

ORIGINAL ARTICLE

Knowledge of HIV infection, risk perception, and sexual behaviour of undergraduates. May female medical students act as peer educators?

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Key words

HIV infection • Sexual behaviour • Peer education

Summary

This paper is aimed to verify whether the knowledge and beliefs of female medical freshmen about HIV infection, their personal risk perception, and their sexual behaviour differs from their female peers, in view of the possibility of female medical student-based peer education. A purposive, theoretical quota sampling method was used to recruit the target population. A self-administered anonymous questionnaire was delivered to both female medical and non medical freshmen during March 2004 (n = 266: 124 medical students and 142 non medical students) in Catania (Sicily). The data were analysed for the whole

sample and for the two groups of students individually. The Chi-square test was used to compare data from the two groups of students. Results showed that knowledge and risk perception about HIV infection were higher for medical students when compared with non medical students. Moreover, a lower rate of sexually active medical students and a higher rate of condom use was found among them. Since female medical students seem more sensitive to risk perception and aware of healthier lifestyles, they could be useful in peer sexual education and appropriate prevention programmes against HIV infection.

Introduction

It is generally thought that cautions to avoid the risk of sexually transmitted infections imply a sexual autonomy which young people rarely achieve. This may be particularly true among young girls who may find it embarrassing to negotiate the use of a condom mainly because this can lead to the risk of a sullied reputation [1].

Sex education may bring changes in HIV-related knowledge and attitudes and may induce more cautious sexual behaviour among young people, although it is not easy to achieve changes in their lifestyle. In particular, there are considerable obstacles to health promotion among young people, since they generally feel uncomfortable discussing sexual issues with adults. For this reason they usually learn about sex and sexually transmitted infections from peers. Moreover, it has been shown that young people prefer to talk about sexual issues with female doctors [2].

There is relatively little information concerning the sexual habits of female medical students even though they are the doctors of the future [3, 4]. Moreover, as far as we know, no published articles have specifically focused on the aptitude of female medical students to communicate health messages to their peers. The present survey was aimed at investigating how much female medical students knew about HIV infection and to verify whether their personal risk perception, attitudes to and practice of sexual health differ from other girls of the same age.

Methods

The study included female freshmen of various disciplines at the University of Catania in order to verify whether medical students' knowledge and beliefs about HIV infection differed from their peers, independently from their university education.

The questionnaire, specifically developed for the survey, included thirty closed questions and collected information on the following issues: (i) knowledge of HIV transmission and prevention (thirteen questions, each with more possible answers); (ii) risk perception (thirteen questions, each with more possible answers); (iii) attitudes towards persons with AIDS (two statements with two possible answers: "yes", "no"); (iv) sexual behaviour, with regard to condom use (one statement with three possible answers: "yes", "no", "sometimes") and number of sexual partners (one statement with three possible answers: "more than one", "one", "none").

In early 2004 preliminary work was done to select the sample. A pre-tested questionnaire was voluntary filled out by the students recruited after lectures by a purposive, theoretical quota sampling method [5]. The quota of students included in the study was selected based on availability for interviewing and on three other criteria: (i) gender (female); (ii) matriculation year (first year); (iii) discipline (Medicine, Economics, Engineering, Formation Science, and Law). Confidentiality and secrecy were assured by not asking any question regarding identity of the responding student. In total, 124 female medi-

cal freshmen, from 18 to 22 years of age (77.5% of all the female medical freshmen, mean age 20 years) and 142 female freshmen of other disciplines (Economics, Engineering, Formation Science, and Law), who were the same age, agreed to complete a copy of the self administered questionnaire. The questionnaire took about 10 minutes to complete the included questions.

Assessment of knowledge was made according to whether the answer was correct or incorrect. Non-response and "do not know" were categorized as incorrect. The data were analysed for the whole sample and for the two groups of students individually. Prevalence rates were calculated to quantify the answers and perform frequency tabulation. Differences between answers were tested using χ^2 test. A *P* value < 0.05 was considered to be significant.

Results

Data obtained from the questionnaire administered for the survey are shown in Table I. The overall knowledge of the participants about HIV infection revealed that only a few students (7.5%) knew the meaning of the "window period" and there were some misconceptions about the transmission of the infection, since a relatively large proportion of participants (20.7%) thought that only people with AIDS can transmit the virus, and that the infection can be transmitted also through kissing on the mouth (12.4%). Although a large proportion of students (88.7%) knew that unsafe sex is particularly dangerous, a relatively large proportion of them (30.8%) did not think that promiscuous sexual intercourse increases the risk of HIV infection. Moreover, some students (2.2%) considered the birth control pill to be sufficient protection against infection.

Questions about risk perception showed that many students (65.0%) thought they were at risk of HIV as anybody else. About half the sample (56.8%) stated they would trust in medical practitioners if they suspected they might have been infected with HIV, while a significant proportion (24.8%) said they would turn to a friend. Only relatively few students (38.7%) knew where they could have an HIV test and many of the participants (19.5%) did not know whether the test was completely confidential or not. Common sources of knowledge about HIV were magazines (78.2%) and television (65.4%).

Questions on sexual behaviour showed that the majority of the participants (62.8%) had already had sexual intercourse, about half of them (49.8%) with more than one partner. Moreover, condom use was stated by less than half the sample of the sexually active students (45.5%). Table I also shows the differences between medical and non medical students. The knowledge of the medical students about HIV is higher than that of the other students. In fact, a significant higher percentage understand the meaning of the acronym AIDS (98.4% compared to 74.0%; $\chi^2 = 29.687$, *p* = 0.000) and of HIV serological positivity (96.0% compared to 74.7%; $\chi^2 = 21.471$, *p* =

0.000), correctly believing that the infection is without symptoms for several years (89.5% compared to 72.5%; $\chi^2 = 11.081$, *p* = 0.000) and that it can be transmitted also when symptoms are not present (81.5% compared to 62.7%; $\chi^2 = 10.533$, *p* = 0.001). Moreover, medical students know well how (93.6% compared to 76.0%; $\chi^2 = 13.946$, *p* = 0.000) and where (46.0% compared to 32.4%; $\chi^2 = 4.584$, *p* = 0.032) it is possible to have an HIV test. Finally, a larger proportion of medical students are aware of being at risk of HIV as anybody else (72.6% compared to 58.5%; $\chi^2 = 5.207$, *p* = 0.022). Also questions on sexual behaviour showed some differences between the two groups. In fact, a lower proportion of medical freshmen had already had sexual intercourse (53.2% compared to 71.1%; $\chi^2 = 8.328$, *p* = 0.004), and a higher percentage of the sexually active medical students used a condom (60.0% compared to 36.6%; $\chi^2 = 7.237$, *p* = 0.007).

Discussion

Young people are especially vulnerable to HIV infection. This may be due to a variety of factors including: (i) low risk perception; (ii) less experience or assertiveness in sexual negotiation skills that may enable them to avoid unprotected sex, and (iii) the perception that AIDS is a disease affecting older people [1, 6-8].

Health promotion through information, communication and education is important as a major intervention in HIV infection prevention. In particular, sex education is the foremost weapon against the spread of HIV among young people. In fact, sex education seeks both to reduce the risks of potentially negative outcomes from sexual behaviour and to encourage young people to decide for themselves what the negative outcomes of sexual risk-taking behaviour are [9].

It has been noticed that more is needed to improve teenagers' access to, and use of, primary care sexual health services, while effective and appropriate sex education can be developed only if more is known about young people's sexuality and the points which they bring to the educators [10, 11]. In fact, the frequent over-emphasis on the negative aspects of sexually transmitted diseases may result in young people rejecting what adults say, seeking guidance and role models from television, magazines, books, as well as leaflets and websites. For this reason, they need to acquire the skills to be able to differentiate between accurate and inaccurate information. Also, teenagers' poor trust in adults to keep information confidential and the lack of adults' communication skills around sexual matters could be the most common reasons for the failure of educational programmes aimed at preventing HIV from spreading among young people. Peer education interventions that are concerned with personal relationships, feelings and values and that include information on sexual risk could be particularly successful since young people can easily have one-to-one discussions with their peers which focus on their sexual experiences and on the possibility of avoiding

Tab. I. Descriptive statistics for the questionnaire administered for the survey (*to be continued*).

Statement of questions	All students	Medical students	Non medical students	χ^2
1. Meaning of the acronym "AIDS"				
Correct	85.4%	98.4%	74.0%	p = 0.000
Incorrect	14.6%	1.6%	26.0%	
2. Knowledge of AIDS etiology				
Correct	99.3%	99.2%	99.3%	p = 0.538
Incorrect	0.7%	0.8%	0.7%	
3. Knowledge of AIDS etiopathogenesis				
Correct	95.5%	96.8%	94.4%	p = 0.517
Incorrect	4.5%	3.2%	5.6%	
4. Meaning of HIV serological positivity				
Correct	84.6%	96.0%	74.7%	p = 0.000
Incorrect	15.4%	4.0%	25.3%	
5. Believing that the infection is without symptoms for several years				
Correct	80.5%	89.5%	72.5%	p = 0.000
Incorrect	19.5%	10.5%	27.5%	
6. Meaning of "window period"				
Correct	7.5%	4.8%	9.9%	p = 0.188
Incorrect	92.5%	95.2%	90.1%	
7. Believing that AIDS is related to risky behaviour				
Correct	96.3%	98.4%	94.4%	p = 0.162
Incorrect	3.7%	1.6%	5.6%	
8. Risk perception				
Yes	82.0%	84.0%	80.3%	p = 0.549
No	18.0%	16.0%	19.7%	
9. Believing that the infection can be transmitted also when symptoms are not present				
Correct	79.3%	81.5%	62.7%	p = 0.001
Incorrect	20.7%	18.5%	37.3%	
10. Believing that the infection can be transmitted also through kissing on the mouth				
Correct	87.6%	90.3%	85.2%	p = 0.282
Incorrect	12.4%	9.7%	14.8%	
11. Believing that unsafe sex is particularly dangerous for HIV infection				
Correct	88.7%	91.1%	86.6%	p = 0.334
Incorrect	11.3%	8.9%	13.4%	
12. Believing that promiscuous sexual intercourse increases the risk of HIV infection				
Correct	69.2%	72.6%	66.2%	p = 0.321
Incorrect	30.8%	27.4%	33.8%	
13. Believing that sexual transmitted diseases increase the risk of HIV infection				
Correct	22.5%	24.2%	21.1%	p = 0.653
Incorrect	77.5%	75.8%	78.9%	
14. Believing that persons who do not have sexual intercourse are not at risk of HIV infection				
Correct	77.8%	78.2%	77.5%	p = 0.999
Incorrect	22.2%	21.8%	22.5%	
15. Believing that the use of condom is a sufficient protection against HIV infection				
Correct	91.4%	89.5%	93.0%	p = 0.437
Incorrect	8.6%	10.5%	7.0%	
16. Believing that the birth control pill is a sufficient protection against HIV infection				
Correct	97.8%	96.8%	98.6%	p = 0.561
Incorrect	2.2%	3.2%	1.4%	
17. How it is possible to have an HIV test				
Correct	84.2%	93.6%	76.0%	p = 0.000
Incorrect	15.8%	6.4%	24.0%	
18. Awareness of being at risk of HIV as anybody else				
Correct	65.0%	72.6%	58.5%	p = 0.022
Incorrect	35.0%	27.4%	41.5%	
19. Awareness of risks due to promiscuous sexual intercourse				
Correct	97.7%	99.2%	96.5%	p = 0.283
Incorrect	2.3%	0.8%	3.5%	

Tab. I. Descriptive statistics for the questionnaire administered for the survey (*continues*).

Statement of questions	All students	Medical students	Non medical students	χ^2
20. Awareness of the importance of being a faithful partner				
Correct	94.7%	96.8%	93.0%	p = 0.265
Incorrect	5.3%	3.2%	7.0%	
21. Trust in medical practitioners				
Yes	56.8%	57.2%	56.3%	p = 0.978
No	43.2%	42.8%	43.7%	
22. Where it is possible to have an HIV test				
Correct	38.7%	46.0%	32.4%	p = 0.032
Incorrect	61.3%	54.0%	67.6%	
23. Awareness of the confidentiality of the HIV test				
Correct	80.5%	83.9%	77.5%	p = 0.246
Incorrect	19.5%	16.1%	22.5%	
24. Have already met persons with HIV infection				
Yes	10.5%	9.7%	11.3%	p = 0.825
No	89.5%	90.3%	88.7%	
25. Have continue to go about with persons with HIV infection				
Yes	10.5%	9.7%	11.3%	p = 0.825
No	89.5%	90.3%	88.7%	
26. Had already had sexual intercourse				
Yes	62.8%	53.2%	71.1%	p = 0.004
No	37.2%	46.8%	28.9%	
27. Number of partners				
1 partner	50.2%	57.6%	45.5%	p = 0.173
> 1 partner	49.8%	42.4%	54.5%	
28. Use of condom among who had already had sexual intercourses				
Yes	45.5%	60.0%	36.6%	p = 0.007
No	54.5%	40.0%	63.4%	
29. Have already had an HIV test				
Yes	4.9%	4.0%	5.6%	p = 0.749
No	95.1%	96.0%	94.4%	
30. Sources of information about HIV infection				
Magazines	78.2%	87.1%	70.4%	p = 0.544
Television	65.4%	67.7%	63.4%	

infection [12]. On the contrary, while numerous studies have evaluated peer-led educational programmes on AIDS prevention among high risk populations (i.e., intravenous drug users and their partners, prostitutes) [13, 14] and gay men [15-17], the success of peer-led prevention programs within a young population is still controversial [18], mainly because the reported success was generally high only among the peer-leaders themselves, and the evidence of improvement among the target population was not so clear [19, 20].

A recently reported randomized controlled trial was aimed at evaluating the effectiveness of peer education when compared to teacher-led curricula in AIDS prevention programs conducted in schools in Rome [21]. The only apparent benefit of the peer-led intervention, compared to that led by teachers, was a greater improvement in knowledge of HIV. Neither of the interventions induced changes in sexual behaviour. Thus, peer-leader selection appears to be a crucial and delicate point in pursuing effectiveness in this kind of intervention, and there are many doubts as to the methods for selecting peer-leaders.

Even though the involvement of leaders different from the target population could compromise the recommended similarity between peers and target population [22, 23], we think that attempts should at least be made to increase the knowledge on the suitability of peer-led interventions for HIV prevention in young populations. For community-based trials, recruiting women in groups after lectures by female medical students has been proposed as an effective and cost-effective way [24]. To the best of our knowledge, no other surveys have studied the possibility of female medical student-based peer education on AIDS prevention. Our study suggests that female medical students may provide good opportunities for their peers to access advice and information about HIV infection in less formal ways, as they would be able to talk about their attitudes and views. Information obtained from the present survey provides evidence that, apart from some lack of basic knowledge regarding HIV infection, many negative attitudes and risk-taking behaviour are held by the majority of the non medical freshmen included in the sample. On the contrary, medical freshmen not only have greater and

more accurate knowledge about HIV infection, but are also more cautious in their sexual behaviours. The more adequate knowledge about various aspects of HIV infection showed by medical students is probably due to the fact that their interest in health sciences provides some increase in their understanding of the pathology although they haven't already had the possibility to study epidemiology and prevention of infectious diseases. Moreover, their interest in medical studies has probably great effect on their perceptions of HIV infection so that they are more receptive to available advice to avoid the infection.

Our data lead to the hypothesis that the involvement of these students in developing and providing safe sex

education may be an important and effective way of better enhancing young people's knowledge, attitudes and behaviour towards the prevention of HIV and other sexually transmitted infections, particularly HPV infections that frequently are acquired by adolescents following first intercourses. This is particularly true mainly because it has been shown that young people prefer to talk about sexual issues with female doctors [2]. Obviously sex education has to be sustained at university because peer education programmes have to provide training, support and supervision for peer educators, and include regular monitoring and evaluation, since basic training provides the foundation on which more complex knowledge is built up over time.

References

- [1] Hillier L, Harrison L, Warr D. "When you carry condoms all the boys think you want it": negotiating competing discourses about safe sex. *J Adolesc* 1998;21:15-29.
- [2] Nwokolo N, McOwan A, Hennebry G, Chislett L, Mandalia S. Young people's views on provision of sexual health services. *Sex Transm Infect* 2002;78:342-5.
- [3] Aggarwal O, Sharma AK, Chhabra P. Study in sexuality of medical college students in India. *J Adolesc Health* 2000;26:226-9.
- [4] Fayers T, Crowley T, Jenkins JM, Cahill DJ. Medical student awareness of sexual health is poor. *Int J STD AIDS* 2003;14:386-9.
- [5] Fabbris L. *L'indagine campionaria. Metodi, disegni e tecniche di campionamento*. Roma: La Nuova Italia Scientifica 1989, p. 83-4.
- [6] Ellen JM, Adler N, Gurvey JE, Millstein SG, Tschann J. Adolescent condom use and perceptions of risk for sexually transmitted diseases: a prospective study. *Sex Transm Dis* 2002;29:756-62.
- [7] Warr DJ. The importance of love and understanding: speculation on romance in safe sex health promotion. *Womens Stud Int Forum* 2001;24:241-52.
- [8] Yarnall KS, McBride CM, Lyna P, Fish LJ, Grothaus MA, Scholes D. Factors associated with condom use among at-risk women students and non students seen in managed care. *Prev Med* 2003;37:163-70.
- [9] Agha S, Van Rossem R. Impact of a school-based peer sexual health intervention on normative beliefs, risk perceptions, and sexual behaviour of Zambian adolescents. *J Adolesc Health* 2004;34:441-52.
- [10] Burack R. Young teenagers' attitudes towards general practitioners and their provision of sexual health care. *Br J Gen Pract* 2000;50:550-4.
- [11] Donovan C, Mellanby AR, Jacobson LD, Taylor B, Tripp JH. Teenagers' views on the general practice consultation and provision of contraception. *The Adolescent Working Group*. *Br J Gen Pract* 1997;47:715-8.
- [12] Caron F, Godin G, Otis J, Lambert LD. Evaluation of a theoretically based AIDS/STD peer education program on postponing sexual intercourse and on condom use among adolescents attending high school. *Health Educ Res* 2004;19:185-97.
- [13] Centers for Disease Control and Prevention. *Community-level prevention of human immunodeficiency virus infection among high-risk populations: the AIDS Community Demonstration Projects*. *MMWR* 1996;45:1-16.
- [14] CDC AIDS Community Demonstration Projects Research Group. *Community-Level HIV Intervention in 5 cities: final outcome data from the CDC AIDS Community Demonstration Projects*. *Am J Public Health* 1999;89:336-45.
- [15] Kelly JA, St. Lawrence JS, Diaz YE, Stevenson LY, Hauth AC, Brasfield TL, et al. HIV risk behaviour reduction following intervention with key opinion leaders of population: an experimental analysis. *Am J Public Health* 1991;81:168-71.
- [16] Kelly JA, St. Lawrence JS, Stevenson LY, Hauth AK, Kalichman SC, Diaz YE, et al. Community AIDS/ HIV risk reduction: the effects of endorsements by popular people in three cities. *Am J Public Health* 1992;82:1483-9.
- [17] Kelly JA, Murphy DA, Sikkema KJ, McAuliffe TL, Roffman RA, Solomon LJ, et al. Randomised, controlled, community-level HIV-prevention intervention for sexual-risk behaviour among homosexual men in US cities. *Lancet* 1997;350:1500-5.
- [18] Kirby D, Korpi M, Adivi C, Weissman J. An impact evaluation of project SNAPP: an AIDS and pregnancy prevention middle school program. *AIDS Educ Prevent* 1997;9(Suppl A):44-61.
- [19] Smith MU, Dane FC, Archer ME, Devereaux RS, Katner HP. Students Together Against Negative Decisions (STAND): evaluation of a school-based sexual risk reduction intervention in the rural south. *AIDS Educ Prevent* 2000;12:49-70.
- [20] Smith MU, Di Clemente RJ. STAND: a peer educator training curriculum for sexual risk reduction in the rural south. *Prev Med* 2000;30:441-9.
- [21] Borgia P, Marinacci C, Schifano P, Perucci CA. Is peer education the best approach for HIV prevention in schools? Findings from a randomized controlled trial. *J Adolesc Health* 2005;36:508-16.
- [22] Reeder GD, Pryor JB, Harsh L. Activity and similarity on safe sex workshops led by peer educators. *AIDS Educ Prev* 1997;9:77-89.
- [23] Strange V, Forrest S, Oakley A, RIPPLE Study Team. Randomized Intervention of PuPIL-Led sex Education. Peer-led sex education-characteristics of peer educators and their perceptions of the impact on them of participation in a peer education programme. *Health Educ Res* 2002;17:327-37.
- [24] Ivaz S, Brennan S, Dean S, Hay S, Hay P, Kerry S, et al. Lessons learned from recruiting young female students to a randomised controlled trial of Chlamydia screening. *Fam Pract* 2006;23:188-91.

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