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SEXUAL HEALTH AMONG PORTUGUESE ADOLESCENTS: CHANGES IN A 8 YEAR PERIOD (2002-2010)

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Abstract

Recently HIV is falling in a significant number of countries, partly due to the adoption of preventive behaviors, which demonstrates that decreasing sexual transmission of HIV is possible. The aim of this research was to analyze preventive sexual behavior in Portuguese adolescents, including information and attitudes about HIV/AIDS, and assessing whether they changed from 2002 to 2010. Data were collected through a self-administered questionnaire from the Portuguese sample of the Health Behaviour in School-aged Children (HBSC), a collaborative WHO study. The study provided national representative data of 10587 Portuguese adolescents, randomly chosen from those attending 8th and 10th grades and the opportunity to examine trends in sexual behaviour on a national level. In terms of preventive behaviours, results showed an increasing trend regarding the percentage reporting first sexual intercourse at 14 years old or more and condom use at last sexual intercourse and a stabilized trend concerning having had sexual intercourse and contraceptive pill use. Nevertheless, in terms of information and attitudes about HIV/AIDS, results showed a systematic decreasing trend.
Key words: *adolescents, attitudes, information, preventive behaviours, sex education.*

Introduction

According to UNAIDS (2011), at the end of 2010 there were about 34 million people living with HIV infection in the world and 42% of the newly HIV/AIDS infected occur in young people aged between 15 and 24 years old.

In Portugal, according to the latest available report from the national monitoring center of sexually transmitted diseases (CVEDT, 2011), there was a proportional increase in the number of cases of heterosexual transmission among the 20-49 year old cohort (which means that some were infected during adolescence), confirming the epidemiological pattern recorded annually since 2000 (CVEDT, 2011).

Recently HIV is falling in a significant number of countries, partly due to the adoption of preventive behaviors, which demonstrates that decreasing sexual transmission of HIV is possible. In fact, literature claims that prevention is the best way to control STIs and condom use is generally accepted as the best preventive behavior regarding STIs among sexually active individuals. Nevertheless, young people still are a major concern as their risk for infections is higher than in adults (UNAIDS, 2010), mainly because of their physical, emotional and cognitive immaturity. In addition, young people are particularly vulnerable to STIs and subsequent health problems because they don't have the necessary information regarding STIs prevention, are more reluctant to search for information and are more frequently involved in risky sexual behaviors, such as engaging in sex

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without condom and having multiple sequential partners (UNAIDS, 2008). For those reasons, early sexual initiation has been identified as a crucial indicator for sexual health (CDC, 2010; UNAIDS, 2010; WHO, 2010).

Though there are several HIV prevention interventions currently being put into practice, the majority aren't theory-based and instead focus (almost) completely on information and do not invest in training motivation and behavioral skills (Currie, Hurrelmann, Settertobulte, Smith, & Todd, 2000). As a consequence, these interventions do not have a relevant impact on young people's behaviors. Therefore, it is critically important to implement interventions based on theories that have empirically demonstrated to decrease sexual risk behaviors (Currie, Hurrelmann, Settertobulte, Smith, & Todd, 2000).

According to literature, if young people have information and motivation on preventive sexual behaviors, they may change their attitudes and their behaviors (Belo, & Silva, 2004; Synovitz, Herbert, Kelley, & Carlson, 2002).

The information-motivation behavioral skills (IMB) model (Bandura, 1989) has been validated over the years with several populations. According to this model, HIV prevention information, motivation, and behavioral skills are fundamental determinants of HIV preventive behaviors. As for information, it contemplates information regarding HIV transmission and prevention; as for motivation, it refers to the engagement in HIV preventive behaviors, as well as personal motivation (positive attitudes towards the performance of HIV preventive actions) and social motivation (perceived social support for engaging in these actions); and as for behavioral skills, it refers to the specific skills one needs so as to perform HIV preventive actions, which includes the sense of self-efficacy for doing them (Bandura, 1989;1994; Fisher, & Fisher, 1992; 1993). Hence, according to the IMB model there are three prerequisites to have HIV preventive behaviors: information, motivation and behavioral skills. The three of them together determine individuals' ability to have preventive behaviors.

According to WHO's recommendations (2008), in the absence of an effective cure for HIV/AIDS, and taking into account the particular epidemiology of the disease, the prevention of AIDS depends largely on the adoption and maintenance of safe behaviors, therefore the educational strategies that modify or eliminate risk behaviors are central to prevent the spread of this pandemic.

Since adolescence is the stage of transition between childhood and adulthood, and this stage is characterized by a plasticity and vulnerability of the personality, adolescents are naturally more prone to understand the concepts that will lead them to a healthier physical, psychological and sexual maturity. It is crucial that they realize that their sexuality can be experienced in a healthy and happy way, and that to protect from STIs, including HIV/AIDS, they have to use condoms always (for it is the only way of protection against HIV/AIDS and other STIs among sexually active individuals) (Matos, 2008).

As such, it is crucial to educate young people *before* they engage in sexual behaviors as it is easier to adopt than change behaviors. To be successful, the prevention must involve not only working on information but also motivation and behavioral skills (Eurostat, 2012; UNFPA, 2005).

In order for a IMB–based model HIV intervention to be effective for Portuguese adolescents, their specific information, motivation and behavior skills deficits must be addressed, which requires identifying them previously to intervention. As a result, this article aims to analyze preventive sexual behavior in Portuguese adolescents, including information and attitudes about HIV/AIDS, and assessing whether they have changed and how they have changed from 2002 to 2010.

This analysis is important in terms of surveillance and epidemiological trends of risky sexual behaviors. Further, study findings provide insights into the relations between adolescents' sexual behaviors and sex education, which is likely to moderate the effects of individual risk factors on sexual behaviors.

Methodology of Research

General Background of Research

Data were collected through a self-administered questionnaire from the Portuguese sample of the Health Behavior in School-aged Children (HBSC) study of 2002, 2006 and 2010 (Currie et al., 2000;

Matos et al., 2003; 2006). The HBSC study has been conducted every four years in 43 countries in collaboration with the World Health Organization (WHO) with the aim to describe young people's health and health behaviors as well as understand how they relate to different social contexts.

Sample of Research

The sampling unit used in this survey was the class. The 139 schools in the sample were randomly selected from the official national list of public schools (Ministério da Educação, 2013), stratified by region. In each school, classes were randomly selected in order to meet the required number of students for each grade, according to the international research protocol (Currie et al., 2000).

The study provided national representative data of 10587 Portuguese adolescents, randomly chosen from those attending 8th and 10th grade of high school and the opportunity to examine trends in sexual behavior on a national level. The sample included 52.7% girls and 47.3% males, whose mean age was 15.04 years (standard deviation 1.33). The majority of adolescents were of Portuguese nationality (93.8%), 52.1% attended the 8th grade and 47.9% attended the 10th grade and were distributed proportionally by all the educational Portuguese regions (North, Center, Lisbon and Tagus Valley, Alentejo and the Algarve) in the mainland (see table 1).

Table 1. Socio demographic characteristics for the total sample.

	2002 (N=3762)		2006 (N=3331)		2010 (N=3494)		Total1 (N=10587)	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Gender								
Male	1806	48.0	1579	47.4	1622	46.4	5007	47.3
Female	1956	52.0	1752	52.6	1872	53.6	5580	52.7
Grade								
8th grade	2181	58.0	1740	52.2	1594	45.6	5515	52.1
10th grade	1581	42.0	1591	47.8	1900	54.4	5072	47.9
Nationality								
Portuguese	3382	93.3	3101	94.1	3145	94.2	9628	93.9
African + Brazilian	116	3.2	111	3.4	94	2.8	321	3.1
Other	127	3.5	82	2.5	101	3.0	310	3.0
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Age	15.12	1.35	15.07	1.34	14.94	1.30	15.04	1.33

[1] *The total numbers differ considering that some subjects have not replied to some variables.*

Instrument and Procedures

In the questionnaire, which covered a wide range of questions about behaviors and lifestyles in adolescence, it was selected issues that relate to socio-demographic characteristics, sexual behavior, information regarding HIV/AIDS transmission / prevention and attitudes towards people living with HIV/AIDS. Further information about the survey procedures can be found elsewhere (Currie et al., 2012; Roberts et al., 2009).

Sexual behaviour. Sexual behaviors were measured through the following behaviors - ever had sexual intercourse (Yes/No), age of first sexual intercourse (11 years or less/12-13 years/14 years or more), male condom use at last sexual intercourse (Yes/No), and contraceptive pill use at last sexual intercourse (Yes/No).

Information regarding HIV/AIDS transmission/prevention. Participants were asked to respond to nine statements about HIV/AIDS transmission/prevention (Currie, Samdal, Boyce & Smith, 2001). The Portuguese version of the scale was used (Matos, et al., 2011). Young people were asked

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to respond to nine statements about HIV/AIDS transmission/prevention: 1."it is possible to become infected with HIV/AIDS by sharing needles"; 2."it is possible to become infected with HIV/Aids from coughing and sneezing"; 3."an ***HIV***-infected pregnant woman may pass the virus to her baby"; 4."it is possible to become infected with HIV/AIDS by hugging someone infected"; 5."the oral contraceptive can protect against HIV/AIDS infection"; 6."it is possible to become infected with HIV/AIDS by engaging in unprotected sexual intercourse with someone just once"; 7."someone who looks healthy can be HIV infected"; 8."it is possible to become infected with HIV/AIDS by sharing a glass, fork/spoon"; 9."it is possible to become infected with HIV/AIDS by blood transfusion in a Portuguese hospital". Items were rated on a three response options (1=Yes, 2= No and 3= I do not know). Only responses that showed correct information scored and so final scores ranged from 0 to 9, with high scores suggesting more information. These items were shown to have adequate reliability (Cronbach's alpha of 0.81).

Attitudes towards HIV/AIDS - infected people. Young people were asked to respond to five statements about attitudes towards HIV-infected people (Currie, Samdal, Boyce & Smith, 2001). The Portuguese version of the scale was used (Matos, et al., 2011). Participants were asked to respond to: 1. "I wouldn't be a friend of someone if he had AIDS", 2. "Adolescents with AIDS should be allowed to go to school", 3. "I would sit near an infected student in classroom", 4. "I would visit a friend if he or she had AIDS" and 5. "HIV infected people should live apart of the rest of people". Items were rated on a 3-point rating scale (1= disagree to 3= agree). After recoding items 1 and 5, final scores ranged from 5 to 15, with high scores suggesting more tolerant attitudes. These items were shown to have adequate reliability (Cronbach's alpha of 0.76).

This study had the approval of a scientific committee, an ethical national committee and the national commission for data protection and followed strictly all the guidelines for human rights protection.

Data Analysis

Analyses and statistical procedures were carried out in the *Statistical Package for Social Sciences* program (SPSS, version 20.0 for Windows). Overall, structured self-reported questionnaires were responded by 10587 participants. The total numbers differed considering that some participants have not replied to some questions. Means, standard deviations, frequencies and other descriptive statistics were performed to characterize the sample. The level of statistical significance was set at $p < 0.001$ due to the size of the sample.

Chi-square tests were used to examine sexual behaviors, information regarding HIV/AIDS transmission/prevention and attitudes towards HIV/AIDS - infected people, according to base year. Upward or downward trends were determined through the comparison of the module that corresponded to an adjusted residual $\geq \left| 1.9 \right|$. ANOVA tests were used to examine final scores according to base year and upward or downward trends were determined through Scheffe post hoc tests. Analyses were controlled for gender, age and school grade.

Results of Research

Table 2 shows trends in sexual behaviour between 2002 and 2010.

There was no statistically significant difference for the percentage of young people reporting ever having had sexual intercourse (23.7% in 2002, 22.7% in 2006 and 21.8% in 2010) ($\chi^2(2) = 3.84$; $p = 0.147$).

Among those who were sexually active, an overall increase was observed in age of first sexual intercourse ($\chi^2(4) = 57.46$; $p < 0.001$) peaking in 2006 (56.8% in 2002 versus 71.1% in 2006, and 68.9% in 2010 at 14 years or more). From 2002 to 2006 a decreasing trend was observed among those who initiated at 11 years or less as well as among those who initiated between 12 and 13. In both cases it stabilized from 2006 onwards.

Among those who were sexually active, 82.5% reported that they or their partner used a condom the last time they had engaged in sexual intercourse, which means that about 18% are currently at high risk. Considering the three cycles of the study, an increase was observed ($\chi^2(2) = 31.36$; $p <$

0.001), which was especially strong between 2002 and 2006 (71.8% in 2002, 81.1% in 2006 and 82.5% in 2010).

There was no statistical significant difference neither for the percentage of young people reporting having used the contraceptive pill at last sexual intercourse (40.0% in 2002, 47.1% in 2006 and 53.5% in 2010) ($\chi^2(2) = 11.60$; $p = 0.003$).

Table 2. Differences between 2002, 2006 and 2010 for questions about sexual behaviour.

	2002		2006		2010		Total1		χ^2	p
	N	%	N	%	N	%	N	%		
Sexual intercourse									3.835	0.147
Yes	862	23.7	723	22.7	748	21.8	2333	22.7		
No	2772	76.3	2464	77.3	2688	78.2	7924	77.3		
Young people who have had sexual intercourse										
	2002		2006		2010		Total1		χ^2	p
	N	%	N	%	N	%	N	%		
Age of 1st sexual intercourse									57.456	0.000
11 years or less	143	17.2	68	9.7	54	7.4	265	11.7		
12 – 13 years	217	26.1	134	19.2	173	23.7	524	23.2		
14 or more	473	56.8	497	71.1	504	68.9	1474	65.1		
Condom use at last sexual intercourse									31.364	0.000
Yes	595	71.8	555	81.1	591	82.5	1741	78.1		
No	234	28.2	129	18.9	125	17.5	488	21.9		
Pill use at last sexual intercourse									11.599	0.003
Yes	118	40.0	156	47.1	183	53.5	457	47.2		
No	177	60.0	146	52.9	159	46.5	511	52.8		

[1] *The total numbers differ considering that some subjects have not replied to some variables.*

In bold – values that correspond to an adjusted residual ≥ |1.9|

Table 3 shows trends in information regarding HIV/AIDS transmission / prevention between 2002 and 2010 for the total sample.

According to results, from 2002 to 2010, young people more often said that coughing, sneezing and hugging someone infected with HIV/AIDS could be a means of transmission and that the contraceptive pill could protect a woman from being infected. In 2010, young people less often claimed that a person could become infected with HIV/AIDS if he/she used a needle and / or a syringe already used by an infected person, that an infected pregnant woman could infect her baby and that one could become infected by engaging in unprotected sexual intercourse with someone just once. Results showed a decreasing trend in five out of nine statements concerning information regarding HIV/AIDS transmission/prevention.

A slight increase in information was observed peaking in 2006 but decreasing substantially in 2010 in two of the remaining statements: respondents disagreed that the oral contraceptive could protect against HIV/AIDS infection ($\chi^2(4) = 102.058$; $p < 0.001$) and agreed that someone who looked healthy could be HIV infected ($\chi^2(4) = 151.145$; $p < 0.001$) (9.8% in 2002, 11.3% in 2006

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and 13.5% in 2010; and 76.0% in 2002, 78.2% in 2006 and 67.0% in 2010, respectively).

The only statement with which young people presented more accurate information was about the impossibility of becoming infected with HIV/AIDS by blood transfusion in Portugal.

Overall, from 2002 to 2010 there was a systematic decrease in information regarding HIV/AIDS transmission/prevention. The *Post*-hoc comparisons by the *Scheffe* method indicated that young people reported having more information regarding HIV/AIDS transmission/prevention in 2002 than in 2006 and in 2010.

Table 3. Differences between 2002, 2006 and 2010 for information regarding HIV/AIDS transmission/prevention for the total sample.

	2002		2006		2010		Total[1]		χ^2	p
	N	%	N	%	N	%	N	%		
It is possible to become infected with HIV/AIDS by sharing needles									360.893	0.000
Yes	3500	94.1	2831	89.8	2558	79.9	8889	88.2		
I do not know	128	3.4	249	7.9	484	15.1	861	8.6		
No	93	2.5	74	2.3	159	5.0	326	3.2		
It is possible to become infected with HIV/Aids from coughing and sneezing									137.908	0.000
Yes	454	12.2	445	13.9	464	14.6	1363	13.5		
I do not know	732	19.7	753	23.5	972	30.5	2457	24.3		
No	2525	68.0	2002	62.6	1751	54.9	6278	62.2		
An HIV-infected pregnant woman may pass the virus to her baby									438.626	0.000
Yes	3298	89.0	2564	80.2	2194	68.8	8056	79.8		
I do not know	302	8.1	485	15.2	792	24.9	1579	15.7		
No	106	2.9	150	4.7	201	6.3	457	4.5		
It is possible to become infected with HIV/AIDS by hugging someone infected									464.847	0.000
Yes	114	3.1	175	5.5	254	8.0	543	5.4		
I do not know	234	6.3	349	10.9	671	21.1	1254	12.4		
No	3352	90.6	2673	83.6	2262	71.0	8287	82.2		
The oral contraceptive can protect against HIV/AIDS infection									102.058	0.000
Yes	361	9.8	361	11.3	429	13.5	1151	11.4		
I do not know	905	24.5	694	21.7	957	30.1	2556	25.4		
No	2432	65.8	2145	67.0	1792	56.4	6369	63.2		
It is possible to become infected with HIV/AIDS by engaging in unprotected sexual intercourse with someone just once									258.596	0.000
Yes	3251	87.9	2766	86.7	2414	76.1	8431	83.8		
I do not know	260	7.0	273	8.6	581	18.3	1114	11.1		
No	187	5.1	150	4.7	177	5.6	514	5.1		

	2002		2006		2010		Total[1]		χ^2	p
	N	%	N	%	N	%	N	%		
Someone who looks healthy can be HIV infected									151.145	0.000
Yes	2800	76.0	2485	78.2	2124	67.0	7409	73.8		
I do not know	572	15.5	517	16.3	796	25.1	1885	18.8		
No	313	8.5	177	5.6	251	7.9	741	7.4		
It is possible to become infected with HIV/AIDS by sharing a glass, fork/ spoon									119.840	0.000
Yes	798	21.5	726	22.8	701	22.1	2225	22.1		
I do not know	922	24.9	931	29.2	1139	35.9	2992	29.7		
No	1986	53.6	1534	48.1	1330	42.0	4850	48.2		
It is possible to become infected with HIV/AIDS by blood transfusion in a Portuguese hospital									748.894	0.000
Yes	3138	84.7	2060	64.6	1747	55.0	6945	69.0		
I do not know	415	11.2	788	24.7	1043	32.8	2246	22.3		
No	153	4.1	339	10.6	387	12.2	879	8.7		

	2002		2006		2010		Total				Scheffe post
	M	SD	M	SD	M	SD	M	SD	F	p	hocs[2]
Total scale	6.30	1.70	6.16	2.08	5.32	2.60	5.95	2.18	196.117	0 .000	a<b<c

[1] *The total numbers differ considering that some participants have not replied to some variables.*

[2] *The a, b, c and < > signs – represent statistically significant differences within groups for p<0.050 by the Scheffe POSTHOC method. In bold – values that correspond to an adjusted residual ≥ |1.9 |*

Table 4 shows trends in attitudes towards HIV/AIDS infected people between 2002 and 2010 for the total sample.

It was found that in 2002 young people agreed more often that adolescents with AIDS should be allowed to go to school, that they would be able to attend a class next to a colleague infected with HIV/AIDS, and that they would visit a friend that was infected, and more adolescents disagreed that HIV infected people should live apart of the rest of the people.

Overall, from 2002 to 2010, results showed a decreasing trend in four out of five statements concerning positive attitudes towards people with HIV/AIDS: adolescents with AIDS should be allowed to go to school ($\chi^2(4) = 72.083$; $p < 0.001$); I would sit near an infected student in classroom ($\chi^2(4) = 117.797$; $p < 0.001$); I would visit a friend if he or she had AIDS ($\chi^2(4) = 201.713$; $p < 0.001$); and HIV infected people should live apart of the rest of the people ($\chi^2(4) = 144.506$; $p < 0.001$). The *Post*-hoc comparisons by the *Scheffe* method indicated that young people reported having more positive attitudes towards people with HIV/AIDS in 2002 than in 2006 and in 2010.

Separate analyses for control variables (gender, age and school grade) were conducted regarding all variables under study. The same patterns were found in each of the three survey years concerning a) information regarding HIV/AIDS transmission / prevention, b) attitudes towards HIV infected people, and c) pill use at last sexual intercourse. Nevertheless, regarding sexual intercourse, age of first sexual intercourse and condom use results were confounded by the control variables. Due to space reasons the results of these analyses weren't presented here.

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Table 4. Differences between 2002, 2006 and 2010 for attitudes towards HIV-infected people for the total sample.

	2002		2006		2010		Total[1]		χ^2	p
	N	%	N	%	N	%	N	%		
I wouldn't be a friend of someone if he had AIDS									13.461	0.009
Agree	226	6.1	222	7.0	235	7.5	683	6.8		
I'm not sure	629	17.0	588	18.5	608	19.3	1825	18.2		
Disagree	2852	76.9	2366	74.5	2308	73.2	7526	75.0		
Adolescents with AIDS should be allowed to go to school									72.083	0.000
Agree	2586	70.1	2188	69.3	1928	61.3	6702	67.1		
I'm not sure	644	17.5	550	17.4	727	23.1	1921	19.2		
Disagree	457	12.4	418	13.2	489	15.6	1364	13.7		
I would sit near an infected student in the classroom									117.797	0.000
Agree	2615	70.8	2106	66.6	1835	58.4	6556	65.6		
I'm not sure	775	21.0	749	23.7	927	29.5	2451	24.5		
Disagree	305	8.3	309	9.8	381	12.1	995	10.0		
I would visit a friend if he or she had AIDS									201.713	0.000
Agree	3104	83.9	2540	80.6	2206	70.1	7850	78.5		
I'm not sure	425	11.5	444	14.1	667	21.2	1536	15.4		
Disagree	172	4.6	169	5.4	272	8.6	613	6.1		
HIV infected people should live apart of the rest of people									144.506	0.000
Agree	294	8.0	293	9.3	330	10.5	917	9.2		
I'm not sure	300	8.1	314	9.9	509	16.3	1123	11.2		
Disagree	3103	83.9	2551	80.8	2293	73.2	7947	79.6		

	2002		2006		2010		Total[1]				Scheffe post hocs[2]
	M	SD	M	SD	M	SD	M	SD	F	p	
Total scale	13.47	2.02	13.28	2.13	12.84	2.24	13.21	2.14	76.815	0.000	a<b<c

[1] *The total numbers differ considering that some participants have not replied to some variables.*
In bold – values that correspond to an adjusted residual ≥ |1.9|

[2] *The a, b, c and < > signs – represent statistically significant differences within groups for p<0.050 by the Scheffe POSTHOC method.*

Discussion

The goal of this study was to document recent trends in preventive sexual behaviors in Portuguese adolescents, including information and attitudes about HIV/AIDS, and assessing whether they have changed and how they have changed from 2002 to 2010.

In terms of preventive behaviors, results showed that in 2010, on average 78.2% (n=7924) of 8th and 10th grade adolescents have not had sexual intercourse. Comparing the data from the 2002,

2006 and 2010 HBSC surveys, results showed an increasing trend regarding the percentage reporting first sexual intercourse at 14 years old or more and condom use at last sexual intercourse (even though the explanation may rely partially on gender, age or school grade) and a stabilized trend regarding having had sexual intercourse and contraceptive pill use at last sexual intercourse.

In terms of information and attitudes about HIV/AIDS, results showed that in 2010 on average 8th and 10th grade adolescents are well information and have moderately tolerant attitudes towards people with HIV/AIDS. Comparing the data from the 2002, 2006 and 2010 HBSC surveys results showed a systematic decreasing trend.

Therefore, on the one hand, there's an improvement on sexual reproductive health because in 2010 preventive behaviors have either increased or stabilized, which means that there was a bigger chance adolescents could be better informed and motivated, and have better behavioral skills than in 2002 and 2006. Moreover, since age of first sexual intercourse is stabilizing at 14 or more, it seems that adolescents are not anticipating their sexual debut, probably because of all the HIV/AIDS campaigns and structured sex education being implemented in Portugal.

On the other hand, some aspects of sexual reproductive health caused some concern: the systematic reduction of information regarding HIV/AIDS transmission / prevention, and decrease in tolerant attitudes towards people with HIV/AIDS. Though in general, adolescents were well informed about the main HIV/AIDS transmission routes and how to protect themselves from becoming infected, their information decreased and a minority still lacked information about main issues. This conclusion reinforced findings from other studies in this area (Currie, Hurrelmann, Settertobulte, Smith, & Todd, 2000; Eurostat, 2012). In 2010, 13.5% believed the oral contraceptive could protect against HIV/AIDS infection. This may be the reason why some of them haven´t used a condom during last sexual intercourse and, unfortunately, why the incidence of HIV/AIDS continues to be so significant in this age group.

And 18.3% (in 2010 compared to 8.6% in 2006 and 7.0% in 2002) didn't know it is possible to become infected with HIV/AIDS by engaging in unprotected sexual intercourse with someone just once. Though most adolescents admitted knowing that it is possible for a person to have intercourse without a condom once and get infected with HIV/AIDS, it seems that quite a few students may be underestimating the risk in the sense that their risk perception is not consistent with their reports of involvement in potentially risky behaviors such as not having used condom during the last sexual intercourse.

In relation to the percentage reporting condom use during last sexual intercourse, it is important to refer that still about 18% are not using it and thus continue engaging in sex risk behaviors.

There is a residual group of adolescents who engage in unprotected or poorly protected sexual activity. It is imperative to find out why the message doesn't get through to these adolescents and what their particular characteristics are, so that prevention interventions become more successful with this group.

As for the decrease in tolerant attitudes towards people with HIV/AIDS, it is important to say that, in general, respondents did show positive attitudes, they were tolerant and inclusive. Nonetheless, there was a general decrease in their tolerant attitudes, which must be analyzed, mainly because it was not the only area they have shown a setback.

Some authors (Matos, 2008) believe that a few adolescents are no longer concerned about being well informed on prevention and transmission of HIV/AIDS, as long as they use a condom. In this sense they may not be so concerned either about being tolerant towards HIV infected people, they may see it as the consequence of their own irresponsibility, lacking the capacity to consider that condoms aren't 100% effective, so even using a condom at every sexual intercourse there's a chance of becoming infected for condoms can break, tare and slip off.

The results showed a gap between what young people knew about HIV/AIDS and what they expressed in sexual behavior. Thus, we can say that is not information per se, although it is a major prerequisite, which will implement the behavioral changes. Several studies have emphasized the relativization of the amount of information about HIV/AIDS, both regarding preventive behavioral strategies and decision making about personal risk of infection (Matos, 2008; UNAIDS, 2009).

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Conclusions

Overall, young people have more preventive sexual behaviors (have their first sexual intercourse older and use condom and contraceptive pill at their last sexual intercourse) than before. Nevertheless, there is still a residual group of about 18% of adolescents among those sexually active who engage in unprotected or poorly protected sexual activity. Also, a reduction of information regarding HIV/AIDS transmission/prevention and of positive attitudes towards people with HIV/AIDS was observed.

With what the perception of vulnerability is concerned, young people continue to underestimate the risk mainly because of the sense of invulnerability among heterosexuals in general and the social representation of the illness onset (DiClemente, Forrest, & Mickler, 1990). Moreover, adolescents' typical egocentrism also translates into difficulties in realizing their vulnerability (Boruchovitch, 1992).

The analyses suggested that formal sex education in school context promotes protective sexual behaviors, but there is still a lot to be done since not all adolescents refer having protective behaviors and that can bring major negative outcomes in terms of public health (Ramiro, Reis, Matos, Diniz, & Simões, 2011). Besides, though adolescents seemed to have focused on preventive behaviors, they seemed to have disregarded information and attitudes in general. This suggested that sex education programs implemented in Portugal are still too limited to teaching sessions, strongly homogenized in their content and consequently inadequate to enhance the level of information and attitudes regarding HIV, let alone personal and social skills of different target groups.

HIV prevention school-based programs have been suggested (Basen-Engquist, et al., 1997; Thurman, 2000) as a means of effective universal access when targeting adolescents. Schools present a valuable setting because that's where nearly all adolescents spend a significant part of their time; it possesses educational structures and resources that will favor the integration of the HIV theme in the context of sexual health education programs (Diclemente et al., 2000). However, research emphasizes that few programs achieve positive results. This is probably due to the lack of a theory at the base of the intervention program (Fisher, & Fisher, 2000).

Since 1986, sex education in Portugal has been compulsory in elementary and middle school and from 2010 onwards in high school too. Moreover, a group of specialists (GTES, 2007) hired by the Portuguese Ministry of Education produced specific legislation and established support measures for the implementation of sex education in school context. Though the government has done a great effort to regulate all necessary aspects and published a conceptual framework for sex education, not all schools comply with the Portuguese Ministry of Education guidelines just yet.

Moreover, there isn't a program of intervention based on a specific theory as studies show it should (Kirby, Laris, & Rolleri, 2007). National guidelines indicate teachers should improve adolescents' information, not only regarding HIV/AIDS transmission and prevention but also to clarify myths and misconceptions, work on their attitudes, and motivation to condom use, as well as develop their personal and social skills, which are somehow similar to the IMB model (Information, Motivation and Behavior model). But it is necessary that the IMB model, which has demonstrated intervention efficacy, *is* clearly adopted, i.e., identified, explained and then applied and evaluated in Portuguese schools.

The findings of this study must be considered in light of the study's strengths and limitations. The HBSC provides the ability to assess trends through repeated measurements at several frequently spaced points in time, thereby providing a unique opportunity to examine trends. Nevertheless, it relies on self-reported measures and recall bias. Also, the questionnaire doesn´t contemplate measures about adolescents' motivation and behavioral skills that are part of the IBM model (Fisher, & Fisher, 1992; 1993), so not all variables of the IBM model were assessed.

The authors of this research do not intend to advocate abstinence-only programs. Evidence does not indicate that abstinence-only interventions effectively decrease risk among adolescents (Kohler, Manhart, & Lafferty, 2008; Underhill, Operario, & Montgomery, 2011).

Future research should investigate the prevalence of evidence-based programs used in formal

settings as well as determine their effectiveness when implemented on a large scale. There is also a need to better understand the process of scaling up the implementation of evidence-based programs (Ramiro, Reis, Matos, Diniz, & Simões, 2011).

As a final note, it's important to emphasize adolescents' increasing ability to adopt preventive behaviors, therefore findings are promising.

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