

Knowledge of HIV infection and transmission: a knowledge, attitudes, beliefs and practices (KABP) survey among a sample of students at the “Magna Graecia”, University of Catanzaro

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Abstract

Background. Continuous spreading of HIV infection may be due to lack of knowledge, especially among young people. It is important to monitor level of knowledge and risk behaviours especially in young people to set up appropriate preventative and informative campaigns.

Methods. We assessed knowledge of HIV infection and risk factors in a sample of students at the “Magna Graecia” University of Catanzaro, using an anonymous multiple-choice questionnaire.

Results. Two-hundred and sixteen medical students attending the first year at “Magna Graecia” University (age: 18-20 years) were prescribed an anonymous multiple-choice questionnaire. Knowledge of HIV infection was scarce in a significant percentage of students. They were often practicing risk behaviours at risk for acquisition of HIV infection and other sexually transmitted infections.

Conclusion. This study shows that preventative and informative campaigns are urgently needed in earlier stage of adolescence to avoid acquisition of HIV infection and other sexually transmitted diseases.

Key words

- HIV infection
- students
- knowledge
- behaviour

INTRODUCTION

According to current estimates, 110 000-150 000 HIV infected people will live in Italy in 2020 [1]. Almost 25% of infected people are unaware of their infection status [2]. As a result, a large proportion of HIV infected patients are not prescribed combination antiretroviral therapy (cART), contributing to the spreading of the infection, substantially. Such a phenomenon is largely due to a scant knowledge of the modes of transmission of HIV, mainly because of lack of informative campaigns and an appropriate sex education. Lowering age of the sexual debut, which takes place in a period

of incomplete psychosexual development, increases the risk of acquiring HIV. Importantly, among people screened for sexually transmitted diseases with a new HIV diagnosis in the Italian surveillance system, percentage of patients whose age was between 15 and 24 years was 14.6% compared to 5.5% for the old diagnoses [3]. These data suggest that interventions to prevent spreading of HIV infection are urgently required among young people. Since 2012, a significant increase in the number of HIV diagnoses was reported in the Calabria region, accounting for an incidence rate of 24 cases per 100 000 inhabitants [4]. This is likely to be an underesti-

mated phenomenon since more than 500 HIV infected patients are currently followed-up [5].

There are no up-to-date data regarding knowledge or risky sexual behaviours among youths in the Calabria region. So we decided to evaluate the level of knowledge and practice of risky behaviours in a student population at the University "Magna Graecia" in Catanzaro (Southern Italy). This study, which represents by itself a prevention intervention, aimed at evaluating the need of preventative campaigns.

POPULATION AND METHODS

A descriptive study was conducted using a questionnaire on knowledge, attitude, beliefs and prevention (KABP), administered to students who were asked to indicate only their gender for the sake of anonymity reasons. Date of birth was not asked to guarantee anonymity, but all students had an age of 18 to 20 years. The questionnaire was distributed by members of the Italian Secretariat of Students of Medicine (SISM) Association to students attending the first year of the Medical School. This was implemented as a peer intervention to obtain reliable representation of knowledge and risky behaviours at the end of the Secondary School.

The questionnaire, composed by ten multiple-choice questions with true/false answers (Table 1), was distributed in a University classroom, during normal class hours, without advance notice, according to the following plan: counting students, registration of the number of students who accepted to fill in the questionnaire, registration of the number of questionnaires distributed, registration of the number of questionnaires handed in.

A statistical analysis was performed to test for statistically significant differences between male and female students ($p < 0.05$, Yates correction).

RESULTS

Among 218 administered questionnaires, two were not got back. So, sample comprised 216 medical students in total (100 males, 110 females and 6 who did not specify their gender).

Overall, 7.4% of students thought that they had an insufficient knowledge about AIDS and HIV infection and only 7.9% believed that they had an excellent knowledge. Among the remaining students, 40.3% responded that they had a good knowledge, 41.5% moderate, and 2.8% did not answer. No statistically significant differences were observed for the level of knowledge between males and females.

Although comparison between gender groups did not provide statistically significant results, many students demonstrated to have misleading information on risk behaviours (Figure 1.A). Overall, depending on risk factors, only 1 to 6 males and 2 to 6 females did not answer. Among those who responded, overall 18.7% mistakenly believed that kissing constitutes a risk for HIV transmission. Moreover, 22.3% students considered reciprocal masturbation to be a risk for acquisition of HIV infection. Regarding oral sex, 62.1% students thought that "receiving oral sex" (passive role) is a risk, while only 67.7% of them thought that "practicing oral sex" (active role) is a risk. With regard to penetration

Table 1
Questionnaire used for the survey

1. What knowledge do you believe you have on the issue of AIDS/HIV?

- a) Excellent
- b) Good
- c) Moderate
- d) Insufficient
- e) No answer

2. What behaviour is a risk of HIV infection?

- a) Receive in anal sex
- b) Receive in vaginal sex
- c) Kissing
- d) Reciprocal masturbation
- e) Receive in oral sex
- f) Penetrate in vaginal sex
- g) Practice oral sex
- h) Penetrate in anal sex

3. Which body fluids do you believe are capable of transmitting HIV?

- a) Urine
- b) Sweat
- c) Saliva
- d) Vaginal secretions
- e) Sperm
- f) Blood

4. When do you use a condom?

- a) Always
- b) Never
- c) Sporadically in occasional sex
- d) Always in occasional sex
- e) No answer

5. If your partner asks you to avoid condom, how do you behave?

- a) Refuse
- b) Accept
- c) Accept, depending on the situation
- d) No answer

6. What do you consider a sexual encounter at risk, during which you would always use a condom?

- a) With each new partner whose HIV status is unknown
- b) With each occasional partner whose HIV status is unknown
- c) With a migrant
- d) With a drug addicted or ex drug addicted
- e) With a homosexual/bisexual
- f) With someone ill or just discharged from hospital

7. Whom would you advise to take the test?

- a) All the sexual active population
- b) Those who have behaviour at risk
- c) Those in a stable relationship
- d) Those who live in contact with an HIV positive person
- e) No one
- f) No answer

8. Why do you use a condom?

- a) To avoid pregnancy
- b) To avoid HIV
- c) To prevent sexually transmitted diseases
- d) I do not use condom
- e) No answer

9. Can a person who looks healthy have HIV?

- a) Yes
- b) No

10. If a condom tears during sex with an HIV-positive partner, is there a pharmaceutical treatment that you can undertake which significantly reduces the possibility of contagion?

- a) Yes
- b) No

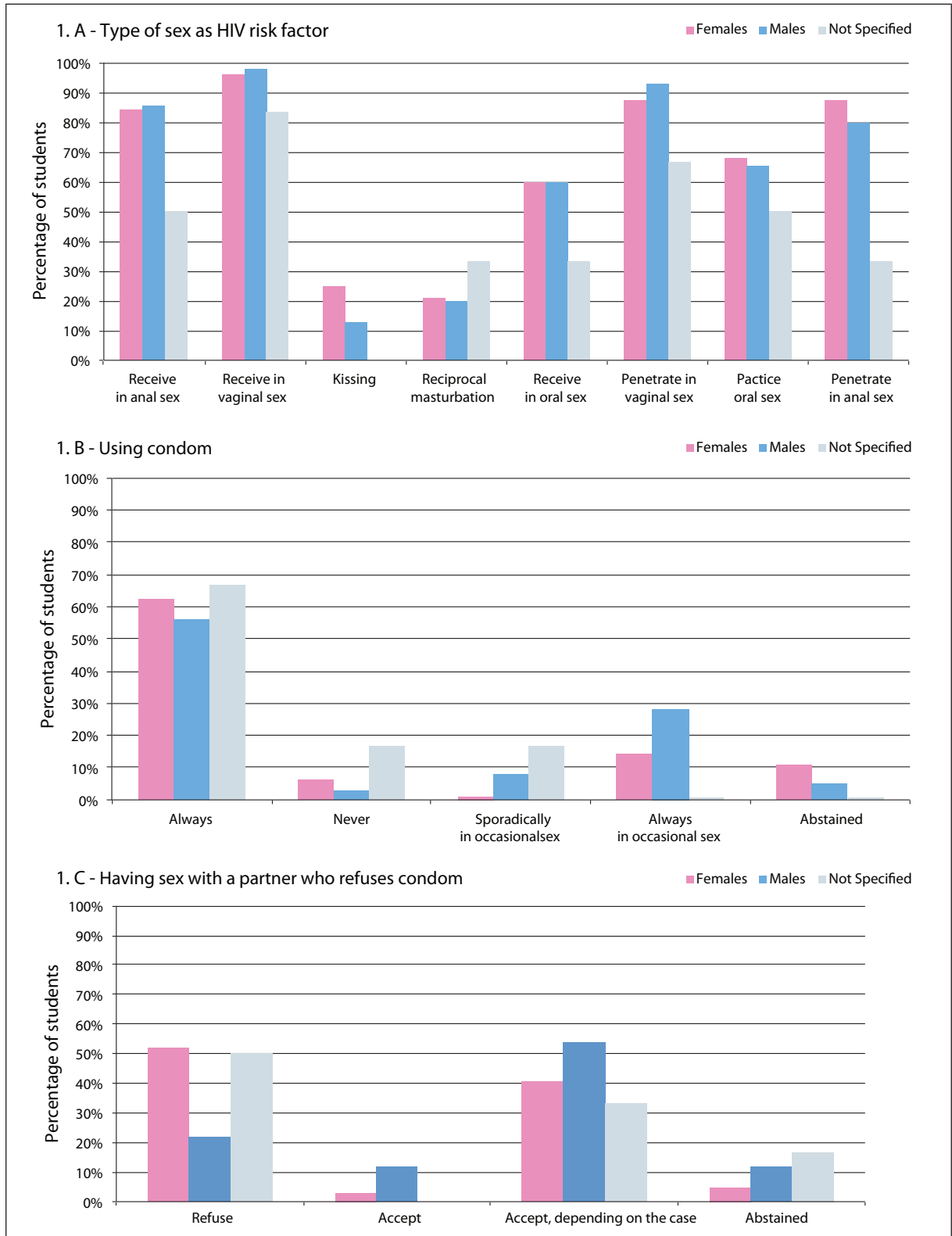


Figure 1 Knowledge of risk associated with type of sexual intercourse (1.A) and use of condom (1.B and 1.C). 1.A Answers to question n. 2 (Which of the following behaviours is a risk for HIV transmission?) Percentages are calculated without students who did not answer (1 m, 3 f, 1 person who did not specify his/her gender). 1.B Answers to question n. 4 (When do you use condom?). 1.C Answers to question n. 5 (If your partner asks you to avoid condom, how do you react?).

both in anal sex and vaginal sex, we found that 89.5% and 90.6% students believed that these constitute a risk for HIV acquisition.

For answers to question n. 3, 28.4%, 23% and 13.6% students thought that urine, saliva and sweat, respectively, could transmit HIV. Percentages rose for vaginal secretion (85.3%) and sperm (86.5%). With regard to blood, only 95.2% students thought that it could transmit HIV. No statistically significant differences between males and females were found except for vaginal secretion (75.7% males vs 94.4% females; $p = 0.03$) and sperm (78.8% males vs 93.5% females; $p = 0.003$).

For using condom (question n. 4), only 62% students declared to use it "always", 4.6% "never", 5.1% "sporadically in occasional sex", 19.5% "always in occasional sex", and 7.9% students did not answer. As shown in *Figure 1.B*, males used condom "always in occasional sex" more than females (28% males vs 14.5% females; $p = 0.008$). Moreover, males declared to use "sporadically" condom more frequently than females (8% males vs 0.9% females; $p = 0.03$). Importantly, even if the difference was not statistically significant, 3% males and 6.4% females declared they were "never" using condoms.

For question n. 5, only 37.9% students would "refuse" sexual intercourse if a partner does not accept condom, while 46.8% students would "accept, depending on the situation", 6.9% would "accept anyway", and 7.8% students did not answer. A statistically significant difference between males (22%) and females (51.8%) was observed in "refusing sex" if partner asks not to use condom ($p < 0.001$; *Figure 1.C*). Furthermore, 20% males vs 2.7% females would "accept anyway" ($p = 0.02$).

For question n. 6 (*Figure 2.A*), more than 80% students responded that all the listed sexual behaviours were "at risk". All females considered any of the following behaviours are at risk: having sex with "each new partner whose HIV status is unknown", having sex "each occasional partner whose HIV status is unknown" and having sex with "a drug addicted or ex-drug addicted" individual. Percentages of females for the other answers were also high: 98.1% for "sex with migrants", 97.2% for "sex with a homosexual/bisexual person" and 95.3% with a person "just discharged from hospital". In the male group, percentages were lower but always more than 90%. No statistically significant differences were found between males and females.

In response to question n. 7 also, no statistically significant differences were found between males and females (*Figure 2.B*). Overall 60% medical students would advise "all the sexually active population" to be tested for HIV and 29.7% would advise "those who have behaviours at risk" to be tested. Only 0.5% students would suggest to "those with a stable relationship" to be tested.

In answer to question n. 8 (*Figure 2.C*), the only statistically significant difference between males and females was found when reason to use condom was HIV prevention (17% males vs 29.1% females; $p = 0.03$). Overall, 56.5% students declared that they used condoms "to prevent pregnancy", 49.5% of them declared to use condoms "to prevent sexually transmitted diseases", while 10.6% students did not answer.

In response to question n. 9, 100% females answered

that a person with HIV infection can appear "healthy", while only 50% males gave the same answer ($p < 0.001$). Lastly, in answering to question n. 10, overall only 43% students were aware of treatment to prevent infection in case of a risk (so called "post-exposure prophylaxis"), without a statistically significant difference between male and female genders.

DISCUSSION

Our results demonstrate that knowledge of the interviewed students about HIV is scarce and that they practice risk behaviours very frequently. Moreover, we found that cultural background on sexually transmitted diseases is poor in general. For example, not only 1:2 students used condoms to prevent sexually transmitted diseases but also percentage was lower (1:4) for HIV prevention. This clearly indicates that many students did not know that HIV is a sexually transmitted disease. Regarding the availability of treatment for HIV infection, students were unaware of post-exposure prophylaxis to reduce the risk of acquiring HIV in case of a significant risk factor.

Overall, these results are alarming. Indeed, among people aged between 25-29 years, the risk of acquiring HIV is estimated to be 15.6 per 100 000 inhabitants while it is far lower in the general population (6.1 per 100 000 inhabitants) [4]. The fact that these cases may be prevented if informative and preventative campaigns are implemented clearly makes our results important for public health policies. Even more alarming is the fact that our sample included students whose age was higher than that of the sexual debut [6], putting them at risk for quite a long period without providing the necessary information for prevention and early diagnosis. For these reasons we think that preventative campaigns should be more suitably placed in earlier periods of life (starting from primary and secondary schools).

Several factors may influence the underestimation of HIV as a public health issue nowadays. With the advent of effective, simple and well tolerable combination antiretroviral therapies (cART), HIV is not perceived to be a relevant problem anymore, so the importance of this condition is mistakenly underestimated. In addition, cultural and economic constraints may have further limited the implementation of effective campaigns to inform populations at risk. The most dramatic consequence is that the expected benefits of early treatment leading to prevention of HIV transmission [7] are severely hampered.

For the reasons above, training of specialized professionals is necessary, especially including young people, who can then play an active role in raising awareness and spreading of knowledge (*i.e.*, peer-education strategies). Furthermore, it is necessary to perform periodic surveys in order to monitor the level of knowledge and risk behaviours. These surveys may also help to raise attention of the interviewed populations, acting as preventative intervention by themselves. With this objective in mind, we discussed with students their answers and distributed informative materials in a dedicated meeting afterwards. Level of knowledge and risk behaviours were also studied in a parallel group of 50 Law stu-

**Figure 2**

Perceiving risk associated with characteristics of the partner (2.A) testing (2.B) and objective of using condom (2.C). 2.A Answers to question n. 6 (*What do you consider a sexual encounter at risk, during which you would always use a condom?*). Percentages are calculated without students who did not answer (7 m, 2 f). 2.B Answers to question n. 7 (*Whom would you advise to take the HIV test?*). 2.C Answers to question n. 8 (*Why do you use condom?*).

dents. Interestingly, notwithstanding the fact that this small group included students who were older (4-5 year gap) than those belonging to the medical group, level of knowledge was insufficient (data not shown) and about 1:10 Law students did never use condom. Hence, lack of information acquired at sexual debuts did not appear to be amendable as time goes by. The possible effects of our intervention on knowledge and risk behaviours merit to be studied with follow-up questionnaires.

Female students performed better than males at some questions, demonstrating higher levels of knowledge (ability of vaginal secretions and sperm to transmit HIV and possible HIV infection in apparently healthy individuals) and attitude towards safer behaviours (better contractual abilities in using condom). It is difficult to interpret this finding but it may be hypothesized that maternity interest makes women more informed and careful. Alternatively, female students may have overestimated their knowledge and ability to abstain from sex without condom, while males considered having sex a more important value than risk prevention for a clearer demonstration of masculinity. Further psycho-social and behavioural researches are needed to confirm our hypothesis.

Our study is affected by several drawbacks. The number of students is limited and only those who were present (52.5% students attending the first year) were interviewed. Moreover, even if anonymity was guaranteed, the proximity in which questionnaires were administered could have influenced students in answering to the questions.

In conclusion this study demonstrates that is urgent to perform educational programs for prevention of sexually transmitted diseases (including HIV infection) especially in the early adolescence. This must be considered as a real public health priority.

REFERENCES

1. Camoni L, Regine V, Stanecki K, Salfa MC, Raimondo M, Suligoi B. Estimates of the number of people living with HIV in Italy. *Biomed Res Int* 2014;209619. DOI: 10.1155/2014/209619
2. Hamers FF, Phillips AN. Diagnosed and undiagnosed HIV-infected populations in Europe. *HIV Med* 2008;9(Suppl. 2):6-12. DOI: 10.1111/j.1468-1293.2008.00584.x.Review
3. Le Infezioni Sessualmente Trasmesse: aggiornamento dei dati dei due Sistemi di Sorveglianza sentinella attivi in Italia al 31 dicembre 2013. *Not Ist Super Sanità* 2015;28(2). Available from: www.iss.it/binary/ccoa/cont/Notiziario_IST_febbraio_2015_dati_2013_.pdf.
4. Aggiornamento delle nuove diagnosi di infezione da HIV e dei casi di AIDS in Italia al 31 Dicembre 2014. *Not Ist Super Sanità* 2015;28(2). Available from: www.iss.it/binary/ccoa/cont/HIV_AIDS_DIC_2015.pdf.
5. Postorino MC, Luciani F, Mangano C, Carpentieri MS, Scerbo P, Priamo A, Berardelli G, Marino R, Vallone A, Serrao N, Pisani V, Costa C, Terremoto A, Foti G, Cosco L, Calderazzo M, Corigliano D, Scordo P, Strazzulla A, Torti C; CalabHIV Study Group. Demographical, viro-immunological, clinical and therapeutical characteristics of HIV infected patients in an "Epidemiologically unexplored" region of Italy (Calabria Region): the CalabrHIV Cohort. *Mediterr J Hematol Infect Dis* 2015;7(1):e2015054. DOI: 10.4084/MJHID.2015.054
6. Grunbaum JA, Kann L, Kinchen SA, William B, Ross JG, Lowry R, Kolbe L. Youth risk behaviour surveillance-United States, 2001. *MMWR Surveill Summ* 2002;51(4):1-62.
7. Williams B, Wood R, Dukay V, Delva W, Ginsburg D, Hargrove J, Stander M, Sheneberger R, Montaner J, Welte A. Treatment as prevention: preparing the way. *J Int AIDS Soc* 2011;14(Suppl. 1):S6. DOI: 10.1186/1758-2652-14-S1-S6

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Conflict of interest statement

There are no potential conflicts of interest or any financial or personal relationships with other people or organizations that could inappropriately bias conduct and findings of this study.

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