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UNIVERSITY STUDENTS' KNOWLEDGE OF, AND ATTITUDES TOWARDS, HIV AND AIDS, HOMOSEXUALITY AND SEXUAL RISK BEHAVIOUR: A QUESTIONNAIRE SURVEY IN TWO FINNISH UNIVERSITIES

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Summary. This study describes Finnish university students' knowledge and attitudes towards HIV and AIDS, homosexuality and sexual risk behaviour. Finnish-speaking students were randomly selected from all registered students at two universities in Finland ($N = 9715$, $n = 950$). The data were collected by using a modified version of the State University of New York at Buffalo School of Nursing AIDS Study Questionnaire on sexual risk behaviour developed by Held and Chng. The total response rate was 35% ($n = 333$). The data were analysed using quantitative statistical methods. Normally distributed data were analysed by *t*-test and one-way ANOVA, with Bonferroni corrections. Non-normally distributed data were analysed using the Mann-Whitney U-test and Kruskal-Wallis test, followed by a post-hoc test. The majority of students were familiar with HIV and AIDS, including its mode of transmission. However, there were still some misconceptions concerning HIV and AIDS. The oldest students and women had a more positive attitude towards people living with HIV and AIDS (PLWHA). Of patients with HIV or AIDS, intravenous drug users were perceived most negatively. Male students had more homophobic attitudes. Students who reported that religion had an important role in their lives had significantly stricter attitudes towards sexual risk behaviour. Students' knowledge correlated positively with general attitudes towards HIV and AIDS. Knowledge about HIV and AIDS will lead to more positive attitudes towards HIV and AIDS as a disease, towards those infected as well as homosexual people. There is a need to focus on preventive health care and sexual health promotion by educating young people and changing their attitudes towards sexual risk behaviour.

Introduction

Since 1981, when the first diagnosis of Acquired Immunodeficiency Syndrome (AIDS), caused by the Human Immunodeficiency Virus (HIV), was made in the United States (Gottlieb *et al.*, 1981), AIDS has grown into an international pandemic (UNAIDS, 2008). According to the World Health Organization (WHO), there were 33 million HIV infections worldwide in 2007. Two million people died because of AIDS in 2007 (UNAIDS, 2008). As in other European countries, the first HIV infections and AIDS patients in Finland were found at the beginning of the 1980s. In Finland, the number of infections was 2793 (2033 men, 760 women) on 27th February 2011. One-third of the HIV-positives were infected abroad (874), and most are between 25 and 39 years of age ($n = 1503$), while the number of infections among those aged 20–29 was 819. The number of infections among people in heterosexual relationships has increased ($n = 1110$), as there were 28 new heterosexual infections in 2001 and 52 by the end of 2010. The majority of HIV-positives were homosexual men ($n = 888$). A minority of the HIV-positives ($n = 358$) were intravenous drug users, and only a few ($n = 15$) have been infected through a blood transfusion (National Institute for Health and Welfare, 2011). Although the number of infections might be low in Finland compared with other countries, it is an important topic to study among young people, as Finland is surrounded by countries where HIV is highly prevalent (i.e. Russia, Latvia, Estonia and Poland).

In parallel with an increased risk for a sexually transmitted infection in Finland, the requirements for sexual education and study material on HIV/AIDS and other sexual disease have expanded. In the 1980s and 1990s, extensive sexual education campaigns were organized for the entire population in Finland. As part of this campaign, the Ministry of Social Affairs and Health sent a sexual education magazine to all youngsters aged 16, accompanied by a contraceptive and a letter to the parents, up until the year 2004. Currently, according the first national action programme for the promotion of sexual and reproductive health (2007–2011), sexual and reproductive health studies are included in the health education studies and the curriculum of comprehensive schools at the secondary level and vocational schools at the tertiary level (Ministry of Social Affairs and Health, 2007).

The skills learned to reduce the risk of HIV infection are transferable to other health issues, and thus empower students to take control and responsibility for their actions. This empowerment, combined with good knowledge and healthy attitudes, will also render the learned skills useful outside the educational settings (Svenson *et al.*, 1997; Serlo, 2008). Due to this, it is important to study university students' knowledge about HIV and AIDS.

HIV and AIDS, as well as related behaviours, such as substance abuse, sex work and homosexuality, are emotionally charged issues and therefore frequently associated with fear, stigma and prejudice (De Bruyn, 1999; Parker *et al.*, 2002; Vidanapathirana *et al.*, 2009). Applying Goffman's (1990) typology of stigma, HIV/AIDS can be regarded as 'blemishes of individual character perceived as weak will'. A stigmatized person is often discriminated against, regarded as inferior and even dangerous by so-called 'normal' people. In the context of the present study, stigma is intensified by a lack of knowledge of HIV transmission and lack of a vaccine for HIV and AIDS, which is seen as a serious life-threatening illness. In addition, cultural norms of silence

regarding sexuality and sexual practices, and moral beliefs about sexual risk behaviours and substance abuse determine stigma related to HIV and AIDS (Vidanapathirana *et al.*, 2009).

Stigma can be divided into felt stigma and enacted stigma. Felt stigma refers to real or imagined negative societal attitudes and potential discrimination, while enacted stigma refers to the real experience of discrimination arising from HIV and AIDS (Jacoby, 1994; Scrambler, 1998). Stigma has several negative impacts on social interactions between people infected by HIV and their families, or other groups with whom they interact (Hereck *et al.*, 2002). Discrimination as a result of stigma impairs the well-being and quality of life of these people and their next of kin (Nilsson, 2002). Stigma related to HIV and AIDS is the greatest barrier to prevention of further infections and provision of adequate treatments. Because of stigma, people may avoid participation in actions such as health promotion and education to reduce their risk (India, 2002).

The moral aspect of stigma is quite visible in the case of HIV/AIDS. Although the biological mode of HIV transmission is the same, people tend to have the most negative attitude towards homosexuals and intravenous drug users (Serlo, 2008). This implies that people tend to judge people with AIDS or HIV on the basis of a lack of responsibility and recklessness of behaviour that led to HIV and AIDS. Consequently, people's sympathy towards different types of persons with HIV and AIDS varies. As HIV and AIDS and related issues are emotionally charged issues, it is important to study university students' attitudes towards HIV and AIDS, homosexuality and sexual risk behaviour. In addition, this study attempted to examine whether their sympathy towards different types of HIV/AIDS patients (bisexual, child, haemorrhagic disease patient, prostitute, IV drug user and homosexual) varied.

Concerning university students' situation, young adults are at an early stage of sexual behaviour, changing partners frequently, and are therefore at a higher risk of sexually transmitted diseases, including HIV. There are several studies concerning different groups and their knowledge of, and attitudes towards, HIV and AIDS and homosexuality: for instance, people in general (Muinonen *et al.*, 2002; Nkya *et al.*, 2006; Tee & Huang, 2009; Durojaiye, 2009; Samsuddin *et al.*, 2010), students (Huang *et al.*, 2005; Svenson *et al.* 2007; Serlo, 2008; Tung *et al.* 2008; St Rose, 2008; Nwezeh, 2010), and medical and nursing staff (Kermode *et al.*, 2005; Salyer *et al.*, 2008; Umeh *et al.*, 2008; Veeramah *et al.*, 2008). Muinonen with her colleagues (2002) studied HIV-related knowledge, attitudes and behaviour among a group of young people aged 13–16 years in Finland. Knowledge levels were relatively low and infected people were somewhat stigmatized, although homosexuality was less stigmatized than in other developed countries. There was a strong association between adolescents' general and homophobic attitudes, as pupils who showed more positive general attitudes towards AIDS and persons with AIDS also had more positive attitudes towards homosexually oriented people.

Serlo (2008) compared university students' knowledge and attitudes towards HIV and AIDS in Finland and Kenya. Students in both countries had a good level of knowledge concerning HIV and AIDS. The most negative attitudes were found towards homosexuality and intravenous drugs users. A follow-up study among the Swedish

general population (1989–1994) showed that the attitudes towards HIV and AIDS can be changed by increasing people's knowledge of the illness (Herlitz & Strandell, 1997).

However, the level of students' knowledge did not have an effect on the level of their beliefs and prejudices in Finland and Kenya (Serlo, 2008). Mass media, television, magazines, newspapers and pamphlets, rather than family members, friends or medical personnel, are the major sources of information about AIDS-related issues for adolescents and young adults (Huang *et al.*, 2005; Serlo, 2008; Tung *et al.*, 2008). The way the media deals with, and informs about, sexually transmitted diseases such as HIV and AIDS has an influence on general attitudes and common reactions, especially among young people (Holmström, 2002).

In Sweden, Herlitz & Steel (2000) revealed that the use of condoms became significantly more prevalent among teenagers and among 20- to 24-year-olds with no regular partner. At the same time, there was also a reduction in the number of sexual partners and casual sexual contacts in these groups. Serlo (2008), who researched university students' attitudes in Kenya and Finland, concluded that there was no relationship between students' knowledge and their number of sex partners or frequency of sexual activity, and more importantly, that students' age and the importance of religion in their lives influenced the use of prevention. A study of female university students in Taiwan revealed that sexually active women had more overall HIV and AIDS knowledge compared with those who were not sexually active (Tung *et al.*, 2008). Research among Chinese university students showed that students at the faculties of engineering, economic and administrative sciences and architecture had a better knowledge of AIDS than students at the faculties of arts, natural sciences and education (Huang *et al.*, 2005).

This study describes Finnish university students' knowledge of, and attitudes towards, HIV and AIDS, homosexuality and sexual risk behaviour at two Finnish universities. The study is part of a larger research project concerning HIV and AIDS conducted by the Department of Nursing Science, University of Tampere, Finland.

Research questions

The aim of this study was to investigate the knowledge of, and general attitudes towards, AIDS and HIV. In addition, students' attitudes towards homosexuality and sexual risk behaviour were examined. Five research questions were presented:

- What is the student's level of knowledge about HIV and AIDS?
- What is their general attitude towards HIV, AIDS and people infected by the virus?
- What is the student's attitude towards homosexuality?
- What is the student's attitude towards sexual risk behaviour?
- How sympathetic are they to different types of people with HIV and AIDS?

Methods

The study used modified versions of two North American questionnaires (Held, 1993; Chng & Moore, 1994). The following three scales of the questionnaire were modified from Held's instrument: a knowledge test related to HIV and AIDS (25 items), general attitudes towards HIV and AIDS and people who are infected (26 items) and items

related to homophobia (nine items). The fourth scale was a modification of Chng and Moore's research instrument measuring students' sexual risk behaviour (ten items). This modified version of this whole instrument has been piloted and used in Finland among early adolescents (Muinonen *et al.*, 2002).

The items concerning the respondents' knowledge about HIV and AIDS consisted of various declarative sentences about the characteristics of HIV and AIDS. The respondents had three options to choose from (true, false or do not know) to assess whether the statement was correct or incorrect. Scoring in the knowledge domain was based on the number of correct answers, which were coded as one (incorrect and do not know were coded as zeros). Thus, the maximum score for the correct answers in this section was 25, and the minimum was zero.

The items measuring general attitudes, including attitudes towards intravenous drug users, prostitutes and persons with haemophilia, were on a 5-point Likert scale: 1 = strongly agree, 2 = agree, 3 = undecided, 4 = disagree, 5 = strongly disagree. The homophobia scale measured attitudes towards homosexually oriented people, while attitudes to sexual risk behaviour measured attitudes relating to certain sexual behaviours. A 5-point Likert scale was used for the homophobia and sexual risk behaviour items as well. The item points were summed up within each domain and then divided by the number of items in that domain, resulting in an average individual general attitude score, an individual homophobic score and a sexual risk behaviour score ranging from 5 to 0. The highest score indicated the most positive attitudes towards homosexuality. The highest score in sexual risk behaviour indicated taking more risks in sexual behaviour and the lowest score indicated taking fewer risks in sexual behaviour.

The value of Chronbach's alpha was 0.908 for attitudes and 0.905 for the general attitude scale and 0.741 for the homophobic scale. For sexual risk behaviour, the alpha value was 0.632.

Sympathy towards six types of people with HIV and AIDS – bisexual, child, haemorrhagic disease patient, prostitute, IV drug user and homosexual – was measured by asking how uncomfortable the person would feel if they were involved with various types of people with HIV and AIDS (e.g. whether it would be uncomfortable to be involved with a child who has HIV or AIDS). These six questions taken from the general attitude scale were on a 5-point Likert scale: 1 = strongly agree, 2 = agree, 3 = undecided, 4 = disagree, 5 = strongly disagree.

Eighteen background questions were included in the questionnaire. These consisted of some demographic characteristics, such as student's campus, age, marital status, if they had any children, their major subject, mother tongue and nationality. In addition, four questions about their previous experience of people with HIV and/or AIDS were included: if they knew some HIV-positive people or a person with AIDS; if they had ever been asked to provide care for people living with HIV/AIDS (PLWHA); if they had ever provided care for someone living with HIV/AIDS; if they had ever refused to care for someone living with HIV/AIDS; and if they were willing to provide care for someone living with HIV/AIDS.

This descriptive cross-sectional survey was conducted in 2008. The research permissions were received from the department of student affairs at both universities. In Finland, no ethical approval is required for a study such as this (National Advisory Board on Research Ethics, 2009).

Finnish-speaking degree students, not including doctoral students, were randomly selected from student registers at two universities ($N = 9715$). The sample was selected randomly without any prior sampling. The final sample consisted of 950 students. The questionnaires were mailed to each subject's home address, which was found in the student register. An introduction letter that briefly described the study, guaranteed confidentiality and voluntary participation was attached to each questionnaire. Potential participants were also given the opportunity to contact the researcher by phone or email. All questionnaires were returned to the main researchers at both universities in sealed and pre-paid envelopes. The students also had the possibility of leaving an empty questionnaire. The students answered the questionnaire voluntarily, and their anonymity was guaranteed. Returning the questionnaire was considered consent to participate. The overall response rate was 35% ($n = 333$).

Data analysis

The demographic variables and students' knowledge scores on HIV and AIDS were first investigated by descriptive analyses. After that, the knowledge scores and averages of the general attitude, homophobic and sexual risk behaviour scores were analysed by descriptive analysis in order to get an overview of the data.

The Kolmogorov-Smirnov one-sample test and Levene's test were used to indicate if the data were normally distributed. The association between more than two background variables (age, faculty) and the scale scores was tested using one-way ANOVA for normally distributed scores with Bonferroni corrections. Kruskal-Wallis tests were used for non-normally distributed scores. When the background variable had more than two categories, post-hoc tests were used.

The correlations between numerical background variables and the scale scores were tested using the Spearman test in items that were not normally distributed. Students' sympathy towards various types of people with HIV and AIDS was analysed by relative frequencies and cross-tabulations with chi-squared tests because they were categorical items. Chi-squared tests were calculated from the original tables with five categories (strongly agree, agree, cannot say, disagree, strongly disagree). In all analyses, p-values of <0.05 were interpreted as statistically significant in all tests. The data were analysed using SPSS for Windows version 17.0.

Results

Sample description

Of the respondents, 19% were male and 81% female. Their average age was 28.3 years (SD $\pm$ 8.9) with a range of about 19–65 = 46 years. Over half of the students (57%) were in a permanent relationship and 25% of them had children. Nine per cent of the students reported that religion had a very important role in their lives. Two-thirds of the students (66%) reported having sufficient information about HIV and AIDS. Ten per cent had experience of caring for a person with HIV or AIDS, and 60% of them were willing to take care of a person with HIV or AIDS. The demographic characteristics of the students are shown in Table 1.

Table 1. Demographic characteristics of university students, Finland, 2008 ($n = 333$)

Characteristic	*n*	%
Campus		
Campus 1	175	55
Campus 2	143	45
Age (years)		
19–22	94	28
23–26	104	32
27–30	44	13
31–65	90	27
Relationship status		
Relationship	188	57
No relationship	144	43
Faculty		
Health sciences	88	28
Natural sciences	67	21
Arts, education, theology	77	24
Social sciences	87	27
Gender		
Male	64	19
Female	268	81
Importance of religion		
Important	99	30
Not very important	230	70
Children		
Yes	81	25
No	248	75
Family member, friend or another person with HIV or AIDS		
Yes	29	9
No	303	91
Have you ever been asked to care for a person with HIV or AIDS?		
Yes	33	10
No	300	90
Have you ever refused to care for a person with HIV or AIDS?		
Yes	1	0.3
No	329	99.7
Have you ever cared for a person with HIV or AIDS?		
Yes	35	10
No	297	90
Are you willing to care for a person with HIV or AIDS?		
Yes	212	60
No	109	34
Have you ever lived, worked, or studied abroad more than 6 months?		
Yes	65	20
No	265	80
Do you have sufficient information about HIV/AIDS?		
Yes	220	66
No	112	34

Students' knowledge of HIV/AIDS

The majority of the students were familiar with HIV and AIDS, including its mode of transmission. The average knowledge score was 17.09 (SD $\pm$ 4.18, minimum 2 and maximum 25) on a scale from 0 to 25. The students' background variables were significantly associated with their knowledge scores.

Students who were pursuing a health-related major had significantly more knowledge of HIV and AIDS compared with students who were studying social sciences (mean 21.2 vs. 16.0, $p = 0.01$), natural sciences (mean 21.2 vs. mean 17.1, $p < 0.01$) or arts, education or theology (mean 21.2 vs. 13.4, $p < 0.01$). In addition, students who were studying arts, education or theology had significantly less knowledge than students at the faculty of natural sciences (mean 13.4 vs. mean 17.1, $p < 0.01$) or at the faculty of social sciences (mean 13.4 vs. 16.0, $p < 0.01$).

The students' age was also significantly associated with their knowledge of HIV and AIDS. The youngest students (under 23 years old) had significantly less knowledge about HIV and AIDS compared with the oldest students (over 30 years old) (mean 15.8 vs. 18.6, $p < 0.001$). Moreover, students who reported having adequate skills to deal with AIDS and HIV also had significantly better knowledge of HIV and AIDS compared with those who reported not having adequate skills (mean 17.4 vs. 16.3, $p = 0.012$).

Students' attitudes towards people living with HIV/AIDS

The students' general attitudes, measured on a 5-point scale, were quite positive (mean 3.7) (SD $\pm$ 0.63), varying between 1.7 and 5.0. Several background characteristics of the students were significantly associated with the attitude scores. Students majoring in a health-related subject (e.g. medical science, nursing science) had significantly more positive general attitudes towards PLWHA than those who were studying natural sciences (e.g. chemistry) (mean 3.9 vs. mean 3.5) ($p < 0.026$).

The oldest students (30 years plus) had significantly more positive attitudes towards PLWHA compared with under-22-year-olds (mean 4.0 vs. 3.6, $p < 0.001$) or students between 27 to 30 years of age (mean 4.0 vs. mean 3.6, $p = 0.032$). Students who had children had significantly more positive attitudes towards PLWHA compared with those who did not have children (mean 3.8 vs. 3.6, $p = 0.002$). In addition, female students' general attitudes were significantly more positive than male students' attitudes (mean 3.7 vs. 3.4, $p = 0.003$).

On average, the students did not have very homophobic attitudes (mean 4.5) (SD $\pm$ 0.74). However, attitude towards homosexuality varied between 1.44 and 5.0. Students who reported that religion had an important role in their lives had significantly stronger homophobic attitudes compared with students who regarded religion as less important for them (mean 4.3 vs. 4.6, $p = 0.04$). Male students had significantly stronger homophobic attitudes compared with female students (mean 4.1 vs. mean 4.6, $p < 0.001$).

Attitude scores for sexual risk behaviour, on a 5-point scale, ranged between 1 and 4.40 (mean 2.0) (SD $\pm$ 0.55). Students who considered religion an important factor in their lives had a stricter attitude towards sexual risk behaviour compared with less religious students (mean 1.9 vs. mean 2.1, $p = 0.007$).

Table 2. Percentage of subjects who strongly agree or disagree with the statement 'I would feel uncomfortable in contact with [a type of person with HIV/AIDS]' by gender, age and educational field

		Type of person with HIV/AIDS					
Variable	Category	IV drug user	Haemophiliac	Prostitute	Homosexual	Bisexual	Child
Gender	Male	67.2	43.7	48.4	36.0	29.7	11.0
($n = 330$)	Female	42.1	30.4	26.7	9.8	9.8	4.9
	Total	47.0	33.0	30.9	14.8	13.6	6.1
	Sig. (χ^2)	0.003	0.002	0.000	0.000[a]	0.001[a]	0.027[b]
Age	≤22	58.7	35.9	41.2	18.4	13.1	9.8
($n = 330$)	23–26	51.9	33.6	34.6	14.4	15.3	5.8
	27–30	47.7	38.6	37.3	15.9	25.0	2.3
	31+	28.9	26.7	17.8	11.1	6.6	4.4
	Total	47.0	33.0	30.9	14.8	13.6	6.1
	Sig. (χ^2)	0.002[a]	0.005[a]	0.001	0.255[c]	0.003[c]	0.057[d]
Education	Health sciences	34.5	24.1	21.8	5.7	9.1	2.3
($n = 317$)	Natural sciences	49.3	32.8	37.3	20.8	16.4	9.0
	Arts & letters	48.7	38.2	32.9	14.5	15.7	7.9
	Social sciences	55.1	36.7	32.1	29.5	16.1	6.9
	Total	46.7	32.8	30.6	14.8	14.2	6.3
	Sig. (χ^2)	0.051	0.003	0.201	0.058[e]	0.729[e]	0.247[f]

[a]One cell has expected count less than 5.
[b]Three cells have expected count less than 5.
[c]Five cells have expected count less than 5.
[d]Seven cells have expected count less than 5.
[e]Four cells have expected count less than 5.
[f]Nine cells have expected count less than 5.

Students who had better knowledge of HIV and AIDS had more positive general attitudes ($r = 0.221$, $p < 0.001$.) In addition, those students who had more positive general attitudes had less homophobic attitudes ($r = 0.656$, $p < 0.001$). Students who had a more liberal attitude towards sexual risk behaviour had less homophobic attitudes ($r = 0.126$, $p = 0.025$).

Sympathy towards people with HIV/AIDS

Table 2 shows the percentage of students who strongly agree or disagree with the statement 'I would feel uncomfortable with [a type of person with HIV/AIDS]' cross-tabulated by gender, age and education. It shows that 47% of the students felt uncomfortable with IV drug users and only 6.1% with HIV-infected children. Furthermore, 33% and 30.9% felt uncomfortable with haemophiliac patients and prostitutes respectively, whereas for homosexuals and bisexuals these figures were 14.8% and 13.6%. Of the background variables, gender was always significantly associated with the type of person with HIV and AIDS. The relative difference between men and women was

particularly clear in the case of homosexuals (26.2%) and IV drug users (25.1%). Older students tend to have a more positive attitude towards IV drug users, haemophilic patients, prostitutes and bisexuals than the younger students, but there is no clear linear association between the age groups and the categories measuring the attitudes. Finally, the students in health sciences tended to be less often uncomfortable with haemophiliac patients than the students in natural sciences, arts and letters and the social sciences. The obvious interaction between gender, age and education was not analysed.

Sympathy score could be calculated from the five Likert scale items, and thus the correlation between sympathy and knowledge could be calculated. However, this could not be done in a reliable way because even after various transformations the distribution of the sympathy score was not normal. Moreover, the association between knowledge and sympathy was not linear. If the assumptions of normality and linearity are ignored, it could be said that there was only a slight correlation between sympathy and knowledge (about 0.160). Instead, there was a strong correlation between sympathy and general attitude (about 0.840) and sympathy and homophobic attitude (about 0.750).

Discussion

This study described university students' knowledge and general attitudes towards HIV and AIDS, as well as their homophobic attitudes and perception of sexual risk behaviour at two Finnish universities. The results showed that although the students' level of knowledge varied, on average they had a good level of knowledge about HIV and AIDS (see also St Rose, 2008; Tung *et al.*, 2008; Veeramah *et al.*, 2008; Nwezeh, 2010). However, there were some students with a very low knowledge level of HIV and AIDS, suggesting that there are still students that need further education about HIV and AIDS issues: accurate HIV and AIDS information is the first step in preventing the spread of this epidemic.

Students at the faculty of health sciences had more knowledge about HIV and AIDS compared with other students. Obviously, students interested in health-related subjects have gathered more knowledge and are more likely to be interested in health issues. However, previous studies have shown that people working in health care may have deficits in their HIV/AIDS knowledge (Aisien & Shobowale, 2005; Kermode *et al.*, 2005; Dijkstra *et al.*, 2007; Umeh *et al.*, 2008; Salyer *et al.*, 2008), and conversely that people without health-related university education may show high levels of knowledge about HIV/AIDS issues (Nkya *et al.*, 2006; Tee & Huang, 2009).

In addition, older students had more knowledge about HIV and AIDS compared with younger students (see also Samsuddin *et al.*, 2010), which might be explained by personal life experience. On the other hand, this result might also imply that health education in primary and secondary schools *does not include enough* knowledge about HIV and AIDS (Huang *et al.*, 2005). Indeed, in many countries the resources for preventive work have been cut and new generations are growing up with less knowledge of HIV and AIDS (Attawell & Elder, 2006). At the same time, the influence of mass media and the Internet on young people has expanded enormously (Holmström, 2002; Serlo, 2008). Young people are also sensitive to the influence of their peers (Stephenson *et al.*, 2004; Cai *et al.*, 2008). Unfortunately, information that circulates in the mass media, Internet or peer groups is not always accurate or reliable (Huang *et al.*, 2005;

Serlo, 2008; Tung *et al.*, 2008), making these platforms a favourable ground for the circulation of false information about HIV and AIDS. However, Tee & Huang (2009, see also St Rose, 2008) did not find any statistically significant correlation between age and HIV and AIDS knowledge, whereas Amodio *et al.* (2010) found that younger age was significantly associated with knowledge of HIV (see also Durojaiye, 2009).

This study found that students' general attitudes towards PLWHA were quite positive. Students pursuing a major in health sciences, who were female and older and had children had more favourable attitudes towards PLWHA. Studies conducted with nurses and doctors (Aisien & Shobowale 2005; Kermode *et al.*, 2005; Umeh *et al.*, 2008) have, however, shown that people with health-related qualifications may also exhibit discriminative and negative attitudes towards PLWHA. Contradictory findings have also been presented (Salyer *et al.*, 2008; Veeramah *et al.*, 2008). In a study conducted by Tee & Huang (2009), no significant differences were found between male and female participants regarding attitudes towards PLWHA. Interestingly, Tee & Huang (2009) found a statistically significant negative correlation between age and attitudes towards PLWHA: younger people had more favourable attitudes towards PLWHA than older people.

In this study, students' attitudes towards sexual risk behaviour varied. Their attitudes concerning casual sexual relations were more conservative, which may decrease their risk of HIV transmission within the population (Herlitz & Ramstedt, 2005). The results of this study lend support to the results of Serlo (2008), that the importance of religion seems to be a protective factor for sexual risk behaviour. It was also noticed that although HIV and AIDS are by definition a stigma for a person, students' sympathy towards various types of HIV/AIDS patients varied. The most disliked group was IV drug users, whereas students did not feel uncomfortable when in contact with children with HIV/AIDS. It seems that people tend to judge HIV and AIDS patients on the basis of how they got the virus. This might affect the extent to which various patients get medical, mental and social support.

The respondents' judgements of haemophiliac patients and prostitutes seem to be based on different grounds. In the case of prostitutes the lack of sympathy might be based on the perception of the transmission mode of HIV, the controllability of that kind of activity, and the moral responsibility that follows thereafter. Consequently, a prostitute is held personally responsible for his or her state of affairs and thus does not deserve sympathy. In the case of haemophilic patients, the lack of sympathy could be mainly based on fear of infection, which might be related to the ignorance of HIV infection mechanisms in general. Indeed, some correlation was found between sympathy and knowledge. Furthermore, this interpretation received more support from the fact that the health science students tended to be much less unsympathetic towards haemophilic patients than the other students (see also Lupton, 1999; Steins & Weiner, 1999; Cobb & De Chabert, 2002; Wong & Wong, 2006).

As in any survey, the present study has some limitations that necessitate caution in interpreting the results. First, the questionnaire was rather long and the students might not be used to participating in surveys. Second, there was no information regarding non-respondents, and it was possible that non-respondents may differ notably from respondents. For example, those who are not interested in, or do not value, the meaning of the research topic chose not to respond. By contrast, those who responded may

have been more interested in the research topic. Third, the results of this study are based on the students' self-report and perception. These results do not necessarily represent their attitudes and sexual risk behaviour in real-life situations.

Despite these limitations, the results of this study can be used when planning educational interventions to prevent HIV and AIDS, and later for assessing the effectiveness of such programmes. It is well established that the skills learned to reduce the risk of HIV infection are transferable to other health issues. These skills also empower students to take control of, and responsibility for, their own actions. This empowerment, combined with good knowledge and healthy attitudes, will allow the transfer of these skills outside the educational setting where they were learned (Svenson *et al.*, 1997; Serlo, 2008).

However, the lack of necessary knowledge, values and skills often results in ineffective and inconsistent HIV and AIDS prevention programmes (Tung *et al.*, 2008). Therefore, HIV and AIDS programmes should be planned on a more comprehensive basis. By bringing together students, health education professionals and the external community as well as university administration, the responsibility will be shared. Previous studies have usually observed attitudes towards HIV and AIDS and sexual risk behaviour. In future studies it might be more interesting to study the change in attitudes and risk behaviour in order to find the issues that might facilitate the prevention of HIV and AIDS. It would also be important to target those individuals who have the most negative attitudes, engage in sexual risk behaviour and lack knowledge of HIV and AIDS. The fight against AIDS should involve the family, peer group, education system, mass media and society at large.

Conclusions

The students' knowledge of, and attitudes towards, HIV and AIDS and homosexuals varied most strongly with respect to faculty, gender and age. Overall, the students neither have strong negative attitudes towards HIV and AIDS, nor strong homophobic attitudes. The students' sympathy towards various types of people with HIV and AIDS varied too. Intravenous drug users were perceived most negatively. The students' attitude towards sexual risk behaviour was not generally very liberal, and religious beliefs seemed to be an inhibiting factor. Although the situation seems to be reasonably good, there are individuals who have rather negative attitudes, scant knowledge and who do not perceive the risks of liberal sexual behaviour. There is a need to develop effective education interventions, particularly to increase the level of knowledge of HIV and AIDS and how the virus can be transmitted through sexual risk behaviour. This would prevent further increase in HIV infections. Knowledge about HIV and AIDS would also lead to more positive attitudes towards PLWHA as well as homosexual people. Such education programmes should be comprehensive, targeting not only young people, but also the mass media and the Internet.

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