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SCIENTIFIC ARTICLE

Vulnerability of adolescents to sexually transmitted infections

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KEYWORDS
Adolescents;
Sexually;
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Abstract
Background: In Portugal a large percentage of teens do not know any form of infection or treatment of sexually transmitted infections, making them vulnerable, because the consequences of untreated STI are severe and entail high health care costs.
Objectives: Analyze the influence of socio-demographic and contextual variables on knowledge about sexually transmitted infections.
Methods: A descriptive, non-experimental and cross-sectional study. The non-probabilistic convenience sample consists of 1216 adolescents attending the 9th year of studies in Portuguese Public Schools. They are all a part of the project PTDC/CPE-CED/103313/2008.
Results: The mean age was 14.69 years old; 12.6% had already initiated sexual intercourse; 48.1% have favorable attitudes towards sexuality; boys showed more favorable attitudes than girls, (X2 = 36,348, p = 0.000). There are statistically significant differences between sex, sexuality dialogue with teachers and health professionals (p = 0.000), age (p = 0.004) and attitudes of adolescents towards sexuality. Girls have more knowledge about sexually transmitted infections than boys with significant statistic differences (t = -5550; p = 0.000). As for the boys, the youngest (14 years old) are the ones with more knowledge about STIs (f = 7.700; p = 0.000). Globally, teenagers who do not date, that live in urban areas and those who have had sex have more knowledge but with no significant differences.
Conclusion: The results point to the need for effective and integrated sex education programs over an extended health education perspective on the gender variables, place of origin (rural and urban), dating, having sexual intercourse are considered in order of decrease adolescents' vulnerability to sexually transmitted infections.

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Background

Adolescence is an unique phase of life which is characterized as a period of significant physical and psychological changes associated with preparation for adulthood and to a resize of social roles. The development of specific skills that allow intimate relationships happens along the life cycle but particularly during adolescence, when private behaviors and dating usually begin. Sexual involvement may or may not be present. However, although it may not initially exist, the trend is that, with the evolution of the relationship and the increase of physical intimacy between partners, contraception measures and protection will be needed.

Teenagers have been classified as a potential risk group particularly because of their sexual behaviors, including early initiation of sexual intercourse, inconsistent condom use, the brevity of relationships and the practice of unprotected sex with multiple partners.[1,2] Other authors[3] also reported several studies on sexual behaviors where teenagers are considered a group of priority intervention because of the reasons above.[4-7] In what concerns sexually transmitted infections there are also specific risk factors during adolescence.[8] To this author there is a greater vulnerability to sexually transmitted infections (STIs) in young girls due to the immaturity of the cervical epithelium, which makes it more fragile and prone to infections. The need for experimentation and curiosity so characteristic of adolescence and the inconsistent use of condoms with partners whose sexual history is unknown,[9] associated with the false perception of omnipotence (the conviction that the infection will never affect them), potentiate the risk. In Granja's study[10] *Chlamydia* infections are the most common during adolescence followed by gonorrhea and hepatitis B.

According to Nelas and collaborators[11] a large percentage of teens don't know any form of transmission of STI nor its signs and symptoms, which shows that information is not being effectively spread. Genital sores were the most pointed symptom, followed by discharge and itching in genital organs. There was a more significant knowledge regarding the signs and symptoms of AIDS compared to other STIs. In this study a significant percentage of adolescents were unable to identify the cure of any IST, and about 50% did not know how to answer the question.

STIs are now considered a serious public health problem due to its magnitude, the difficulty of identifying the symptoms and the impact they may have on sexual health and reproductive future. Effective and early treatment of STIs is of fundamental importance as the wounds, inflammation, discharge and warts on genitals are gateways to other STIs. Aside from those caused by virus (AIDS, HPV and Herpes) there is cure for all STI if treatment is done properly, involving both sexual partners.

Materials and methods

An observational, descriptive, correlational, not experimental, cross-section study was performed under the project MISIJ -FCTF-PTDC / CPE-CED / 103313/2008, using a sample of 1216 adolescents attending the 9th grade of Education. The self-fulfillment data collection instrument has three parts: the first aims to obtain sociodemographic data and variables on sexual behaviors and includes 12 questions; the second part seeks to obtain data on the attitudes of teenagers towards sexuality and consists of 28 questões[12] and the third part is the Knowledge Scale about STIs. To analyze the results the SPSS- Statistical Package for Social Sciences (Version 21.0 for Windows) was used, having outlined an array of descriptive and inferential analysis, using decision trees and multiple regressions.

Results

Sociodemographic and sexual characterization

The teenagers' age varies between 14 and 18 years old, corresponding to an average of 14.69. Girls (mean = 14.76 years ± 0.875 SD) representing 54.77% of the sample are younger than boys (mean = 14.63 ± 0798) with significant differences (t = 2.725, p = 0.007). The majority lives in villages (boys 47.5% vs girls 50.0%).

Of the 25.3% of teens who are currently dating, 32.4% are male and 29.6% have 1-6 months relationship. Regarding girls the highest percentage (39.2%) has a 1-6 months relationship and 19.3% have been dating for 1 year or more. Among the groups there was no statistical significance (X^2 = 8.643; p = 0.071). Approximately 50% talk about sexuality with their mother, 45% look for their father, 42.1% brother/sister, but most of them (53.3%) speak with friends. Girls talk more with friends (53.8%), their mother (49.5%) and others (3.8%). Boys talk more with their father (50%), brother/sister (45.6%), girlfriend (41.6%), teachers (40.9%) and doctors/nurses (42.0%). 15.1% of boys and 10.5% of girls have had sexual intercourse.

The first sexual intercourse occurred at the average age of 13.83 years old (± 1.50 years), at 14 years old for 6.1%, 15 years old for 13.4% and at 16 years old for 32.8%. There were no significant differences between groups (t = 1.722, p = 0.087).

Of the ones taking contraception measures 60.6% are male and 39.4% are female with significant differences (X^2 = 27,215; p = 0.000). Boys aged 16 and more register the greater use of contraception. As for contraception, 62.8% use condoms and 37.2% pills. Only 5.5% of girls use condoms, the rest (94.5%) uses the pill. Generally teenagers use condoms more frequently (62.8%) than the pill (37.2%) but not with statistically significant differences (X^2 = 4.237; p = 0.120). We assess that 12.9% of boys do not use condoms in all sexual relations, about 15% only use it sometimes but 71.9% use it often. Regarding girls, 17.8% do not use condoms in all sexual relations, 18.5% only use it sometimes and 63.7% use condoms in all sexual relations. There was no statistical significance between the groups (X^2 = 4.237; p = 0.101).

Attitudes of adolescents towards sexuality

Regarding the connection between attitudes towards sexuality and gender we found that adolescents with unfavorable attitude are mostly female (66.7%) while good attitudes are registered mostly in boys (53.7%), with statistically significant differences (X^2 = 36,348; p = 0.000) (Fig. 1).

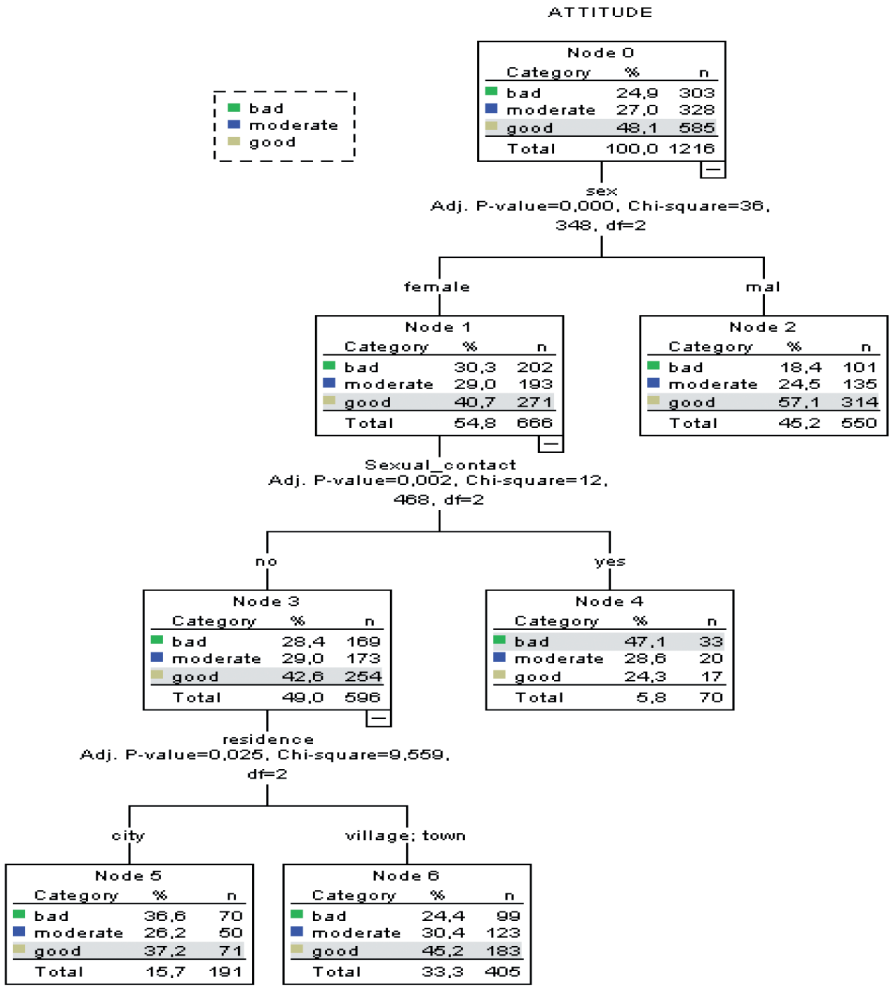

Figure 1 Decision tree for attitudes towards sexuality.

We observed that most teens with bad attitudes towards sexuality do not date (69.6%), talk mainly with friends (55.8%) and 83.2% don't have sex. As for those who have good attitudes towards sexuality most (52.8%) also talk with friends, 41.7% talk with girlfriends, and 89.4% don't have sex. Among those who have initiated their sex life we found that, of those who have bad attitudes towards sexuality, 37.3% started their sex life up to 13 years old and 7.8% at 16 or more years old. The majority of adolescents (35.0%) with moderate attitudes towards sexuality started their sex life at 15 years old and 10.0% at 16 or more years old. Of those who have good attitudes towards sexuality 38.7% started their sex life up to 13 years old and 9.7% at 16 or more years old.

As for attitudes of teenagers towards sexuality and the use of contraception, we found that 75.2% of those who have bad attitudes towards sexuality and 82.1% of those who have good attitudes towards sexuality take contraception measures. Differences between groups are significant (X^2 = 9.475; = 0.009).

Through the algorithm based on chi-square test for CHAID method we studied the link between some variables. The attitudes consign three categories that define the segments under study: bad, moderate or good. The results show that there are three levels of depth where variables are statistically significant. The explanatory variables including "sex", "sexual intercourse" and "living area" are spread over six knots, being four of them terminal. In knot zero 48.1% is classified as having good attitudes. The first level of depth is obtained through the variable "gender" indicating that this is the variable that best predicts attitudes towards sexuality, and male is a terminal knot. In this level the probability of having good attitudes towards sexuality is 57.1% for men and 40.7% for women.

In the second level of depth the variable "sexual intercourse" appears and best predicts sexual attitudes in women, causing knots 3 and 4. The knot 3 shows that only 24.3% of those women who had sex were classified as having good attitudes towards sexuality. Among adolescents who didn't have sexual intercourse the prevalence of good attitudes towards sexuality is 42.6%. From this knot emerges the third level of analysis that includes the residence and leads to two terminal knots. For adolescents living in villages the probability of having good attitudes towards sexuality is 45.2%, the ones living in cities have a probability of 37.2%.

Knowledge about STI

Adolescents with better knowledge are the ones living in villages (22.2%), aged 14 (25.2%), that have been dating from one to six months (19.2%) and didn't start their sex life (40.4%) (Table 1).

Among teenagers who have already started their sex life, the ones not having sexual intercourse now are the ones with better knowledge about sexually transmitted infections (41.6%).

We studied the connection between knowledge about sexually transmitted infections and sociodemographic and of sexual context variables using the CHAID method. The dependent variable is classified into three categories: insufficient, sufficient and good. We found three levels of depth featuring as explanatory variables "sex", "sexual intercourse" and "age" also spread over six knots, four of them terminals. The zero knot indicates that 43.7% of adolescents have good knowledge. The first level of depth figures the variable "sex", being male is the terminal knot and ranks 37.3% of adolescents with good knowledge. For females the probability of a good knowledge is slightly higher (40.0%). From this knot derives the second level of depth that sets having sexual intercourse as a predictor variable causing knots 3 and 4. The terminal knot 3 reveals that 55.7% of girls who have had sex have good knowledge. In female adolescents who didn't have sex the prevalence of good knowledge is 40.2%. On the third level of analysis emerges "age" with two terminal knots. For teenagers with 16 or more years old who didn't have sex the prevalence of good knowledge is only 26.9 %% while for adolescents aged 14 and 15 years old is 50.0% (Fig. 2).

Table 1 Sociodemographic characterization based on knowledge about sexually transmitted infections

	Poor		Intermediate		Good		Total	
	n	%	n	%	n	%	n	%
Residence								
Village	244	20.1	80	6.6	270	22.2	594	48.8
Town	87	7.2	35	2.9	102	8.4	224	18.4
City	153	12.6	46	3.8	199	16.4	398	32.7
Total	**484**	**39.8**	**161**	**13.2**	**571**	**47.0**	**1216**	**100.0**
Age								
14 years old	218	17.9	85	7.0	307	25.2	610	50.2
15 years old	181	14.9	57	4.7	188	15.5	426	35.0
More than 16 years old	85	7.0	19	1.6	76	6.3	180	14.8
Total	**484**	**39.8**	**161**	**13.2**	**571**	**47.0**	**1216**	**100.0**
Dating								
No	357	29.4	126	10.4	425	35.0	908	74.7
Yes	127	10.4	35	2.9	146	12.0	308	25.3
Total	**484**	**39.8**	**161**	**13.2**	**571**	**47.0**	**1216**	**100.0**
Time of Dating								
Less than 1 month	38	12.3	10	3.2	26	8.4	74	24.0
1 to 6 months	39	12.7	13	4.2	59	19.2	111	36.0
6 months to 1 year	25	8.1	7	2.3	29	9.4	61	19.8
1 to 2 years	10	3.2	2	0.6	21	6.8	33	10.7
More than 2 years	15	4.9	3	1.0	11	3.6	29	9.4
Total	**127**	**41.2**	**35**	**11.4**	**146**	**47.4**	**308**	**100.0**
Sexual Intercourse								
No	435	35.8	137	11.3	491	40.4	1063	87.4
Yes	49	4.0	24	2.0	80	6.6	153	12.6
Total	**484**	**39.8**	**161**	**13.2**	**571**	**47.0**	**1216**	**100.0**
Currently active sex life								
No	439	36.1	147	12.1	506	41.6	1092	89.8
Yes	45	3.7	14	1.2	65	5.3	124	10.2
Total	**484**	**39.8**	**161**	**13.2**	**571**	**47.0**	**1216**	**100.0**

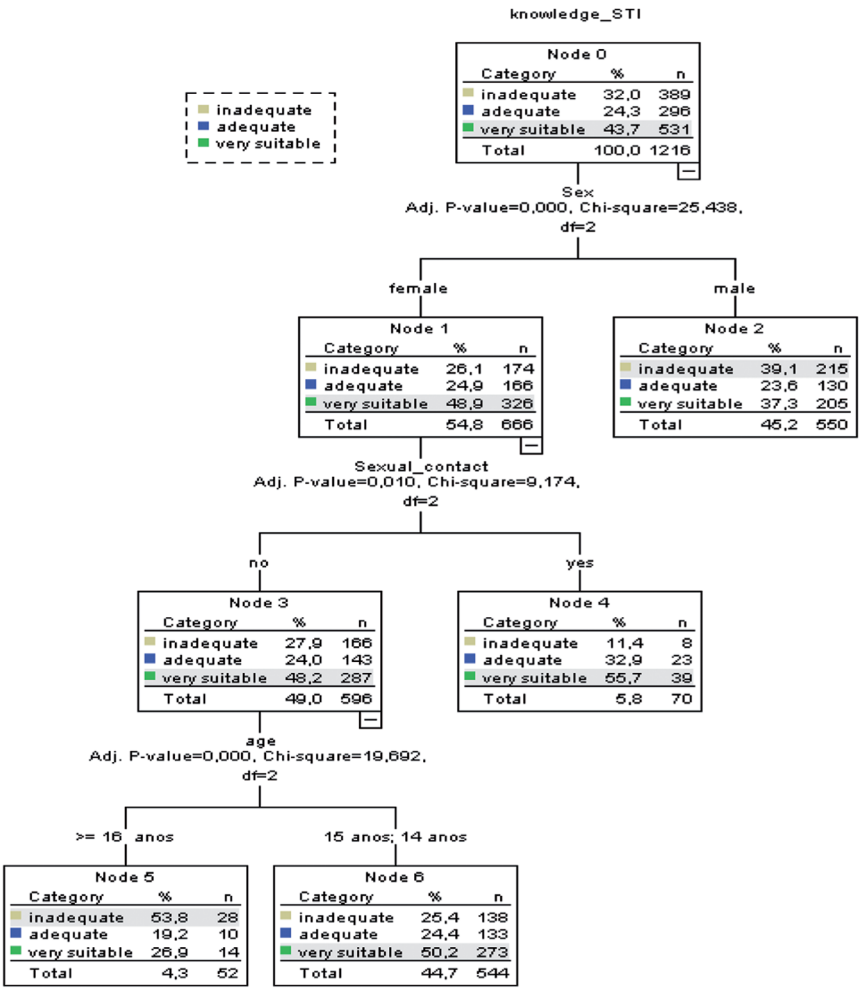

Figure 2 Decision tree for knowledge towards sexuality.

The study concerning knowledge about sexually transmitted infections ends with a univariate linear regression. As independent variables we considered "attitudes towards sexuality", "sex" and "age". The figure reveals that "age" and "sex" have no statistical relevance, ranking attitudes as a predictor that explains 99% of variability (Fig. 3).

Discussion

Our results and the literature review suggest that in order to provide effective changes in the behavior of adolescents, we have to intervene in the training process, considering the teenager's profile (gender, age and knowledge about STI), their needs, fostering personal and social skills (interpersonal relationships, ability to achieve tasks and solve problems, capacity of planning and change circumstances) and even environmental support (support from parents, peers, community and teachers), aspects that can be more easily changed in community interventions.[3,9,13] We found that teenagers who have bad attitudes towards sexuality don't take contraceptive measures nor protect themselves against STIs, becoming more exposed and vulnerable. Younger female teenagers who didn't have sex have the higher prevalence of good knowledge about STIs. The development of favorable attitudes towards sexuality reduces sexual risk behaviors, making adolescents healthier and happier.

What we know about the theme

Teenagers have been classified as a potential risk group by their sexual behaviors, including early initiation of sexual activity, inconsistent condom use, the brevity of relationships and the practice of unprotected sex with multiple partners. The consequences of untreated STI are severe and

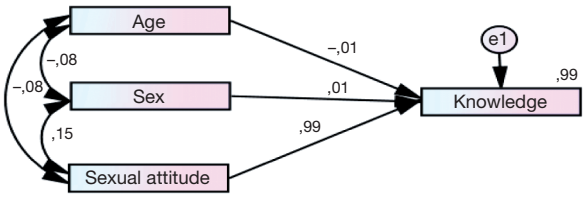

Figure 3 Regression model for knowledge about STI.

entail high health care costs for youth, families and the communities where they live.

What we get out of the study

The results point to the need for effective and integrated sex education programs with extended health education considering variables such as gender, place of origin (rural and urban), dating and having sexual intercourse in order to decrease adolescents' vulnerability to sexually transmitted infections.

Conflict of interests

The authors declare that there are no conflicts of interests.

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