KNOWLEDGE, BEHAVIOUR AND ATTITUDES REGARDING HIV/AIDS AMONG UNDERGRADUATE STUDENTS IN AN IRISH UNIVERSITY

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ABSTRACT

Aim and Objective: The aim of the study was to investigate knowledge, behaviour and attitudes of undergraduate university students about HIV/AIDS. The study focused on students' attitudes towards people living with HIV/AIDS and also an exploration of the relationship between students' level of knowledge and risky behaviour regarding HIV/AIDS. **Methodology:** A cross-sectional descriptive study conducted in an Irish University among undergraduate students in 2012. A web questionnaire consisted of items related to HIV/AIDS knowledge, behaviour and attitudes was sent to all undergraduate students aged 18 years or above via Survey Monkey. Data were analysed using SPSS. Descriptive statistics was performed to describe demographic variables, HIV-related knowledge, behaviour and attitudes. Independent t-test and one-way analysis (ANOVA) tests were used to examine the differences in knowledge and attitudes about HIV/AIDS between genders and their academic years. $P < 0.05$ was set to determine statistical significance. **Results:** A total of 520 students responded to the survey (response rate = 5.2%), 469 participants were included in the final sample with the mean age 22.04 years (SD = 5.9). The majority of students who participated in this study were Irish (n=429/91.5%) and were studying in their first (n=146/31.1%) or second (n=158/33.7%) academic year. More than 95% were able to identify primary routes of HIV/AIDS transmission. Results showed that males were more aware of their personal risk as compared to females about HIV/AIDS (p=0.03). 82.5% stated that they never tested for HIV, and 43% reported that they had engaged in unprotected sexual intercourse while 42% indicated that they needed HIV/AIDS prevention education. **Conclusion:** Despite the fact that majority of students were aware of the transmission of HIV/AIDS, this study showed that students were less likely to translate their knowledge about HIV/AIDS transmission into healthy behaviour. Health and education sectors need to review the way in which they are delivering the information in relation to HIV/AIDS risk awareness and safer sex practice and to develop and implement new policies to promote HIV/AIDS prevention education and healthy sexual behaviour among university students.

KEYWORDS HIV/AIDS, knowledge, behaviour, attitude, undergraduate students, Irish University

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Introduction

Human immunodeficiency virus infection / acquired immunodeficiency syndrome (HIV/AIDS) is a disease of the human immune system caused by the human immunodeficiency virus [1]. The human immunodeficiency virus is a retrovirus that infects cells of the immune system by destroying or impairing their function leading to increased susceptibility to infections. The most advanced stage of HIV infection is acquired immunodeficiency syndrome (AIDS). It can take 10-15 years for an HIV-infected person to develop AIDS [2]. A person with HIV infection has AIDS when person's immune system is too weak to fight against common infections / opportunistic infections, or the number of immune system cells (CD4) in the blood of an HIV positive person drops below a certain level [3].

Research indicates that HIV originated in West-central Africa during the early twentieth century [4]. AIDS was first recognized by the Centers for Disease Control and Prevention in 1981 [5]. HIV be can transmitted via unprotected and close contact with a variety of body fluids of infected individuals, such as blood, breast milk, semen and vaginal secretions. Individuals cannot become infected through ordinary day-to-day contact such as kissing, hugging, shaking hands, or sharing personal objects, food or water [6].

HIV is one of the world's leading infectious killers, claiming more than 25 million lives over the past three decades [6]. In 2011, approximately 1.7 million deaths were occurred due to HIV/AIDS worldwide [7]. According to WHO, in 2011 an estimated 34.2 million people were living with HIV, and of those, 2.5 million people were newly diagnosed worldwide and about 2.2 million of them were adult [7].

In 2010, an estimated 68% (22.9 million) of all HIV cases and 66% of all deaths (1.2 million) occurred in Sub-Saharan Africa [8]. South & South East Asia are the second most affected areas; in 2010 this region contained an estimated 4 million cases or 12% of all people living with HIV resulting in approximately 250,000 deaths [8]. However, the rate of HIV prevalence is lower in East Asia (0.1%) and Western and Central Europe (0.2%) [8].

The Centre for Disease Control and Prevention (CDC) estimates 1.2 million people in the United States are living with HIV infection, and about 20% of infected were unaware of their infection [9]. In 2009, an estimated 17,774 people with AIDS died, and nearly 619,400 people with AIDS in the U.S. have died since the epidemic began [9]. In the United Kingdom, there were an estimated 86,500 people living with HIV which resulted in 516 deaths and approximately a quarter (26%, 22,200) of HIV-infected people were estimated to be unaware of their infection in 2009 [10].

Ireland became part of the HIV global crisis in 1985, in response to which, an Irish National AIDS Strategy Committee (NASC) established. NASC took a multi-disciplinary approach, involving statutory and non-statutory organisations and people who were living with HIV and AIDS. In 2000 "AIDS Strategy 2000" was published. The members of the Education and Prevention sub-committee of NASC published the Education and Prevention Plan for 2008-2012 in 2008 [11].

Despite the national HIV prevention approaches, there has been a general upward trend in the number of HIV infections in Ireland. In 2008, there were 9.55 newly diagnosed HIV infections per 100,000 populations [11]. A total of 320 new infections were reported during 2011 in Ireland with the incident rate of 7.0 per 100,000 populations in which 235 were male and 85 were female, giving a male-to-female ratio of 2.8% and 8.8%. The highest proportion of new diagnoses in 2011 (42.5%) were among men who have sex with men (MSM) [12].

Recent reports indicate that 30% of individuals infected with HIV in Europe are unaware of their infection [13]. In Ireland, 62.2% of cases were asymptomatic at the time of HIV diagnosis, and 8.8% diagnosed with AIDS at the time of their HIV diagnosis [13].

Young people (15-24 years old) are of international concern in the HIV/AIDS epidemic and are labelled "at risk" group. Young women are especially vulnerable to HIV, and they disproportionately account for 64% of the young people living with HIV worldwide [14]. The importance of focusing on young people recognized at a global level by the 2002 United Nations General Assembly Special Session. The Millennium Development Goals (MDGs) are an essential framework for young people's health. The MDG six is particularly relevant to young people's health about HIV/AIDS [15].

However, despite these promises, young people remain at the center of the HIV/AIDS pandemic. Globally, the number of new HIV infections in adults were 6000 per day in 2010, and 42% of them were among young people (15-24) [16]. College and University students as a population are particularly vulnerable to HIV infection [17]. Centres for Disease Control and Prevention stated that the epicentre of the HIV/AIDS epidemic is college students [18]. Inadequate knowledge of HIV/AIDS regarding prevention measures can produce the false perception of the disease among this population.

Materials & Methods

The study had a cross-sectional design. The data collection was done with the help of a questionnaire. The study conducted in an Irish University among 10,000 undergraduate students in 2012. Eligible subjects included if they were aged 18 years or older and an undergraduate student registered at the study site. A web questionnaire survey was carried out using Survey Monkey technology amongst all undergraduate students aged 18 years or above recorded at the study site in 2012. A cover letter accompanying the questionnaire explained the purpose of the study. Students asked for voluntary participation. Participants informed of confidentiality and anonymity. A reminder email was also sent to members within three weeks to increase response rate. Data collection completed in August 2012. The questionnaire consisted of three main self-administered sections that required approximately 10 minutes to complete. The parts of this study were (a) Demographic questions, (b) HIV/AIDS Knowledge and Attitudes (consist of four subdivisions) (c) HIV/AIDS-related Behaviour.

The demographic questionnaire collected data regarding age, sex, academic year, nationality and field of education.

HIV/AIDS knowledge and attitudes assessed with a 24 item scale. HIV/AIDS knowledge and attitudes section contained four subscales (1 = Transmission Myths, 2 = facts, 3 = personal risk, 4 = Attitudes). Each item was scored on a 5-point Likert scale: (1= strongly agree, 2 = agree, 3 = not sure, 4 = disagree, and 5 = strongly disagree). Total scores ranged from 24 to 120, and subscale scores range from 8 to 40 for transmission myths and facts, 3 to 15 for personal risk, and 5 to 25 for attitudes. Higher scores indicate accurate views on HIV/AIDS in this study.

HIV/AIDS-related behaviours examined with yes/no statements covering unprotected sexual intercourse, HIV test, and the need for HIV/AIDS prevention education.

	Variables	N	Percentage
Gender	Male	151	34
	Female	318	66
Ethnicity	Irish	429	91.5
	Non-Irish	40	8.5
Age in years	18-22	376	80.2
	23-26	40	8.5
	>27	53	11.3
Academic year	First year	146	31.1
	Second year	158	33.7
	Third year	90	19.2
	Fourth year	58	12.4
	Fifth year	17	3.6
Fields of Education	Arts, Celtic Studies, and Social Science,	138	29.4
	Business and Law,	72	15.4
	Medicine and Health,	92	19.6
	Science, Engineering, and Food Science	167	35.6

Table 1: Socio-Demographic Characteristics of the Participants (N = 469).

Data were analysed using SPSS version 18.0. Descriptive statistics was performed to describe demographic variables, HIV-related knowledge, attitudes and behaviours. Independent t-test and one-way analysis (ANOVA) tests were used to examine the differences in knowledge and attitudes about HIV/AIDS between genders and their academic years. $P < 0.05$ was set to determine statistical significance.

Results

A total of 520 students responded to the survey (giving a response rate of 5.2%), 469 participants included in the final sample. 51 participants excluded due to submission of incomplete questionnaires. The socio-demographic characteristics of the participants summarized in Table 1. Of the respondents 34% (n=151) were males and 66% (n=318) were females. The mean age of the participants was 22.04 years (SD = 5.9). The highest proportion (80.2%) of the participants aged between 18-22 years, and the smallest proportion (19.8%) being 23-26 years or more. 91.5% participants were Irish (n=429).

The majority of students were in either their 2nd (n=158/33.7%) or 1st (n=146/31.1%) year, while lesser number of students were in their 3rd (n=90/19.2%), 4th (n=58/12.4%) or 5th year (n=17/3.6%). The highest proportions of the participants were part of science, engineering and food science (35.6%) or arts, Celtic studies and social science (29.4%) faculties respectively. While small proportions of the participants mentioned that they were either part of business and law (15.4%) or the faculty of medicine and health (19.6%).

The data are related to knowledge and attitudes about HIV/AIDS amongst the participants displayed in Table 2 & 3. The HIV/AIDS knowledge and attitudes had four subscales. Each item scored on a 5-point Likert scale (1 = strongly agree to 5 = strongly disagree). The mean total score of the questionnaire was 84.29 (SD= 8.03). Transmission Myths contained eight items. The possible score range was from 8 to 40. Results showed that the mean score for transmission myths subscale was 30.02 (SD=5.59) among university students (Table 2). Facts had eight items. The possible score range was from 8 to 40. Results indicate that the mean score for facts subscale was 18.32 (SD=1.81), (Table 2).

Escape special TeX symbols (Personal Risk had three statements regarding HIV/AIDS, and possible score range was 3 to 15. The mean score of own risk among university students was 13.31 (SD= 1.82), (Table 2). Attitudes had five statements about people living with HIV/AIDS. The possible score range was 5 to 25. The mean score for Attitudes subscale was 22.33 for Attitudes subscale (SD= 2.74), (Table 2).

Transmission Myths:

Of the respondents 67.3% believed that HIV can be transmitted through sharing toothbrush or razor, 38.2% through mosquito bites and 33.8% agreed that HIV can be spread through saliva. About 11.7% believed that HIV can be contracted through sharing utensils, and 11.0% agreed that HIV can be contracted through sharing cigarettes. While fewer than ten percent agreed that HIV can be spread through sharing food (8.6 percent), coughing and sneezing (5.2 percent) or through hugging an infected person (0.2 percent), (Table 2).

Items	Mean (SD)	Percentage Agree
Transmission Myths	**30.02 (5.59)**	
HIV/AIDS can be spread by coughing and sneezing	4.43(0.86)	5.2
AIDS can be contracted through, sharing cigarettes	4.13(1.07)	11.0
HIV/AIDS can be,spread through hugging an infected person	4.79(0.45)	0.2
HIV can be, spread through sharing food	4.21(0.99)	8.6
HIV can be spread through saliva	3.31(1.36)	33.8
HIV can be spread by sharing toothbrush,or razor	2.35(1.22)	67.3
Mosquitoes can transmit HIV	2.90(1.24)	38.2
HIV can be contracted through sharing utensils	3.87(1.08)	11.7
Facts	**18.32 (1.81)**	
HIV can be transmitted through, an open wound	1.38(0.63)	94.9
HIV can be transmitted through, blood transfusion	1.17(0.42)	98.8
HIV can be transmitted through, sexual intercourse	1.09(0.33)	99.8
HIV can be transmitted from mother to her baby (b),	1.33(0.64)	95.7
HIV can be spread through sharing needles	1.10(0.33)	99.6
People can, reduce the risk of HIV transmission by using condoms (b)	1.34(0.60)	97.6
AIDS can cause, death	1.33(0.72)	95.3
Life is normal for people who are HIV positive without AIDS.	2.87(1.10)	43.2
Personal Risk	**13.31(1.82)**	
Westerners are less susceptible to, contracting AIDS than Asians	4.15(0.98)	6.0
AIDS only affects intravenous (IV) drug users, prostitutes and, homosexuals	4.74(0.57)	1.0
Person can protect himself against AIDS by being vaccinated for it.	4.42(0.83)	3.0
Attitudes	**22.33 (2.74)**	
People with HIV should be kept out of school	4.50(0.80)	3.2
I would end my friendship if my friend had AIDS	4.66(0.63)	0.8
I am willing to do, volunteer work with AIDS patients (b)	2.46(1.09)	52.5
If a family member, contracts HIV he/she should move out	4.68(0.61)	1.2
People with HIV should stay home or in a hospital.	4.47(0.78)	2.2

Table 2: HIV/AIDS Knowledge and Attitudes among Undergraduate University Students (N=469). Note. Items scored on a five-point Likert scale ranging from 1 = strongly agree to 5 = strongly disagree. (a) Percentage agreed was computed by points 1 and 2 of the Likert scale. (b) Items reversed only when computing for subscale mean and standard deviation. All other data in this table are presented in the original form.

Items	*Percentage %*				
Transmission Myths	**Strongly Agree**	**Agree**	**Not Sure**	**Disagree**	**Strongly Disagree**
Can HIV/AIDS be spread through coughing and sneezing?	0.9	4.3	7.0	26.7	61.2
Can AIDS be contracted through sharing cigarettes?	2.3	8.7	11.5	28.6	48.8
Can HIV/AIDS be spread through hugging an infected person?	0.0	0.2	1.3	17.8	80.7
Can HIV be spread by sharing food?	1.3	7.3	11.0	29.8	50.0
Can HIV be spread through saliva?	11.6	22.2	15.5	24.9	25.8
Can HIV be spread by sharing toothbrush or razor?	25.6	41.7	13.2	10.5	9.0
Can Mosquitoes bites transmit HIV?	14.8	23.4	33.7	12.9	15.2
Can HIV be contracted through sharing utensils?	3.4	8.3	20.0	33.9	34.3
Facts					
Can HIV be transmitted through open wound?	68.8	26.1	3.8	1.1	0.2
Can HIV be transmitted through blood transfusion?	84.9	13.9	0.9	0.4	0.0
Can HIV be transmitted through sexual intercourse?	91.5	8.3	0.0	0.0	0.2
Can HIV be transmitted from mother to her baby?	75.8	19.9	4.1	0.0	0.2
Can HIV be spread through sharing needles?	90.4	9.2	0.2	0.2	0.0
Can People reduce the risk of HIV transmission by using condoms?	71.4	26.2	1.9	0.0	0.4
Can AIDS cause death?	76.2	19.1	1.7	1.5	1.5
Is Life normal for people who are HIV positive without AIDS?	9.2	34.0	25.2	24.4	7.3
Personal Risk					
Westerners are less susceptible of contracting AIDS than Asians.	1.5	4.5	18.9	27.1	48.0
AIDS only affects intravenous (IV) drug users, prostitutes and homosexuals.	0.6	0.4	1.5	18.9	78.5
You can protect yourself against AIDS by being vaccinated for it.	0.4	2.6	12.5	23.9	60.6
Attitudes					
Should People with HIV be kept out of school?	1.3	1.9	6.0	27.4	63.5
I would end my friendship if my friend had AIDS.	0.2	0.6	5.3	20.9	72.9
I am willing to do volunteer work with AIDS patients.	22.5	30.0	30.4	13.1	4.1
If a family member contracts HIV he/she should move out.	0.6	0.6	2.4	22.4	73.9
People with HIV should stay home or in a hospital.	1.3	0.9	7.7	30.2	60.0

Table 3: HIV/AIDS Knowledge and Attitudes. Based on 5-point Likert scale format, (1 = strongly Agree to 5 = Strongly Disagree). (N=469)

Facts:

The majority of participants (more than 95 percent) believed that HIV can be transmitted through sexual intercourse (99.8%), sharing needles (99.6%) and blood transfusion (98.8%) or from mother to her baby (95.7 percent).

About ninety-five percent (94.9%) of participants agreed that HIV can be transmitted through an open wound. Of the respondents, just over ninety-five percent (95.3%) believed that HIV can cause death, and almost ninety-eight percent (97.6%) agreed that using a condom can reduce the risk of HIV transmission. Forty-three percent of participants agreed that life is normal for people who are HIV positive without AIDS, (Table 2)

Personal risk:

Findings on own risk showed that six percent of participants agreed that Western are less susceptible to contracting HIV than Asians, and three percent agreed that they can protect themselves against AIDS by being vaccinated for it. While one percent of participants believed that AIDS only affects intravenous drug users, prostitutes and homosexuals, (Table 2).

Attitudes:

Approximately half of the respondents (52.5%) were willing to do volunteer work with AIDS patients. Three percent of participants agreed that people with HIV should be kept out of school. Only two percent of participants agreed that people with HIV should stay home or in the hospital. Of the respondents just over one percent (1.2%) agreed to move out a family member if they were HIV positive, while 0.8% agreed that they would end a friendship if their friend had AIDS, (Table 2).

The majority of the participants (82.5%) stated that they had never been tested for HIV. Of the respondents, forty-three percent responded that they had engaged in unprotected sexual intercourse while almost forty-two percent stated that they needed HIV/AIDS prevention education (Table 4).

Independent t-tests were performed to explore the differences

Questions	YES	(%)	NO	(%)
Have you had unprotected sexual intercourse?	n=203	43.3	n=266	56.7
Have you ever been tested for HIV?	n=82	17.5	n=387	82.5
Do you think you need HIV/AIDS prevention education?	n=196	41.8	n=273	58.2

Table 4: HIV/AIDS-Related Behaviour among Undergraduate University Students (N=469)

	Female, M (SD)	*Male, M (SD)*	*P value*
Transmission Myths	30.03 (5.79)	30.00 (5.18)	0.96
Facts	18.34 (1.86)	18.26 (1.72)	0.68
Personal risk	13.19 (1.94)	13.57 (1.55)	0.03
Attitudes	22.40 (2.78)	22.18 (2.66)	0.45
Total mean score of HIV knowledge	84.28 (8.52)	84.29 (6.90)	0.99

Table 5: Independent t-tests on HIV/AIDS knowledge and attitudes by males and females (N=469)

in HIV/AIDS knowledge and attitudes for males and females (Table 5). Women showed more accurate views regarding facts and opinions, but the actual difference did not reach statistical significant. However, there was a statistical significant difference between males (M = 13.57, SD = 1.55) and females (M = 13.19, SD = 1.94) in relation to personal risk ($p < 0.05$). Males were more aware of personal risk perceptions as compared to females. There was no significant difference found between student's age groups and their field of educations about HIV/AIDS knowledge and attitudes.

An analysis of variance (ANOVA) was also conducted to explore the level of HIV/AIDS knowledge and attitudes in different academic years adjusted for genders (Table 6). The results showed that there was a significant difference in knowledge about transmission myths (p-value = 0.03) in females according to their academic years rather than males (p-value =0.11). Women studying in their third and fourth school year showed more accurate knowledge regarding transmission myths as compared to women studying in their first and second academic year. Moreover, there were significant differences in knowledge about facts in males (p-value = 0.02) about their school years. Surprisingly, men studying in their second and third academic year showed real knowledge level regarding events as compared to males studying in their fourth academic year. The significant differences were found in females about personal risk (p-value = 0.02) as compared to men (p-value = 0.36) in their school years. Females in their third and fourth studying year were more aware of personal risk perception as compared to females in their first and second academic year. However, there were no significant differences in attitudes about their academic years, (Table 6).

Items	Males (P-value)	Females (P- value)
Transmission Myths	0.11	0.03
Facts	0.02	0.53
Personal Risk	0.36	0.02
Attitudes	0.31	0.98

Table 6: Summary of analysis of variance (ANOVA) for HIV/AIDS knowledge and attitudes in different academic year students adjusted for gender (N = 469).

Discussion

The study showed that the majority of the students had a good knowledge about the main routes of HIV/AIDS transmission with no significant difference between males and females. A high proportion of students (more than 95%) were able to identify that sexual intercourse can transmit HIV/AIDS, sharing needles, blood transfusion, open wound and mother to baby which is inconsistent with the findings of a study (Huang et al. 2005) [19] carried out in Chinese students where a large number of students (95%) had misconceptions about transmission of HIV through sharing needles.

This study also demonstrated that many misconceptions still exist about other modes of transmission (e.g. by mosquitoes) in this population. Approximately 38% of students reported that mosquitoes can transmit HIV. Studies carried out in other countries illustrate similar finding [17, 20-25]. Furthermore, about 34 percent of students believed that HIV can be spread through saliva that is consistent with a study carried out by Chinese students by Huang et al. These findings illustrate the need for more education about HIV/AIDS among university students.

The results demonstrated a small proportion of students had misconceptions regarding transmission of HIV through sharing cigarettes (11%) or by cough and sneezing (5%) which is inconsistent with other studies carried out in Chinese (Tung et

al. 2008 ; Tung et al. 2011) [19, 22] and Greek (Ouzouni et al. 2012) [24] university students. Also, less than one percent (0.2%) of students reported the transmission of HIV/AIDS by causal contact e.g. hugging. It is inconsistent with the finding of other studies conducted among university students in China [19, 22], Turkey [21], United Arab Emirates [23] and Taiwan [17].

In this study, 98 percent of students were aware that the use of condoms can reduce the risk of HIV/AIDS transmission (Figure A). This finding is similar to the studies carried out in university students in Turkey [21], Greece [24], United States [20], Nigeria [26] and Malaysia [25]. However, the finding is inconsistent with studies carried out in China [19, 22] and Taiwan [17]. It may be explained by limited sex education and a lack of in-depth HIV /AIDS knowledge among university students in these countries.In a study conducted in Ghana, only 77.5% students identified condom usage as means of preventing HIV infection [32]. The study showed that a small proportion of students was unaware of their personal risk. For example, only one percent of students thought that AIDS could affect only intravenous drug users, prostitutes, and homosexuals. Six percent considered that they are less susceptible to contracting AIDS than Asians which is inconsistent with the findings of other studies carried out in China, Greece and Taiwan. Moreover, only three percent of students were unaware that there is no vaccine to protect from HIV/AIDS. The study indicates that Irish students knew that HIV/AIDS was incurable as compared to other university students in other countries.

Findings showed that the majority of students held a positive attitude towards people with HIV/AIDS. For example, a small proportion of students considered that people with HIV should stay at home or in hospital (2.2%), just over one percent (1.2%) deemed to move out a family member if they were HIV positive, while less than one percent (0.8%) considered that they would end a friendship if their friend had AIDS. These findings demonstrate that Irish students showed more positive attitudes towards people with HIV/AIDS as compared to other studies (Tung et al. 2008; Tung et al. 2011; Ouzouni et al. 2012)[17, 22, 24]. Moreover, only three percent of students considered that people with HIV/AIDS should be kept out of school which is inconsistent with the findings of studies carried out in Arab (M. Gańczak et al. 2007)[23] and Turkish (Figen Cok et al. 2001)[21] students. This may explain the social and cultural factors (e.g. stigma, mass media and policies towards people living with HIV/AIDS) which have impacted on university student's views and their emotional reactions towards people living with HIV/AIDS in these countries.

Results showed that nearly half of the students reported their willingness to do volunteer work with AIDS patients, consistent with the finding in studies carried out in Taiwan [17] and Greece [24].

Regarding HIV/AIDS behaviour, approximately 43 percent of students reported that they had unprotected sexual intercourse. Studies carried out in the United States [20], Turkey [21] and China [22] illustrate similar findings. This result showed that despite the fact that vast majority of students were aware of the transmission of HIV/AIDS, this study showed that students were less likely to translate their knowledge about HIV transmission into healthy behaviour. Also, they engaged in risky sexual behaviours that put them at risk of acquiring HIV/AIDS and other sexually transmitted diseases. Efforts need to be made to prevent factors that quickly influenced the safer sex practice. For example, "an Irish Study of Sexual Health and Relationships" [27] raised the issue of the cost of condoms in Ireland, where they are among the most expensive in Europe. One of the recommendations from this study was for the removal of the 21% Value Added Tax (VAT) on condoms to make them more accessible to young people and low-income groups. In result, VAT on condoms was reduced to 13.5% in 2008 [28].

In this study, only 18 percent of students reported that they had ever been tested for HIV, consistent with the finding in other studies carried out in the United States [20] and Turkey [21]. A study by Flack et al. [29] reported a widely recognized practice on college campuses, usually called "hooking up," that explicitly allows sexual interaction without commitment or even affection. This practice occurs between persons who do not know one another well and usually without any expectation to continue the relationship. In these circumstances, where a large number of students are engaged in risky sexual behaviour and had never been tested for HIV, the infected students are likely to infect their uninfected partners without knowing it. Such findings indicate a serious public health threat for university students. Efforts must be made to educate and promote HIV testing on college campuses [20]. Moreover in the present study, about 42% of students reported that they needed education on the prevention of HIV/AIDS.

Another study conducted among students in Nigeria revealed that the knowledge about HIV/AIDS was very high with 97.1% of participants having real knowledge of HIV/AIDS [30]. The primary source of HIV/AIDS information was the mass media. It also showed that male students had better knowledge than females [30]. A study recently conducted at a University in China showed that students had real knowledge, but negative attitude towards HIV/AIDS and HIV/AIDS patients, and 15% of them reported having at least one high-risk behavior related to sex and unprotected sex [31]. Thus, HIV/AIDS health education efforts should be intensified to change attitude and practice among university students in addition to their knowledge.

Conclusion & Recommendations

The results of this study revealed that knowledge of the students was high as compared to studies carried out in other countries. It may explain the implementation of many successful programmes to support HIV/AIDS education and prevention in Ireland. However, this study also demonstrated that there are still some misconceptions among university students that indicate that there remains a need to increase and focus on specific HIV/AIDS education to university students.

This study showed that a high proportion of students was engaged in risky sexual behaviour as well as had never been tested for HIV/AIDS. A range of national bodies (e.g. Open Heart House, the Sexual Health Centre, AIDS West, Dublin AIDS Alliance and Red Ribbon Project) are focusing on HIV/AIDS prevention and sexual health behaviour through campaigns in Ireland. Such campaigns can play a significant role among university students to promote their awareness about HIV/AIDS and healthy sexual habits. Students Health Sectors also need to review the way in which they are delivering the information about HIV/AIDS risk awareness and safer sex practice. It is also important that students should have access to condom machines, and condoms should be available to students at affordable cost. The national AIDS strategy committee also recommends to all third-level institutions to increase condom availability and place condom distribution mechanisms on university campuses. [28]

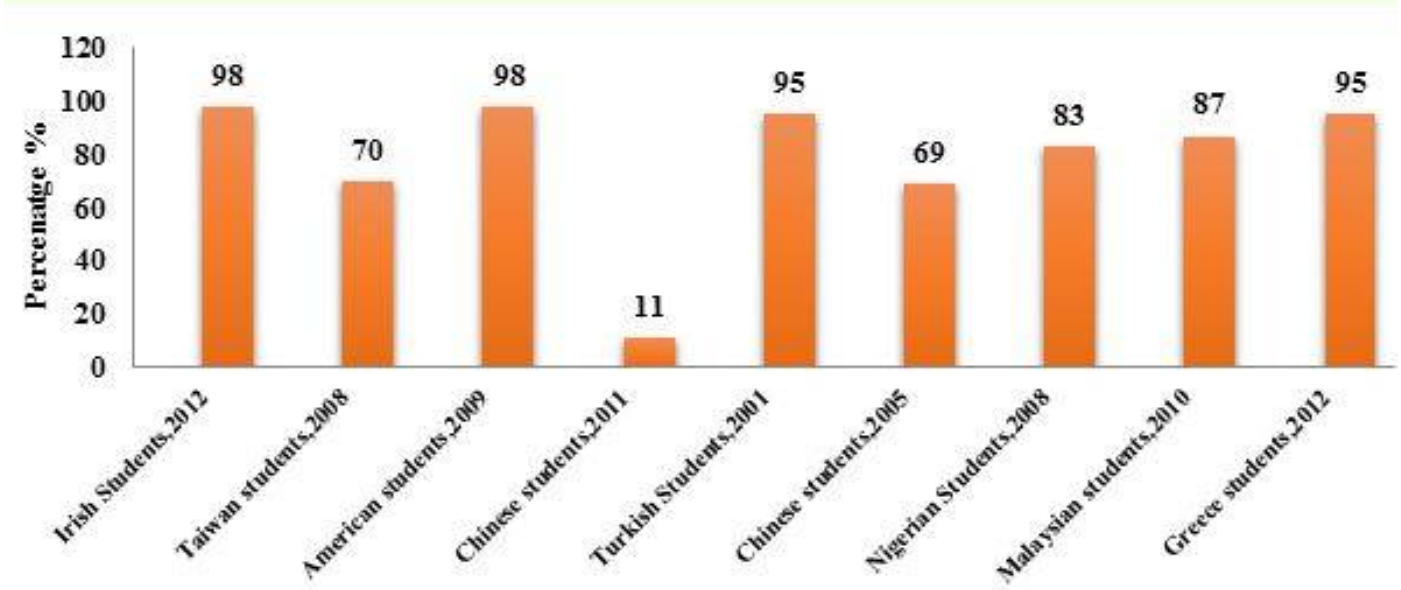

Figure A: Students who believed Condom Use reduced the Risk of HIV/AIDS Transmission..

This study also identified that a large number of students stated that they needed more education about HIV/AIDS prevention. The need for more HIV/AIDS education and prevention has been documented from the literature review. In Ireland, the Department of Education and Skills (DES) is continuing to support HIV/AIDS prevention education throughout the school system. To meet the expectations, it is important to develop and implement new policies to increase HIV/AIDS prevention education that target the University students.

Authors' Statements

Competing Interests

The authors declare no conflict of interest.

Ethical approval

Ethical approval obtained from the Clinical Research Ethics Committee of the Cork Teaching Hospitals in June 2012. Completion and submission of the questionnaire recognised as participant's consent.

References

1. Sepkowitz, K. A. AIDS—the first 20 years. N Engl J Med June 2010: Vol 344: 1764-1772.
2. World Health Organization (WHO), (2012a). HIV/AIDS. http://www.who.int/topics/hiv_aids/en/
   (Accessed 10/7/2012)
3. Health Protection Surveillance Centre (HPSC), (2011a). HIV and AIDS-Some Facts. http://hpsc.ie/hpsc/A-Z/HIVSTIs/HIVandAIDS/Factsheet/
   (Accessed 9/07/2012).
4. Sharp, P. M. & Hahn, B. H. Origins of HIV and the AIDS Pandemic. Cold Spring Harb Perspect Med. 2011 Sep; 1(1): a006841. doi: 10.1101/cshperspect.a006841
5. Gallo RC. A reflection on HIV/AIDS research after 25 years. Retrovirology 2006, 3:72.
6. World Health Organization (WHO), (2012b). HIV/AIDS.
   Available http://www.who.int/mediacentre/factsheets/fs360/en/?&lang=en_us&output=json&session-id=0d1e5ab5d3d6a9d78ffc2371e9da9601 http://www.who.int/mrdiacentre/factsheets/fs360/en/?&lang=en_us&output=json&session-id=0d1e5ab5d3d6a9d78ffc2371e9da9601
   (Accessed 02/08/2012)
7. UNAIDS,(2011). World AIDS Day Report; http://www.unaids.org/en/media/unaids/contentassets/documents/unaidspublication/2011/JC2216_WorldAIDSday_report_2011_en.pdf
   (Accessed 25/08/12)
8. Centers for Disease Control and Prevention (CDC), (2012). HIV in the United States at a Glance. http://www.cdc.gov/hiv/resources/factsheets/PDF/HIV_at_a_glance.pdf
   (Accessed 25/08/12)
9. Health Protection Agency (HPA), (2010). HIV in the United Kingdom:2010 Report. http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1287145367237
   (Accessed 23/08/12).
10. UNIADS, (2008). Report on the UNGASS Declaration of Commitment on HIV and AIDS; http://data.unaids.org/pub/Report/2008/ ireland_2008_country_progress_report_en.pdf?&lang=en_us&output=json&session-id=dbe9228af0bf9c6abf0fa6b78802c89f
    (Accessed 3/08/2012)
11. Health Protection Surveillance Centre (HPSC), (2011b). HIV in Ireland 2011. http://www.hpsc.ie/hpsc/A-Z/HIVSTIs/HIVandAIDS/Presentations/

File,13436,en.pdf?&lang=en_us&output=json&session-id=8e7a5c1ffcf557f0961840350093b405

(Accessed 06/07/2012)

12. Health Protection Surveillance Centre (HPSC), (2010). Annual Report 2010, p: 83 http://www.hpsc.ie/hpsc/AboutHPSC/AnnualReports/File,13092,en.pdf

(Accessed 12/07/2012)

13. World Health Organization (WHO), (2011b). Global HIV/AIDS response, Epidemic update and health sector progress towards Universal Access, 3: 63. http://whqlibdoc.who.int/publications/2011/9789241502986_eng.pdf

(Accessed 11/08/2012)

14. World Health Organization (WHO), (2011c). Young people: health risks and solutions. http://www.who.int/mediacentre/factsheets/fs345/en/

(Accessed 23/08/12)

15. World Health Organization (WHO), (2011d). Global epidemic, UNAIDS World AIDS Day Report; http://www.who.int/hiv/data/en/index.html

(Accessed 12/07/2012)

16. Tung, W. C., Hu, J., Davis, C., Tung, W. K. & Lin, Y. M. Knowledge, attitudes, and behaviours related to HIV and AIDS among female college students in Taiwan. Journal of Human Behavior in the Social Environment 10/2008; 17:361-375. DOI: 10.1080/10911350802068102

17. Centers for Disease Control and Prevention (CDC), (2004). HIV/AIDS and college students. A CDC pathfinder 1995 Author, Atlanta.

18. Huang, J., Bova, C., Fennie, KP., Rogers, A. & Williams, AB. Knowledge, attitudes, behaviours, and perceptions of risk related to HIV/AIDS among Chinese university students in Hunan, China. AIDS Patient Care STDS. 2005 Nov;19(11):769-77.

19. Inungu J, Mumford V, Younis M. & Langford S. HIV Knowledge, attitude and practice among college students in the United States. Journal of Health and Human Services Administration 2009; Vol. 32(3): 259-277.

20. Cok F. Gray LA. & Ersever H. Turkish university students' sexual behaviour, knowledge, attitudes and perceptions of risk related to HIV/AIDS. Culture, Health & Sexuality 2001; 3: 81-99.

21. Tung WC., Hu J, Efird, JT, Su W, Yu L. HIV knowledge and condom intention among sexually abstinent Chinese students. Int Nurs Rev. 2013 Sep;60(3):366-73. doi: 10.1111/inr.12039. Epub 2013 May 30.

22. Ganczak M, Barss P, Alfaresi F, Almazrouei S, Muraddad A, Al-Maskari F. Break the silence: HIV/AIDS knowledge, attitudes, and educational needs among Arab university students in the United Arab Emirates. J Adolesc Health 2007; 40: 572 e1–8.

23. Ouzouni C, Nakakis K. HIV/AIDS knowledge, attitudes and behaviours of student nurses. Health Science Journal 2012; 6(1): 129 - 150

24. Jahanfar Sh, Sann Lye M, Rampal L. Sexual Behavior, Knowledge and Attitude of Non-Medical University Students Towards HIV/AIDS in Malaysia. Shiraz E Medical Journal 2010, 11(3);126 - 135

25. Odu, O. O., Asekun-Olarinmoye, E. O., Bamidele, J. O., Egbewale, B. E., Amusan, O. A. & Olowu, A. O. Knowledge, attitudes to HIV/AIDS and sexual behaviour of students in a tertiary institution in south-western Nigeria. The European Journal of Contraception and Reproductive Health Care 2008; 13(1): 90-96

26. Layte R, McGee H, Quail A, Rundle K, Cousins G, Donnelly C, Mulcahy F, Conroy R (2006). The Irish study of sexual health and relationships. Dublin. Crisis Pregnancy Agency in assoc. with the Department of Health and Children.

27. Department of Health and Children (DOHC). HIV and AIDS Education and Prevention Plan 2008-2012. http://www.nationalplanningcycles.org/sites/default/files/country_docs/Ireland/hiv_plan_ireland.pdf

28. Flack .F. Jr, Daub man K.A., Caron M.L. et al. Risk factors and consequences of unwanted sex among university students: hooking up, alcohol, and stress response. Journal of Interpersonal Violence 2007; 22(2): 139-57.

29. Abiodun O, Sotunsa J, Ani F, Jaiyesimi E. Knowledge of HIV/AIDS and predictors of uptake of HIV counseling and testing among undergraduate students of a privately owned university in Nigeria. BMC Research Notes 2014, 7:639 doi:10.1186/1756-0500-7-639

30. Maimaiti N, Shamsuddin K, Abdurahim A, Tohti N, Memet R. Knowledge, Attitude and Practice Regarding HIV/AIDS among University Students in Xinjiang. Global Journal of Health Science 2010; 2(2): 51 - 60

31. Asante KO and Oti-Boadi M. HIV/AIDS knowledge among undergraduate university students: implications for health education programs in Ghana. Afr Health Sci. 2013 Jun; 13(2): 270–277. doi: 10.4314/ahs.v13i2.11