Risk perception of sexually transmitted diseases and teenage sexual behaviour: attitudes towards in a sample of Italian adolescents

M. BERGAMINI[1], A. CUCCHI[2], E. GUIDI[1], A. STEFANATI[1], B. BONATO[1], S. LUPI[1], P. GREGORIO[1]
[1] Department of Medical Sciences, Branch of Hygiene and Occupational Medicine, University of Ferrara, Italy; [2] Department of Hygiene, Public Health Local Unit of Ferrara, Italy

Summary

The aim of the study is to determine awareness about sexually transmitted diseases (STDs) and their prevention in people aged 14-19 of Ferrara and province.
The study was carried out using a self-administered standardised anonymous questionnaire in a sample of students attending to three upper secondary schools.
Total number of collected questionnaires was 2695, the average age of interviewed was 17.1. Only 52.3% of respondents correctly recognized STD definition. Over 95% of subjects identified acquired immune deficiency syndrome (AIDS), while properly classification of Hepatitis B increased with age and lowest degree of knowledge concerned herpes infection and Candidiasis. Sex without condom (95.97%) and needle exchange in drugs abusers (94.9%) are considered high risk behaviours. 80.3% of interviewed, without distinc-
tion of school attendance, sex, and age considered lack of information as a situation of high risk. Condoms are not used by 46.4% of the subjects in case of sex with a regular partner and by 9.5% with casual partner. Majority of students declared condoms very safe in preventing STDs but an important percentage indicated also contraception methods; correct answers were higher among females and increased with age. Main sources of information were TV (21.6%), school (21.1%) and friends (14.8%) and a few sought information from family doctor (7.4%) and web (4.8%).
The study suggests, as priority, to improve teenagers' awareness about risk behaviours and prevention of STDs. School can play an important role in reinforcement of sexual education programmes and directing young people to general practitioners and primary sexual health care services.

Introduction

Sexually Transmitted Diseases (STDs) are a large group of infectious diseases associated with different aetiologies (bacteria, chlamydia, mycoplasma, fungi, viruses, protozoa and ectoparasites), and characterized by their sexual transmission and genital location [1]. The risk of severe complications and their role in the increased risk of human immunodeficiency virus (HIV) transmission [2] make STDs a social problem worldwide. In fact, several studies demonstrated a strong association between both ulcerative and non-ulcerative STDs and HIV infection [3, 4], so that there is clear evidence that conventional STDs increase the likelihood of HIV transmission [5]. The World Health Organization (WHO) estimated 333 million/year worldwide the total of STDs cases, mostly localized in the south-east Asia, in Africa, and Latin America [6], where the higher prevalence is seen among sexually active young people [7]. The sex-related incidence of STDs is greater among males than in females (except during adolescence, when the ratio is reversed), yet the prevalence is greater among women and homosexual men [8, 9].

The current spread of STDs is related with a number of different factors involving not only their aetiology (emerging pathogens, and antibiotic resistance), but also inadequate

health information [10], low income [11], and modified sexual lifestyles (frequent unprotected intercourse with different partners, an increased demand for prostitution, and the decreasing average age at which young men and women become sexually active) which have occurred in the general population in the last 50 years [12]. In regards to this last feature, adolescents and young adults (15-24 years old) represent only 25% of the sexually active population but almost 50% of all new acquired STDs [12] – this is caused by sexual ignorance, non-use of condoms, increased number of relationships between young subjects and older partners, use of psychoactive substances, and poor attitude towards consulting specialist health care services [13]. In a recent randomized controlled trial, it was demonstrated that the behavioural intervention promoted by Sexual Awareness For Everyone (SAFE) on teenagers (aged 14 to 18 years) significantly decreased high-risk sexual behaviours [14].
In Italy, even though adolescents have their first sexual experience at a very early age, and often without protection against STDs [15], a health education programme has been running for the last several years, with special attention given to the prevention of STDs [16]. In order to determine how information and awareness about STDs may modify sexual behaviours of Italian adolescents, a study was per-

formed on a sample of students of 14-19 years living in Ferrara and its province.

Materials and methods

STUDY DESIGN

A cross-sectional study of a sample of students population attending upper secondary school was developed to achieve the following objectives: a survey of the knowledge of STDs, the source of related information, knowledge level related risk and its influence in determining sexual lifestyles.

THE QUESTIONNAIRE

A structured self-administered questionnaire containing 18 closed questions was used for data collection. The aim of this approach was to ensure that answers could be reliably aggregated and that comparisons could be made with confidence between subgroups or different survey periods. The design of the questionnaire was developed following the international guidelines [17]. The questions were close-ended, providing a set of responses or options from which respondents indicated their choice. (Close-ended questions are particularly useful where the study concerns factual issues, and can be narrowed down to a limited range of responses.)

As to the content of the questions, the items were formulated considering the following features:

1) basic knowledge of STDs and the risks involved;
2) perception of risk and measures to prevent it;
3) sources and quality of information;
4) sex and age.

To determine the best formulation and sequence of the questions, a pilot study in two phases with an increasing number of respondents was performed. In the first phase we asked each respondent of a small group the degree of understanding of each item in the questionnaire, the degree of self-awareness for each question asked, and the appropriateness of the terminology used. In the second phase the entire questionnaire was administered – based on the responses, it was corrected, supplemented, and amended. The distribution of questionnaires took place in the course of one day in all the considered school-classes. The completion time was 10 minutes.

THE SETTING

The present study was performed in three different upper secondary schools located in the Emilia-Romagna Region (Northern-Italy).

THE POPULATION

This investigation has considered students of both sexes, 15-19 years of age, attending upper secondary school. In order to verify the existence of different knowledge levels in students from different kinds of school, the questionnaire was distributed in three different high schools, one focussing more on humanities, one on sciences and one on technical studies. The sampling of the population was

conducted among the students from the towns of Ferrara and Cento. In view of the sensitivity of the topics covered by the questionnaire, the under-age students needed written consent of their parents in order to take the test.

THE DATA ANALYSIS

Statistical analysis was calculated by chi-squared test.

Results

This study was completed between December 2011 and February 2012. The sample consisted of 2800 students – 26.9% of the entire school population of the province of Ferrara. The questionnaire was completed by 2695 students, representing 96.2% of the considered population sample and 42.6% of the students attending upper secondary schools in the province of Ferrara. The average age of the respondents was 17.1 years (SD ± 1.25). The group of respondents consisted of 1145 males (42.5%) and 1550 females (57.5%). The division by year of attendance was the following: second year: 34.8% (mean age 15.9 years), third year: 22.8% (mean age 16.8 years), fourth year: 18.6% (mean age 17.8 years), fifth year: 23.8% (mean age 18.7 years).

The first area of investigation was the real knowledge of what an STD is (Tab. I). Five definitions were proposed to define this point. The 52.3% of respondents answered correctly, with a no significant difference among sexes ($p = 0.1352$). In contrast with the fact that the second-year students had many uncertainties [60.4% gave wrong answers], 65.5% of the fifth-year students were able to identify the correct definition ($p < 0.0001$). The kind of school attended by the students had no significant influence on their answering ($p = 0.1352$) .

To better determine the information level among the students, a list of 17 diseases was included (Tab. II). The results were fairly uniform only for AIDS, which has been correctly recognized by over 95% of subjects with no significant difference among sexes. Although the Hepatitis B had a considerable percentage of proper identification among all students (total: 74.6%, males: 70.9%, females: 77,3%), the level of knowledge increases with age, going from 73.0% in the 15-16 years old subgroup to 78.0% for students aged 18-19 ($p = 0.0294$). A slightly lower level of knowledge was demonstrated with regards to herpes infection (total: 69.1%) with a significant difference ($p < 0.0001$) between younger and older students of both sexes (62.0% and 74.2% respectively). Candidiasis was correctly recognized by 65.5% of subjects, with a significant gender-related difference. In fact, 77.1% of the female students answered correctly, compared to the much lower 48.9% of the male students ($p < 0.0001$). With regard to the no-sexually transmitted diseases, the respondents correctly identified botulism (88.4%), leptospirosis (62.2%), cholera (67.2%), measles (71.2%), tetanus (72.2%), chickenpox (73.9%), flu (74.1%), salmonellosis (75.8%), and rabies (81.1%). The most surprising finding was that the majority of respondents (72.0%) identifies Hepatitis A as a STD.

The second item considered the ability among the adolescents to recognize risk situations for STDs (Tab. III). In

Tab. I. Definition of what a sexually transmitted disease is. Expressed percentages according to gender and year of attendance.

A sexually transmitted disease is :	Total	Males	Females	Year of attendance	
				2nd	5th
• a disease transmitted by any form of physical contact (kissing, caressing, etc …) between males and females	0,4	0,8	0,2	0,1	0,0
• a disease only transmitted by sexual intercourse	21,1	21,4	21,0	28,9	14,5
• a disease only transmitted by petting	25,5	22,6	27,6	30,9	18,7
• a disease only transmitted through males having sex with males	0,6	1,1	0,2	0,5	0,8
• a disease mostly transmitted by sex, but not only	52,3	54,1	51,0	39,6	65,5

Tab. II. Identification of a true or false sexually transmitted disease. Expressed percentages according to gender and year of attendance.

Disease	Total		Gender				Year of attendance			
			Males		Females		2nd		5th	
	yes	no	yes	no	yes	no	yes	no	yes	no
Rabies	18,9	81,1	22,4	77,6	16,3	83,7	19,0	81,0	18,8	81,2
Candidiasis	65,5	34,5	48,9	51,1	77,1	22,9	50,5	49,5	78,5	21,5
Pediculosis	16,8	83,2	20,9	79,1	13,7	86,3	19,8	80,2	12,5	87,5
Botulism	11,6	88,4	17,7	82,3	7,1	92,9	17,0	83,0	6,3	93,7
Flu	25,9	74,1	32,5	67,5	21,0	79,0	28,0	72,0	25,4	74,6
Tetanus	27,8	72,2	31,4	68,6	24,7	75,3	30,1	69,9	25,3	74,7
Leptospirosis	37,8	62,2	42,5	57,5	33,9	66,1	46,0	54,0	26,9	73,1
Cholera	32,8	67,2	37,7	62,3	29,0	71,0	38,8	61,2	29,3	70,7
AIDS	98,9	1,1	98,5	1,5	99,3	0,7	98,2	1,8	99,7	0,3
Herpes	69,1	31,0	67,1	32,9	70,4	29,6	62,0	38,0	74,2	25,8
Salmonellosis	24,2	75,8	29,3	70,7	20,4	79,6	28,0	72,0	18,6	81,4
Hepatitis A	72,0	28,1	71,6	28,4	72,0	28,0	73,2	26,8	70,1	29,9
Chickenpox	26,1	73,9	30,3	69,7	23,0	77,0	30,3	69,7	25,1	74,9
Hepatitis B	74,6	25,4	70,9	29,1	77,3	22,7	73,0	27,0	78,0	22,0
Parkinson's disease	4,0	96,0	5,5	94,5	2,9	97,1	4,8	95,2	2,4	97,6
Measles	28,8	71,2	33,2	66,8	25,5	74,5	31,8	68,2	28,6	71,4
Down's syndrome	8,1	91,9	10,0	90,0	6,6	93,4	11,3	88,7	5,1	94,9

Tab. III. Ability among adolescents to recognize risk situations. Expressed percentages according to gender and risk.

	Total			Males			Females		
	High risk	Low risk	No risk	High risk	Low risk	No risk	High risk	Low risk	No risk
Multiple partners	76,8	19,5	3,7	66,7	28,0	5,3	84,3	13,3	2,4
Sex without condom	96,0	3,4	0,6	94,1	4,7	1,2	97,5	2,3	0,2
Sex out of marriage	8,2	36,2	55,6	8,5	37,6	53,9	8,0	35,2	56,8
Sex before marriage	4,5	28,7	66,8	4,1	30,6	65,3	5,0	27,3	67,7
Needle exchange in drug abusers	94,9	2,5	2,6	92,9	3,1	4,0	96,3	2,0	1,7
Pregnancy	10,9	35,2	53,9	8,8	37,1	54,1	12,5	33,6	53,9
Blood transfusion	42,9	43,0	14,1	37,5	47,2	15,3	46,8	40,0	13,2
Vaginal sex	60,3	33,3	6,4	54,4	37,0	8,6	64,8	30,6	4,6
Anal sex	47,6	37,9	14,5	45,4	35,9	18,7	49,1	39,6	11,3
Oral sex	23,3	43,2	33,5	21,5	44,5	34,0	24,7	42,1	33,3
Kisses	2,2	24,7	73,1	1,9	23,6	74,5	2,5	25,6	71,9
Stings	6,1	31,9	62,0	6,8	34,9	58,3	5,5	29,4	65,1
Underwear exchange	4,1	31,2	64,7	3,2	25,1	71,7	4,8	35,9	59,3
Toothbrush exchange	9,6	35,9	54,5	7,9	39,6	52,5	10,7	33,4	55,9
Shaking hands	0,9	3,0	96,1	1,3	3,3	95,4	0,5	2,8	96,7
Hugging	0,6	2,2	97,2	0,7	3,0	96,3	0,5	1,7	97,8
Coughing and / or sneezing	3,4	36,2	60,4	3,6	38,9	57,4	3,3	34,3	62,4
Working in the same room	1,2	8,8	89,9	2,1	11,6	86,3	0,6	6,8	92,6
Sexual violence	92,6	6,0	1,4	89,5	8,3	2,2	94,9	4,3	0,8
Exchange of glasses and cutlery	6,1	38,5	55,4	5,3	40,7	54,0	6,7	36,7	56,6
Lack of knowledge of the STDs	80,3	16,0	3,7	76,9	18,6	4,5	82,7	14,2	3,1

Tab. IV. Prevalence among adolescents of attitudes to use condom in sex with casual or single partner. Expressed percentages according to gender and year of attendance.

	Total			Males			Females			2nd			5th		
	Never	Sometimes	Always	Never	Sometimes	Always	Never	Sometimes	Always	Never	Sometimes	Always	Never	Sometimes	Always
Single partner	10,0	36,4	53,6	12,4	42,8	44,8	8,2	31,7	60,2	5,8	38,5	55,7	18,0	36,1	45,9
Casual partner	3,9	5,6	90,5	4,7	7,4	87,9	3,3	4,3	92,4	5,6	5,5	88,9	3,8	6,7	89,5

this case, three options were provided: high risk, low risk, no risk. Among the students of both sexes perception of high risk was respectively attributed to the following features: sex without condom (95.97% of respondents) and the needle exchange among drug abusers (94.9% of respondents). When it comes to multiple sexual partners, however, a relevant sex-related difference ($p < 0.0001$) was observed (total: 76.8%, males: 66.7%, females: 84.3%). On the other hand, it is very comforting to note that the majority of respondents (80.3%), without distinction of school attendance, sex, and age considered the lack of information as a situation of high risk of contracting an STD.

As to sexual practices, a surprising absence of STDs-related risk was respectively attributed to oral sex by 33.5% of subjects of both sexes, to anal sex by 14.4% of subjects (males: 18.7%, females: 11.3%), and vaginal sex by 6.3% of the interviewed (males: 8.6%, females: 4.6%).

Table IV illustrates the findings as to the use of condoms within a relationship and with casual partners. 46.4% of the subjects do not use condoms regularly when in a relationship. This percentage falls at 9.5% in case of sex with casual partners (males: 12.1% , females: 7.6%). Surprising enough, age seems to have little influence over this behaviour (second-year students: 11.1%, fifth-year students: 10.5%) ($p = 0.7401$).

Questions about the means of prevention of STDs have been included within this area of information. Students were asked to establish whether these items were very safe, partly unsafe, or unsafe in preventing STDs (Tab. V). Even though the vast majority of students is correct in considering the use of condoms as very safe in preventing STDs, there is a surprisingly significant minority of students considering very safe the following items: contraceptive pills (total: 22.1%, males: 27.1%, females: 18.0%), spermicides (total:14.6%, males: 16.2%, females: 13.5%), intra uterine device (IUD) (total:18.2%, males: 20.6%, females: 16.6%). The morning-after pill (total: 9.8%, males: 13.6%, females: 6.9%) ($p < 0.0001$), and the *coitus interruptus* (total: 8.1%, males: 12.2%, females: 5.2%) ($p < 0.0002$) obtained lower percentages. In this area of questions, a gender difference that sees females give correct answers in much higher percentage than males was found. However, with older students these gender differences became less pronounced. Similarly, the percentages of those who identified as a "highly secure protection" contraceptive pills, spermicides, IUD, morning-after pills, and *coitus interruptus* appeared significantly reduced among fifth-year students ($p < 0.0001$).

The last part of the survey was aimed to investigate the role of information in STDs prevention. The first item concerned the role of the school to provide information about health and sexual education. 96.8% of the students declared that school should provide information, with the 68.7% of respondents thinking it should be given to them starting from their pre-teen years, while only 28.1% believed that they should receive this kind of information in high school only. With regard to the sources of information, television (total: 21.6%) and school

Tab. V. Knowledge about the means to prevent sexually transmitted diseases among adolescents. Expressed percentages according to gender and year of attendance.

				Gender						Year of attendance					
	Total			Males			Females			2nd			5th		
	Very safe	Partly safe	Unsafe	Very safe	Partly safe	Unsafe	Very safe	Partly safe	Unsafe	Very safe	Partly safe	Unsafe	Very safe	Partly safe	Unsafe
Contraceptive pills	22,1	23,5	54,4	27,1	26,2	46,7	18,0	21,7	60,3	27,5	29,9	42,5	13,3	18,7	68,0
Morning-after pills	9,8	30,0	60,2	13,6	35,6	50,8	6,9	25,9	67,2	12,0	39,8	48,2	7,3	18,2	74,5
Condom	89,0	10,0	1,0	88,6	10,0	1,4	89,2	10,1	0,7	88,0	11,3	0,6	91,2	7,1	1,7
Single partner	56,6	36,4	7,0	57,0	34,8	8,2	56,3	37,5	6,1	56,9	35,7	7,3	54,5	38,9	6,6
No pregnancy	13,7	31,4	54,9	16,0	33,2	50,8	11,7	30,1	58,2	20,4	34,6	45,0	6,2	25,3	68,5
Spermicides	14,6	46,9	38,4	16,2	49,1	4,7	13,5	45,4	41,0	19,0	55,0	26,0	6,0	36,9	57,1
Intra uterine device	18,2	39,1	42,7	20,6	43,9	35,5	16,6	35,5	47,9	25,7	45,0	29,3	10,4	30,8	58,8
Coitus interruptus	8,1	38,3	53,6	12,2	39,1	48,7	5,2	37,7	57,2	11,0	49,2	39,8	4,9	30,9	64,2

(total: 21.1%) were indicated as the most frequent sources, followed by friends (total: 14.0%), parents (total: 13.1%), and newspapers (total: 13.1%). The most surprising finding was that only a small percentage of subjects mentioned the family medical practitioner (total: 7.4%) and web search engines (total: 4.8%) as their source of information.

Discussion

This study was encouraged by the fact that it appeared advisable to investigate how the levels of knowledge about sex and STDs are able to influence young people's sexual behaviours. The use of a structured self-administered questionnaire seemed the easiest and cheapest way to investigate this aspect, because it is considered the only feasible technique to reach a number of responders large enough to allow a statistical analysis of the results [18]. The data analysis indicates several aspects deserving comment. The first important finding is the fact that, in spite of the questionnaire dealing with fairly sensible issues (sex and STDs), 96.2% of parents gave their consent. The first area of investigation was the real knowledge of what an STD is. Here just a little above half of the respondents answered correctly. In spite of this imperfect knowledge of the basics about STDs, students showed to have a good understanding of the risks of AIDS and hepatitis. Unfortunately, other STDs do not share this level of awareness. The lowest level of awareness regarded herpes infection and Candidiasis, with a strong significant gender-related difference ($p < 0.0004$), since females were shown to answer more correctly than males. This is most probably due to the greater awareness females have about gynaecological infections. The kind of school attended by the interviewed students showed to have no significant impact in the responses they gave.

The second area of investigation considered the young person's ability to recognize risk situations for STDs. Three quarters of the interviewed population were unanimous in considering the lack of information as a possible risk factor. However, this does not seem to significantly affect the sexual habits of a considerable percentage of teenagers who believe that oral, anal, and vaginal sex are at low risk of contracting an STD. So much so that they feel comfortable entrusting prevention of STDs to the use of condom, contraceptive pills, spermicides, and IUD. This result implies that a significant percentage of teenagers confuse STDs

and pregnancy preventions. A general agreement was observed in the perception of risk related to sex with multiple partners, whereas a single partner was seen as a safety factor. However, this awareness was significantly higher among second-year female students, who also believe it is important to always use condoms [19] even with a single partner. The questionnaire shows that this particular belief is affected by the age of the interviewed student and that fifth-year female students are more likely to trust their partner (rather than rely on the use of condom). In spite of the increasing trust, the greater part of the respondents didn't see the partner as a sufficient source of information about sex and STDs. Indeed, the majority of males and females reported receiving sexual health information especially from television, school and friends. It is interesting to note that, contrary to what was observed in other studies [20, 21], internet as a source of information was considered less important than newspapers, and it was used only by a minority of respondents. The lack of knowledge about the appropriateness of using local health care services has been detected in the overall student population and at all ages, as noted by previous studies [22, 23]. The present study suggests that work is needed to improve teenagers' access to, and use of, primary sexual health care services. In particular, the identification of strategies that improve teenagers' awareness of services and general practitioners' approaches towards teenagers could be considered a priority.

A further key point to emphasize is the fact that no substantial differences were observed in the responses given by students of different kinds of schools. These findings lead to the conclusion that what the students know about sex and connected risk of STDs is uncertain and derives mostly from the media (especially TV) and their friends. So, the school has an important role in conveying basic information, but it does not help to create proper awareness of the risks associated with sex and fails in modifying sexual behaviours. Although the proportion of correct answers was observed to increase for fifth-year students, the fact that a high percentage of students confuses the prevention against STDs and pregnancy is an indication that a confusion of ideas thrives among our teenagers, despite the apparent easiness of their life conduct. Therefore, it is necessary to reinforce preventive measures in the younger age groups to design and implement sexual education programmes, and further studies are needed to better understand how our children think and act about their sexual life.

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■ Correspondence: Mauro Bergamini**,** Department of Medical Sciences, Branch of Hygiene and Occupational Medicine, University of Ferrara, via Fossato di Mortara 64/B, 44100 Ferrara, Italy. Tel. +39 0532 455 373 - Fax +39 0 532 205066 - E-mail: brm@unife.it