

# Sexual Behaviour and Condom Use as a Protection against Sexually Transmitted Infections in Student Population

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## ABSTRACT

*The aim of the study was to determine the differences in sexual behaviour and condom use as a protection against sexually transmitted infections (STI) between the first-year and the last-year students. Data were collected by filling anonymous and consented questionnaire in June of 2011 at University of Josip Juraj Strossmayer in Osijek, Croatia. Out of 857 students in the planned sample, 462 (53.9%) filled out the questionnaire, and 353/462 (76.4%) were sexually active. Data from sexually active students were processed and statistically significant results between first-year and the last-year students were presented. Studied sample consisted of 192/353 (54.4%) first-year students and 161/353 (45.6%) last-year students. Average age of sexual initiation for the first-year students was  $17.28 \pm 1.29$  years, a for the last-year students  $18.45 \pm 2.14$  years, and the difference is significant (Mann-Whitney test = 10335.00,  $p < 0.01$ ). First-year students have lower number of sexual partners ( $\chi^2 = 28.005$ ,  $p < 0.01$ ), during relationship they had lower number of intercourses with the third person ( $\chi^2 = 17.947$ ,  $p < 0.01$ ), and feel that lower number of their friends were already sexually active at the time of their own sexual initiation ( $\chi^2 = 18.350$ ,  $p < 0.01$ ). First-year students more often inform their partners about existing or previous STI ( $\chi^2 = 14.476$ ,  $p < 0.01$ ) and curiosity significantly influenced their decision regarding sexual initiation ( $\chi^2 = 8.689$ ,  $p < 0.05$ ). First-year students more often used condom at their first sexual intercourse ( $\chi^2 = 7.275$ ,  $p < 0.01$ ), and more rarely used withdrawal ( $\chi^2 = 6.380$ ,  $p < 0.05$ ). At their last sexual intercourse, first-year students more often used any kind of protection ( $\chi^2 = 3.853$ ,  $p < 0.05$ ), more often used condom ( $\chi^2 = 11.110$ ,  $p < 0.01$ ) and withdrawal ( $\chi^2 = 5.156$ ,  $p < 0.05$ ), and more rarely used contraceptive pills ( $\chi^2 = 4.405$ ,  $p < 0.05$ ). First-year students more often use condom in a permanent relationship ( $\chi^2 = 13.384$ ,  $p < 0.05$ ), and also plan to use it during following intercourse in the permanent relationship ( $\chi^2 = 17.575$ ,  $p < 0.01$ ). Growing condom use and decreasing risky sexual behaviour among students, as well as other adolescents and young adults needs to be maintained. Youth should learn before sexual initiation that only correct condom use at every sexual intercourse protects them against STI and human immunodeficiency virus (HIV). Sexual education and STI/HIV prevention programmes, positive role of media (television) and civil organisations that communicate with the youth can help that. Such changes among adolescents and young adults should have to be seen in student population as well.*

**Key words:** adolescents, young adults, students, sexual behaviour, condom use

## Introduction

Sexually transmitted infections (STI) and sexually transmitted diseases (STD) as their clinical manifestations include more than 30 bacterial, viral and parasitic

entities which have in common that they are sexually transmitted and for some of them that is not the only way of transmission. Due to different methodology and

data collection, and large number of asymptomatic infections, true prevalence of STI in the world is hard to determine. Based on mandatory reporting and epidemiological studies the estimated number of people who acquire STI is between 350 and 400 million a year, i.e. approximately one million people daily<sup>1,2</sup>. A great number of infected people, dependent on gender and agent, are not treated due to asymptomatic course and undiagnosed infection<sup>2-4</sup>. This results in chronic infections of genitourinary tract that can lead to infertility, ectopic pregnancy and cervical cancer in women, and early death in new born and adults<sup>1-3</sup>. STI represent great health and economic problem to the infected individual and society as well<sup>4,5</sup>. This is particularly evident for viral STI in adolescents and young adults, on whose treatment is being spent 90% of totally intended means<sup>6</sup>. Furthermore, most of the STI increase the risk of HIV infection that still has the greatest public health significance in the world. Treatment of STI reduces incidence of HIV for approximately 40%<sup>2,4</sup>. Total incidence of STI is increasing among youth worldwide. Although adolescents and young adults (15–24 years) comprise only 25% of sexually active population, they acquire over 50% of all newly acquired STD. In developed world countries, STD is among first ten causes of disease in men, and second cause of illness in women of mentioned population<sup>4</sup>. High prevalence of STI among youth (firstly adolescents) is a result of larger number of factors. Aside from biological (i.e. organism immaturity), social (i.e. lack of parental monitoring, problems of communication with parents, family doctor, peers) and epidemiological factors (i.e. spreading and acceptance of false information, asymptomatic course of the STI), great influence has risky sexual behaviour, such as avoidance and/or incorrect and irregular condom use<sup>3</sup>. Also, changing partners is frequent, whom are also often older and with greater risk. Probability of protected and/or unprotected sexual intercourses under the influence of intoxicating agents (alcohol and drugs) is higher in this population<sup>3,7-9</sup>. Risky sexual behaviour increases risks for STI and also for unwanted pregnancy, and a risk for sexual victimisation, i.e. intercourse with force or under treat of force and/or sexual contact forced by blackmail<sup>10,11</sup>. Student population is a part of population of late adolescents and young adults. In Croatia, there are several studies that investigated sexual behaviour and attitude among adolescents and young adults<sup>12-20</sup>. However, in a smaller number of these studies studied population was only student population<sup>21-25</sup>. Aim of this study was to asses and present difference in sexual behaviour and condom use as a protection against STI between the first-year and the last-year students of integrated studies at University of Josip Juraj Strossmayer in Osijek, Croatia.

## Materials and Methods

### *Examinees and research organisation*

Paper shows results of cross-sectional study in student population regarding sexual behaviour and condom

use as a protection against STI. Study was conducted in June of 2011 at the University Josip Juraj Strossmayer in Osijek, Croatia by filling a questionnaire. This university is one of four large high education institutions in Croatia. Examinees were all regular students of both sexes at their first or last year of studying at university integrated studies with headquarters in Osijek, i.e. medical and law students, students of teacher education and mathematics-physics. Sample comprised total of 857 students of both sexes, i.e. 516 (60.2%) first-year and 341 (39.8%) last-year students. Only questionnaires from sexually active students were processed. Investigation was conducted among regular students of integrated studies due to greater availability and lesser dispersion of students during studying. These studies are not divided into undergraduate and graduate part. Questionnaire was anonymous and consented, specially formed for planned investigation. Beforehand participants obtained Information for the participant in the study containing information regarding the study. Used questionnaire is, with a written consent from the director, adjusted form of questionnaire used in research project Behavioural following of HIV. Investigation was conducted in the classrooms of four previously mentioned studies, and due to ended classes at one of the studies, questionnaire and additional material with paid return envelope addressed to university office was mailed to the students at their home address. Data were introduced into previously created database.

### *Methods*

Data analysed in the study were year and type of study (first or last year of four mentioned studies), sexual behaviour indicators (age of the first sexual intercourse, total number of partners in the last 12 months/in life, intercourses with the third person during permanent relationship, number of partners in the last 12 months outside relationship, residency or travel outside Croatia and sexual intercourses abroad, commercial sexual intercourses i.e. paying for or charging of sex, sex with alcohol and drug abuse, sexual orientation of a partner, influence of friends and other reasons in decision making regarding sexual initiation), protection against STI/condom use indicators (protection at first and last sexual intercourse, frequency of condom use inside and outside relationship, condom use in commercial sex, condom use in the future sexual intercourse with permanent or casual partner), anamnestic data of participant regarding acquired STI in the last 12 months, data on informing a partner regarding existing STI, and data regarding unusual genital secretion.

### *Statistics*

Data were analysed using descriptive statistics and categorical variables were analysed using  $\chi^2$ -test. In cases of distribution that is not normal, Mann-Whitney test was used. Analysis was conducted using statistical programme SPSS (version 17.0, SPSS Inc., Chicago, IL, USA).

In all statistical analyses accepted level of statistical significance was  $p < 0.05$  or less.

## Results

From the planned sample, questionnaire was filled by 53.9% (462/857) of students of both sexes, i.e. 54.7% (282/516) of first-year students and 52.8% (180/341) of last-year students. Obtained sample consisted of 61.0% (282/462) of first-year students and 39.0% (180/462) of last-year students. Sexually active were 76.4% (353/462) of the students of both sexes, i.e. 68.1% (192/282) of first-year students and 89.4% (161/180) of last-year students in the sample. With respect to year of the study, sample had 54.4% (192/353) of sexually active first-year students and 45.6% (161/353) of sexually active last-year students. Average age of all students in the total sample was  $21.07 \pm 2.36$  years, while average age in the sample of sexually active students was  $21.40 \pm 2.40$  years, and in the sample of sexually inactive students it was  $19.98 \pm 1.85$  years. Average age of sexual initiation in first-year students was  $17.28 \pm 1.29$  years, and in last-years students it was  $18.45 \pm 2.14$  years.

### *Sexual behaviour differences between first and last-year students*

First-year students ( $Mdn=150.33$ ) started with sexual intercourses significantly earlier than last-year students ( $Mdn=208.81$ ) (Mann-Whitney test= $10335.00$ ,  $p < 0.01$ ). However, first-year students had significantly lower number of sexual partners than last-year students ( $\chi^2=28.005$ ,  $p < 0.01$ ). Curiosity significantly more often influenced decision regarding sexual initiation in first-year students than in last-year students ( $\chi^2=8.689$ ,  $p < 0.05$ ). First-year students, opposite to last-year students, feel that at the time of their sexual initiation only small number of their friends had been sexually active ( $\chi^2=18.350$ ,  $p < 0.01$ ). While in a relationship, first-year students have significantly lower number of intercourses with the third person than last-year students ( $\chi^2=17.947$ ,  $p < 0.01$ ) and significantly more often inform their partners about existing or previous STI ( $\chi^2=14.476$ ,  $p < 0.01$ ).

### *Condom use differences between first and last-year students*

At their first sexual intercourse, first-year students significantly more often used condom ( $\chi^2=7.275$ ,  $p < 0.01$ ) and statistically more rarely used withdrawal ( $\chi^2=6.380$ ,  $p < 0.05$ ) than last-year students (Figure 1). At their last sexual intercourse, first year students significantly more often used any kind of protection ( $\chi^2=3.853$ ,  $p < 0.05$ ), significantly more often used condom ( $\chi^2=11.110$ ,  $p < 0.01$ ) and withdrawal ( $\chi^2=5.156$ ,  $p < 0.05$ ), and significantly more rarely used contraceptive pills ( $\chi^2=4.405$ ,  $p < 0.05$ ) than last-year students (Figure 2). Also, there is a significant difference in reasons for not using condom at their last sexual intercourse between first and last-year students ( $\chi^2=25.594$ ,  $p < 0.01$ , Table 1). First-year students significantly more often use condom with per-

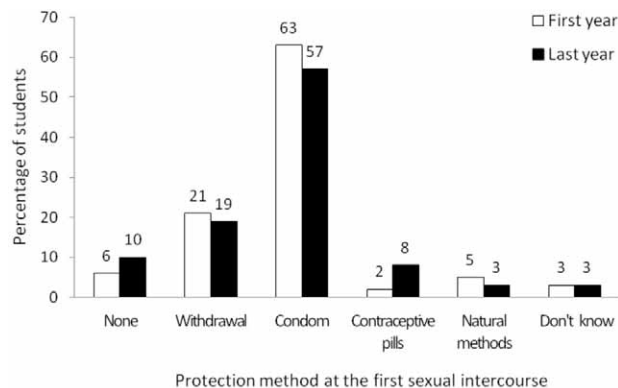


Fig. 1. Use of protection at the first sexual intercourse in first and last-year students.

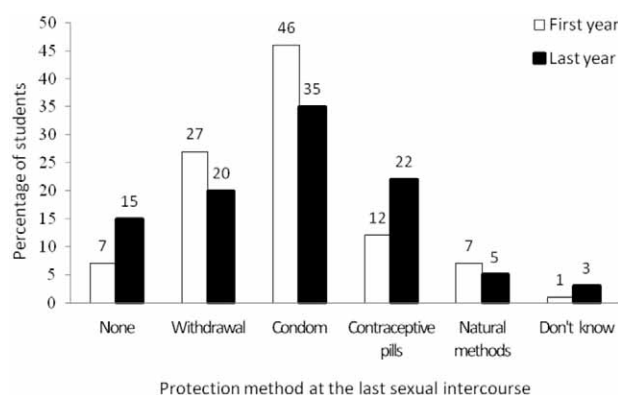


Fig. 2. Use of protection at the last sexual intercourse in first and last-year students.

manent partner ( $\chi^2=13.384$ ,  $p < 0.05$ ) and significantly more often plan to use it in the future sexual intercourse with permanent partner ( $\chi^2=17.575$ ,  $p < 0.01$ ) than last-year students.

## Discussion

High prevalence of STI among adolescents and young adults is in a great extent result of risky sexual behaviour<sup>3,4</sup>. As indicators of risky sexual behaviour, most frequently are used median age of the first sexual intercourse, condom use at first/last sexual intercourse, consistency of condom use inside/outside relationship, number of sexual partners (total and/or in the last 12 months), commercial sex without condom, and also intercourses under the influence of alcohol and/or drugs<sup>11,26</sup>. Comparing in our study the age of sexual initiation between first and last-year students, we observed that significantly higher number of first-year students started with sexual intercourse at younger age (Table 2). Obtained result is in accordance with other studies that showed increase in number of adolescents (first-year students are late adolescents) that engage in sexual intercourses at younger age<sup>15,17,27,28</sup>. However, average age of

**TABLE 1**  
REASONS FOR NOT USING CONDOM AT THE LAST SEXUAL INTERCOURSE IN FIRST AND LAST-YEAR STUDENTS

Reasons for not using condom	First year N (%)	Last year N (%)
Got carried away	14 (7.69)	4 (2.55)
Did not have one	15 (8.24)	15 (9.55)
Too expensive	0	4 (2.55)
Partner did not want to	1 (0.55)	4 (2.55)
I don't like using it	12 (6.59)	22 (14.01)
They create erection problems	1 (0.55)	0
I used something else	28 (15.38)	26 (16.56)
I assessed that it is not necessary	15 (8.24)	17 (10.83)
We planned pregnancy	0	4 (2.55)
Total	86 (47.24)	96 (61.15)
We used condom	96 (52.76)	61 (38.85)
Total	182 (100.00)	157 (100.00)

sexual initiation in both groups of our students is a bit higher than in other studies<sup>24,29</sup>. As expected, results of our study and other studies show that in spite of earlier sexual initiation, first-year students have significantly lower number of sexual partners<sup>29</sup>. In our first-year students, curiosity, unlike sexual experience of friends, significantly influenced sexual initiation. In fact, at the time of their sexual initiation, only small number of their friends was already sexually active. Results of other studies showed that students, and other adolescents and

**TABLE 2**  
AGE OF SEXUAL INITIATION IN FIRST AND LAST-YEAR STUDENTS

Age of sexual initiation	First year – N (%)	Last year – N (%)
11	1 (0.52)	0
12	0	0
13	1 (0.52)	2 (1.24)
14	2 (1.04)	3 (1.86)
15	12 (6.25)	6 (3.73)
16	28 (14.58)	8 (4.97)
17	57 (29.69)	34 (21.12)
18	6 (31.77)	43 (26.71)
19	29 (15.10)	21 (13.04)
20	1 (0.52)	18 (11.18)
21	0	10 (6.21)
22	0	8 (4.97)
23	0	6 (3.73)
24	0	1 (0.62)
25	0	1 (0.62)
Total	192 (100.00)	161 (100.00)

young adults, as reasons for sexual initiation also state sexual desire, affirmation to others or themselves, desire for relationship refreshment, showing faithfulness/pleasing partner, love and sometimes violence<sup>15,30–35</sup>. First-year students significantly more often inform their partners about existing or previous STI, and also have significantly lower number of casual sex during permanent relationship. Lower number of intercourses with the third person during permanent relationship among our first-year students is in accordance with other studies that showed that this type of risky behaviour is more frequently exhibited among males and older population<sup>18,36,37</sup>. Similarly to other studies, condom is also in our study in both groups of students the most frequent protection method at the first sexual intercourse<sup>29,38</sup>, and first-year students use it significantly more often. Since the last century eighties, studies have showed increase in condom use among adolescents and young adults at the first sexual intercourse<sup>39,40</sup>. Identical result among adolescents and young adults in Croatia in period from 1997 till 2001 showed study from 2001<sup>17</sup>. Increase in condom use at first sexual intercourse among students also showed studies from 2004 and 2010<sup>22,24</sup>. Furthermore, recent studies conducted in this population confirm further growth of condom use at first sexual intercourse<sup>20</sup>. Certain studies showed greater probability of condom use in younger age groups than in older ones. Also, exposure to electronic and printed media and postponing of sexual initiation have positive influence on increase of condom use at first sexual intercourse<sup>17,41</sup>. Increase of condom use at first sexual intercourse can be attributed also to change in attitude towards condom use due to increase of awareness of different STI/HIV<sup>17</sup>. At the same time, there is a decrease in use of contraceptive pills and withdrawal at first sexual intercourse, which has positive significance considering their ineffectiveness in protection against STI<sup>24,39</sup>. After decrease in condom use in period from the late seventies till the early eighties, in the last century nineties condom use again took first place with the sudden HIV expansion worldwide<sup>42,43</sup>. Together with increase in condom use, decrease in use of other methods (contraceptive pills, withdrawal) has been observed. Today, results of numerous studies show that at the last sexual intercourse among students, and other youth, condom as a protection against STI takes the first place<sup>15,17,18,29,44–47</sup>. This population, besides condom, most frequently uses contraceptive pills, withdrawal and natural methods<sup>32,45–48</sup>. Our results, as those from study conducted in 1999, show that first-year students significantly more often used any kind of protection at the last sexual intercourse than last-year students<sup>29</sup>. This increase in condom use is more significant in younger age groups than in older ones<sup>49,50</sup>. Also, probability of condom use at the last sexual intercourse is higher if condom was also used at the first sexual intercourse<sup>10,18</sup>. Furthermore, numerous studies showed positive influence of sexual education and STI/HIV prevention programmes on increase in condom use<sup>51–53</sup>. On the contrary, most frequent reasons for not using a condom are: unplanned sex, alcohol abuse, fear of losing partner's trust and con-



fidence in the partner, turning over decision on condom use to the partner, monogamous relationship, romance overtaking caution, insecurity in the relationship, use of other methods of protection etc<sup>44,54</sup>. However, analysis of condom use between the first and the last sexual intercourse in this population showed increase in use of contraceptive pills and decrease in condom use at the last sexual intercourse<sup>29,48</sup>. Use of contraceptive pills and withdrawal is significantly more often in older adolescents/students of the last years and in long-term relationships, which is also confirmed by our results<sup>10,29,44,55</sup>. According to literature data, increase in use of contraceptive pills in late adolescents and students of the last years is a result of their greater fear from pregnancy and higher incidence of monogamous relationships in which often disappear barriers that include condom use as a protection against STI/HIV<sup>10,29</sup>. Generally, main reasons for use of protection in student population are prevention of STI and pregnancy. One study showed that around 30% of students of the last years stated pregnancy prevention as the main reason for protected sexual intercourses<sup>29</sup>. Also, in the last decade in Slovenia, increase in use of contraceptive pills among adolescents has been observed, as a result of increase in positive attitude of adolescents toward their use. Such change in attitude is a result of more frequent prescription of contraceptive pills by the gynaecologists and greater availability of new contraceptive pills on the market<sup>48</sup>. On the other hand, condoms are more often used in casual than in permanent relationships. This has been observed in studies conducted among student population<sup>57–59</sup>. Similar attitudes have been found among adolescents who state that condom use is particularly important in casual sex<sup>60</sup>. It is known that alcohol and drug abuse, earlier sexual initiation and large number of previous sexual partners increase a risk for sexual engagement with casual partner<sup>61</sup>. All stated confirms the fact that casual sex is more hazardous regarding HIV/STI than permanent relationship<sup>62</sup>. However, even in the long-term relationship safety comes in question if both partners are not faithful i.e. negative at STI/HIV test. In behavioural studies may occur problems of data accuracy and reliability, and also authenticity and recall problems. Such problems result from voluntary participation. Also, due to anamnestic data collection on acquired STI without their laboratory confirmation, these data are often underestimated<sup>56</sup>. Despite the fact that the students in this study are late adolescents and young adults, obtained results cannot be generalised on all adolescent and young adult population i.e. persons aged 15 to 24 years. Particularly because students are, with regard to their education, information and social background (cultural capital), more »elite« part of population, so obtained results show only upper edge of investigated sexual behaviour and condom

use in population of adolescents and young adults<sup>22</sup>. As shown, a large part of the results of our study are consistent with results of similar studies conducted in Croatia. However, our study has some greater or lesser restrictions that mostly do not allow generalization with the others. One limitation of our study is the relatively low response rate (about 54%) of students from the planned sample survey, which was partly caused by the unavailability of the students due to the completion of the final year on one of the Faculties. Specifically, the response of the final year students was only about 32% despite the paid postage for the anonymous reply. Also, due to the huge differences between male and female students we received a reply from (20.4% M: 79.6% F) the gender distribution of students is not shown, neither are the possible biological differences in their sexual behavior. Since our study was cross-sectional, obtained results show only momentarily state regarding sexual behaviour and condom use in investigated population. Although condom does not provide absolute protection, its regular and correct use significantly reduces possibility for STI/ HIV acquisition<sup>63</sup>. Therefore, it is necessary to further promote its use, but also to encourage reduction of risky sexual behaviour among adolescents and young adults. Youth should learn before sexual initiation that only correct condom use at every sexual intercourse protects them against STI/HIV. Sexual education and STI/HIV prevention programmes, media (i.e. television) and civil organisations that communicate with the youth can help that<sup>10,13,17,51–53,56,64,65</sup>. Numerous studies showed that in- and out of school sexual education and prevention programmes increase knowledge on sexuality and condom use, reduce number of sexual partners and delay sexual initiation, and thus reduce risky sexual behaviour in this population<sup>51–53,64,65</sup>. Observed positive changes in certain forms of risky sexual behaviour are relatively long-term<sup>65</sup>, and programmes do not increase sexual activity among participants<sup>51</sup>. Studies also showed that abstinence programmes in this population in most cases do not give expected positive results<sup>18</sup>. Results of investigation from 2004 showed that in Croatia every seventh sexually active female student and every twelfth sexually active male student have sexual health problems<sup>22</sup>. On the other hand, certain studies showed positive influence of sexual education and STI/HIV prevention programmes in reducing risky sexual behaviour<sup>66</sup>. Therefore, sexual education and STI/HIV prevention programmes in Croatia surely deserve its place also in student population.

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## SPOLNO PONAŠANJE I UPORABA PREZERVATIVA KAO ZAŠTITE OD SPOLNO PRENOSIVIH INFEKCIJA U STUDENTSKOJ POPULACIJI

### SAŽETAK

Procijeniti različitost u spolnom ponašanju i uporabi prezervativa kao zaštiti od spolno prenosivih infekcija (SPI) između studenata prve i završne godine. Podatci za istraživanje prikupljeni su anonimnim i dobrovoljnim anketiranjem u lipnju 2011. godine na Sveučilištu Josipa Jurja Strossmayera u Osijeku. Anketiranju je pristupilo 462/857 (53,9%) studenata iz planiranog uzorka, od kojih je 353/462 (76,4%) bilo spolno aktivno. U radu su obrađene ankete samo spolno aktivnih studenata i prikazani statistički značajni rezultati između studenata prve i završne godine. Istraživani uzorak sastojao se od 192/353 (54,4%) studenata prve godine i 161/353 (45,6%) studenata završne godine. Prosječna dob spolne inicijacije kod studenata prve godine je  $17,28 \pm 1,29$  godina, a kod studenata završne godine  $18,45 \pm 2,14$  godina i statistički je značajna (Mann-Whitney test=10335,00,  $p < 0,01$ ). Studenti prve godine imaju manje spolnih partnera ( $\chi^2=28,005$ ,  $p < 0,01$ ), tijekom veze imali su manje odnosa s trećom osobom ( $\chi^2=17,947$ ,  $p < 0,01$ ), a smatraju i da je manji broj prijatelja već bio spolno aktivan kod njihove spolne inicijacije ( $\chi^2=18,350$ ,  $p < 0,01$ ). Studenti prve godine češće informiraju partnere o postojećim ili prošlim SPI ( $\chi^2=14,476$ ,  $p < 0,01$ ), a znatizelja je značajno utjecala na njihovu odluku o stupanju u prvi spolni odnos ( $\chi^2=8,689$ ,  $p < 0,05$ ). Studenti prve godine kod prvog spolnog odnosa češće su koristili prezervativ ( $\chi^2=7,275$ ,  $p < 0,01$ ), a rjeđe prekinuti snošaj ( $\chi^2=6,380$ ,  $p < 0,05$ ). Pri posljednjem spolnom odnosu, studenti prve godine češće su koristili ikakvu zaštitu ( $\chi^2=3,853$ ,  $p < 0,05$ ), odnosno češće su koristili prezervativ ( $\chi^2=11,110$ ,  $p < 0,01$ ) i prekinuti snošaj ( $\chi^2=5,156$ ,  $p < 0,05$ ), a rjeđe kontracepcijske pilule ( $\chi^2=4,405$ ,  $p < 0,05$ ). Studenti prve godine češće koriste prezervativ u stalnoj vezi ( $\chi^2=13,384$ ,  $p < 0,05$ ), a planiraju ga češće koristiti i pri sljedećem odnosu u stalnoj vezi ( $\chi^2=17,575$ ,  $p < 0,01$ ). Postojeći rast korištenja prezervativa, kao i poticaj smanjenja rizičnog spolnog ponašanja među studentima, ali i ostalim adolescentima i odraslim mladima potrebno je i dalje održati. Mladi bi trebali prije stupanja u spolne odnose naučiti da ih samo ispravno korištenje prezervativa kod svakog spolnog odnosa štiti od SPI i virusa humane imunodeficijencije (HIV). U tome mogu pomoći programi spolne edukacije i prevencije SPI/HIV-a, pozitivna uloga medija (televizije), te civilne udruge koje komuniciraju s mladima. Tako ostvarene promjene među adolescentima i odraslim mladima, sigurno bi se uočile i u studentskoj populaciji.

