

The project “D.E.A.Th. by Eros to Thanatos AIDS and Sexually Transmitted Diseases”. A multimedia exhibition as a means of prevention of sexually transmitted infections

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Abstract

Background: An educational intervention on Sexually Transmitted Diseases (STDs) accompanied by a multimedia exhibition was proposed in order to verify the effectiveness of an exhibition as a tool for prevention, to increase awareness in youth and to evaluate whether it yielded changes in the sexual behaviour of its' visitors. The Target population were high schools and university students.

Methods: The Exhibition consisted of a historical overview and four other sections: biological and clinical aspects, epidemiology, prevention and a section called the Red Zone with clear and explicit images relating to STDs. The exhibition was supported by three observational studies carried out on about 2000 students of two High Schools and the university in the city of Cassino, Italy. Data collection took place through three different types of “ad hoc” questionnaires. The Statistical analysis carried out was that typical of cross-sectional surveys. We utilized the statistical program Epi-Info 3.5.

Results: Regarding survey 1, 48% of 529 students taking part said that the exhibition had contributed “enough” for them to acquire new knowledge, 75.2% had already had sexual intercourse and 37.7% of them did not change their sexual habits. Relative to survey 2, 583 responded to the pre test and 403 post-tests returned. Regarding knowledge, data obtained from processing of pre-tests showed how 63.9% of the sample did not know how many STDs existed, whilst this value dropped in post test answers to 49.2%. AIDS was the best known disease (96%) whilst other STDs were little known. The educational intervention partly increased these percentages. With regard to sexual practices although 43% of the sample claimed to have already had sexual intercourse (66% male and 34% female). The family doctor is seen by a high percentage of young people (70% - 68.6%) as the first figure which should address an individual affected by a sexually contracted disease. Only 46% (pre and post tests) recognized at risk groups such as “drug addicts”, homosexuals and heterosexuals.

Eight hundred university students participated in Survey 3. The sample had good knowledge about HIV transmission and the AIDS disease and 93% of respondents knew how to avoid infection. They identified drug users and homosexuals as the most prone to infection to HIV, while awareness of infection risk among heterosexuals was less marked. Despite its importance, awareness of condom use was worrying as only 44.2% reported to always one.

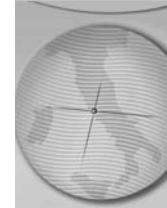
Conclusions: The exhibition can be considered as an effective prevention tool for new knowledge acquisition but not for the modification of behaviours already present. Even in this study, it looks like the long-term effects, in populations who have had health education interventions with the models of behavioural change, are not sufficiently protective. Therefore, it is necessary to intensify efforts to broadly apply the most effective models of self empowerment in order to change risk behaviours.

Key words: sexually transmitted infections, youth, prevention

Background

The incidence of Sexually Transmitted Infections (STIs) in the world is in continuous increase with more than 340 million new cases caused by more

than 30 bacterial, viral and parasitic pathogens occurring throughout the world every year in men and women aged 15–49 years and affecting at least 111 million young people under 25 years of age



[1,2]. STIs are a major global cause of acute illness, infertility, long term disability and death, with severe medical and psychological consequences for millions of men, women and infants [3].

In early 2000, following the unexpected increase registered in Europe, where STIs had seemed under control, the European Center for Disease Prevention and Control (ECDC) considered the fight against STIs as an absolute priority of public health and they recommended all the European Union countries to improve epidemiological surveillance systems. Furthermore, in Italy, where these data were never collected and analyzed in a systematic way previously, an epidemiological surveillance programme to monitor infection by *C. trachomatis*, *N. gonorrhoeae* and *T. vaginalis* was started. The first results observed, in particular, that *C. trachomatis* prevalence was significantly higher in subjects aged between 14 and 24 [4-8]. Cognitive processes characterizing adolescence make youth certain about having complete control of their actions though, at the same time, makes them inadequately able to assess risk [9]. Sexual activity onset coincides with adolescence and is consequently a crucial moment for the possible negative consequences of unprotected sex. One can definitely say that the adoption of "incorrect" sexual habits (lower age of first sexual intercourse, increased sexual promiscuity, sex tourism) are considered the main causes of STI [10,11].

Considering prevention campaigns conducted against the spread of AIDS and other STDs, we found some elements of light but also some shadows. In particular, repression, prohibition and deterrence have proven to be unable to eradicate these problems, but rather to contain this widespread "social evil", especially among the youth population. Certainly the complexity of the problem today is such that it is very difficult to identify a single type of adequate and effective prevention [12,13]. We believe that a wrong approach to information might make the fight against AIDS and sexually transmitted infections not totally satisfactory, until now. Primary prevention in schools and prevention campaigns conducted through the media, highlight the emotional and moral problems and principally appeal to "positive" values, with the aim of promoting the "beauty" of life [14,15]. By connoting messages in a moralistic way, however, this method risks to contact only those people who recognize the ethical code transmitted, thus excluding subjects most at risk: young people with problems of social identification and adaptation. Primary prevention interventions are unfortunately difficult to apply, unless any risk behaviour is eliminated and

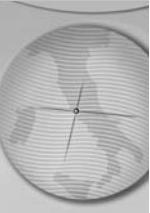
therefore there's a need for additional methods for the design of preventive actions and an implementation and evaluation of eventual results. The degree of targeting aims is a key element in determining the ability to achieve results [16,17]. Moreover, information on how transmission occurs and the characteristics of different diseases is rather lacking. This knowledge, so important for prevention, for a mature and free awareness of young people faced with this problem, is often spread in a distorted and instrumental fashion by those who know these issues in an inaccurate way. Education should cover the nature of the infection and on the risk reduction of the consequences of STIs to prevent both transmission to others and acquisition of future infections [18].

Sending clear messages to adolescents about STDs and their consequences has been the basis of research conducted between 2003 and 2008 by the Research Center for the Dissemination of Scientific Culture and Education to Health (CRDCS) through a project funded by the National Institute of Health which has proposed the implementation of a series of educational interventions on STDs accompanied by a multimedia exhibition. Entitled "DEATH. From Eros to Thanatos. AIDS and Sexually Transmitted Diseases" the project aimed to verify the effectiveness of an exhibition as a tool for prevention of STDs and to evaluate a person's understanding, language and content of this issue, to increase knowledge in young people about how transmission of several venereal diseases and HIV infection occurs and, finally, to measure whether it yielded changes in the sexual behaviour of its visitors. The Target population was represented by high schools and university students.

Methods

The project was developed in stages through various educational and informational tools at different times and involved teachers, students and parents.

The first phase saw the involvement of teachers with a training course explaining elements of sex education. Protagonists of the second phase were students; after presenting them the general outline of the project they collected anonymous questions from themselves. Meetings sought to help girls and boys to identify their sexuality and to better understand what were correct attitudes and lifestyles. A workshop on Sexuality Education, finally, allowed students through a series of expressive activities and simulations, to free their imagination, curiosities, doubts and to promote the attitude that feeling good with yourself means being well with others. Parents were invited to attend a



series of mini-conferences on the subject. On their conclusion, a small, clear and concise booklet, intended to provide useful easy to use guidance, was distributed. This allowed students to "track" specific meetings in order to help them remember the topics discussed. The last phase of project was the creation of an educational-informational display, culminating with a lecture on prevention, based on scientific information. With effective images and simple understandable language historical, medical and epidemiological issues of sexually transmitted diseases were presented, focusing on one important aspect: AIDS and STDs are preventable if you have proper behaviour.

The visit to the exhibition was supported by observational studies that assessed the levels of knowledge and risk perception about AIDS and HIV infection among high school and university students of Cassino city, Italy. The methodology adopted in carrying out diverse research will be described in a later section.

Statistical Methods

Data collection took place through three different types of "ad hoc" questionnaires on the basis of several investigations and standardized through small pilot studies conducted on small parts of samples. The administration involved CRDCS specially trained staff.

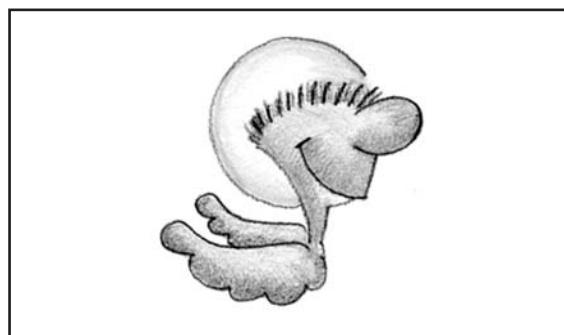
Statistical analysis was that typical of a cross-sectional survey. We assessed prevalence of variables related to the opinions, attitudes and knowledge about sex education and sexually transmitted diseases through the administration of anonymous questionnaires with multiple responses. Differences between groups were tested by χ^2 and *t Student* test for categorical and quantitative variables respectively. Multiple logistic regression analysis evaluated the influence on the dependent variables: knowledge, attitudes and behaviours regarding sexuality, of different explanatory variables, including socio-demographic ones. We utilized the Epi-Info 3.5 statistical program.

The exhibition "D.E.A.Th. From Eros to Thanatos AIDS and Sexually Transmitted Diseases "

Title "DEATH. From Eros to Thanatos" was chosen to indicate that sexual behaviour without vigilance can have very serious consequences. In order to make the visit more amusing and more casual, a character, Mikelangelo (for friends Mike), like a guardian angel and a virtual guide for visitors, was created (Figure 1).

The Exhibition began with a brief historical overview indicating how STIs have accompanied

Figure 1. Mikelangelo, guardian angel and virtual guide of the exhibition (designed by Lugli R.).



humans since their appearance on earth. Each disease, its origin and its historical evolution were then outlined as well as information on methods of contraception.

The Exhibition consisted of four categories:

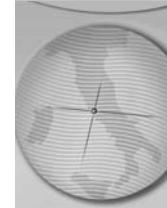
- Biology and clinical Aspects
- Epidemiology
- Prevention
- Red zone

The section on BIOLOGY AND CLINICAL Aspects outlined characteristics of pathogens responsible for major STDs and the case histories correlates, highlighting the need to consider them very seriously, as these cause serious health consequences. The results of infection, from the acute symptoms to chronic infection, and serious delayed consequences such as infertility, ectopic pregnancy, cervical cancer, and the untimely death of infants and adults, was shown. How the presence of other STDs in a person, such as syphilis, cancroids ulcers or genital herpes simplex virus infection greatly increases risk of acquiring or transmitting HIV [1] was also communicated.

To understand new terms, visitors were suggested to consult the available glossary or, alternatively, ask for an explanation to exhibition guides.

In the EPIDEMIOLOGY section, distribution and frequency of both HIV/AIDS and major STDs in Italy, Europe and in the world were shown, highlighting their health and economic burden.

The section devoted to PREVENTION stems from a series of investigations previously undertaken by the Chair of Hygiene, which explored knowledge, attitudes and behaviour toward these illnesses and involved university students and high schools in the Catchment Area of the University and of other national universities [19]. The results of these investigations revealed that most young people knew the epidemiological characteristics and transmission of HIV, whilst relatively ignoring or underestimating classic venereal and emerging diseases such as Hepatitis B, genital Condyloma,



and Chlamydia. The objective driving this section was therefore the need for correct provision of information necessary for the prevention of all sexually transmitted diseases. We tried to illustrate some key aspects such the importance of being faithful with one's partner, the risks associated with casual sex, but also the importance of condom use and the risk posed by drug use. Furthermore, the HIV test was described in detail and participants were informed about the major national and international websites on which to explore these topics.

The Fourth section, called the RED ZONE, represented a very sensitive area of the exhibition and included clear, explicit and strong images on the consequences of STDs, and was visited only by those who requested it.

There were three Investigations related to the project that accompanied the exhibition, as follows.

Survey 1: Information for Prevention! A Multimedia Exhibition as a means of prevention of sexually transmitted diseases in a sample of high school students

Objective

The first survey sought to assess both the understanding of the exhibition and to verify whether there had been changes in behaviour.

Methods

For data collection, an anonymous questionnaire consisting of 14 closed questions with answers that required the expression of an opinion on a scale of values from 0 to 4 (0 = off, 1 = little, 2 = somewhat, 3 = very, 4 = very much), or no, I do not know), was administered to students of two High Schools (one focusing on humanities and one focusing on sciences) in the city of Cassino (FR). It was administered a few weeks after the visit to the exhibition, to allow students to internalize the new knowledge and / or modify existing ones.

Results

529 students entered the study, mainly women (64.6%), attending two types of High School one focusing on humanities (61.5%) and the other on sciences (38.5%), with a mean age of 16.2 ± 2.7 Sd.

Regarding the role of the exhibition as a provider of new knowledge on the topic of STDs, referring to the scale of values proposed in the questionnaire, 48% said that the exhibition contributed "enough" to acquire new knowledge, especially those on STDs first ignored by boys such as the risks resulting from inappropriate behaviour and the means for preventing them. No statistically significant differences neither between two different High schools nor between gender were observed. When asked to judge the capability of the exhibition to explain STD themes, for 4.2% of boys the language used was too technical and scientific, while for 31.9% the terms used were already part of their vocabulary. For the majority of the sample, understanding the issues was easy (82.4%). The section they suggested to most focus on was Prevention (55%).

75.2% of adolescents surveyed had already had sexual intercourse and 37.7% of them did not change their sexual habits at all whilst 25.4% altered it enough, 24.4% a little, 10.3% very and only 2.3% of the sample very much. Stratification by sex and age, on modification of sexual behaviour, showed statistically significant gender differences (Table 1). The images enclosed in the "red zone" were considered useful for prevention by 8.3% of the sample.

Survey 2: From Eros to Thanatos, AIDS and Sexually Transmitted Diseases. Evaluating the effectiveness of an educational intervention on AIDS and STDs in a sample of high school students of Cassino

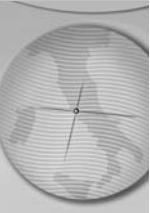
Objective

In order to evaluate the effectiveness of an

Table 1. Stratification by sex and age for the sexual behaviour modification of respondents.

Males	14 years	15 years	16 years	17 years	18 years	Females	14 years	15 years	16 years	17 years	18 years
0= nothing	13.3%	52.4%	30.3%	29.4%	29.4%	0= nothing	41.4%	41.1%	40.5%	35.7%	37.5%
1 = little	20 %	23.8%	30.3%	35.4%	20.6%	1 = little	17.2%	15.1%	33.3%	21.4%	28.6%
2= enough	33.3%	19%	30.3%	23.5%	47.1%	2 = enough	27.6%	26%	16.7%	17.9%	21.4%
3 = very	33.3%	4.8%	9.1%	8.8%	0	3 = very	6.9%	15.1%	9.5%	21.4%	8.9%
4= very much	0	0	0	2.9%	2.9%	4 = very much	6.9%	2.7%	0	3.6%	3.6%

$(\chi^2 = 23.12; p = 0.049)$



educational intervention on AIDS and STDs in a student population.

Methods

The study was conducted by administering an anonymous self-compiled questionnaire, before and after the implementation of educational interventions, to another sample of students attending the last three years of High School Humanities and High School Sciences in Cassino. The post test was administered at the beginning of the school, 6 months after the pre test and the exhibition. The distribution of the questionnaire to students took place during school hours by operators CRDCS in the absence of teachers, as expressly requested by the students, and was not preceded by any discussion of the issue.

The questionnaire consisted of 25 questions that assessed their knowledge of STDs, means of transmission and Prevention. Furthermore, part of the sample consented to reporting information on sexual habits.

Results

Five hundred eighty-three responded to the pre test and 403 (69%) post-tests returned. Since the distribution of post-test questionnaires took place at the beginning of the year, following the educational interventions, as specified by the research protocol, children attending the last year were lost. The sample was composed by adolescents with a mean age of 17 years \pm 1.8 DS, equally divided by gender (male 49.7% and 50.3% females). Regarding knowledge, data obtained from pre-tests showed how 63.9% of the sample did not know how many STDs existed, with a statistically significant difference between males (66.7%) and females (33.3%) ($\chi^2 = 17.17$; $p = 0.0042$). In post test answers, there was a reduction in that percentage to 49.2%. AIDS appeared to be the best known disease (96%) regardless of gender, age and or school type. The Survey revealed that other STDs are also little known among the young population, with severe and dangerous gaps observed. In fact, other than AIDS, only genital herpes (64.2%), syphilis (42.8%) Hepatitis B (38.5%) were recognized as being sexually transmitted diseases. The educational intervention partly changed this situation, in fact, and there was an increased knowledge about these diseases (Figure 2). On the most likely means of transmission, 84% indicated sexual intercourse with any partner. Use of condoms as the best prevention was recognized as such by the majority of respondents (90%), 46.2% of the entire sample identified being in a relationship with one partner as another effective system of defence, and finally, a significant percentage youth

respondents indicated abstinence from sex (17%) which also improved post-test (Figure 3). With regard to sexual practices, 43% of the sample aged between 16 and 17 years for both males and females, claimed to have already had sexual intercourse (66% male and 34% female) with an average frequency of twice per week for males and once per week for females. Regarding the number of partners with whom they had intercourse in the last three years, in the pre test, males stated that they had more than three partners (83.3%) whilst females, reported only having had one partner (43.8%). Even in this case there was a statistically significant gender difference ($\chi^2 = 9.641$; $p = 0.008$). The trend remains unchanged, as expected, in the post-test. The family doctor is seen by a high percentage of young people (70% - 68.6%) as the first figure which should address the individual affected by a sexually contracted disease. Only 12.5% would address a dermatologist. Only 46% (pre and post tests) recognized at risk groups such as "drug addicts", homosexuals and heterosexuals. Respondents appeared to know the difference between HIV and AIDS affected patients (60% - 73.6%) and they considered sharing some behaviours such as shaking hands, kissing or using the same utensils etc. as fairly dangerous (22%). Statistical analysis found no significant differences in responses between two schools.

Survey 3: Consultation on the levels of information and risk perception about AIDS and HIV infections in students of the University of Cassino (FR)

Objective

In order to assess the level of knowledge about AIDS and HIV infection, attitudes and sexual behaviours in a population of students and to verify the degree of perceived risk associated unsuitable behaviours.

Methods

A sample of 1000 students was selected from the University of Cassino in 2005/2006. Sampling was carried out by random extraction from the five Faculties of the University to obtain a homogeneous distribution by sex and type of degree. An observational study of prevalence was conducted between January and June 2006, through a standardized, multiple choice, self-reported questionnaire, anonymously compiled. The questionnaire had 38 fully structured questions. A pilot study on 50 subjects to validate the questionnaire and its comprehensibility, its applicability and its reproducibility was conducted previously. It was administered during lecture hours and in places where students gathered. The questionnaire included questions on demographic

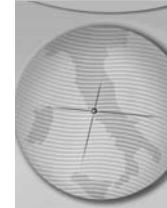


Figure 2. The best known STIs.

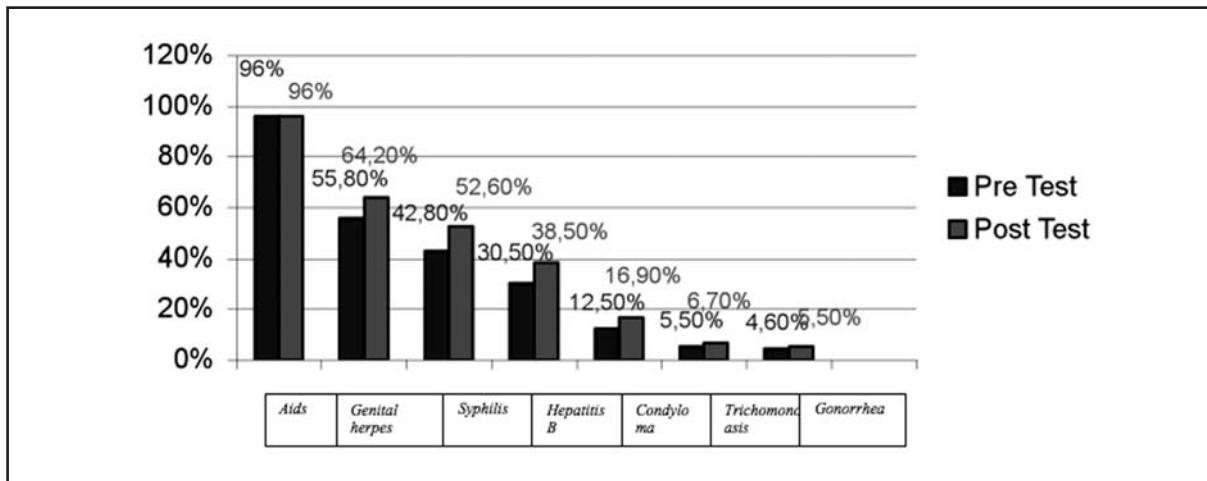
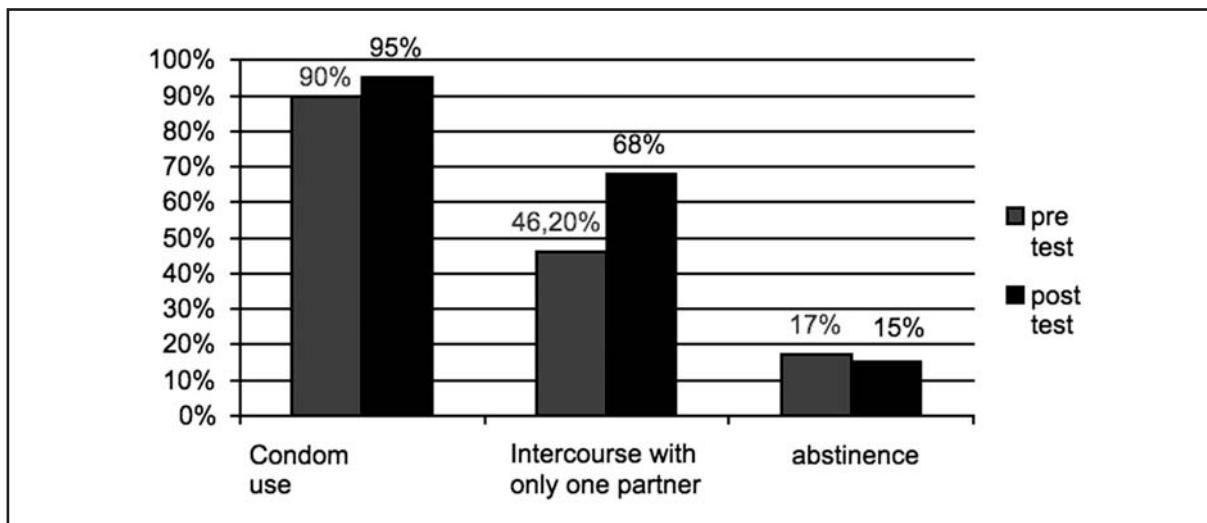


Figure 3. Best method to STDs prevention.



data and questions designed to detect the degree of knowledge about AIDS/HIV, sexual behaviour, and level of risk perception.

Results

Eight hundred students participated voluntarily. The Population examined was composed of 58.8% women and 41.2% men, with a mean age of 24.7 ± 4.4 SD years and 25.9 ± 5.4 SD respectively (Mann-Whitney = 9.123; $p < 0.0025$). The sample appeared to have good knowledge about HIV transmission and AIDS disease, acquired mainly from the media, school and scientific books, and 93% of respondents knew how to avoid infection. In fact, the subjects had an excellent knowledge of the main ways AIDS is transmitted, and recognized blood sample (90%), sperm (84%), vaginal discharges and pre-ejaculatory fluid as body fluids capable of transmitting disease. The sample was aware that infection can occur even when subjects does not show any symptoms of HIV disease too. The risk of infection through intact skin and insect and mosquito bites was also ruled out.

The sample identified drug users and homosexuals as the most prone to infection with HIV, while awareness of infection risk among heterosexuals was less marked. They indicated condom use as the main means of preventing disease, especially for girls: 76.7% (compared with 74% of boys). Despite the important awareness of condom use, however, 74.4% reported to use them and only 44.2% to use them always. Females said they always used condoms in 45% of cases compared with 43.4% of males ($\chi^2 = 8.3265$; $p = 0.008$). Moreover, the higher the number of partners (more than four) the higher the percentage (72.8%) of those who used condoms rarely ($\chi^2 = 15.90$; $p = 0.04$). 84.8% of respondents had already had sexual intercourse in their lives, 23.4% reported at least having had a one night stand though girls reported a lower rate of one night stands than boys: 20.9% vs 38.5% ($\chi^2 = 25.5035$; $p = 0.0001$). 9% reported homosexual activity and 90% declared to use condoms often. Interesting differences between prior knowledge and age of

first sexual intercourse emerged. Among those who had sexual intercourse before thirteen years, only 83, 8% had correct knowledge vs. 95% of those who had intercourse after 16 years ($\chi^2 = 26.9962; p = 0.0001$). The logistic regression identified determinants of risk behaviours: male, age of first intercourse under 12, alcohol use (Table 2).

Discussion

The project certainly aroused great interest. Although the respondents were not fully representative of the national student youth population, we found some very interesting data. Respondents showed a good knowledge about AIDS but not of other STDs, and especially about Condyloma, which represents about one third of incident cases in Italy [20], and Hepatitis B. Though the awareness about HIV transmission can be considered satisfactory, nevertheless this accurate information is not always followed by appropriate behaviour, particularly as regards the use of condoms. Indeed, although most of the sample recognized condoms as the most effective barrier and method against infection, only 40% used them regularly and other national studies confirmed this data [10,21].

The exhibition can be considered an effective prevention tool for new knowledge acquisition but not for modification of knowledge already present. The increase in knowledge seems to have made students more aware and accountable on the topic and more prudent in sexual intercourses.

It is important to stress that information and training on these topics should be given before individuals become sexually active and, therefore, before they adopt risky behaviours [12,21]. The educational process must be run efficiently, adequately and continuously over time to achieve the desired effect. A good health education in public schools can improve students' knowledge, although this is not sufficient to produce behavioural changes. It is important to encourage young people to change their behaviour, making them aware of their personal ability to protect their health [22]. In fact, as claimed by World Health Organization "The education process needs to be carried out efficiently and appropriately to have the wanted effect. If the patient is not educated about infection, he is at higher risk of becoming re-infected and spreading infection to sexual partners. A person who is made aware, through appropriate health education, is more likely to be cooperative and receptive of the health-care provider's advice" [23].

Boys declare to have access to several sources of information about safe sex (peers, partners, press, television, etc..), but despite this, their

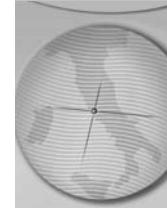
knowledge is sloppy and imprecise; similar data were reported by another study in a nearby area [21]. This Study also showed that the general practitioner should play a vital role, and is, in fact, often the first contact that a patient has and should therefore be stimulated and supported to inform and educate.

Educational interventions, as established by post-tests and by other national surveys, changed the knowledge of the sample and were effective in changing risk behaviours regarding the use of condoms, even if it was not possible to verify whether these changes were maintained over time. As other surveys demonstrate, this study showed how the majority of young people, while recognizing the severity of the infection, still have a poor attitude towards adopting prudent sexual behaviour and underestimated the risk of contracting AIDS through heterosexual intercourse [10,16,21].

Conclusions

The future of the AIDS and STDs epidemic in Italy will be determined by the sexual behaviour of its population. Prevention remains the main weapon against this possible outbreak, and it is necessary to enable innovative and effective educational strategies that focus on the perception of risk in order to raise awareness in young people about the risks resulting from their sexual behaviour and promoting positive change for health (e.g. promotion of condom use and reduction of the number of sexual partners).

As noted by many authors [12,14], even in this case, it looks like the long-term effects, in populations who have had health education interventions with the models of behaviour change (with assumption of a direct relationship between increase knowledge and change in behaviour), are not sufficiently protective. Therefore, it is necessary to intensify efforts to broadly apply the most effective models of self empowerment, based on the involvement and on the assumption of personal responsibility in recipients of this intervention in order to change risk behaviours. However, it is important to draw up a list of clear and pressing demands by students, for further information on STDs: they want to have a more active role in the design of interventions and they underscore the need for more detailed information, particularly regarding prevention. In particular, in a survey conducted in Italy using focus groups, they suggested advertising campaigns produced by teenagers, using language, methods and images that may have more chance of reaching the youth world [14,24]. Furthermore, the effectiveness of

**Table 2.** Multivariate logistic model for the dependent variable “sexual intercourse” and some independent variables.

	OR	95% CI	p
Sex			
Males	1.2	1.1-1.8	0.02
Females (reference)	1		
Age 1° sexual intercourse			
<12	14.8	2.2-35.29	0.004
>16 (reference)	1		
Freq. of sexual intercourse			
Often	19.7	5.2-34.08	0.0001
Sometimes (reference)	1		
Source of Information			
High School	2.1	1.1-4.2	0.02
Friends	1.7	1.1-3.2	0.001
Parents (reference)	1		
Abuse of Alcohol			
Yes	4.06	2.4.-6.8	0.0001
No (reference)	1		
Origin			
South	2.07	1.2-12.4	0.05
North	1		

prevention interventions related to HIV and AIDS, conducted on adolescents, pointed out that an accurate understanding of the nature and way of infection is not sufficient to induce more cautious sexual behaviours or reduce risk situations. On the other hand, methods that include forms of

partnership and involvement of youth groups, especially in areas of daily life, proved to be more suitable and better able of transmitting messages and making them open to discussion, and provide skills necessary to assume the role of “change agent” [25].

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