

REPRODUCTIVE HEALTH AND RISK FACTORS OF NON-COMMUNICABLE DISEASE IN FEMALE STUDENT POPULATION (STEPWISE APPROACH)

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ABSTRACT

University students are a specific adolescent population which is preparing to take participation in different domains of a society as its integral and creative part. Chronic noncommunicable diseases have a major impact on women's reproductive health, so their adverse epidemiological situation has significant effects on reproductive health in general. Since non-communicable chronic diseases have been a growing burden on reproductive health, the aim of this paper is assess reproductive behavior and risk factors of non-communicable disease in female student population on Faculty of Medical Sciences University of Kragujevac. This study was conducted as a prospective cross-sectional study. The sample includes 59 female students of The Faculty of Medical Sciences, University of Kragujevac. The study was conducted in three stages based on the methodology and instruments recommended by STEPwise Approach to Noncommunicable Disease Risk Factor Surveillance of the World Health Organization (STEPS). About 71.2 % of the participants reported that they had a sexual intercourse. In average, the respondents were 18 years old ($SD \pm 1.222$) at the time of their first sexual intercourse. At that point, a little less than one third of them did not use any type of protection (31.7%). During the last sexual intercourse, about 65.5% did not use protection. About 22.5% of our subjects have morning glycemia with prediabetes values (glycemia cut off ≥ 5.5 mmol/L). Hypercholesterolemia is present in 3.4% of the respondents (cut off ≥ 5.2 mmol/l). Most respondents are eutrophic (18.8% preobese and 2.1% obese). The android obesity type is the least frequent (about 10%). This results indicates that female students has unhealthy habits in terms of their reproductive health and preventive measures. This activity indicaty a wide array of preventive action which will aim at preserving reproductive health and health in general.

Keywords: Reproductive health, risk factors of non-communicable disease, female student population.



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INTRODUCTION

University students are a specific adolescent population which is preparing to take participation in different domains of a society as its integral and creative part. Period of university education, in addition to biological and psychological maturation, represents the period when individuals undergo the process of inclusion into social community. At this life stage, young people are expected to acquire skills and abilities that will enable them to take on the most important roles in all social activities. The processes of inclusion into a society, as a rule, last until an individual meets a certain degree of social autonomy, responsibility and independence (1)

The World Health Organization defines health as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. The same applies to reproductive system, its functions and processes (2). Chronic noncommunicable diseases have a major impact on women's reproductive health, so their adverse epidemiological situation has significant effects on reproductive health in general. In addition to traditional and widely known diseases and conditions, haemostatic disorders (either as a propensity for hemorrhages or thromboses) have been increasingly recognized nowadays as significant indicators of reproductive health of female population.

The definitions of reproductive health are complex and frequently multi-layered. The most comprehensive are those which recognize that reproductive health implies responsible, safe and satisfying sex life, the ability to reproduce and make free decisions about personal reproduction (3). The studies have shown that reproductive health problems are one of the most frequent causes of morbidity among the youth and that sexually transmitted diseases (STDs), unwanted pregnancies and sexual abuse have become a global public health issue of great importance. More than 400 million people annually suffer from sexually transmitted diseases. This leads to a conclusion that prevention represents a fundamental process in preserving reproductive health (4).

In Serbia, cervical cancer has been occupying a significant place in the total structure of morbidity and mortality for a long period of time. With 1300 newly diagnosed patients and 500 deadly outcomes annually, this malign disease is the second leading and the fourth most fatal cancer disease in female population. Diachronically observing, the distribution of cervical cancer based on age has had a growing trend of occurrence after the age of 30 and the maximum frequencies among the age groups 45 - 49 and 70 - 74 years of life. The current data indicate unfavorable changes in age distribution where peak values of morbidity are moving towards younger age groups (5). These changes strengthen the effects on reproductive health. In addition, according to Cancer Registry of the Republic of Serbia for 2015, the age-adjusted incidence rate of cervical cancer was 18.1 and the mortality rate 6.1 per 100,000 women (6). These findings are devastating taking into consideration fact that cervical cancer is one of the most preventable malign diseases.

Since non-communicable chronic diseases have been a growing burden on reproductive health, the aim of this paper is assesses of reproductive behavior and risk factors of non-communicable disease in female student population of Faculty of Medical Sciences University of Kragujevac by using the WHO STEPS approach.

MATERIAL AND METHODS

This study was conducted as a prospective cross-sectional study. The sample includes 59 female students of The Faculty of Medical Sciences, University of Kragujevac. The study was conducted in three stages based on the methodology and instruments recommended by STEPwise Approach to Non-communicable Disease Risk Factor Surveillance of the World Health Organization (STEPS).

Step 1. This stage is a questionnaire-based assessment. This study used three questionnaires as instruments: a general standardized questionnaire, a questionnaire about sexual behavior and a questionnaire about cervical cancer prevention. The general questionnaire inquires about demographic and socioeconomic indicators. In addition, the participants filled in two more questionnaires. The first of the two inquired about their sexual behavior (e.g. the age of the first sexual intercourse, the use of contraception, sexually transmitted diseases, pregnancies, abortions, etc.) while the other inquired about their practices which are crucial in cervical cancer prevention (e.g. whether they had ever done a Pap test, when and where they did it the last time, what the results were, etc.).

Step 2. The second phase of the assessment refers to simple physical measurements which include anthropometric measurements (height, weight, circumference, BMI) and the measurements of arterial blood pressure (with measurement methods and interpretations of the obtained results in accordance with the WHO recommendations). The weights were measured with the same calibrated digital scale and the heights with the same calibrated stadiometer. Both the heights and the weights were measured while standing and wearing no shoes and only light clothes. The waist circumference values (WC) were measured with a plastic metric tape. The body mass indexes (BMIs) were calculated with the following formula: $BMI = \text{weight (kg)} / \text{squared height m}^2$. Based on the WHO classification, a BMI of 25 - 30 kg/m² is considered overweight, and BMI ≥ 30.0 kg/m² as obesity. Blood pressure was measured after spending at least five minutes in sitting position. We used an automatic sphygmomanometer and a tailored sized cuff. The arm was placed at the heart level and both feet were placed on the ground. When blood pressure was evaluated as high (systolic blood pressure (SBP) ≥ 140 mm Hg and diastolic blood pressure (DBP) ≥ 90 mm) the measurement was redone after 5 minutes.

Step 3. The third phase refers to biochemical analyses (fasting glycemia, total cholesterol). Glycemia and

cholesterol concentrations were measured with automatic analyzing devices suitable for the examinations on field. The values were determined as: glycemia cut off $\geq 5.5\text{mmol/L}$ and cholesterol cut off $\geq 5.2\text{mmol/l}$ (7).

The statistical analysis and assessment of the data was conducted with IBM Statistical Package for the Social Sciences (SPSS, software version 19.0). The data cleaning was performed to prevent any missing values, coding error or any illogical data values. The qualitative variables were presented as numbers and percentages and the continuous variables as means and standard deviations (SD).

Ethical approval was obtained from the Faculty of Medical Sciences Ethical Committee. The ethical standards are in accordance with international (the Helsinki Declaration) and national legislation. The necessary measures were taken to protect the privacy of the respondents and to ensure information confidentiality of individuals, with regard to the processing of personal data and on the free movement of such data, in accordance with the Law on Personal Data Protection (8), Law on Official Statistics (9) and the Directive (95/46/EC) of European Parliament on the protection (10). The researchers were obliged to administer a printed document to all participants which informed them about the study and their rights including to whom and how they could submit complaints if they felt that their rights were in any way compromised. The respondents were also required to sign an informed consent.

Statistical analyses

Statistical analysis was performed using SPSS for Windows 20.0 (SPSS Inc. USA). Continuous variables are summed as arithmetic means, medians and standard deviations, and categorical variables as proportions (percentages of categories).

RESULTS

STEP 1

Sexual health

About 71.2 % of the participants reported that they had a sexual intercourse. In average, the respondents were 18 years old ($SD \pm 1.222$) at the time of their first sexual intercourse. At that point, a little less than one third of them did not use any type of protection (31.7%). During the last sexual intercourse, about 65.5% did not use protection. During the last 12 months, 11.1% students had sex with more than one partner. About 2.4% of students had an STD.

Cervical cancer prevention

The results show that 63.6% of the students have never done a Pap test. Among those who were tested, about 15.4% did a Pap test because pain or other symptoms were present and 23.1% never found out the results of their Pap test.

STEP 2

The results of our study show that the average weight of the respondents is 63.46 ± 9.847 kg, the average height - 167.03 ± 5.6501 cm, the average waist circumference - 76.86 ± 6.710 cm and the average BMI - 22.717 ± 3.061 kg/m². Most respondents are eutrophic (18.8% preobesity and 2.1% obesity). The android obesity type is the least frequent (about 10%). The mean heart rate is 81.1 ± 8.96 and arterial hypertension was found in 3.4% of the subjects.

STEP 3

About 22.5% of our subjects have morning glycemia with prediabetes values. Liporegulation is satisfactory; hypercholesterolemia is present in 3.4% of the respondents.

DISCUSSION

The results of our study indicate that 71,2% of our subjects had a sexual intercourse and that they were approximately 18 years old when they had their first sexual experience ($SD \pm 1.222$). The 5.3% of them was pregnant at some point. Similarly, the study conducted in educational institutions in Illorin, Nigeria revealed that 77.6% of the female students had had a sexual intercourse with 98.6% of them not being married. Unwanted pregnancies were detected in 67.8% of the students and induced abortions in 63.5% (11). The Malaysian National Health and Morbidity Survey showed that 27% of the female population had already had sex before the age of 14. The same report revealed that 11% of females had had multiple sex partners. Another report showed that 8.3% of the students had sexual intercourse at the mean age of 15. In another study, the authors found that persons who had become sexually active at earlier age had more chance of having multiple sex partners. A study conducted in China showed that females who had had their first sexual intercourse before the age of 18 were more likely to have multiple partners in comparison to those whose first sexual experience had occurred at the age of 19 or more (12). A study that surveyed 630 students in three Italian cities revealed that just over a half of the students were sexually active with the mean age of the first intercourse of 15.6 years ($SD \pm 1.3$) (13). A survey conducted on Portuguese adolescents indicated that 44 - 95% of the adolescent population was sexually active and that there was an increase in the age of the first intercourse which was 15.6 years at the time. They also found that early sexual activity commencement was related to tobacco and regular alcohol consumption (14).

The results of our study indicate that about 31.7% of our subjects did not use any kind of protection during their first sexual debut and that about 65.5% did not use it during their last sexual intercourse. Contraception was most commonly obtained from medical workers (22.7%). During the last 12 months, 11.1% of the students had more than one sexual partner. Approximately 2.4% of the respondents had already had a sexually transmitted disease. The similar studies were conducted in other countries. In Nigeria, only 25.4% of the subjects used any contraception. Reportedly, friends and

relatives had been used as the most frequent sources of information about contraception (73.7%) and fear of side effects was the most common reason for nonuse (77.5%) (11). In Brazil, 94% of the surveyed young people were aware of the condom use in STD prevention but only 34% used it (12). In Bangladesh, the use of contraception among the women aged 10 - 49 rose from 49 - 61% from 1996 to 2011. During the same time period, the values rose from 33 - 47% among married adolescents [20]. In Malawi, the use of contraception among married women aged 15 - 49 rose from 13 - 46% from 1992 to 2010 (15). With Portuguese adolescents, condoms were the most commonly used contraceptive method during their first (76 - 96%) and subsequent (52 - 69%) sexual encounters. However, only one third of the subjects had visited a medical facility for contraception or STD counseling. (14) Condoms were also the most frequently used contraception type in Italian adolescents where coitus interruptus, natural family planning and no method were also commonly provided answers (13).

The results of this study show that 63.6% of the selected population has never done a Pap test while 15.4% have done it due to pain or other symptoms. The results also indicate that 23.1% has never found out the result of their testing. Similar results were obtained in other countries. For example, in South Africa, a cross-sectional study showed that 15% (22/147) of female university students aged 18 - 26 who had been sexually active and had heard about cervical cancer, had had a Pap test. Students who had had a Pap test had significantly higher average scores on knowledge, benefit and motivation, and self-efficacy in comparison to those who had never done it (16). A study conducted in Brasil on 437 female university students found that 30.4% of the students had no knowledge on the meaning of altered outcome and that 30% had never obtained their results from the doctors' offices (17). In Latin American countries the share of the recent Pap smear was below 55%. For example, in the Dominican Republic the proportion was 49% (95% CI, 49% - 50%), in Bolivia 42% (95% CI, 41% - 43%) and in Peru 52% (95% CI, 51% - 53%). The proportion of women unfamiliar with Pap smears grew in both Bolivia and Peru and the levels of knowledge were consistently higher in the latter country (18). The similar studies were also conducted in the neighboring countries. The screenings for cervical cancer in Hungary were about 74%. In Albania, the screening rate for women in their reproductive age (15 to 44 years) was the lowest in the region with only 3.2% (19).

Our STEP 2 results show that the average height of the respondents amounts to 63.46 ± 9.847 kg and the average height to 167.03 ± 5.6501 cm. The results of the similar studies indicate that average weight and height values of the students in Mexico were 59.0 ± 13.0 kg and 159.9 ± 60.0 cm, respectively (20). In Iran, those values were 58.1 ± 8.63 kg and 159.4 ± 59.88 cm (21) and in Lebanon, 60.49 ± 9.96 kg and 164.12 ± 5.98 cm (22). The average BMI value of the surveyed population in our study amounts to 22.717 ± 3.061 kg/m². Most subjects are eutrophic (18.8% with preobesity

and 2.1% with obesity). The android type of obesity is the least frequent (about 10%). Arterial hypertension has been found in 3.4% of the respondents.

A cross-sectional study conducted on 375 students attending Saint-Joseph University of Beirut aged 18 - 25 (both the medical science and social science campus included) revealed preobesity and obesity prevalence rates (20.6% and 8%, respectively) that are higher than our results. However, their values of the average BMI (22.45 ± 3.47 kg/m²) are similar to ours (22). The results of the study conducted in Turkey which included 650 medicine students evaluated the average BMI which is slightly lower than the results obtained in our study (20.89 ± 1.6 kg/m²) (23).

STEP 3 results of our study show that every fifth subject has morning glycemia at the level of prediabetes (22.5%). The lower prevalence of prediabetes with respect to our results was found among adolescent population in Qatar (4.2%) (24) and Lebanon (2.5%) where no participant had a diabetes (22). The prevalence rates of prediabetes and type 2 diabetes in adolescents and young adults (aged 12 - 19) have been increasing drastically in the United States (17.7% and 0.8%, respectively (25,26).

The primary limitation of this study is its cross-sectional design which does not enable inferences about potential causal relations between the explanatory variables and disorders of interest. Furthermore, self-reporting nature of the questionnaires also presents a limitation. Finally, our sample included a small group of students attending only one faculty. Since other universities are excluded, the generalizations are necessarily limited.

CONCLUSION

This study indicates that a huge number of female students has bad habits in terms of their reproductive health and preventive measures. On the other hand, weight and lipo statuses, as well as cardiovascular parameters are not disturbed in the third decade of life. This activity indicaty a wide array of preventive action which will aim at preserving reproductive health and health in general. The focus of the activity should be on both primary and secondary prevention. The activities of primary prevention should be based on intensifying the education about health in order to develop and master health-preserving skills in young adults. The activities of the secondary prevention should be focused on organized, systematic and more frequent screenings. These would enable early detections of unrecognized health disorders in asymptomatic disuse phases.

Table 1. Sexual health

<i>Variables</i>		n	%
Have you ever had a sexual intercourse?	yes	42	71.2
	no	17	28.8
		18.08	
How old were you when you had your first sexual intercourse?		±1.222	
The first sexual intercourse was with:	a spouse	1	2.6
	someone you did not marry	37	94.9
	I don't know	1	2.6
Did you use protection during the first sexual intercourse?	yes	28	65.9
	no	14	31.7
When was the last time you had a sexual intercourse?	last week	18	43.9
	from a week to a month ago	11	26.8
	from a month to a year ago	10	24.4
	more than a year ago	2	4.9
How many partners did you have during the last 12 months?		1.06 ±0.34	
Did you have sexual intercourses with more than one partner during the last 12 months?	yes	3	11.1
	no	24	88.9
Did you use any protection during the last sexual intercourse?	condom	14	35
	pill	17	68
Where did you get the protection for unwanted pregnancies/infections?	from a store/machine	8	40
	from a medical worker	5	22.7
	from a friend	2	10.5
Have you ever had a sexually transmitted disease?	yes	1	2.4
	no	40	97.6
Have you ever asked for advise/treatment concerning STDs?	yes	1	7.1
	no	12	85.7
Have you ever had sexual intercourses with same-sex partners?	yes	1	1.8
	no	56	98.2
Have you ever been pregnant?	yes	3	5.3
	no	54	94.7
		25.3	
How old were you when you were pregnant?		±4.041	
Have you ever had an abortion?	yes	1	12.5
	no	7	87.5

Table 2. Cervical cancer prevention

<i>Variables</i>		n	%
Have you ever done a Pap test?	yes	20	36.4
	no	35	63.6
How old were you when you were first tested for cervical cancer?		20.33±2.50	
When was the last time you were tested for cervical cancer?	less than a year ago	7	53.8
	from 1 - 2 years ago	2	15.4

<i>Variables</i>	<i>n</i>	<i>%</i>
	I don't know	4 30.8
	a routine check-up	5 38.5
	a check-up after indeterminate abnormal results	1 7.7
Why were you tested?	recommended by a medical worker	1 7.7
	for pain and other symptoms	2 15.4
	other	1 7.7
	a health center	2 20
Where were you last tested?	a private practice	5 50
	a hospital, clinic, clinical center	3 30
	normal	10 76.9
What was your result?	I don't know	3 23.1
	yes	4 36.4
Did you have check-ups due to your result?	no	6 54.5
	I don't know	1 9.1
	yes	1 8.3
	no	10 83.3
Did you undergo treatment after your Pap results?	I don't know	1 8.3
	because I was not told to do so	4 50
Why didn't you undergo treatment?	I don't know	4 50
	because I did not have time	1 16.7
What is the main reason you have never done a Pap test?	due to bad quality of health service	1 16.7
	I don't know	4 66.7

Table 3. Assessment of blood pressure

<i>Variables</i>	<i>n</i>	<i>%</i>
Has your blood pressure ever been measured by a medical worker?	yes	58 98.3
	no	1 1.7
The average systolic blood pressure:	115.68 ±12.69	
The average diastolic blood pressure:	71.37±8.30	
Has a medical worker ever informed you about your higher levels of blood pressure or hypertension?	yes	5 8.5
	no	54 91.5
Were you informed about it during the last 12 months?	yes	4 15.4
	no	22 84.6
Did you take any medication prescribed by a doctor for high blood pressure during the last two weeks?	yes	2 8.0
	no	23 92.0

Table 4. Biochemical measurement

Variables		n	%
Has your blood sugar level ever been measured by a medical worker?	yes	42	71.2
	no	17	28.8
The average blood sugar level:		5.27± 0.480	
Has a medical worker ever informed you about your higher blood sugar levels or diabetes?	yes	8	17.0
	no	39	53.0
Were you informed about it during the last 12 months?	yes	5	23.8
	no	16	76.2
Did you take any medication prescribed by a doctor for diabetes during the last two weeks?	yes	1	4.5
	no	21	95.5
Are you currently taking insulin prescribed by a doctor for your diabetes?	yes	1	4,5
	no	21	95.5

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CONFLICT OF INTERESTS

The authors fully declare that there is no conflict of interest that could be perceived as prejudicing the impartiality of the research reported.

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