

We are IntechOpen, the world's leading publisher of Open Access books Built by scientists, for scientists

4,800

Open access books available

122,000

International authors and editors

135M

Downloads

Our authors are among the

154

Countries delivered to

TOP 1%

most cited scientists

12.2%

Contributors from top 500 universities



WEB OF SCIENCE™

Selection of our books indexed in the Book Citation Index
in Web of Science™ Core Collection (BKCI)

Interested in publishing with us?
Contact book.department@intechopen.com

Numbers displayed above are based on latest data collected.

For more information visit www.intechopen.com



Knowledge, Attitude and Behaviour Related to Sexually Transmitted Infections in Portuguese School (Adolescent) and College Students

Lúcia Ramiro, Marta Reis,
Margarida Gaspar de Matos and José Alves Diniz
*Projecto Aventura Social - Faculdade de Motricidade
Humana / Universidade Técnica de Lisboa, Cruz Quebrada
CMDT-LA/UNL - Centro de Malária e Doenças Tropicais, Laboratório Associado
Instituto de Higiene e Medicina Tropical, Universidade Nova de Lisboa, Lisboa
Portugal*

1. Introduction

Many adolescents in Portugal experience serious health and social problems related to sexually transmitted infections (STIs). Sexually transmitted infections are spread by sexual contact. Treatment is available for most STIs but prevention of these diseases is the preferable option, since they can have serious, long-term, health and social implications. Prevention is the way to control STIs.

The goals of this chapter are to analyze knowledge, attitudes and behaviours related to sexually transmitted infections in Portuguese school (adolescent) and college students.

1.1 STIs: Why is it a problem?

Globally, over 100 million STIs occur each year in people under the age of 25 years old (UNAIDS, 2008), and an estimated 11.8 million people aged 15-24 were living with HIV by mid-2002. Further, about half of all new HIV infections worldwide, or nearly 6,000 cases per day, occur in young people (UNAIDS, 2008).

The latest Portuguese report from the national monitoring center of sexually transmitted diseases (CVEDT, 2009) states that the total number of cumulative cases of HIV/AIDS was about 35 thousand with about 15 thousand of these being cases of AIDS. From the analysis of the distribution of the cases of AIDS according to the transmission categories, it appears that 40% are cases associated with heterosexual transmission. In fact, statistics suggest that the cases of AIDS confirm the epidemiological pattern recorded annually since 2000, that is, there is a proportional increase in the number of cases of heterosexual transmission.

Young people are particularly vulnerable to STIs and consequent health problems because:

- They lack information about how to prevent STIs;

- They are less likely to seek proper information or treatment due to fear, ignorance, shyness or inexperience;
- Early sexual experience can result in trauma to vaginal tissue, increasing adolescent women's vulnerability to STIs;
- Adolescents who begin sexual activity early are more likely to have a greater number of lifetime sexual partners.

Other risk factors for adolescents are:

- Unprotected sex (without condoms).
- Sex with multiple (sequential) partners.
- Having a partner who has other sex partners.
- Having a partner with STI symptoms.
- Sex with a new partner or more than one partner in the last three months.
- Sex with strangers or sex in exchange for money.
- Vulnerability to sexual violence, coercion and abuse.

According to UNAIDS (2008), some strategies to reduce STIs:

- Provide teens with the information, skills, and support they need to practice safe sexual behaviour. This programme should be tailored to youths' needs and age appropriate, culturally sensitive and teach sexual and reproductive options. Build on current knowledge of best practices by emphasizing communication, skill-building activities, and role-playing.
- Educate adolescents and young people about the risks of sexually transmitted diseases, including HIV/AIDS. Incorporate promising strategies into comprehensive STIs prevention programs including: individual and peer education, counseling, case management, after school activities, and building support systems and relationships with caring adults.
- Increase access to reproductive health care. Encourage all health care providers who provide care to youth to include comprehensive, age-appropriate information on sexual health issues, including prevention of STIs. Make confidential STI screening and treatment services easily accessible to teenagers along with culturally sensitive counseling and education regarding the use of available protective measures.

1.2 Sexual behaviour, knowledge and attitudes

Many adolescents and young adults engage in sexual intercourse, often with multiple (sequential) sex partners and without using condom. In 2006, 22.7% of high school students in Portugal reported having had sexual intercourse (Reis et al., 2011), with a majority (71.1%) reporting having had sexual intercourse for the first time at 14 years old or later. In a US research, 47.8% of high school students reported having had sexual intercourse (Eaton et al., 2008), with 7.1% reporting having had sexual intercourse for the first time before age 13. Early initiation of sexual activity has been pinpointed as an important indicator in terms of sexual health (Centers for Disease Control and Prevention, 2010; UNAIDS, 2010; WHO, 2010). Some studies even report that early sexual activity is associated with other risk behaviours, such as substance use (Madkour et al., 2010).

Although most adolescents do not have concurrent sex partners at any given point in time, the number of sex partners cumulates over time. Moreover, among sexually active young adults,

only 81.3% (Portuguese survey) and 61.5% (U.S. survey) reported using a condom the last time they had sexual intercourse (Reis et al., 2011; Eaton et al., 2008). In spite of the fact that many have used condoms at some time during an episode of sexual intercourse, comparatively few report using them every time they have sex (Reis et al, 2011; Eaton et al., 2008). Thus, young adults engage in sexual behaviours that place them at risk for acquiring STIs, including HIV.

According to literature, if young people possess knowledge, information and motivation on safe sexual behaviour, they may change their attitudes and their behaviours (Synovitz et al., 2002; Thompson et al., 1999). Improving knowledge related to HIV prevention and attitudes about people living with HIV are other important aims of sexual and reproductive health. Some theories claim that being well informed about transmission/preventive behaviours regarding HIV and other STIs and developing a positive attitude towards people infected with HIV are crucial to change people’s behaviours.

2. Study 1: HBSC - Health Behavior in School-aged Children

The Health Behavior in School-aged Children (HBSC) is a collaborative WHO study, developed by 44 countries in order to study school-aged behaviour regarding health and risk behaviours in adolescence. Portugal is part of this group since 1996 (Currie et al, 2000).

2.1 Method

2.1.1 Sample

The 2010 study provides national representative data of 5050 Portuguese adolescents, randomly chosen from those attending 6th, 8th and 10th grade of high school. The sample included 52.3% girls and 47.7% males, whose mean age was 13.98 years (standard deviation 1.85). The majority of adolescents are of Portuguese nationality (94.4%), 30.8% attended the 6th grade, 31.6% attended the 8th grade and 37.6% attended the 10th grade. This study uses a subset of 8th and 10th graders (n=3494). This sample included 53.6% girls and 46.4% boys, whose mean age was 14.94 years (standard deviation 1.30) (table 1).

	2010 Total sample (N=5050)		2010 Subset (N=3494)	
	N	%	N	%
Gender				
Male	2407	47.7	1621	46.4
Female	2643	52.3	1873	53.6
Grade				
6th grade	1556	30.8	-	-
8th grade	1594	31.6	1594	45.6
10th grade	1900	37.6	1900	54.4
Nationality¹				
Portuguese	4562	94.4	3145	94.2
Other	269	5.6	193	5.8
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Age	13.98	1.85	14.94	1.30

¹The total numbers differ considering that some adolescents have not replied to nationality.

Table 1. Socio demographic characteristics of total sample (N=5050) and subset (N=3494).

2.1.2 Procedure (study 1 and 2)

The procedure followed for school and college students was similar. Data were collected through a self-administered questionnaire. In study 1, data were collected from the Portuguese sample of the Health Behavior in School-aged Children (HBSC) and all procedures were followed according to the international research protocol. Study 2 - the Sexual and Reproductive Health in University Students (HBSC / SRHCS) - is an extension of the HBSC. The sampling unit used in these surveys was the class. The 139 schools/19 colleges in the samples were randomly selected from the official national list of schools/colleges, stratified by region (North, Center, Lisbon and Tagus Valley, Alentejo and the Algarve) in the mainland. In each school /college, classes were randomly selected in order to meet the required number of students for each grade. The surveys are nationwide and were conducted in 2010 for the Ministry of Portuguese Health and for the National Coordination for HIV/AIDS Infection by the Technical University of Lisbon. These studies have the approval of a scientific committee, the Ethics National Committee and the National Commission for Data Protection and followed strictly all the guidelines for human rights protection.

2.2 Measures (study 1 and 2)

For the purpose of these studies, the following parameters were assessed as detailed below:

Risky sexual behaviour was measured through the following behaviours - ever had sexual intercourse (Yes/No), age, condom use at first sexual intercourse (Yes/No). Condom use at last sexual intercourse (Yes/No) was also measured in adolescents. Another four behaviours were measured in college students: usual condom use (Yes/No), condom use last 12 months (Always/other options), occasional partners (Yes/No) and having had a sexually transmitted infection (Yes/No). As for having had sexual intercourse with alcohol (Yes/No) and drugs (Yes/No), it was measured separately in college students and jointly in adolescents. As documented in literature, having ever had sexual intercourse, occasional partners, an STI and sexual intercourse after having drunk too much alcohol or taken drugs, answer "Yes" was the one considered risky behaviour. As for condom use (first and last sexual intercourse), answer "No" was considered risky behaviour.

Knowledge regarding HIV/AIDS transmission/prevention - Adolescents and young adults were asked 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 positive knowledge/more information.

Attitudes towards HIV/AIDS infected people. Young people were asked to respond to five statements about attitudes towards HIV-infected people: 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 positive attitudes.

Attitudes towards condom use. Adolescents and young adults were asked to respond to four statements: 1. « It would be embarrassing to buy condoms in a store», 2. « It would feel uncomfortable carrying condoms with me.», 3. «It would be wrong to carry a condom with me because it would mean that I' m planning to have sex» and 4. « It would feel uncomfortable to ask for condoms at health care services.». Items were rated on a 3-point rating scale (1= disagree to 3= agree). After recoding all items, final scores ranged from 4 to 12, with high scores suggesting more positive attitudes.

2.3 Results

Analyses and statistical procedures were carried out in the *Statistical Package for Social Sciences* program (SPSS, version 19.0 for Windows). The total numbers differ according to sample use (8th and 10th grade sample; 8th and 10th grade adolescents who reported having had their first sexual intercourse) and considering that some adolescents have not replied to some parameters.

Overall, questionnaires were responded by the subset of 8th and 10th graders (3494 participants), between 13 and 21 years old. Findings show the majority is not sexually active (78.2%). There is significant variation by gender since boys more often have had sexual intercourse than girls ($\chi^2(1) = 57.31$; $p = .000$). Of the ones that refer having already had their first sexual intercourse, 68.9% referred that it happened when they were 14 or more. The results showed that, despite both the majority of boys (63.1%) and girls (77.1%) having had their first sexual intercourse at the age of 14 or later, boys more often claim to have started younger (at 11 or less and between 12 and 13) ($\chi^2(2) = 19.63$; $p = .000$). 93.8% refer having used the condom in the first sexual intercourse. As for the last sexual intercourse, 95.2% refer they have used condom. Significant variation was obtained between genders in relation to condom use in first sexual intercourse ($\chi^2(1) = 4.19$; $p = .041$) with girls referring more frequent use of the condom (96.2%) than boys (91.9%). Results showed that the majority (87.3%) did not have sexual intercourse under the effect of alcohol and drugs. Yet, boys did it more frequently than girls ($\chi^2(1) = 11.76$; $p = .001$), see table 2.

The total mean score of general HIV/AIDS knowledge was 5.32 (out of 9 points), with girls ($M = 5.58$, $SD=2.49$) showing significantly more knowledge than boys [$(M = 5.02$, $SD=2.69$ ($t(2902) = -5.941$, $p < 0.000$)] (see table 3).

The mean total score in relation to attitudes towards HIV-infected people was 12.84 ($SD=2.24$), with boys showing significantly less positive attitudes ($M = 12.42$, $SD=2.35$) than girls [$(M = 13.19$, $SD=2.09$ ($t(2854) = -9,690$, $p < 0.000$)] (see table 4).

	Boys (N=1588)		Girls (N=1848)		Total ¹ (N=3436)		χ^2
	N	%	N	%	N	%	
Ever had sexual intercourse							57.309***
Yes	437	27.5	311	16.8	748	21.8	
No	1151	72.5	1537	83.1	2688	78.2	
Only adolescents who reported having had their first sexual intercourse (N=748)							
	Boys		Girls		Total ¹		χ^2
	N	%	N	%	N	%	
Age of 1 st sexual intercourse (N=731)							19.628***
Age 11 or less	43	10.1	11	3.6	54	7.4	
Ages 12 and 13	114	26.8	59	19.3	173	23.7	
Ages 14 or more	268	63.1	236	77.1	504	68.9	
Condom use (% of people who responded yes)							
1 st sexual intercourse (N=511)	284	91.9	227	96.2	511	93.8	4.185*
last sexual intercourse (N=554)	302	94.1	252	96.6	554	95.2	1.919
Having had sexual intercourse under the influence of alcohol or drugs (N=693)							
Yes	66	16.4	22	7.6	88	12.7	
No	337	83.6	268	92.4	605	87.3	

¹The total numbers differ considering that some adolescents have not replied to some parameters.

* p < .05; ** p < .01; *** p < .001

In bold - values that correspond to an adjusted residual $\geq |1.9|$

Table 2. Differences between gender and risky *sexual behaviours*.

	Boys		Girls		Total ¹		χ^2
	N	%	N	%			
I wouldn't be a friend of someone if he had AIDS (N=3151)							
Agree	147	10.2	88	5.1	235		53.546***
I'm not sure	324	22.5	284	16.6	608		
Disagree	970	67.3	1338	78.2	2308		
Adolescents with AIDS should be allowed to go to school (N=3144)							
Agree	813	56.5	1115	65.4	1928		27.160***
I'm not sure	368	25.6	359	21.1	727		
Disagree	259	18.0	230	13.5	489		
I would sit near an infected student in classroom (N=3143)							
Agree	746	51.9	1089	63.9	1835		47.805***
I'm not sure	480	33.4	447	26.2	927		
Disagree	212	14.7	169	9.9	381		
I would visit a friend if he or she had AIDS (N=3145)							
Agree	920	63.9	1286	75.4	2206		58.630***
I'm not sure	347	24.1	320	18.8	667		
Disagree	172	12.0	100	5.9	272		
HIV infected people should live apart of the rest of people (N=3132)							
Agree	175	12.2	155	9.1	330		48.082***
I'm not sure	293	20.4	216	12.7	509		
Disagree	965	67.3	1328	78.2	2293		
	Boys		Girls		Total		
	M	SD	M	SD	M	SD	t
Total scale	12.42	2.35	13.19	2.09	12.84	2.24	-9.690***

¹ The total numbers differ considering that some adolescents have not replied to some parameters.

*p<0.05; **p<0.01; ***p<0.001

In bold - values that correspond to an adjusted residual $\geq |1.9|$

Table 4. Differences between gender and attitudes towards HIV-infected people.

The mean total score in relation to attitudes towards condoms was 8.73 (SD= 2.50), with boys showing significantly more positive attitude (M = 8.86, SD=2.53) than girls [(M = 8.63, SD=2.46 (t (3081) = -2,546, p< 0.011)] (see table 5).

	Boys		Girls		Total ¹		χ ²
	N	%	N	%			
It would be embarrassing to buy condoms in a store. (N=3158)							
Disagree	579	40.0	560	32.8	1139		17.796***
Neither agree nor disagree	350	24.2	474	27.7	824		
Agree	520	35.9	675	39.5	1195		
It would feel uncomfortable carrying condoms with me. (N=3146)							
Disagree	793	55.0	725	42.5	1518		48.526***
Neither agree nor disagree	324	22.5	482	28.3	806		
Agree	325	22.5	497	29.2	822		
It would be wrong to carry a condom with me because it would mean that I'm planning to have sex. (N=3134)							
Disagree	719	50.1	951	56.0	1670		11.031**
Neither agree nor disagree	379	26.4	397	23.4	776		
Agree	338	23.5	350	20.6	668		
It would feel uncomfortable to ask for condoms at the health care services (N=3112)							
Disagree	698	49.1	799	47.3	1497		4.962
Neither agree nor disagree	321	22.6	440	26.0	761		
Agree	402	28.3	452	26.7	854		
	Boys		Girls		Total		t
	M	SD	M	SD	M	SD	
Total scale	8.86	2.53	8.63	2.46	8.73	2.50	2.546*

¹The total numbers differ considering that some adolescents have not replied to some parameters.

*p≤0.05; **p≤0.01; ***p≤0.001

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

Table 5. Differences between gender and attitudes towards condoms.

3. Study 2: Sexual and Reproductive Health in University Students (HBSC / SRHCS)

A nationwide survey was conducted for the Ministry of Portuguese Health and for the National Coordination for HIV/AIDS Infection to assess HIV/AIDS-related knowledge, attitudes, and practices among the population aged 18-35 years. The aim of this research was to identify those behaviours that put young people at risk of HIV infection. Disseminating the findings is also crucial since it may potentiate an advocacy tool in order to mainstream HIV/ AIDS prevention programs at university level. Therefore it is also expected that it can help catalyze a more effective role for universities to fight against diseases as well as contribute to build intervention strategies that raise public awareness.

3.1 Method

3.1.1 Sample

The sample is composed of 3278 Portuguese college students, between 18 and 35 years old, randomly chosen from those attending university during the academic year of 2009/2010. Data were collected through a self-administered questionnaire. The sample included 70% women and 30% men. The mean age was 21 years old (standard deviation 3). The majority of students are Portuguese (97.3%), single (95.5%), catholic (71.9%), heterosexual (96.4%) and were proportionally distributed among all the educational Portuguese regions, see table 6.

		N	%	M	SD
Gender	Male	993	30.3	-	-
	Female	2285	69.7	-	-
Age		3278		21.01	3.00
Nationality	Portuguese	3189	97.3		
	European countries	45	1.4		
	Brazilian	25	0.8		
	African countries	19	0.6		
Marital Status	Single	3131	95.5	-	-
	Married	84	2.6	-	-
	Unmarried cohabitation	51	1.6	-	-
	Divorced	12	0.4	-	-
Religious affiliation	Catholic	2357	71.9	-	-
	Protestant	40	1.3	-	-
	Buddhist	7	0.2	-	-
	Orthodox	7	0.2	-	-
	None	860	26.2	-	-
	Other	7	0.2	-	-
Sexual Orientation ¹	Heterosexual	2754	96.4	-	-
	Homosexual	79	2.8	-	-
	Bisexual	22	0.8	-	-

¹The total numbers differ considering that some young adults have not replied to sexual orientation.

Table 6. Socio demographic characteristics.

3.2 Results

Analyses and statistical procedures were carried out in the *Statistical Package for Social Sciences* program (SPSS, version 19.0 for Windows). The total numbers differ according to sample use (complete sample; young adults who reported having had their first sexual intercourse) and considering that some young adults have not replied to some parameters.

Structured self-reported questionnaires were responded by 3278 participants, between 18 and 35 years old. From the total sample, 83.3% (N=2730) young people have already begun their sexual life. Men reported more often than women having had sexual intercourse ($\chi^2(1) = 29.15$; $p = .000$). Of these, 79.2% referred that they have had their first sexual intercourse at the age of 16 or later and 86.8% used the condom in their first sexual intercourse. The results showed that, despite both the majority of men (72%) and women (82.5%) having had their first sexual intercourse at the age of 16 or later, men most often claim to have started younger (at 11 or less, between 12 and 13, and between 14 and 15) ($\chi^2(3) = 60.05$; $p = .000$). Men reported more often having used condom in the first sexual intercourse than women ($\chi^2(1) = 18.56$; $p = .000$). It was also observed that among the students who already have sexual intercourse, 69% use condom usually. Significant variation was obtained between genders in relation to usual condom use ($\chi^2(1) = 4.41$; $p = .036$). Regarding genders, men refer more frequent usual use of condom (71.7%) than women (67.7%). When asked about frequency of condom use on last 12 months, only 32.6% refer using it always. Results showed that the majority of men (57.4%, 53.1%, 10.7%) have occasional sexual partners and

sexual relations under the effect of alcohol and drugs. And they do it more frequently than women [$(\chi^2(1) = 333.11; p = .000)$; $(\chi^2(1) = 166.52; p = .000)$; $(\chi^2(1) = 57.22; p = .000)$, respectively]. Regarding STIs, 3.3% reported having already had an STI (see table 7).

	Male (N=993)		Female (N=2285)		Total (N=3278)		χ^2
	N	%	N	%	N	%	
Ever had sexual intercourse							29.153***
Yes	880	88.6	1850	81.0	2730	83.3	
No	113	11.4	435	19.0	548	16.7	
Only young adults who reported having had their first sexual intercourse (N=2730)							
	Male		Female		Total ¹		χ^2
	N	%	N	%	N	%	
Age of 1 st sexual intercourse (N=2730)							60.05***
Age 11 or less	14	1.6	2	0.1	16	0.6	
Ages 12 and 13	44	5	39	2.1	83	3.0	
Ages 14 and 15	188	21.4	282	15.2	470	17.2	
Age 16 and more	634	72	1527	82.5	2161	79.2	
Condom use (% of people who responded yes)							
1 st sexual intercourse(N=2369)	728	82.7	1641	88.7	2369	86.8	18.56***
Usually (by the participant or partner)(N=1884)	631	71.7	1253	67.7	1884	69.0	4.41*
Always on last 12 months (N=842)	283	34.5	559	31.7	842	32.6	2.03
Occasional sexual partners (N=2669)							
Yes	484	57.4	396	21.7	880	33	333.11***
No	359	42.6	1430	78.3	1789	67	
Have sexual intercourse under the influence of alcohol (N=2658)							
Yes	446	53.1	497	27.3	943	35.5	166.52***
No	394	46.9	1321	72.7	1715	64.5	
Have sexual intercourse under the influence of drugs (N=2565)							
Yes	88	10.7	58	3.3	146	5.7	57.22***
No	731	89.3	1688	96.7	2419	94.3	
Have you had an STI (N=2647)							
Yes	28	3.4	59	3.3	87	3.3	0.02
No	807	96.6	1753	96.7	2560	96.7	

¹The total numbers differ considering that some young adults have not replied to some parameters.

* p< .05; ** p< .01; *** p< .001

In bold - values that correspond to an adjusted residual $\geq |1.9|$

Table 7. Differences between gender and risky *sexual behaviours*.

Knowledge regarding HIV/AIDS transmission/prevention: the distribution of each item is shown in Table 8. The level of general HIV/AIDS knowledge among young adults was high, as indicated by a total mean score of general HIV/AIDS knowledge of 7.82 out of 9 points, with females (M = 7.90, SD=0.90) showing significantly more knowledge than males [(M = 7.65, SD=1.33 (t (3215) = 421.30, p< 0.000)].

	Male		Female		Total ¹		χ^2
	N	%	N	%	M	SD	
It is possible to become infected with HIV/AIDS by sharing needles (N=3264)							13.554**
Yes	963	97.9	2259	99.1	3222		
No	8	0.8	15	0.7	23		
I do not Know	13	1.3	6	0.3	19		
It is possible to become infected with HIV/Aids from coughing and sneezing (N=3253)							27.417***
Yes	64	6.5	75	3.3	139		
No	848	86.5	2097	92.3	2945		
I do not Know	68	6.9	101	4.4	169		
An HIV-infected pregnant woman may pass the virus to her baby (N=3256)							47.621***
Yes	876	89.3	2174	95.6	3050		
No	43	4.4	51	2.2	94		
I do not Know	62	6.3	50	2.2	112		
It is possible to become infected with HIV/AIDS by hugging someone infected(N=3254)							27.491***
Yes	29	3	50	2.2	79		
No	931	95.2	2221	97.6	3152		
I do not Know	18	1.8	5	0.2	23		
The oral contraceptive can protect against HIV/AIDS infection (N=3255)							20.861***
Yes	16	1.6	30	1.3	46		
No	929	95	2222	97.6	3151		
I do not Know	33	3.4	25	1.1	58		
It is possible to become infected with HIV/AIDS by engaging in unprotected sexual intercourse with someone just once(N=3257)							19.914***
Yes	953	97.1	2255	99.1	3208		
No	14	1.4	15	0.7	29		
I do not Know	14	1.4	6	0.3	20		
Someone who looks healthy can be HIV infected(N=3249)							16.347***
Yes	937	95.7	2223	97.9	3160		
No	12	1.2	22	1	34		
I do not Know	30	3.1	25	1.1	55		
It is possible to become infected with HIV/AIDS by sharing a glass, fork /spoon (N=3246)							29.658***
Yes	163	16.7	242	10.7	405		
No	712	72.8	1839	81.1	2551		
I do not Know	103	10.5	187	8.2	290		
It is possible to become infected with HIV/AIDS by blood transfusion in a Portuguese hospital (N=3249)							5.438
Yes	552	56.3	1374	60.6	1926		
No	331	33.7	681	30	1012		
I do not Know	98	10	213	9.4	311		
	Male		Female		Total		t
	M	SD	M	SD	M	SD	
Total scale	7.65	1.33	7.90	0.90	7.82	1.05	421.30***

¹The total numbers differ considering that some young adults have not replied to some parameters.

*p≤0.05; **p≤0.01; ***p≤0.001

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

Table 8. Differences between gender and knowledge regarding HIV/AIDS transmission/prevention.

The mean total score in relation to attitudes towards condoms was 10.10 (SD= 2.08). There was no statistically significant difference between genders ($t(1961) = 1.567$, $p < 0.117$) (see table 10).

	Male		Female		Total ¹	χ^2	
	N	%	N	%			
It would be embarrassing to buy condoms in a store. (N=3196)						36.390***	
Disagree	649	67.6	1287	57.6	1936		
Neither agree nor disagree	207	21.6	540	24.2	747		
Agree	104	10.8	409	18.3	513		
It would feel uncomfortable carrying condoms with me. (N=3188)						14.904***	
Disagree	706	73.9	1543	69.1	2249		
Neither agree nor disagree	183	19.2	439	19.7	622		
Agree	66	6.9	251	11.2	317		
It would be wrong to carry a condom with me because it would mean that I'm planning to have sex. (N=3188)						22.653***	
Disagree	548	57.4	1468	65.7	2016		
Neither agree nor disagree	256	26.8	520	23.3	776		
Agree	150	15.7	246	11.0	396		
It would feel uncomfortable to ask for condoms at health care services. (N=3189)						7.791*	
Disagree	620	65.0	1512	67.7	2132		
Neither agree nor disagree	222	23.3	426	19.1	648		
Agree	112	11.7	297	13.3	409		
	Male		Female		Total		t
	M	SD	M	SD	M	SD	
Total scale	10.19	1.94	10.07	2.13	10.10	2.08	1.567

¹The total numbers differ considering that some young adults have not replied to some parameters.

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$

In bold - values that correspond to an adjusted residual $\geq |1.9|$

Table 10. Differences between gender and attitudes towards condoms.

4. Conclusions

Regarding sexual behaviours, overall, findings show the majority of Portuguese adolescents (13-21 years old) is not sexually active (78.2%), while the majority of Portuguese young adults are (83.3%). Young Portuguese adults (18 - 35 years old) reported having had their first sexual intercourse at 16 years old or later. As for Portuguese adolescents, they reported it happened at 14 or more. This suggests that there is a tendency for anticipating time of sexual initiation. These results are comparable to those that have been found in a similar nationwide US research, the Youth Risk Behavior Surveillance, with 64% of young Americans (10 - 24 years old) referring not being sexually active (CDC, 2010). These may be considered similar since the age interval is broader, therefore lowering frequency of sexual

activity. As for age of sexual onset, the average age for 16-20 year-olds in European countries in 2004 was 16.5 (Global Sex Survey, 2005), thus confirming our results regarding young adults. In a more recent research, 16-19 year old Brazilians reported their sexual debut to have been at 14.9 years old. (Paiva, V.; Calazans, G.; Venturi, G.; Dias, R.; & Grupo de Estudos em População, Sexualidade e AIDS, 2008.)

The rates of condom use during first sexual intercourse were very high among both Portuguese adolescents (93.8%) and young adults (86.8%). Yet, they clearly are not consistent since only 69% of young adults claim using the condom usually and only 32.6% refer using it always on last 12 months. Therefore, this suggests that protective behaviours are abandoned over time. These results seem much more promising than those of a Brazilian research (Paiva, V.; Calazans, G.; Venturi, G.; Dias, R.; & Grupo de Estudos em População, Sexualidade e AIDS, 2008), where only 65.6% of adolescents reported having used condom during first sexual intercourse.

Considering other risky behaviours, such as having had occasional sexual partners, 33% (this was asked to college students only) of young Portuguese adults reported it. These results represent higher risk than those presented by an American study (Eisenberg, Ackard, Resnick & Neumark-Sztainer, 2009) with 21.5% of young adults (median age 20.5) reporting having had occasional sexual partners.

Results showed that the majority (87.3%) of Portuguese adolescents did not have sexual intercourse under the effect of alcohol and drugs, whereas the majority of young adults (53.1%) reported the situation, considering alcohol alone. The findings related to Portuguese adolescents are confirmed in the YRSB research (CDC, 2010), with 78.4% stating not having had sexual intercourse under the effect of alcohol and drugs. As for having sexual intercourse under the effect of drugs alone, the frequency of young Portuguese adults who reported it is lower (10.7%), though serious. It was also asked to young adults if they had ever had an STI and 3.3% reported having already had an STI.

In both Portuguese studies, there is significant variation by gender since boys and men more often have had sexual intercourse, claim to have started their sexual life younger, reported having had occasional partners (young adults), having had sexual intercourse under the influence of alcohol or drugs than girls and women. Conversely, in relation to condom use in first sexual intercourse, Portuguese adolescent girls referred more frequent use of the condom (96.2%) than Portuguese boys (91.9%), which was not observed in the young adults' study. These variations by gender suggest boys and men engage in risky sexual behaviours more often than girls and women. These findings are confirmed in other studies: American boys and men initiated their sexual life younger (16.9 years old) than girls and women (17.4 years old) and stated more often (29% Vs. 14%) having had occasional partners (NSSHB, 2010; Eisenberg, Ackard, Resnick & Neumark-Sztainer, 2009).

As for knowledge regarding HIV/AIDS transmission/prevention, the total mean score of general HIV/AIDS knowledge was 5.32 among Portuguese adolescents and 7.82 among Portuguese young adults, out of 9 points. The results reveal significant variation in responses by gender: girls (M = 5.58, SD = 2.49) and young women (M = 7.90, SD=0.90) demonstrated significantly more knowledge than boys (M = 5.02, SD = 2.69) and young men (M = 7.65, SD=1.33). So, overall, results revealed the majority has a moderate/high level of

knowledge but boys and young men showed bigger risk acceptance, while girls demonstrated better knowledge in relation to risk-taking. Overall, most studies reveal a moderate / high level of knowledge: in a South African study (Bana et al., 2010), 56% of 15-24 year-olds reported good knowledge level about HIV/AIDS transmission and in an Iranian study, the knowledge level was considered moderately high (Tavoosi, Zaferani, Enzevaei, Tajik & Ahmadinezhad, 2004).

In relation to attitudes towards HIV infected people, the mean total score was 12.84 (SD= 2.24) among Portuguese adolescents and 14.61 (SD= 1.03) among Portuguese young adults. Final scores ranged from 5 to 15 points. The results reveal significant variation in responses by gender, with boys (M = 12.42, SD=2.35) and young men (M = 14.42, SD=1.28) showing significantly less positive attitudes than girls (M = 13.19, SD=2.09) and young women (M = 14.69, SD=0.90). So, overall, results revealed the majority has a moderate/very positive attitude towards HIV infected people but boys and young men showed less tolerance, while girls demonstrated more tolerant attitude. Results are much higher than in an Iranian research with 15 - 17 year old students, where an intolerant attitude towards HIV infected people, especially when boys were concerned, was observed (Tavoosi, Zaferani, Enzevaei, Tajik & Ahmadinezhad, 2004).

As for attitudes towards condoms, the mean total score was 8.73 (SD= 2.50), among Portuguese adolescents and 10.10 (SD= 2.08) among Portuguese young adults. Final scores ranged from 4 to 12 points. The results revealed significant variation in responses by gender among adolescents, with boys showing significantly more positive attitude (M = 8.86, SD=2.53) than girls [(M = 8.63, SD=2.46). So, overall, results revealed the majority has a moderate/very positive attitude towards asking for, buying and carrying condoms but girls showed more difficulty in those behaviours than boys, who demonstrated a more proactive attitude. The Portuguese results are corroborated in the HBSC Scottish national sample, both in relation to overall attitude towards condom and for gender differences (Kirby, van der Sluijs & Currie, 2010).

STI and HIV infections in adolescents are at epidemic levels worldwide. As long as adolescents continue to engage in sexual behaviours that place them at risk for STI/HIV (e.g., sex without a condom and with multiple sequential sex partners), they will be vulnerable to these health threats. For reasons outlined above, a few of which are amenable to change, adolescents may be especially susceptible to STI/HIV. It is a public health imperative that we incorporate successfully demonstrated strategies from past prevention efforts into current adolescent STI/HIV prevention programs and that we also continue to search for new ways to protect our youth, as well as teach them to protect themselves from STI/HIV infections.

One of the most important facts is that condoms provide the best protection from STIs, including HIV. Condoms must be used consistently and correctly in each act of intercourse (DGS, 2004).

Researchers (Mueller, Gavin & Kulkarni, 2008) advocate that sexual activity during adolescence years may be a risk behaviour since adolescents are still going through their maturity (physical, emotional and psychological) process and therefore it should be part of intervention programs (mainly through sex education) to postpone the initiation of sexual activity.

As a result, it is also acknowledged the potential contribution of sex education to increase condom use (Kirby, Laris & Rolleri, 2007; Mueller, Gavin & Kulkarni, 2008) as well as decrease sexual intercourse associated to alcohol or drugs (Madkour et al., 2010).

Because the rates of HIV/AIDS, particularly in young people, have always been on the top concerns (UNAIDS, 2010), increasing the level of knowledge related to HIV transmission routes and prevention and developing positive attitudes towards HIV infected people have similarly been prioritized as sex education goals (Kirby, Laris & Rolleri, 2007). These studies show that both adolescents and young adults have reasonable knowledge regarding HIV/AIDS transmission/prevention and show positive attitudes towards HIV infected people.

Overall, sexual health is a topic that requires intervention. During the last decades, since AIDS has revealed itself as a major world problem, governments, including the Portuguese, have dedicated time and money to promote safer sexual and reproductive health. The implementation of sex education may be an important part of the solution for this problem. Our analyses suggest that overall the Portuguese youth have safe sexual behaviours, but there is still a need to improve since not all refer having protective behaviours, therefore putting themselves at risk of major negative consequences in terms of public health (Ramiro, Reis, Matos, Diniz, & Simões, 2011). The data from these two studies also clearly show the existence of a set of factors that determine individual differences in the performance of preventive sexual behaviours. It seems that boys and young adult males have a higher probability to get involved in risky sexual behaviours.

One of the most frequently studied factors is STI's knowledge, namely regarding HIV and AIDS. Though most studies reveal that knowledge is crucial, being informed is not enough in order to change people's behaviours. Beliefs related to condom use (such as "decreasing sexual pleasure"), attitudes (positive or negative), the perception of support from meaningful people (relatives, peers, among others), parental attitudes and behavioral skills related to communication, assertiveness, negotiation, self-efficacy) and the intention of having preventive sexual behaviours always are extremely important conditions when trying to explain differences in behaviours (Matos et al., 2010; Carvalho, & Baptista, 2006; Kirby, 2001). A crucial issue on this subject is the perception of risk that young people have, in other words, the least they consider they are at risk (somehow an extension of the sense of invulnerability which is characteristic of adolescence) and therefore the potential consequences of their behaviours, the greatest the likelihood of getting involved in risky behaviours.

Figures regarding the variety of sexual risky behaviours and the variety of factors involved in the performance of preventive sexual behaviours increase the importance of implementing programs and campaigns that aim specifically to change behaviours and promoting sexual and reproductive health (Matos, 2008; Matos et al, 2011). Most programs have youth as target population regardless genders and they are designed to be implemented in school context. In some cases, teachers and parents are also considered as important agents in youth change and peers may be used as opinion leaders (Matos, 2008).

It is fundamental to comprehend sexuality within the context of adolescence if we want to avoid unwanted or unplanned pregnancy in adolescence, abortion and STIs in general and HIV/AIDS in particular. Sexuality has an important role in adolescents' growth and

development so their guidance is essential to enhance a positive, harmonious and responsible adolescence (Matos et al., 2011).

In order to fully understand adolescence, one has to consider the social, family and individual contexts where the adolescent interacts as well as the ways individuals organize sexual experiences. This means that the way adolescents relate sexually to others is deeply influenced by family and social models.

Considering that primary prevention is the one that aims to change behaviours, the evaluation of specific needs must consider the importance of social norms and peer groups, and the development of cognitive and behavioral skills that are essential to promoting and maintaining change. Sex education in health education context requires that the agents involved, whether direct or indirectly (family, schools, communities, institutions, NGOs, city councils, public and private institutes, and places of leisure and entertainment) gain awareness of their importance in young people's development.

Discussing sexuality with a youth audience is not an easy task. Overall, there's a huge difference between what they want to discuss and what adults consider is adequate or important to discuss with them. The main problem of sexuality in adolescence is lack of dialogue because some of the most important issues for them, such as the discovery of their own body, pleasure and their inner self are still taboo matters.

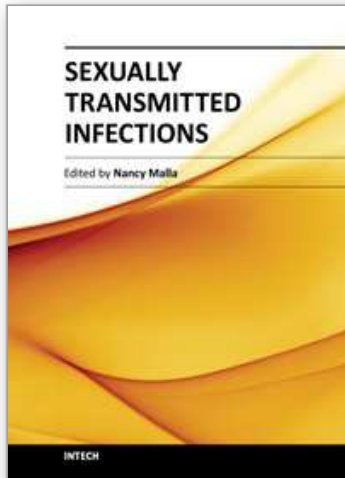
In order to enhance communication with adolescents and young people in general, both in school and university context, it must be developed an environment of understanding, empathy, truthfulness and genuine acceptance and respect for the adolescent/ young adult and his /her doubts, free from judgments. Therefore, the key point identified by experts is meaningful dialogue.

5. References

- Aquilino, M.; & Bragadottir, H. (2000). Adolescent pregnancy: Teen perspectives on prevention. *American Journal of Maternal Child Nursing*, 25, 4, 192-197.
- Bana, A.; Bhat, V.; Godlwana, X.; Libazi, S.; Maholwana, Y.; Marafungana, N.; Mona, K.; Mbonisweni, A.; Mbulawa, N.; Mofuka, J.; Mohlajoa, N.; Nondula, N.; Qubekile, Y.; & Ramnaran, B. (2010). Knowledge, attitudes and behaviours of adolescents in relation to STIs, pregnancy, contraceptive utilization and substance abuse in the Mhlakulo region, Eastern Cape. *South African Family Practice*, 52, 2, 154-158.
- Carvalho, M.; & Baptista, A. (2006). Modelos explicativos dos determinantes dos comportamentos preventivos associados à transmissão do Vírus da Imunodeficiência Humana. [Explanatory models of the determinants of preventive behaviors associated with transmission of Human Immunodeficiency Virus.] *Revista Lusófona de Ciências da Mente e do Comportamento*, 8, 163-192.
- Currie C.; Hurrelmann K.; Settertobulte W.; Smith R.; & Todd J. (2000). *Health and health behavior among young people*. Copenhagen: World Health Organization.
- Centers for Disease Control and Prevention. (2010). Youth Risk Behavior Surveillance - United States, 2009: Surveillance Summaries. Department of Health and Human Services. *MMWR*, 59.

- CVEDT – Centro de Vigilância das Doenças Sexualmente Transmissíveis. Infecção VIH / SIDA. A situação em Portugal a 31 de Dezembro de 2008. [HIV/AIDS. The situation in Portugal on December 31, 2008] (2009). Lisboa: INSA.
- DGS- Direcção Geral de Saúde (2004). Orientações estratégicas. Plano Nacional de Saúde 2004-2010: mais saúde para todos. [Strategic guidelines. National Health Plan 2004-2010: better health for all.]- Lisboa: Direcção-Geral da Saúde.
- Durex, Give and Receive. (2005) Global Sex Survey Results. Retrieved from internet on 19th September, 2011 from: www.durex.com/gss
- Eaton, D.; Kann, L.; Kinchen, S.; Shanklin, S.; Ross, J.; Hawkins, J.; Harris, W.; Lowry, R.; McManus, T.; Cheyen D.; Lim C.; Brener, N.; & Wechsler, H. (2008). Youth risk behavior surveillance, United States, 2007. *MMWR* 57(SS-4), 1-136.
- Eisenberg, M. E.; Ackard, D. M.; Resnick, M. D., & Neumark-Sztainer, D. (2009). Casual sex and psychological health among young adults: Is having “friends with benefits” emotionally damaging? *Perspectives on Sexual and Reproductive Health*, 41(4), 231-237.
- Kirby, D. (2001). *Emerging Answers: Research Findings on Programs to Reduce Teen Pregnancy*. Washington, DC: National Campaign to Prevent Teen Pregnancy.
- Kirby, D.; Laris, B.A.; & Roller, L. (2007). Sex and HIV education programs: Their impact on sexual behaviors of young people throughout the world. *Journal of Adolescent Health*, 40, 206-217.
- Kirby, J.; van der Sluijs, W.; & Currie, C.; (2010). HBSC Briefing Supplement 18b: Attitudes towards condom use among young people. Child and Adolescent Health Research Unit. The University of Edinburgh. HBSC Briefing Paper Series.
- Paiva, V.; Calazans, G.; Venturi, G.; Dias, R.; & Grupo de Estudos em População, Sexualidade e AIDS. Idade e uso de preservativo na iniciação sexual de adolescentes brasileiros. [Age and condom use at first sexual intercourse of Brazilian adolescents.] *Revista Saúde Pública*. 2008, vol.42, suppl.1, pp. 45-53.
- Madkour, A.; Farhat, T.; Halpern, C.; Godeau, E.; & Gabhainn, S. (2010). Early Adolescent Sexual Initiation as a Problem Behavior: A Comparative Study of Five Nations. *Journal of Adolescent Health*, 47(4): 389-398.
- Matos, M.G. et al. (2010). Sexualidade, cultura e saúde sexual em Portugal e na América Latina em M. Matos (coord), *Sexualidade, Afectos e Cultura – Gestão de problemas de saúde em meio escolar*. [Sexuality, affects and culture – Management of health problems in school.] *Coisas de Ler*, p. 159-175.
- Matos, M.G. (ed) (2008). *Sexualidade, Segurança e SIDA*, [Sexuality, Safetiness and Aids.] Lisboa: IHMT/FMH/FCT.
- Matos, M.; Simões, C.; Tomé, G.; Pereira, S.; Diniz, J.; & Equipa do Aventura Social (2006). *Comportamento Sexual e Conhecimentos, Crenças e Atitudes Face ao VIH/SIDA – Relatório Preliminar*, [Sexual Behavior, Knowledge, Beliefs and Attitudes towards HIV/AIDS – Preliminar Report.] Dezembro 2006. Web site: www.fmh.utl.pt/aventurasocial; www.aventurasocial.com.
- Matos, M.G.; Simões, C.; Tomé, G.; Camacho, I.; Ferreira, M.; Ramiro, L.; Reis, M.; & Equipa Aventura Social (2011). *A Saúde dos Adolescentes Portugueses – Relatório do Estudo HBSC 2010*. [The Health of Portuguese adolescents – HBSC Study Report 2010.] ACS/FMH/UTL/CMDT-UNL.

- Matos, M.G.; Reis, M.; Ramiro, L.; & Equipa Aventura Social (2011). *Saúde Sexual e Reprodutiva dos Estudantes do Ensino Superior - Relatório do Estudo* [Sexual Reproductive Health of Collegue Students - Study Report] HBSC/SSREU. ACS/FMH/UTL/CMDT-UNL.
- Mueller, T.E.; Gavin, L.E.; & Kulkarni, A. (2008) The association between sex education and youth's engagement in sexual intercourse, age at first intercourse, and birth control use at first sexual intercourse. *Journal of Adolescent Health, 42*, 89-96.
- National Survey of Sexual Health and Behavior (NSSHB). (2010). Findings from the National Survey of Sexual Health and Behavior, Centre for Sexual Health Promotion, Indiana University. *Journal of Sexual Medicine, 7*, Supplement 5.
- Ramiro, L.; Reis, M.; Matos, M.G.; Diniz, J.; & Simões, C. (2011). Educação Sexual, Conhecimentos, Crenças, Atitudes e Comportamentos nos adolescentes. [Sexual Education, Knowledge, Beliefs, Attitudes and Behaviors among adolescents.] *Revista Portuguesa de Saúde Pública, 29 (1)*:11-21.
- Reis, M.; Ramiro, L.; Matos, M.G.; Diniz, J. A; & Simões, C. (2011). Information and attitudes about HIV/Aids in Portuguese adolescents: state of art and changes in a four year period. *Psicothema, 23(2)*, 260-266.
- Reis, M.; Ramiro, L.; Carvalho; M. & Pereira, S. (2009). A sexualidade, o corpo e os amores em M. Matos & D. Sampaio (coord), *Jovens com Saúde - Diálogo com uma Geração*, [Youth with Health - Dialogue with a Generation.] Lisboa. Texto Editora, p. 265-282.
- Synovitz, L.; Herbert, E.; Kelley, R.; & Carlson, G. (2002). Sexual knowledge of college students in a southern state: Relationship to sexuality education results of Louisiana college student study shows need for sexuality programs. *American Journal of Health Studies*. Retrieved from www.findarticles.com.
- Tavoosi, A.; Zaferani, A.; Enzevaei, A.; Tajik, P.; & Ahmadinezhad, Z. (2004). Knowledge and attitude towards HIV/Aids among Iranian students. *BMC Public Health, 4*, 17.
- Thompson, C.; Currie, C.; Todd, J.; & Elton, R. (1999). Changes in HIV/AIDS education, knowledge and attitudes among Scottish 15-16 years old, 1990-1994 findings from WHO: Health Behaviour in School-aged Children Study (HBSC). *Health Education Research, 14*, 357-370.
- UNAIDS. (2008). Joint United Nations Programme on HIV/AIDS. Report on the global HIV/AIDS epidemic.
- UNAIDS. (2010). Global Report: UNAIDS report on the Global Aids epidemic 2010. Joint United Nations Programme on HIV/Aids. WHO Library Catalogue-in-Publication Data.
- WHO. (2010). Position paper on mainstreaming adolescent pregnancy in efforts to make pregnancy safer. Department of Making Pregnancy Safer. WHO Document Production Services, Geneva, Switzerland.



Sexually Transmitted Infections

Edited by Prof. Nancy Malla

ISBN 978-953-51-0258-8

Hard cover, 244 pages

Publisher InTech

Published online 21, March, 2012

Published in print edition March, 2012

Sexually transmitted infections (STIs) are infections that are spread primarily through person to person sexual contact. There are more than 30 different sexually transmissible bacteria, viruses and parasites. STIs lead to high morbidity and complications. This book entitled as Sexually Transmitted Infections is not a text book but provides useful information for general reference work for physicians, researchers and students interested in the subject. Each chapter is abundant in tips useful to general readers as well. It also includes the Introductory chapter providing an overview with special emphasis on syndromic approach to the management of STIs in clinical setting.

How to reference

In order to correctly reference this scholarly work, feel free to copy and paste the following:

Lúcia Ramiro, Marta Reis, Margarida Gaspar de Matos and José Alves Diniz (2012). Knowledge, Attitude and Behaviour Related to Sexually Transmitted Infections in Portuguese School (Adolescent) and College Students, Sexually Transmitted Infections, Prof. Nancy Malla (Ed.), ISBN: 978-953-51-0258-8, InTech, Available from: <http://www.intechopen.com/books/sexually-transmitted-infections/knowledge-attitude-and-behaviour-related-to-sexually-transmitted-infections-in-portuguese-school-ado>

INTECH
open science | open minds

InTech Europe

University Campus STeP Ri
Slavka Krautzeka 83/A
51000 Rijeka, Croatia
Phone: +385 (51) 770 447
Fax: +385 (51) 686 166
www.intechopen.com

InTech China

Unit 405, Office Block, Hotel Equatorial Shanghai
No.65, Yan An Road (West), Shanghai, 200040, China
中国上海市延安西路65号上海国际贵都大饭店办公楼405单元
Phone: +86-21-62489820
Fax: +86-21-62489821

© 2012 The Author(s). Licensee IntechOpen. This is an open access article distributed under the terms of the [Creative Commons Attribution 3.0 License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

IntechOpen

IntechOpen