

Study of the Sociodemographic Factors and Risky Behaviours Associated with the Acquisition of Sexual Transmitted Infections by Foreign Exchange Students in Portugal



Estudo dos Fatores Sociodemográficos Associados à Aquisição de Infecções Sexualmente Transmissíveis em Estudantes Estrangeiros em Intercâmbio Universitário em Portugal

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 Acta Med Port 2016 Jun;29(6):360-366 - <http://dx.doi.org/10.20344/amp.6692>

ABSTRACT

Background: Sexual transmitted infections are a main cause of morbidity, being a public health problem due to its reproductive complications, mostly observed in teenagers and young adults. The purpose of this study was to evaluate sociodemographic factors and risky behaviours associated with sexual transmitted infections acquisition and to assess personal awareness of risky behaviour and the knowledge about *Chlamydia trachomatis* infection between foreign exchange students in Portugal.

Material and Methods: The main instrument for data collection was a questionnaire, applied to foreign students in university exchange in Portugal, during the years 2012/2013, 2013/2014 e 2014/2015

Results: Three hundred and thirty eight (338) questionnaires were evaluated, being 58.3% female students, aged between 17 and 30 years old. Mean age for the beginning of the sexual activity was 17.5 years old and the mean number of lifetime sexual partners was 6.9. Concerning the answers given: 11.8% mentioned a sexual relationship with the same gender, 9.5% mentioned that they have never done oral sex and 29% assumed they had practiced anal sex; 82.1% mentioned alcohol/drugs consumption; 21% did not know that Sexual transmitted infections can be transmitted through oral sex and 42.3% did not recognize *Chlamydia trachomatis* as an Sexual transmitted infections agent.

Discussion: Although sexual transmitted infections can affect individuals of all ages, races and sexual orientation, various demographic, social and behavioral factors have revealed influence in their prevalence rates.

Conclusion: Despite knowing about sexual transmitted infections, these students maintain sexual risky behaviours, mainly early age for starting sexual activity, multiple sexual partners and the absence of protection during sexual activities.

Keywords: Chlamydia trachomatis; International Educational Exchange; Portugal; Risk-Taking; Sexually Transmitted Diseases; Sexual Behavior; Socioeconomic Factors; Students; Surveys and Questionnaires.

RESUMO

Introdução: As infeções sexualmente transmissíveis são um problema de saúde pública, sendo mais frequentes em jovens. Este estudo teve como principal objetivo avaliar os fatores sociodemográficos e comportamentos associados à aquisição de infeções sexualmente transmissíveis e o conhecimento sobre infeção por *Chlamydia trachomatis* em estudantes estrangeiros em intercâmbio universitário em Portugal.

Material e Métodos: Os fatores sociodemográficos e comportamentos de risco foram estudados por aplicação de um questionário a estudantes em intercâmbio universitário em Portugal, inscritos nos anos letivos de 2012/2013, 2013/2014 e 2014/2015.

Resultados: Avaliaram-se 338 questionários: 58,3% participantes do sexo feminino e 40,8% do sexo masculino (17 aos 30 anos). A idade média apontada para o início da vida sexual foi de 17,5 anos e a média de parceiros sexuais de 6,9. Relativamente às questões inquiridas foi referido: 9,5% negaram atividade sexual oral; 29% com atividade sexual anal; 11,8% com atividade sexual com parceiros do mesmo género; 82,1% refere consumo de álcool/estupefacientes; 42,3% desconhecimento sobre a infeção por *Chlamydia trachomatis* e 21% sobre o risco de transmissão de infeção por via oral.

Discussão: Apesar das infeções sexualmente transmissíveis poderem afetar indivíduos de todas as idades, raças e orientações sexuais, vários fatores demográficos, sociais e comportamentais têm revelado influência nas taxas de prevalência deste tipo de infeções.

Conclusões: Nesta população os fatores de risco associados a uma maior prevalência de infeções sexualmente transmissíveis continuam a existir, nomeadamente início precoce da atividade sexual, parceiros sexuais múltiplos e ausência de medidas de proteção durante as relações sexuais.

Palavras-chave: Assunção de Riscos; Chlamydia trachomatis; Comportamento Sexual; Doenças Sexualmente Transmissíveis; Estudantes; Factores Socioeconómicos; Inquéritos e Questionários; Intercâmbio Educacional Internacional; Portugal.

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Recebido: 11 de setembro de 2015 - Aceite: 24 de maio de 2016 | Copyright © Ordem dos Médicos 2016



INTRODUCTION

Sexually transmitted infections (STIs) are amongst the leading causes of illness worldwide.^{1,2} STI involve very relevant healthcare and economic or social consequences in different countries² and remain a public health concern due to the risk of spreading and development of sequels, mainly without an early diagnosis or treatment.³

In 1999, 92 million new patients with STI were estimated by the World Health Organization (WHO). However, with the increase in estimated notifications, according to the latest estimates, a total of 498.9 million new patients aged 15 to 49 with STI are estimated annually.⁴

Adolescent and young adult patients (aged 10-49 and 15-24, according to WHO definition, respectively) are those in highest risk of getting an STI⁵ which has been supported by a combination of behavioural, biological and cultural factors.⁶

The infection caused by *Chlamydia trachomatis* is the leading bacterial STI worldwide^{7,8} and a strong association between the highest infection rates and youngest age groups has been described.⁹ The fact that Chlamydia infection rate has been increasing in many countries and that most people who are infected with Chlamydia have no symptoms (around 70-85% of women and 50% of men) made it a global public health concern.¹⁰ Despite its under-reporting, an approximately 5 to 15% prevalence is estimated in Europe,¹ with the highest incidence rates in youth aged below 25.^{1,7}

Our study aimed to determine the sociodemographic and behavioural factors associated to STI the acquisition, as well as the awareness regarding the Chlamydia infection by foreign exchange students in Portugal.

MATERIAL AND METHODS

Our study was submitted and approved by the Ethics Committee of the *Instituto de Higiene e Medicina Tropical (IHMT)* at the *Universidade Nova de Lisboa*. Our group of participants included foreign exchange students attending higher education Portuguese institutions in school years 2012/2013, 2013/2014 and 2014/2015, aged 30 or under and having already started sexual activity.

The study included an on-site questionnaire handed to foreign exchange students attending institutions in the Lisbon area and the same questionnaire was sent online to foreign students attending 25 other Portuguese institutions. In order to complete the on-site questionnaire, students attending the Portuguese Language courses for foreigners at the *Faculdade de Ciências Sociais Humanas, Universidade Nova de Lisboa* were mainly contacted

through www.facebook.com and directly contacted during the Medicine internship at the Dermatology Outpatient Clinic in the *Hospital de Santa Maria - Centro Hospitalar Lisboa Norte E.P.E.* The study and its aims were briefly explained to students and those having accepted to participate were offered to sign an informed consent declaration. A free online survey software (survio.com) was used to send the questionnaire online to foreign exchange students through the international relations department of the 25 institutions that agreed to collaborate (Appendix available at: http://www.actamedicaportuguesa.com/revista/index.php/amp/article/view/6692/360-366_Apendice01.pdf), and apart from a direct access link, an explanation text written in English was included.

Anonymity and confidentiality were ensured in both questionnaires, due to the fact that these subjects are usually regarded as sensitive, allowing for the students to opt-out.

IBM® SPSS® (*Statistical package for the social sciences*, version 21, SPSS Inc, Chicago, IL, USA) software was used for statistical analysis. Apart from exploratory data analysis and descriptive statistics, some hypothesis tests were used with a 5% significance level.

RESULTS

In total, 338 questionnaires (167 on-site and 171 completed online) were included in the study.

The participants in our study were aged between 17 and 30 (average - 23.17 and standard deviation - 2.40) and 58.3% were female; three participants did not respond to this question (0.9%).

Students from 46 different nationalities were included in the study and Italian (23.40%, 79/338), Spanish (14.50%, 49/338), German (9.8%, 33/338) and Brazilian (7.4%, 25/338) were the most frequently found nationalities.

In total, 319/338 (94.38%) participants have responded to the question regarding the age of onset of sexual activity and an average age of 17.48 (standard deviation - 2.36) was found. A percentage of 5.96% (19/319) of these participants described having started their sexual activity at the age of 14 or under and 44.20% (141/319) at the age of 18 or above. No statistically significant differences were found between participant's gender and the age of onset of sexual activity.

On average, a number of 6.87 sexual partners since onset of sexual activity was found (standard deviation - 7.52) and 57.70% (195/338) of students described as having one to five partners. The average number of female

Table 1 - Average number of sexual partners according to age of onset of sexual activity

Age of onset of sexual activity (years)	Average number of sexual partners
≤ 14	13.26 (standard deviation: 15.92)
[15 - 17]	7.98 (standard deviation: 7.04)
≥ 18	5.14 (standard deviation: 5.76)

$p < 0.05$ in Kruskal-Wallis non-parametric test (significance value of 0.05)

sexual partners was below the number of male partners (6.01 and 8.11, respectively), corresponding to a statistically significant difference, when using Mann-Whitney's test. As regards the number of sexual partners in the past six months, an average 1.89 (standard deviation - 2.07) was found and 52.07% (60.79% [107/176] female and 39.20% [69/176] male) of the participants described as having only one partner.

Upon using Kruskal-Wallis test, a significant difference between the age of onset of sexual activity and the average number of sexual partners was found (Table 1), higher in the group of participants with an earlier onset of sexual activity (at the age of 14 or under) when compared to the group with a later onset (15-17) and to the group with an even later onset (at the age of 18 or above) (the latter having shown the lowest average value).

When asked about condom use during vaginal or anal intercourse, 67.77% (225/332) of the students confirmed using it, with no significant differences between genders. From those having described no condom use, 50.47% (54/107) have described not using any other method of contraception.

As regards sexual orientation and behaviour, 11.98% (40/334) of the students described having same-sex partners. From these, 60% (24/40) of the students described as exclusively homosexual and 40% (16/40) as bisexual. Only 9.64% (32/332) of the students have described as not having any oral sex, with a statistically significant association between this type of sexual relation and gender, as female participants more frequently denied it than male students (27/32 and 5/32, respectively). As regards anal intercourse, 29.70% of the students (98/330) responded positively, with a tendency towards being more frequently denied by female, when compared to male students (64.20% and 35.80%, respectively). From students having described oral and anal sex, 95% (285/300) and 37.70% (36/98) of these have described no condom use, respectively.

Alcohol and drug use was described by 82.10% (266/324) and 32.13% (107/333) of the students, respectively and most of them (70.48% - 234/332) have described having sex under the influence of alcohol while 19.28% (64/332) under the influence of drugs (mainly marijuana – *Cannabis*

sativa), before or during the sexual intercourse, with no significant differences between genders in any of the cases.

A percentage of 7.83% (26/332) of respondents have described previously acquired STI: genital chlamydial infection (1.8%), genital warts (1.2%), genital herpes (0.6%), gonorrhoea (0.3%), HIV (0.3%) and two co-infected patients (papillomatosis/vaginal yeast infection and genital herpes/vaginal yeast infection). Only 35.84% (119/332) of the students have described having been tested for HIV over the last five years.

As regards the questions aimed to assess STI awareness, 21.02% (70/333) of the students described not knowing the risk of STI passing on through oral sex and 42.34% (141/333) described not having any previous knowledge on Chlamydial infection and a tendency towards a higher awareness of this infection was found in the group of students having described a previous acquired STI.

We also tried to assess the compliance rate to free testing for chlamydial infection and only 42.70% (73/171) of the students in the group of the online questionnaire showed any interest in being tested, while 13.50% (13/171) did not respond. Therefore, no association was found with student's field of study, gender or age of onset of sexual activity, even though a higher willingness to be tested was found in students with previous acquired STI, compared to those with no previous STI (confirmed by Fisher's test).

DISCUSSION

Even though people of any age, ethnicity and sexual orientation may be affected by an STI, different demographic, social and behavioural factors have shown an impact on prevalence rates of STI,¹⁰ including being under the age of 25, being single, having had three or more sexual partners over a three-month period or a new sexual partner over the same period of time,^{10,11} having a sexual partner with an STI¹² or who has sexual contact with multiple partners,¹ alcohol and drug addiction and low compliance to condom use.¹⁰⁻¹²

Overall, an increasing adherence to female participation in studies on sexual education and health has been found, in line with our study,⁷ partly due to the fact that men still believe that this a subject predominantly targeted to women.¹³

On the other hand, women attend family planning and gynaecological clinics, which may increase their awareness towards issues related to sexual and reproductive health.¹³

Different studies in the USA and in the UK have found an association between early onset of sexual activity (at the age of 10-14) and the tendency towards assuming risky behaviours for acquiring an STI, namely regarding a high number of sexual partners throughout life, in line with our study.¹⁴ According to the Centers for Disease Control and Prevention (CDC), young people with early onset of sexual activity are included in a high-risk group for acquiring an STI, mainly due to a high number of sexual partners, to setting up short-term relationships, to low compliance to the use of barrier contraceptives, to biological predisposition to infections (particularly in young women) and also to reduced healthcare service use.¹⁵ This is becoming increasingly important as different studies have found a gradual tendency towards a reduction in the average age of sexual onset.¹⁴ Many sexually active young people described having suffered some social pressure towards sexual onset from certain age onwards and more than half of them describe that, once their sexual life is started, refusing the sexual practice in future relationships becomes more difficult, particularly in men, in whom sexual onset occurs earlier (when compared to women with the same age).¹⁶ An association between gender and early sexual onset was statistically not confirmed in our study.

Even though the comparison with other similar studies has been difficult, as most studies took in consideration the number of sexual partners over 12-month rather than six-month periods, the average number of sexual partners in our group of participants was above what was found in literature.¹⁷

Despite more than half (52.1%) of the students have described having had sexual contact with only one sexual partner over the last six months, testing for chlamydial infection should be offered to these seemingly low-risk population. Some STI, namely chlamydial infection, are relatively frequent in people with few as in people with multiple sexual partners (even though the latter are in higher risk for acquiring the infection).¹⁸

As regards homosexual and/or bisexual relations, the percentage of students in our study who described having same-sex partners was similar to the percentage found in other studies.¹⁹ Therefore and according to the CDC, men who have sex with men (MSM) are at increased risk for STI, mainly due to the frequent change of sexual partner, to high rates of casual sexual contacts and the use of drugs before and during sexual intercourse.⁵

The use of male condoms is extremely efficient for STI prevention as they form a physical barrier against spreading of causative agents, when correctly used.²⁰ Low compliance with condom use and young people's beliefs that the use of methods of contraception, apart from condoms, is already sufficiently safe (even though these do not ensure any protection against STI) show that young people may not be totally aware that unprotected sexual activity may put them in risk for acquiring an STI.²¹ Overall, the values obtained in different studies on condom use are widely variable according to the assessment criteria that have been used. Our study showed similar rates of condom use to those described in some studies carried out in the USA.^{7,21} Most of these studies did not take into consideration any distinction between oral, anal and vaginal sexual relations and a high percentage of young people in our study have described having oral sex without using any condom (95%). A study by the Henry J. Kaiser Family Foundation showed that, when asked about the reasons to reject condom use, many young people have considered that the approach to condom use with his/her sexual partner may raise suspicions regarding his/her own sexual history or regarding his/her partner's history²² and one out of ten young Americans described feeling offended by the suggestion of using a condom during sexual intercourse.²² Some young people also described feeling uncomfortable and ashamed when purchasing condoms, emphasizing their own personal difficulty in approaching issues regarding contraception, even with healthcare professionals.²² They prefer adopting other methods of contraception, particularly the use of oral contraceptives and *coitus interruptus* or external ejaculation, even though these do not ensure an adequate protection against an undesired pregnancy or against STI.²²

The presence of an association between alcohol and drug addiction and the increased frequency of sexual relations and the number of sexual partners, through reduction of inhibitions and subsequent increased risky behaviours has been currently described.^{1,10} In our study, when compared to other similar studies, a similar drug use over the last six months and higher alcohol use were found.⁷ Drug use, which is associated to low condom use and subsequent risk for the acquisition of STI, has been increasing since the nineties and is highly prevalent in young people, after alcohol and tobacco abuse.¹²

Sexual education is clearly important, according to some authors, particularly in young people with an history of STI, as a previous experience may increase awareness regarding risky behaviours and the presence of symptoms suggestive of an infection.²¹ Despite a reduced incidence

of previous STI found in the participants in our study (compared to other studies),¹⁶ we found that students with a previously acquired STI showed a higher tendency towards recognizing a chlamydial infection. Even so, literature is still showing that most young people tend to underestimate the risk for acquiring STI, even when having been diagnosed with an STI in the past.²¹ In addition, risk factors associated to higher prevalence of infection remain unchanged, namely early sexual onset, multiple sexual partners and the absence of any protective measure during sexual relations, despite STI awareness in young people.

One fifth of the respondents described being unaware of the risk for the acquisition of STI through oral sex, in line with what has been found in other studies, which have even described young people's beliefs that this type of relation is the safest and most efficient method of birth control and for STI prevention.²² Other authors have described the presence of gaps and misconceptions in overall knowledge of young people regarding STI: in the USA, two in ten young people believe being able to detect the presence of an STI in their partner, even without using any diagnostic test and one in six described being only in risk of acquiring an STI when any obvious symptom was present.²²

Many young people still ignore Chlamydial infection¹⁴ and even though 42.34% of the students in our group of participants have described not having any previous knowledge regarding this infection, different authors described that unawareness affected more than 50% of young people. Therefore, the fact that our group of participants had higher education than participants in many other similar studies may have had an influence on STI awareness.⁷

No significant gender differences were found regarding Chlamydial infection awareness in our study, even though higher girl's knowledge has been described in literature, which may relate to girl's higher adherence to studies on STI.¹³ Again, no significant differences were found between the group of on-site survey and the group that responded online, despite possible online search for STI by the latter. Even so and regardless of the information source on sexual health, more than 75% of the young people have described, in other studies, the need to obtain further information on sexual subjects due to the relevance of different decisions within sexual relations.²²

In Europe and elsewhere, the rate of students reluctant to free screening is very high, even involving non-invasive sample collecting.^{7,13,23} Screening process, involving the use of laboratory tests in asymptomatic people for diagnosis and management of asymptomatic infections allows not only for

the reduction in the duration of an infection, as also with the potential to reduce transmission and complications.¹⁸ Therefore, CDC and USPST (United States Preventive Services Task Force - USA) guidelines recommend the application of annual screenings to all sexually active women aged under 25, to women at increased risk (new sexual partner or multiple sexual partners) and to MSM (testing for urethral, rectal and pharyngeal infection, whenever adequate).⁵

Different studies aimed to the detection of main barriers to voluntary screening and found different factors explaining for low adherence, including unawareness of being at risk,^{14,23} low public awareness regarding Chlamydial infection,¹³ lack of knowledge regarding what is involved and the access to testing (fear for the use of invasive sample collection techniques^{8,14} or drug detection techniques¹⁴ or believing that these tests are included in routine medical tests),²² asymptomatic nature of Chlamydial infection, misconceptions regarding sexual activity (namely the association of Chlamydial infection to sexual misconduct or exclusively to women)¹³ and also to embarrassment and social stigma.^{14,23}

Considering the low rates of adherence of youth to screening tests, namely for Chlamydial infection, the level of knowledge on chlamydia needs to be monitored, in order to find the best way to reach young people and to promote relevance of sexual health. It is generally believed that conventional approaches used in healthcare services have not been effective enough and new, more opportunistic types of screening programmes seem relevant, involving screening not only in healthcare services, but also in pharmacies, using home-based screening with self-collected specimens (available through the internet or by mail) or even in school. In the UK, this new approach led to a high population coverage, with around 59% of diagnoses in young people aged 15 to 24 beyond genitourinary medicine clinics.

The presence of a statistical relationship between low education and high-risk sexual behaviour has been found in previous studies.⁷ High-risk sexual behaviours were found on a significant scale even in higher educated participants in our study (particularly regarding alcohol and drug use, low condom use and low adherence to testing) and this may be explained by the academic life leading to more frequent opportunities for high-risk behaviours.¹⁹ Apart from this and according to the WHO, migrant populations are at increased risk for getting an STI²⁰ as, at least for some time, they will be living abroad and following different routines.

The limitations to the study are mainly related to the

stigmatizing nature currently associated to sexual subjects, leading people to refuse disclosure of surveys applied to students in different University settings. In addition, an online questionnaire may have led the participants to provide inaccurate information.

CONCLUSIONS

Student life at college favours the presence and consolidation of certain risk behaviours (particularly regarding alcohol and drug use, low condom use and low adherence to screening tests) even in people with higher education. However, these behaviours are not perceived by students as risky, putting them at risk for getting a Chlamydial infection, beyond other STI.

Based on the low rates of young people's adherence to screening tests, namely for chlamydia, the level of knowledge on this bacteria needs to be monitored in order to find the best way to reach young people and to promote STI awareness and the relevance of their sexual health.

Sexual education is crucial for the promotion of behavioural changes, the prevention of infections and to improve the use of healthcare services. Ensuring that young people get an adequate information on STI (modes of transmission, prevention methods and the importance of full course of therapy in order to avoid reinfections) is crucial.

Notification of any infected sexual partner needs to be encouraged, leading them to be tested, as well as to get an

adequate treatment, due to high reinfection and the crucial role in STI dissemination.

Observations

An abstract was presented in the *6as. Jornadas do IHMT*, 11 December 2015. *Andreia GRAVATA et al. Estudo de fatores sociodemográficos associados à aquisição de IST em estudantes estrangeiros em intercâmbio universitário em Portugal.*

HUMAN AND ANIMAL PROTECTION

The authors declare that they followed the procedures according to the regulations established by the Research Ethics Committee and to the Helsinki Declaration of the World Medical Association.

DATA CONFIDENTIALITY

The authors declare that they have followed the protocols of their work centre on the publication of patient data.

CONFLICTS OF INTEREST

The authors declare that there were no conflicts of interest in writing this manuscript.

FINANCIAL SUPPORT

The authors declare that there was no financial support in writing this manuscript.

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