



ORIGINAL RESEARCH

Reproductive health of medical students: exploring knowledge, experiences, and behaviors

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Abstract

Introduction: Sexually transmitted infections (STIs) along with unintended pregnancies, gender-based violence, and gender inequality represent a serious risk to reproductive health in adolescent age. Comprehensive Sexual Education (CSE) plays a central role among public health interventions designed to prepare young people for these challenges. The aim of our research was to examine knowledge, experience, and behaviors regarding reproductive and sexual health among the population of medical students, as well as the possible connection between reproductive health, information, and study success.

Material and methods: A total of 186 second-year and 214 fifth-year medical students were included in the study as a convenient sample taken by random selection. We used a questionnaire of the World Health Organization designed for adolescent sexual and reproductive health. Data were analyzed with the IBM SPSS 25 software.

Results: For the second-year students, primary source of information about sex are conversations with their family and friends (37.6%), while for the fifth-year students it is the faculty curriculum (34.7%). Students with personal experience of STIs showed higher average level of knowledge about STIs and reproductive health ($p=0.011$). Significant positive correlation between the average grade and the level of knowledge about reproductive health was found ($r=0.150$; $p=0.03$).

Conclusion: This study has shown the diverse sexual life of young medical students in Serbia, combined with risky habits and attitudes, also similarly represented in the world. Further research is needed in order to formulate public health policies adjusted to the needs of the Serbian youth.

Keywords: Reproductive health, sexual health, students, medical; knowledge, behavior.

Introduction

World Health Organization (WHO) defines reproductive health as "a state of complete physical, mental and social well-being, not merely the absence of infirmity, in all matters concerning the reproductive system, its functions, and processes. Reproductive health implies that people can have a satisfying and safe sex life, to be able to

reproduce and to have the freedom to decide whether, when, and how often to do so"(1). Acknowledging that people don't partake in sexual relations merely for reproduction, WHO recognized the need for defining fundamental sexual rights. In its Geneva report in 2002 (2), ten fundamental sexual rights were drafted, which are shown in Table 1:

Table 1. Ten fundamental sexual rights according to the Geneva report in 2002.

<ul style="list-style-type: none">• Highest attainable standard of sexual health, including access to sexual and reproductive health care services
<ul style="list-style-type: none">• Seek, receive and impart information related to sexuality
<ul style="list-style-type: none">• Sexuality education
<ul style="list-style-type: none">• Respect for bodily integrity
<ul style="list-style-type: none">• Choose their partner
<ul style="list-style-type: none">• Decide to be sexually active or not
<ul style="list-style-type: none">• Consensual sexual relations
<ul style="list-style-type: none">• Consensual marriage
<ul style="list-style-type: none">• Decide whether or not, and when, to have children
<ul style="list-style-type: none">• Pursue a satisfying, safe, and pleasurable sexual life

As part of a vulnerable population group of young people, students face specific challenges maintaining their reproductive

health and well-being. In line with WHO recommendations on adolescent sexual and reproductive health and rights, we emphasize

the need for comprehensive sexuality education (CSE), counseling and contraception, safe abortion care, sexually transmitted infections (STIs) prevention, and care. Instead of being a solid instrument for strengthening individual control over health, there is growing evidence that social media negatively influences sexual habits, behaviors, and knowledge (3,4). Pornography and unmoderated online content give a distorted picture of optimal sexual practices and deprive young people of the necessary knowledge to maintain their reproductive health and well-being (5,6). This is why many studies are focused on the sexual habits of young people, especially adolescents, exploring their knowledge, attitudes and practices (7-10). Furthermore, specific public health intervention programmes are designed to tackle the growing challenges in maintaining the youth's reproductive health, such as increasing STIs in the student population (11-13). According to previous research, determinants such as demographic characteristics, socioeconomic status, and sexual orientation are significantly correlated with the student population's level of knowledge about reproductive health, sexual education, and sexual habits (3-5, 15).

Comprehensive Sexuality Education (CSE) "aims to equip children and young people with knowledge, skills, attitudes, and values that will empower them to maintain their reproductive and sexual health" (16).

As future health care providers and medical professionals with scientific knowledge in this field, medical students could be a role

model for their peers. In addition to the standard ways of informing themselves about sexual and reproductive health (family, friends, media, internet), medical students also learn about these topics during the medical school curriculum, as well as in different extracurricular activities (workshops, seminars, elective courses).

Our research aimed to examine knowledge, experience, and behaviors regarding reproductive and sexual health among a population of medical students at the University in Belgrade and the potential association between reproductive health knowledge and overall success in higher education.

Material and methods

This cross-sectional study was conducted at the Faculty of Medicine, University of Belgrade, in November 2019. The respondents included in our research were students of the second and fifth years of medical studies. Our convenient sample of students was created by randomly selecting classes on two randomly selected days of the week.

Our research instrument was designed as a questionnaire based on previous work published by John Cleland in cooperation with WHO (17). The questionnaire consisted of 71 multiple-choice questions divided into four segments: sociodemographic characteristics, social and sexual practices, questions on reproductive health, and knowledge assessment. The last segment of the questionnaire was reduced to a series of

ten questions, with each correct answer being scored by one point. A maximum of 10 points

was given to a student who answered all ten questions correctly (Table 2).

Table 2. Test questions on STIs and reproductive health knowledge

1.	Do you think that women can get pregnant during their menstrual bleeding?
2.	Does HIV mean the same as AIDS?
3.	Does an HIV positive person look sick and exhausted?
4.	How much time does it take for an HIV test to be certainly positive or negative after a risky sexual intercourse?
5.	Do you think that HBV infection is common?
6.	Do you think that HBV can be easily transmitted through sexual intercourse?
7.	Do you think that HCV can be easily transmitted through sexual intercourse?
8.	Is syphilis common in our country?
9.	Which virus causes genital herpes?
10.	Which microorganisms are often associated with the inability to conceive?

Statistical analysis

The data were processed using the IBM SPSS 25 software. Descriptive statistics used were: measures of central tendency, measures of variability and relative numbers, and methods of inferential statistics: a) methods for assessing the significance of difference: Chi-square test for categorical data and Student's T-test for numerical data, and b) methods for estimation significance of association, Spearman rank correlation coefficient. $P < 0.05$ was considered statistically significant.

Results

Demographic data

The study included 400 subjects, students of the second and the fifth year of integrated academic studies of medicine (186 and 214 students, respectively), of which 105 (26.3%) were male, and 295 (73.7%) were female.

The mean age of the subjects in the second year of medical studies was 20.3 ± 1.12 years, in the fifth year, 23.7 ± 1.41 years. No statistically significant difference in age was observed between male and female subjects ($p = 0.469$). There was a statistically significant difference in the average grade during the study between the second- and fifth-year medical students ($p < 0.001$), i.e., in the second-year students, the average grade was 8.3 ± 0.8 , and in the fifth-year students 8.6 ± 0.8 . Regarding origin, 87% of respondents came from urban areas in Serbia and reported that they lived with their parents. Students who moved to Belgrade mostly lived in rented apartments (33.8%), homes (13.5%), or apartments (9.5%). In terms of work history, 5.2% of fifth-year college students reported being once employed. A more detailed sociodemographic profile of the respondents included in the study is shown in **Table 3**.

Table 3. Sociodemographic profile of second and fifth-year medical students

Variable	In total	Group		p
		2 nd year	5 th year	
Sex, n (%)				
Male	105 (26.3)	52 (28)	53 (24.8)	0.469
Female	295 (73.8)	134 (72)	161 (75.2)	
Age (years), mean ± SD		20.3±1.12	23.7±1.41	
Average grade, mean ± SD	8.5±0.8	8.3±0.79	8.6±0.76	< 0.001*
Origin				
Village	52 (13)	20 (10.8)	32 (15)	0.206
City	347 (87)	166 (89.2)	181 (85)	
Current accommodation				
Rented apartment	135 (33.8)	62 (33.3)	73 (34.3)	0.073
Dorm for students	54 (13.5)	17 (9.1)	37 (17.4)	
With parents	160 (40.1)	85 (45.7)	75 (35.2)	
Other	12 (3)	4 (2.2)	8 (3.8)	
Own apartment	38 (9.5)	18 (9.7)	20 (9.4)	
Employment				
Yes	15 (3.8)	4 (2.2)	11 (5.2)	0.186
No	384 (96.2)	182 (97.8)	202 (94.8)	

SD – standard deviation

*Statistically significant difference if $p < 0.05$

Student lifestyle, communication, and ways of informing about sex

Regarding tobacco products, 115 respondents reported that they were consuming tobacco products, of which 48 (25.8%) of the second-year students and 67 (31.5%) five-year students. Alcoholic beverages are consumed by 276 subjects, 129 of them (69.4%) from the second, and 147 (69.0%) from the fifth year of study. There was no statistically significant difference in the consumption of tobacco products ($p=0.214$) or alcoholic beverages ($p=0.941$) between second- and fifth-year students. $N=166$ (41.6%) state that they go out several times a month, and 42 (10.5%) every weekend. No statistically

significant difference was found between the second- and fifth-year respondents regarding the frequency of "a night out" ($p=0.576$). More than 40%, i.e., 162 (40.9%) mostly talk about sex with family members or relatives, while 234 (59.1%) talk with friends or other people in the area.

Regarding sources of information for medical students about sex, 37.6% of second-year students are informed about sex through conversations with family and friends, and 18.3% through teaching programmes. In comparison, teaching programmes are the primary source of information for fifth-year students (34.7%), followed by a conversation with family and friends (29.7%). Detailed information is presented in **Table 4**.

Table 4. Lifestyles, communication, and ways of informing medical students about sex

Variable	In total	Group		p
		2 nd year	5 th year	
Tobacco consumption, n (%)	115 (28.8)	48 (25.8)	67 (31.5)	0.214
Alcohol consumption, n (%)	276 (69.2)	129 (69.4)	147 (69.0)	0.941
Amount of alcohol consumption, n (%)				
1-2 drinks	137(34.3)	58 (31.2)	79 (37.1)	0.576
3-4 drinks	124 (31.1)	62 (33.3)	62 (29.1)	
5 or more drinks	62 (15.5)	28 (15.1)	34 (16)	
I do not consume alcohol	76 (19)	38 (20.4)	38 (17.8)	
Nightlife, n (%)				
Several times of year	67 (16.8)	30 (16.1)	37 (17.4)	0.943
Several times of month	166 (41.6)	76 (40.9)	90 (42.3)	
Every weekend	42 (10.5)	22 (11.8)	20 (9.4)	
I rarely go out	110 (27.6)	51 (27.4)	59 (27.7)	
I'm not going out	14 (3.5)	7 (3.8)	7 (3.3)	
Communication about sex, n (%)				
With family/relatives	162 (40.9)	81 (44)	81 (38.2)	0.241
Friends/other	234 (59.1)	103 (56)	131 (61.8)	< 0.001*

Informing about sex, n (%)				
Faculty	108 (27.1)	34 (18.3)	74 (34.7)	< 0.001*
Media	113 (28.3)	61 (32.8)	52 (24.2)	
Physician	26 (6.5)	16 (8.6)	10 (4.7)	
Youth counseling	10 (2.5)	1 (0.5)	9 (4.2)	
Family or friends	132 (33.1)	70 (37.6)	62 (29.1)	
Other	10 (2.5)	4 (2.2)	6 (2.8)	
Extracurricular activities, n (%)	65 (16.3)	26 (14)	39 (18.3)	0.242

*Statistically significant difference if $p < 0.05$

Basic parameters of sexual (reproductive) health of medical students

Out of the total number of respondents included in the study, 96.2% of the second-year students and 91.5% of the fifth-year students stated that they were heterosexual, and 7 (3.8%) and 18 (6.5%) were non-heterosexual orientation ($p = 0.052$). Our respondents most often had their first sexual intercourse at 18. There was a statistically significant difference in the initiation of sexual activity ($p = 0.001$) in favor of younger students, who, on average, engage in first sexual intercourse almost a year earlier than their older counterparts did (17.54 vs. 18.32, respectively). There is a growing trend in

the total number of sexual partners during life, with 25 (14.5%) second-year students having a total of more than three partners, while this is the case for 47 (23.4%) fifth-year students. Also, 39 (22.5%) second-year students did not yet have sexual intercourse compared to 21 (10.4%) fifth-year students ($p = 0.002$). Regarding the use of contraceptives and protection against STIs, looking at the total number of sexually active fifth-year students, 121 (65.8%) use a condom, while this is the case with 102 (74.5%) second year-sexually active students. Detailed information on medical students' sex life and habits is presented in Table 5.

Table 5: Basic parameters of sexual and reproductive life

Variable	Group		p
	2nd year	5th year	
Sexual orientation, n (%)			
Number of responses	186 (100)	214 (100)	
Heterosexual	179 (96.2)	194 (91.5)	0.052
Non-heterosexual	7 (3.8)	18 (8.5)	
First sexual intercourse (age in years), mean \pm SD	17.54 \pm 1.25	18.32 \pm 2.12	0.001*

Total number of sexual partners, n (%)			
Number of responses	173 (100)	201 (100)	
No one	39 (22.5)	21 (10.4)	0.002*
One	57 (32.9)	52 (25.9)	
Two	27 (15.6)	39 (19.4)	
Three	25 (14.5)	42 (20.9)	
More than three	25 (14.5)	47 (23.4)	
Number of emotional partners, median (range)	2 (0-9)	3 (0-20)	
Type of contraception, n (%)			
Number of responses	144 (100)	187 (100)	
Condom	102 (70.8)	121 (64.7)	0.163
Oral contraceptive pills	19 (13.2)	26 (13.9)	
Tracking fertile and infertile days	4 (2.8)	5 (2.7)	
Interrupted intercourse method	12 (8.3)	18 (9.6)	
I don't use protection	7 (4.9)	17 (9.1)	
Pregnancy, n (%)	3 (1.7)	5 (2.4)	0.661
Abortion, n (%)	3 (1.9)	7 (3.4)	0.357

SD – standard deviation

*Statistically significant difference if $p < 0.05$

The level of reproductive health knowledge and safe and risky sexual practices

A statistically significant difference in reproductive health knowledge was found between those with and without previous experience of STIs ($p=0.011$) showing that those who experienced STIs have higher level of knowledge. Students aware that condom is not an effective method for protection of all sexually transmitted infections have shown statistically higher level of knowledge on reproductive health ($p < 0.001$). No difference was found in number of correct/incorrect answers and other respondents' risky attitudes and practices.

Furthermore, a slight positive significant correlation between the average grade during

the study and the level of knowledge about STIs, could be identified (Spearman rank correlation $r=0.150$; $p=0.03$).

Discussion

The results of our study indicate that a significant number of medical students at the University of Belgrade consume tobacco products (28.8%), which does not match the results of the similar research in Hungary reported last year (18), where is a higher prevalence of consumption of smokeless tobacco forms, as well as among medical students at Saint Louis University in Missouri - 6.6% (19). This speaks in favor of the fact that tobacco consumption is more represented in our area than in other developed countries (20-22).

When it comes to alcohol consumption, our students consume alcohol to a similar extent as students in the world, which is confirmed by the mentioned studies (23, 24). It is essential to emphasize that alcohol is an independent risk factor for risky sexual habits, such as promiscuity and sexual aggression (23,25), and is also associated with a higher prevalence of HIV infection among the general and especially student population (26-28).

Interestingly, the sources of information on sex and reproductive health differ concerning the year of study and emphasize the positive impact of teaching at the faculty, where we notice that fifth-year students acquire information and necessary knowledge through lectures (34.7%), unlike their younger colleagues. The latter reach them first through conversations with relatives and friends (37.6%) or the media (32.8%). This is also confirmed by the Swiss study from 2019 and Turkey (29,30). However, nursing and medical students from Madrid University (31) most often access information about sex and contraception through the Internet.

In our study, there was a statistical trend to more openly express personal sexual orientation among older students (8.5%), which is very important because homosexuality has been associated for years with more unrestrained sexual habits, as well as a higher prevalence of STIs, primarily HIV infection and AIDS (32) and especially such students in foreign schools have been the subject of stigmatization and harassment (32,33). Additionally, one of the reasons for this population's reproductive and sexual health vulnerability could be the provision of

poor-quality service by health workers (34). Similar results were obtained by Quetta and co-workers in their study with the population of Chinese medical students from 2016 (35), but also in a survey conducted in Bosnia and Herzegovina in 2017 (36).

When we examined the contraception and STI prevention method among our students, we found that the dominant instrument of protection was a condom in both groups of respondents, younger (70.8%) and older (64.7%). However, it was noticed that 9.1% of fifth-year students do not use any protection. If we take into account that the practice of interrupting intercourse mainly implies not using protection, it can be said that 18.7% of our sexually active fifth year students do not use protection. In a Greek study among medical students, Dinas and colleagues showed that a condom is the main instrument for protection against unwanted pregnancy (45.1%). Still, oral contraceptive pills are more common (4.9%), and 4.9% of female students stated they did not use protection (37). In 17 % of cases, Spanish students declared that they don't use contraception (38).

The study results also indicate that students of the younger generation (second year of study) entered the first sexual intercourse on average a year earlier than their older colleagues from the fifth year of study. These results coincide with the results of other studies (39,40).

Conclusions

The results of our study show the diverse sexual life of young medical students in

Serbia, combined with risky habits and attitudes, which are similarly represented in the world. However, there is still not enough knowledge and awareness about the importance of STIs, the development of healthy lifestyles, and within that, sexual habits and attitudes. Thus, we could ensure the preservation of the reproductive health of the generative population of our country, and first of all, medical students who are future providers of health and educational services. It would be interesting to conduct a similar national study among younger adolescents and high school pupils to design and implement more effective prevention programs at the beginning or before the start of sexual activities of young people.

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