996, Terry et al., 2006). Nonetheless, insufficient knowledge may not be the only barrier to safe

sexual behaviours. This was clearly illustrated by Sowell et al. (1996:39) who found out that 19.9% of their respondents who engaged in unsafe sex in the past six months "knew the risk and chose to take it", underscoring the need for HIV preventative programmes to go beyond giving information.

However, with no cure yet for HIV, preventative measures based on imparting comprehensive HIV/AIDS knowledge remain crucial in tackling the HIV epidemic (UNESCO, 2003). This argument is supported by Koksal et al. (2005:121) who argued that HIV education should not be down played as it is a key strategy for the control of the HIV epidemic "until vaccines and drugs become available, accessible and affordable". Whilst high comprehensive HIV/AIDS knowledge is the most ideal, there comes a time when too much knowledge may also be unwelcome since it diminishes the sense of threat posed by HIV and as such may lead to resurgence of the epidemic, as in some parts of eastern Europe where people view AIDS just like any other chronic disease and no longer see it as a deadly threat associated with risky sexual behaviours (Van Rossem et al., 2010).

Although generally high (almost universal), even in developing countries, basic HIV/AIDS knowledge is not homogeneous among university students. Male students often possess higher knowledge levels than their female counterparts, as revealed by studies in the Philippines (Lacson et al., 1997) and Nigeria (Aluede et al., 2005). Such HIV/AIDS knowledge deficiencies among female students usually leave them vulnerable to the danger of HIV infections. Some female students may, thus, continue to lead risky sexual lifestyles due to lack of adequate knowledge on ways to protect themselves from HIV infections. However, this is refuted by Ntata *et al.* (2008) who found no significant differences in HIV/AIDS knowledge across gender among university students in Malawi. Although male students had marginally higher HIV/AIDS knowledge levels, these were not statistically different from those reported by their female counterparts.

Some contradictory evidence is also reported by Maswanya *et al.* (1999) and Aluede *et al.* (2005). Whilst Aluede *et al.* (2005) noted slightly high HIV/AIDS knowledge levels among younger students and similarities in knowledge levels among married and single university students in Nigeria, other studies found that younger students, especially females, tended to score significantly lower on knowledge of both transmission and prevention of HIV (Maswanya et al., 1999). Maswanya *et al.* (1999)'s findings in Tanzania were, however, supported by Nkuo-Akanji *et al.* (2007) who also observed that Cameroonian students who had spent three or more years at the university were more knowledgeable about HIV/AIDS than their first year counterparts and Jahanfar, Lye and Rampal (2009) for Malaysia, who also found that students with higher knowledge levels were often older (Nkuo-Akenji et al.,

2007, Jahanfar et al., 2009). These results make sense because older students should have been exposed to information for a longer time than the younger ones, especially in very conservative societies where HIV/AIDS education to children or adolescents is prohibited. In such societies, young people will only be exposed to HIV/AIDS education later, especially upon admission to universities where HIV/AIDS information is available and allowed to be taught and discussed.

Despite extensive awareness campaigns about HIV/AIDS all over the world and the generally high basic HIV/AIDS knowledge levels across the entire spectrum of most populations, it is disturbing to note that significant misconceptions regarding the transmission, prevention and cure of HIV still exist, even in this "*elite group*" of young adults, the university students (Cok et al., 2001, Odu and Akanle, 2008). Nkuo-Akenji *et al.* (2007) noted that 14.2% of the students sampled in their study believed that HIV/AIDS has a cure. Students with such beliefs may pose danger, not only in university campuses but also in the societies where they come from, as they may lead risky lives, only to discover that there is no cure for the HIV virus after catching it. Such misconceptions may reflect the high level of false information circulating through formal and informal communication channels and may be a hindrance to efforts meant to curtail the spread of HIV/AIDS pandemic. There is therefore a strong need to dispel such misconceptions and increase correct knowledge about HIV/AIDS among university students.

Furthermore, HIV/AIDS transmission and prevention knowledge among university students has generally been found to vary across faculties of study. Some studies suggest that those in the natural sciences faculties were more knowledgeable about HIV/AIDS than their counterparts in the social sciences faculties (Tasci et al., 2008, Aluede et al., 2005, Nkuo-Akenji et al., 2007). However, this argument is not universal all over the world as Serlo and Aavarinne (1999) found minimal differences between university students from various faculties on their understanding of HIV/AIDS in Finland, thus underlining the need to understand the contexts and dynamics of each country in understanding sexual behaviour issues of students. Despite this, it appears that most findings are rightfully pointing towards higher HIV/AIDS knowledge levels among students from the natural sciences faculty rather than those from social sciences possibly due to their incorporation of some HIV/AIDS information in their curriculum.

It is imperative to note that despite the relatively poor economic conditions in most African countries, accurate knowledge on HIV transmission modes and prevention strategies among university students is also high, but, as in other parts of the world, universal knowledge is yet to be achieved. For example, Ntata *et al.* (2008) found that 68.7% of university students in Malawi felt that they had enough information about HIV/AIDS and there was no significant difference in knowledge

across gender. Similar findings were reported among Nigerian students by Aluede *et al*. (2005), who also did not find any significant differences in HIV/AIDS knowledge between students who live in urban and rural areas. It should be emphasized, however, that knowledge alone had not helped in curbing the spread of HIV infections as evidence suggests that increased education by itself does not eliminate the risk of HIV infection among university students and other sections of the population (Mashegoane et al., 2004, Njikam nee Savage, 2005, Barnett and Whiteside, 2006, Serlo and Aavarine, 1999). In other words, there is failure by students (and other sections of the population) to translate knowledge into protective action and safe sexual behaviour. Therefore, efforts should concentrate on devising ways of cascading accurate HIV knowledge into practical preventative skills.

Methods

The data for this study was part of a large study designed to investigate the determinants of risky sexual behaviours among university students in Zimbabwe. Data collection employed a survey approach. Two universities, one state-owned and one private-owned, were purposively selected for study. In order to maintain anonymity and comply with the recommendations of the Ethical Committee of the private university chosen, the names of the two universities will be withheld. The two universities are hereafter referred to as the "state university" and the "private university", respectively. Since the two universities had various modes of entry, only full-time students studying undergraduate bachelors' degrees for a minimum of 3 years were considered for the present study. This means that only students on conventional degree programmes and those on parallel degree programmes were eligible to be studied, thus excluding those on part-time basis, such as those studying through block release (visiting school programmes), those studying towards diplomas and those doing their postgraduate degrees or course, since they do not spend much of their time at the university and are also often older, thus do not fit into the age group of interest, which is 15-24 years. Stratified random sampling was utilized, where students at each university were stratified using their faculties of study and random samples then taken from each faculty. In order to synchronize the faculties found at the two universities, faculties were divided into 5 strata as follows: Stratum 1 (Commerce or Business), Stratum 2 (Education & Social Sciences), Stratum 3 (Arts & Law), Stratum 4 (Agriculture & Natural Resources Management) and Stratum 5 (Engineering, Science & Technology). A register of all the registered students in each university was sort and students were then put into the respective strata. Simple random sampling was then used to pick respondents from each stratum, in proportion to the total number of students in their respective strata, using computer generated random numbers.

The targeted sample size was 890 students drawn from the two universities. The choice of the sample size was informed by guidelines for determining a sample

size by Gay, Miles and Airisian (2006), who stated that for any population size around 1 500, 20% should be sampled, whereas for any population greater than 5 000, a sample of 400 would be adequate to draw representative conclusions about population parameters. Since the university student population for the state university was 10 231 a sample size of 400 students would have sufficed to produce a representative sample. However, taking into account the inevitable response rate of about 70 percent often associated with self-administered questionnaires, a sample of 600 students was taken in order to reduce the bias that may be brought about by non-response. More students were selected at first, so that in case of a lower response rate, the final sample size would at least be 400 students for the state-owned university. As for the private university, with a student enrolment estimated at 1 482, a sample size of 290 students was taken as this was deemed sufficient to avoid any bias. This was about 20% of students in this university and was thought to produce a representative sample. A self-administered questionnaire was chosen as the most appropriate means of collecting data for this study because of the sensitive nature of the questions asked.

Comprehensive HIV/AIDS knowledge was assessed through eleven (11) questions on HIV transmission modes. These questions were originally asked in a 5-point likkert scale format. In order to come up with a comprehensive HIV/AIDS knowledge score, the 5-point likkert scale was transformed into a dichotomous scale where respondents' responses were taken to be either correct (if the respondents at least disagreed with the statement on HIV transmission) or incorrect (if respondents at least agreed or neither agreed nor disagreed). In order to do this, statements such as HIV can be transmitted through pregnancy (delivery), breast feeding, sharing needles and unprotected anal sex had first to be reverse coded in order for them to depict the same pattern as the rest of the other statements (variables). Using the above categorization, the comprehensive knowledge index was computed for each respondent out of 100%. The following formula was employed to calculate the index:

$$HIV/AIDS\ Knowledge\ Score = \frac{Number\ of\ Correct\ responses}{Total\ Number\ of\ knowledge\ questions} * 100$$

After checking for completeness and consistency, the data collected was analysed using STATA software (version 11.0).

Results and Discussion

The results of this study are organised into the following sub-headings: knowledge of HIV transmission, comprehensive HIV/AIDS knowledge, place of study, gender, place of childhood residence, year and faculty of study, hobbies and semester living arrangements.

Knowledge of HIV transmission modes

Results revealed that the majority of respondents had correct information about ten (10) out of eleven (11) HIV transmission modes studied. Most respondents correctly distinguished those actions that result in the transmission of HIV from those that do not. The majority of respondents rightly highlighted that mosquito bites (90.17%), hugging (94.02%), eating (93.49%) and witchcraft (87.25%) cannot result in HIV infections. In addition, most respondents pointed out that delivery (88.71%), breast feeding (79.68%) sharing needles (82.74%) and unprotected anal sex (75.83%) can result in the spread of HIV infections. The question on whether or not sexual intercourse using a condom can transmit HIV had the least correct responses (37.32%), with whether or not kissing can spread HIV having the second lowest number of correct responses (65.34%). Table 1 shows the distribution of respondents' responses to the eleven questions used to measure the comprehensive HIV/AIDS knowledge among university students.

Table 1 Modes of HIV transmission

Modes of HIV transmission	Correct responses*	Incorrect responses*	Invalid skip*	Total
Mosquito bites	679 (90.17%)	63 (8.37%)	11 (1.46%)	753 (100%)
Pregnancy (delivery)	668 (88.71%)	80 (10.62%)	5 (0.66%)	753 (100%)
Breast feeding	600 (79.68%)	147 (19.52%)	6 (0.80%)	753 (100%)
Sharing needles	623 (82.74%)	126 (16.73%)	4 (0.53%)	753 (100%)
Sex with a condom	281 (37.32%)	466 (61.89%)	6 (0.80%)	753 (100%)
Kissing	492 (65.34%)	257 (34.13%)	4 (0.53%)	753 (100%)
Exchanging clothes	695 (92.30%)	53 (7.04%)	5 (0.66%)	753 (100%)
Hugging	708 (94.02%)	40 (5.31%)	5 (0.66%)	753 (100%)
Eating	704 (93.49%)	45 (5.98%)	4 (0.53%)	753 (100%)
Witchcraft	657 (87.25%)	92 (12.22%)	4 (0.53%)	753 (100%)
Unprotected anal sex	571 (75.83%)	174 (23.11%)	8 (1.06%)	753 (100%)

**Figures in parenthesis are the percentages, whilst those outside are the frequencies.*

Comprehensive HIV/AIDS knowledge

Findings also highlighted that comprehensive HIV/AIDS knowledge was high among the respondents, though it varied from 0% to 100%. The mean score of comprehensive HIV/AIDS knowledge was 81.25% (SD=15.06) for all the respondents from the two universities. The high comprehensive HIV/AIDS knowledge level among respondents was further illustrated by a 10% percentile with a score of 63.64% and a 90% percentile with a score of 100%. In spite that the majority of respondents managed to score 100% in comprehensive HIV/AIDS knowledge scores, it was worrying to observe that five respondents had a score of 0% from the eleven questions used to assess comprehensive HIV/AIDS knowledge. Furthermore, 32 respondents (4.23% of the sample) scored less than 50% in accurate HIV/AIDS knowledge as measured by the same scale. Despite that an average comprehensive HIV/AIDS knowledge level of 81.25% was fairly high; it still fell short of the ideal 100% level of universal knowledge. This is a cause for concern since this sample comprised of the very literate section of the young adult population, which reasonable should be well versed with HIV issues, given their increased exposure to information. Figure 1 shows a histogram summarising the distribution of comprehensive HIV/AIDS knowledge scores among the respondents.

Figure 1 The distribution of HIV/AIDS knowledge scores

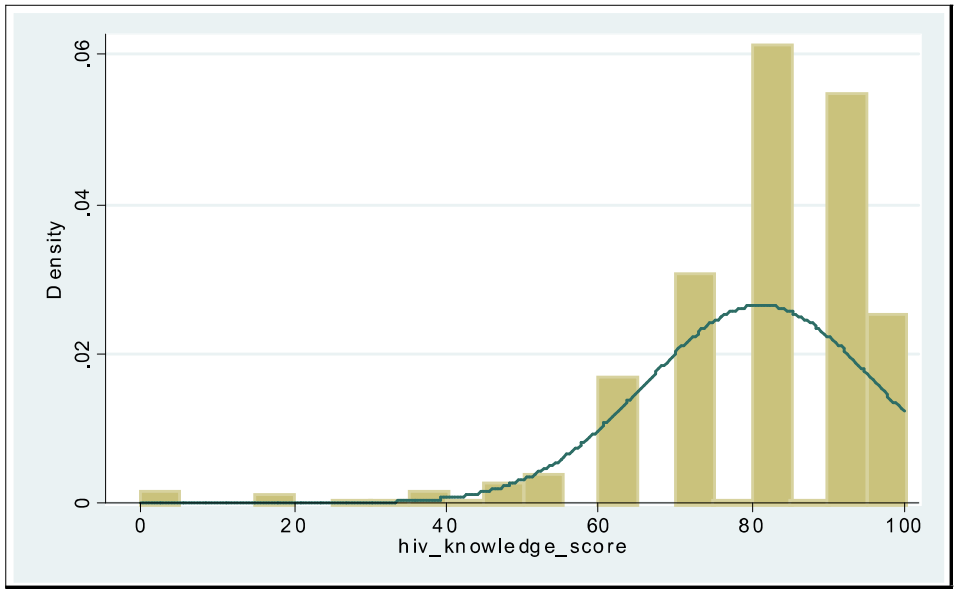

Figure 1 clearly shows that although HIV/AIDS knowledge scores among the respondents range from 0% to 100%, most of the respondents' knowledge scores were concentrated around 80%, with only a few outliers falling below the 40% mark. This means that despite there being few students who do not have comprehensive HIV/AIDS knowledge, the majority of them have accurate knowledge, as evidenced by a significantly large

number of students scoring 100% in the knowledge scale. Table 3 summarises some important descriptive statistics of comprehensive HIV/AIDS knowledge scores across a variety of socio-demographic characteristics of the respondents.

Place of study

It was also observed that respondents from the two universities had high average knowledge levels, scoring an average of 80.27% and 83.85% for the state and private university samples, respectively. However, comprehensive HIV/AIDS knowledge appeared to be slightly higher for respondent taken from the private university sample as compared to those from the state university sample. In addition, respondents from the private university had a slightly lower variability of 14.42% from the mean against a variability of 15.19% for the state university respondents. Whilst some respondents from the two universities scored as high as 100% in comprehensive HIV/AIDS knowledge, it also emerged that the minimum level of knowledge scored by some respondents in the state university sample was 0% as compared to the lowest score of 18.18% scored by respondents from the private university. Nonetheless, it should be noted that the differences in mean comprehensive HIV/AIDS knowledge scores between the two samples was real and statistically significant at 5% level of significance as reflected by the two-sample *t* test of group means which produced the following results: $t(748) = -2.92$, $p < 0.05$. This supports the notion that state university respondents had slightly lower comprehensive HIV/AIDS knowledge scores than their private university counterparts.

Although comprehensive HIV/AIDS knowledge levels were closely related among respondents from the two universities, these calculations show that on average, respondents from the state university had 3.58% lesser accurate HIV/AIDS knowledge scores than their private university counterparts. When the differences in average HIV/AIDS knowledge levels between the two universities were divided by the combined standard deviations, the result was 0.24, which implies that the strength of the difference in HIV/AIDS knowledge levels among the respondents from the two universities should be considered to be moderate, since this statistic lies between 0.2 and 0.49. The results of the two-sample *t* tests are shown in Table 2.

Table 2 Two-sample t test results for HIV/AIDS knowledge by place of study

Group	Number of Observations	Mean	Standard deviation	95% Confidence Interval
State university	542	80.27	15.19	78.99 - 81.55
Private university	206	83.85	14.42	81.87 - 85.83
Combined	**748**	**81.25**	**15.06**	**80.17 - 82.34**

$t(748) = -2.92,\ p = 0.0036$ *Degrees of freedom* = 748

Table 3 Descriptive statistics for respondents' comprehensive HIV/AIDS knowledge

	COMPREHENSIVE HIV/AIDS KNOWLEDGE SCORES (%)			
	Mean	**Standard deviation**	**Maximum**	**Minimum**
Place of study				
State university	80.27	15.19	100	0
Private university	83.85	14.42	100	18.18
Gender				
Males	79.88	16.67	100	0
Female	82.52	13.31	100	0
Place of childhood residence				
Urban, high density	82.13	12.79	100	0
Urban, low density	82.95	14.12	100	18.18
Rural area	78.50	16.83	100	0
Marital status				
Single	81.32	14.62	100	0
Married	78.95	21.77	100	18.18
Year of study				
First year	80.84	13.02	100	0
Second year	81.53	15.59	100	0
Third/fourth year	81.47	17.29	100	0
Faculty of study				
Commerce/business	81.26	15.33	100	0
Education & social sciences	80.88	14.94	100	0
Arts & Law	80.49	15.92	100	0
Agriculture & Natural resources	83.60	12.86	100	36.36
Engineering, Science & Technology	81.40	14.63	100	18.18
Semester accommodation				
Campus	83.94	13.81	100	18.18
Rented-off campus	79.79	15.21	100	0
Live with parents off-campus	78.93	16.89	100	0
OVERALL	**81.25**	**15.06**	**100**	**0**

Gender

Another important observation was the apparent relationship between comprehensive HIV/AIDS knowledge scores and gender. Male respondents in the sample had a slightly lower average comprehensive HIV/AIDS knowledge score of 79.88% as compared to their female counterparts who had a mean score of 82.52%. In fact, the knowledge scores for male respondents were very variable with a standard deviation of 16.67% whereas those for female respondents were lower at 13.31%. However, both male and female respondents had similar minimum and maximum comprehensive HIV/AIDS knowledge scores of 0% and 100%, respectively. Refer to Table 3 for details.

In order to test whether or not the average comprehensive HIV/AIDS knowledge scores for male and female respondents were statistically different from each other, a two-sample *t* test of group means was used. The results confirmed that male respondents' average comprehensive HIV/AIDS knowledge was statistically lower than that of female respondents, as indicated by $t(746) = -2.40$, $p < 0.05$. These results showed that, on average, male respondents have 2.64% lower comprehensive knowledge levels than female respondents. When the differences in average knowledge scores were divided by the combined standard deviation of average knowledge levels for both male and female respondents, the resultant proportion was 0.18, thus depicting that the strength of the differences in average knowledge across gender was weak since it was below 0.2, as predicted by the rule of thumb. Clearly, the difference is statistically significant at 5% level of significance as illustrated by a *t* statistic of -2.40 (). Table 4, details the result of the two-sample *t* test by gender.

Table 5 Two-sample t test results for HIV/AIDS knowledge by Faculty of study

Group	Number of Observations	Mean	Standard deviation	95% Confidence Interval
Male	358	79.88	16.67	78.15 – 81.61
Female	390	82.52	13.31	81.19 – 83.84
Combined	**748**	**81.25**	**15.06**	**80.17 – 82.34**

$t = -2.40$*, $p = 0.0166$, Degrees of freedom = 746

Place of childhood residence

When comprehensive HIV/AIDS knowledge levels were analysed against the place of childhood residence, it emerged that those who spent most of their childhood

in urban areas had slightly higher comprehensive HIV/AIDS knowledge levels than those who had spent their childhood in rural areas. Whilst those who had spent their first 15 years in high density urban areas and low density urban areas had average comprehensive HIV/AIDS knowledge scores of 82.13% and 82.95%, respectively, those who had lived in rural areas had average knowledge scores of 78.50%. Furthermore, childhood urban dwellers (high and low density) had lesser variations in their knowledge level at about 12.79% and 14.12% for high and low density childhood residents, respectively, whereas those who had lived in rural areas had knowledge standard deviations of 16.83%. Apparently, the minimum knowledge score registered in each class of respondents' place of childhood residence was the same at 0% except for the urban low density childhood dwellers, who had a minimum of 18.18%. Similarly, the maximum comprehensive HIV/AIDS knowledge scores were uniform across all places of childhood residence at 100%.

Marital status

An analysis of comprehensive HIV/AIDS knowledge scores and marital status revealed some challenging relationships between the two variables. Although fairly high at 78.95%, the average comprehensive HIV/AIDS knowledge among married respondents was the least after single and divorced/widowed respondents who had averages of 81.32% and 93.94%, respectively. In addition, the variability of comprehensive HIV/AIDS knowledge levels among married respondents, as measured by standard deviation, was highest at 21.77% as compared to 14.62% and 10.50% for the single and divorced/widowed respondents, in that order. However, the minimum comprehensive HIV/AIDS knowledge scored by married respondents was second highest in all marital status categories at 18.18% against 0% and 81.82% for the single and divorced/widowed respondents, respectively. The maximum comprehensive knowledge scores for all the marital status categories were 100%.

Year of study

Surprisingly, the year of study appears to be of limited importance in explaining differences in HIV/AIDS knowledge among respondents from the two universities. The first, second and third/fourth year respondents had fairly similar average HIV/AIDS knowledge levels of 80.84%, 81.53% and 81.47%, respectively. These knowledge levels were fairly high, yet they were similar to each other. The results revealed the uniformity of HIV/AIDS knowledge levels across study levels in both universities. However, the variability of comprehensive knowledge levels seemed to increase with the advancement of students in their studies. Whilst the first year respondents in the sample had a knowledge standard deviation of 13.02%, it rose to 15.59% for the second years and finally to 17.29% for the third/fourth year respondents. The minimum and maximum knowledge scores were also uniform at 0% and 100%, respectively, for all year of study categories.

Faculty of study

The faculty of one's study emerged to have some influence on comprehensive HIV/AIDS knowledge scores of respondents. Comprehensive knowledge levels were lowest among respondents from the faculty of Arts & Law at 80.49% and highest among those in the faculty of Agriculture & Natural resources management at 83.60%. Respondents from other faculties had average comprehensive HIV/AIDS knowledge levels of 81.26%, 80.88% and 81.40% for the faculty of Commerce, the faculty of Education & Social Sciences and the faculty of Engineering, Sciences & Technology, respectively. In addition, the faculty of Agriculture & Natural resources management had the lowest standard deviation of 12.86%, whereas the faculty of Arts and Law had the highest variability of 15.92%. Respondents from other faculties had the HIV/AIDS knowledge standard deviations of 15.33% for the faculty of Commerce, 14.94% for the Education & Social Sciences faculty and 14.63% for the faculty of Engineering, Sciences & Technology. Also worth noting was that the minimum comprehensive HIV/AIDS knowledge scores for Social Sciences faculties (Commerce, Arts & Law and Education & Social Sciences) were all 0%, whereas those from the Natural Sciences faculties (Agriculture & Natural resources management and Engineering, Sciences & Technology) were 36.36% and 18.18%, respectively for the two faculties. The maximum knowledge scores were the same for respondents from all faculties at 100%

In order to test if there was any difference in mean comprehensive HIV/AIDS knowledge scores between respondents from Humanities & Arts faculties (Commerce, Education & Social sciences and Arts & Law) and those from Natural Sciences (Agriculture & Natural Resources Management and Engineering, Science & Technology) a two-sample *t* test was run and the results are summarised in Table 5.

Table 5 Two-sample t test results for HIV/AIDS knowledge by Faculty of study

Group	Number of Observations	Mean	Standard deviation	95% Confidence Interval
Humanities & Arts	554	81.00	15.37	79.72 – 82.28
Natural Sciences	193	81.98	14.18	79.97 – 84.00
Combined	**747**	**81.25**	**15.07**	**80.17 – 82.34**

$t = -0.78$*, $p = 0.4354$, Degrees of freedom = 745

Findings showed that, in spite of respondents from Natural Sciences possessing marginally higher average knowledge score of 81.98%, as compared to 81.00% for respondents drawn from the Humanities & Arts faculties, that difference was

statistically insignificant even at 5% level of significance. In other words, the two groups of respondents had the same level average level of HIV/AIDS knowledge as reflected by a *t* statistic of -0.78 and a *p*-value of 0.44%. The *t* statistic is far from the minimum of 2 for it to be significant and the *p*-value is higher than the 5% level of significance, underscoring that the two averages are the same.

Hobbies

Respondents who spent most of their spare time attending social gatherings such as Discos and parties, had a higher average comprehensive HIV/AIDS knowledge level of 84.24% (SD=13.10). On the other hand, those who had the worst average knowledge levels were those who spent their spare time drinking beer in bars and/or beer halls, with an average of 79.56% (SD=19.14), clearly showing the wide variations in comprehensive knowledge among respondents by hobbies. The category of respondents with the second highest average comprehensive HIV/AIDS knowledge score were those who spent their spare time sporting at 83.64% (SD=17.06), followed by those who went to church at 80.63% (SD=13.97) and finally those who spent their spare time indoors (watching the television, reading novels, playing indoor games, chatting with friends etc) at 80.49% (SD=16.28). Those who spent their spare time indoors, those who went for sporting activities and those who went to drink beer in bars and/or beer halls had standard deviations of 16.28%, 17.06% and 19.14%, respectively. However, all these categories had similar maximum and minimum knowledge scores of 100% and 0% respectively.

Semester living arrangements

Comprehensive HIV/AIDS knowledge also appeared to be dependent on the place of students' residence during the semester. Those living on campus accommodation seemed to have the highest average knowledge levels of up to 83.94%. Those living with their parents, those living in rented off-campus accommodation and those in other living arrangements (live with other relatives or church members) had their average knowledge levels at 78.93%, 79.79% and 83.33%, respectively. Although the maximum knowledge levels were 100% for all living arrangements, those living in campus accommodation and those in other living arrangements (live with other relatives or church members) had a minimum of 18.18% and 36.36%, respectively, while those who live with their parents and those living in rented off-campus accommodation had 0% as their minimum knowledge scores. In line with this, the least variability was observed among those living on campus at 18.81% and those in other living arrangements (live with other relatives or church members) at 13.68%, whereas the other two categories of respondents had standard deviations of 15.21% and 16.89% for those in rented off-campus accommodation and those living with their parents.

The results of this study suggest that comprehensive knowledge on HIV transmission modes was very high among university students. This can possibly be explained by

the generally high basic HIV/AIDS knowledge among the adult population in Zimbabwe (CSO and Macro International, 2007). It seems that HIV awareness campaigns in Zimbabwe have been successful in equipping students with comprehensive knowledge on HIV transmission modes. These awareness campaigns have greatly profited from the high literacy of the country's adult population. However, there is still some room for improvement as universal comprehensive knowledge on HIV transmission modes is yet to be achieved. It is not clear why some students still lack comprehensive HIV/AIDS knowledge given the various awareness campaigns that are conducted at campuses and through public media. There is a possibility of information fatigue on the part of respondents, especially those who think that they have heard enough about HIV/AIDS. It was surprising to note that private university students possessed higher levels of comprehensive HIV/AIDS knowledge than their state university counterparts. Whilst there is no other study that has looked at the variation of knowledge levels across state and private universities, these results were contrary to expectation given that there are more HIV/AIDS awareness programmes at the state than at the private university. Such a relationship between the place of study and comprehensive knowledge on HIV transmission modes can be explained by the fact that students acquire most of their knowledge on HIV/AIDS prior to coming to the university. This is due to the fact that the Zimbabwean education system incorporates HIV/AIDS education from primary to secondary school. By the time students enrol into university, students will have learnt most of the essential aspects of the disease, especially its modes of transmission and preventative strategies.

As noted in the results section, female respondents had significantly higher comprehensive HIV/AIDS knowledge than their male counterparts. These findings contradict those found by previous researchers who document that males are usually more knowledgeable about HIV/AIDS issues than their female counterparts (Lacson et al., 1997, Aluede et al., 2005, Ntata et al., 2008). These results should not be surprising since females, in general, are often more willing to assimilate new information and participate in issues that pertain to their health than males. This argument is supported by the larger number of female students who agreed to take part in this study, whilst a large number of male students backed off citing that they were busy with other things. In addition, HIV/AIDS issues are usually downplayed by men, even young men as they see themselves less vulnerable than their female counterparts.

Also interesting to note was the result that showed that there was no statistically significant difference between respondents drawn from the natural sciences faculties and those drawn from the social sciences faculties in the level of comprehensive knowledge on HIV transmission modes. Despite respondents from the natural sciences faculties being marginally superior to their social sciences

counterparts in terms of HIV/AIDS knowledge, the difference between the two was statistically insignificant. These findings concur to those found by Serlo and Aavarine (1999) among Finland university students. They are, however, contrary to those that document the variability of HIV/AIDS knowledge by faculty of study (Tasci et al., 2008, Aluede et al., 2005, Nkuo-Akenji et al., 2007). The lack of any statistically significant difference in HIV/AIDS knowledge across faculties of study may be testimony to the homogeneity of HIV/AIDS knowledge across students in Zimbabwe, given that most of such knowledge is acquired before enrolling to university.

It was also observed that respondents with a rural childhood background had slightly lower comprehensive HIV/AIDS knowledge than those who spent their first 15 years in urban areas. This is a clear reflection of the dearth of HIV/AIDS information in rural areas at the onset of the HIV/AIDS epidemic. Similar results were found by Aluede et al. (2005) among Nigerian university students. However, as the epidemic became generalised and spread to rural areas, awareness programmes have also spread to these areas, with difference in HIV/AIDS knowledge levels narrowing.

In addition, there were differences in HIV/AIDS knowledge across respondents' years of study. The observed variability, may be pointing towards a slightly high number of senior students who lack accurate HIV/AIDS information, although the majority of them had good average levels. Junior students (first and second years), who are often somewhat younger, may be more willing to accept new information than senior ones, who may think that they have heard enough about HIV/AIDS and that such information is no-longer important to them, possibly due to what is known as 'information fatigue'.

The results also showed that living on university hostels was good for students' HIV/AIDS knowledge accumulation, as compared to other forms of residence. It might thus be the reason behind the high HIV/AIDS knowledge levels at the private university where all of the sampled students were resident at the university's hostels as compared to the state university where only 11.88% of the students sampled were resident at the university's accommodation (hostels). Since most of HIV/AIDS awareness programmes are conducted at university campuses, it is those who stay in hostel who can easily attend, given that those who stay off campus only come to campus for lectures and leave earlier or might prefer to stay away from campus if they do not have lectures and can easily access facilities such as library and internet from close to their places of residence or as a cost cutting measure, since travelling to campuses may be expensive for some students staying in far off-campus rented accommodation. Apparently, those living with their parents off-campus had the least average comprehensive knowledge score of 78.93%, even 2.32% lower than the overall sample's average of 81.25%. This is paradoxical, but may be explained by lack of HIV/AIDS discussions between parents and their children.

Conclusion and Recommendations

Findings of this study show that a significant number of students at the two universities under study had high levels of favourable comprehensive HIV/AIDS knowledge, as reflected by an average score of 81.25%. Worrisome, however, was the observation that a proportion of the student population, though small, had low levels of comprehensive HIV/AIDS knowledge. This was unexpected in this highly literate sub-group of young people. These results may point towards worse comprehensive HIV/AIDS knowledge levels among the less literate segments of young people. Attractive awareness programmes are needed at university campuses to counteract information fatigue among students. There is also need to strengthen HIV/AIDS education at primary and secondary level since results showed that much of students' HIV/AIDS knowledge was acquired prior to their enrolment to university.

It was also revealed that comprehensive HIV/AIDS knowledge levels were fairly uniform across faculties of study. This means that there is no single faculty that can boast of their students having higher comprehensive HIV/AIDS knowledge than others, thus, making it imperative that HIV/AIDS education be incorporated in the curriculum of all faculties in order to bring about universal comprehensive HIV/AIDS knowledge among students.

The comprehensive HIV/AIDS knowledge scores for the state university students were statistically lower than those for students from the private university. It can, thus, be concluded that state university students are knowledgeable about HIV/AIDS than their counterparts at the private university. This necessitates that the state university increases its HIV/AIDS campaigns to increase the awareness of the disease to students.

Findings also revealed that female students had slightly higher comprehensive HIV/AIDS knowledge than their male counterparts. This entails that, on average, female students have an edge of knowledge to their male counterparts. There is urgent need to target male students in HIV/AIDS programming since they naturally exclude themselves, as they see themselves less at risk than their female counterparts.

Results also showed that students in campus accommodation had significantly higher comprehensive HIV/AIDS knowledge than those in off-campus accommodation. Off-campus students should also be targeted with HIV awareness programmes, especially taking information to their places of residence as they are often left out.

References

Adefuye, A. S., Abiona, T. C., Balogun, J. A. & Lukobo-Durrell, M. (2009). HIV sexual risk behaviours and perception of risk among college students: Implications for planning interventions. *BMC Public Health* 9:281.

Aluede, O., Imhonde, H. O., Maliki, A. E. & Alutu, A. N. G. (2005). Assessing Nigerian University students' knowledge about HIV/AIDS *Journal of Social Sciences,* 11, 207-213.

Barnett, T. & Whiteside, A. (2006). *AIDS in the twenty-first century: Disease and globalisation,* New York, Palgrave MacMillan.

Cok, F., Gray, L. A. & Ersever, H. (2001). Turkish university students' sexual behaviour, knowledge, attitudes and perceptions of risk related to HIV/AIDS. *Culture, Health and sexuality,* 3, 81-99.

Conjoh, A. M. & Zhou, Z. (2011). Relationship between adolescents and young adults' knowledge about HIV/AIDS and risk behaviours: How can knowledge be complemented? *Pakistan Journal of Social Sciences,* 8, 52-54.

Cso & Macro International (2007). Zimbabwe Demographic and Health Survey 2005-06. *In:* OFFICE, C. S. (ed.). Calverton, Maryland: CSO and Macro International Inc.

Dinkelman, T., Levinsohn, J. & Majelantle, R. (2006). When knowledge is not enough: HIV/AIDS information and risky behaviour in Botswana. *NBER Working Paper,* 12418.

Ferrer, L., Cianelli, R., Guzman, E., Cabieses, B., Irarrazabal, L., Bernales, M. & Araya, A. (2007). Chilean university students: Knowledge and concern about HIV/AIDS. *Journal of the association of nurses in AIDS care,* 18, 51-56.

Hansson, M., Stockfelt, L., Urazalin, M., Ahlm, C. & Andersson, R. (2008). HIV/AIDS awareness and risk behavior among students in Semey, Kazakhstan: a cross-sectional survey. *BMC International Health and Human Rights,* 8, 1-10.

HSRC 2005. South African National HIV Prevalence, HIV Incidence, Behaviour and Communication Survey, (2005). Cape Town: Human Science Research Council Press.

Jahanfar, S., Lye, M. S. & Rampal, L. (2009). A randomised controlled trial of peer-adult-led intervention on improvement of knowledge, attitudes and behaviour of university students regarding HIV/AIDS in Malaysia. *Singapore Medical Journal,* 50, 173-180.

Koksal, S., Namal, N., Vehid, S. & Yurtserver, E. (2005). Knowledge and attitude towards HIV/AIDS among Turkish students. *Infectious Diseases Journal of Pakistan*, 118-123.

Lacson, R. S., Theocharis, T. R., Strack, R., Sy, F. S., Vincent, M. L., Osteria, T. S. & Jimenez, P. R. (1997). Correlates of sexual abstinence among urban university students in the Philippines. *International Family Planning Perspectives,* 23, 168-172.

Madise, N., Zulu, E. & Ciera, J. (2007). Is poverty a driver for risky sexual behaviour? Evidence from National survey of adolescents in four African countries. *African Journal of Reproductive Health,* 11, 83-98.

Mashegoane, S., Moalusi, K. P., Ngoepe, M. A. & Peltzer, K. (2004). The prediction of condom use intention among South African university students. *Psychological Reports,* 95, 407-417.

Masvaure, T., Terry, P. E., Adlis, S. & Mhloyi, M. (2009). When "No" means "Yes": The gender implication of HIV programming in a Zimbabwean university. *Journal of the International Association of Physicians in AIDS Care,* 8, 291-298.

Maswanya, E. S., Moji, K., Horiguchi, I., Nagata, K., Aoyagi, K., Honda, S. & Takemoto, T. (1999). Knowledge, risk perception of AIDS and reported sexual behaviour among students in secondary schools and colleges in Tanzania. *Health Education Research: Theory & Practice,* 14, 185-196.

Njagi, F. & Maharaj, P. (2006). Access to voluntary counselling and testing services: Perspectives of young people. *South African Review of Sociology,* 37, 113-127.

Njikam Nee Savage, O. M. (2005). Risky sexual behaviour, sexually transmitted infections, HIV/AIDS and health promotion among students in university of Doula. *African Population Studies,* 20, 53-67.

Nkuo-Akenji, T., Nkwesheu, A., Nyasa, R., Tallah, E., Ndip, R. & Angwafo, F. (2007). Knowledge of HIV/AIDS, sexual behaviour and prevalence of sexually transmitted infections among female students of the University of Buea, Cameroon. *African Journal of AIDS Research,* 6, 157-163.

Ntata, P. R. T., Muula, A., Siziya, S. & Kayambazinthu, E. E. (2008). Gender differences in university students' HIV/AIDS-related knowledge and sexual behaviours in Malawi: a pilot study. *Journal of Social Aspects of HIV/AIDS,* 5, 201-205.

Odu, B. K. & Akanle, F. F. 2008. Knowledge of HIV and sexual behaviour among the youths in south-west Nigeria. *Humanity and social sciences Journal,* 3, 81-88.

Omoteso, B. A. (2006). A study of sexual behavior of university undergraduate students in Southwestern Nigeria. *Journal of Social Sciences,* 12, 129-133.

Omungo, P. A. (2008). Sexual relationships, risk perception and condom use at the University of Nairobi. *International Journal of health science,* 1, 80-87.

Sabone, M., Ntsayagae, E., Brown, M. S., Seboni, N. M., Mogobe, K. D. & Sebego, M. (2007). Perceptions of undergraduate students not participating in HIV prevention activities in Botswana. *International Council of Nurses*, 332-338.

Serlo, K. L. & Aavarine, H. (1999). Attitudes of university students towards HIV/ AIDS. *Journal of advanced Nursing,* 29, 463-470.

Sowell, R. L., Seals, B. F. & Phillips, K. D. (1996). Knowledge and risk behaviors of people seeking HIV antibody testing at a community site. *Journal of the Association of Nurses in AIDS care,* 7, 33-41.

Tasci, S., Baser, M., Mucuk, S., Bayat, M., Zincir, H. & Sungur, G. (2008). Erciyes university students' knowledge about AIDS: Differences between students of Natural and Social sciences. *Behavioural Science,* 33, 151-155.

Terry, P. E., Mhloyi, M., Masvaure, T. & Adlis, S. (2006). An examination of knowledge, attitudes and practices related to HIV/AIDS prevention in Zimbabwean university students: comparing intervention program participants and non-participants. *International Journal of infectious diseases,* 10, 38-46.

UNAIDS 1998. Young people and HIV/AIDS: Background discussion paper on the elements of a global strategy. Geneva: United Nations Joint Programme on HIV/AIDS.

UNAIDS. 2008. Global Summary of the AIDS epidemic, December 2007.

Available:http://data.unaids.org/pub/GlobalReport/2008/ 2008_globalreport_core_en.ppt#284,1,Slid [Accessed 15 April 2009].

UNESCO. 2003. *HIV/AIDS and education: a strategic approach* [Online]. Available: http://unesdoc.unesco.org/images/0012/001286/128657e.pdf

[Accessed 25 June 2010].
VAN ROSSEM, R., BERTEN, H. & VAN TUYCKOM, C. (2010). Aids knowledge and sexual activity among Flemish secondary school students: a multilevel analysis of the effects of type of education. *BMC Public Health,* 10, 1-10.