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**PREVENTION OF CERVICAL CANCER: ASSESSMENT OF  
AWARENESS IN HEALTHY AND SICK WOMEN**

**ABSTRACT**

thesis on the award of a scientific and educational degree

**"Doctor"**

We are being ed by a leader and:

Assoc. Prof. Diana Dimitrova

**Prof. Dr. Stefan Ivanov**

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The dissertation work contains 175 standard pages and is illustrated with 15 tables , 87 figures and 5 applications. The literary reference includes 182 literary sources, of which 30 in Cyrillic and 152 in Latin.

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Note: In the auto-ageer, table and figure numbers do not match the numbers in the dissertation work.

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## **ABBREVIATIONS USED**

ASMP – Outpatient for specialized medical care

DNA – Deoxyribonucleic acid

EU - European Union

COC – Complex Oncology Center

LPP – Medical preventive institutions

Ministry of Health – Ministry of Health

Medical University

NGO – NGO

PPPs – sexually transmitted diseases

PCK – Oral hormonal contraceptives

RSI – Regional Health Inspection

CC – Cervical cancer

University of Rousse

SBALOZ – Specialized hospital for active treatment of oncological diseases

WHO – World Health Organisation

HRW – Human papillomavirus

SHU – Shumen University "Ep. Konstantin Preslavski"

CEVAG – Central European Vaccination Council

GSK – Cervarix (a type of vaccine for the prevention of human papillomavirus)

ECDC – European Centre for Disease Prevention and Control

EMA – European Medicines Registration Agency

HIV – Human immunodeficiency virus

HPV – Human papillomavirus

LEEP – Electrosurgical cut with a noose

MSD – Silgard/Gardasil (a type of vaccine for the prevention of human papillomavirus)

PAP – Pap test

## I. INTRODUCTION

Cervical cancer (CC) is one of the three most common malignancies in women. More than 1,000 new cases are diagnosed in Bulgaria annually and about 200-300 women die. According to the Bulgarian National Cancer Registry, negative statistics on cervical cancer is well known, very startling and unfortunately, quite real.

Every year, 270,000 women die in the world, one woman every two minutes. According to the Ministry of Health in Europe, this happens every 18 minutes. In Bulgaria, one woman dies every day and 3 new cases of the disease are diagnosed. The most frightening thing about these indicators is that cervical cancer is the only one that is completely preventable and treatable when diagnosed in a timely manner.

The disease is caused by human papilloma virus (HPV), which is more common in young women, many of whom have not given birth. Besides age, additional risk factors are the early onset of sex life, frequent change of sexual partners, sexually transmitted diseases, compromised immunity.

The only way to detect the disease early remains annual preventive examinations. Timely diagnosis of cervical cancer and successful treatment of pre-cancers is possible only through regular gynecological examinations. In each gynecological office, opportunistic screening is carried out, each gynecological examination is at the same time oncoprophylactic, which means that every woman, regardless of the occasion of the visit to a gynecologist, is taken prophylactic pap smear. In recent years, a primary prophylactic program has been presented, which includes HPV vaccines. They are included in the list of recommended immunizations (according to Ordinance No 15 of 2005 on immunizations in the Republic of Bulgaria (tax, SG 45/05) and are recommended for girls 12 and 13 years old, with the possibility to apply to women up to 25 years old.

The scientific community is united around the following conclusions:

- *Vaccination is the only method of effective and long-lasting primary prevention of cervical cancer.*
- *Vaccination does not cancel regular preventive examinations against cervical cancer.*
- *Vaccination prevention would only affect morbidity and mortality from cervical cancer nationally if vaccination was carried out on a population basis, i.e. if the implementation of CC vaccines became part of the national policy of the state and was borne by it.*
- *For all unvaccinated women, mass screening should be organised, not opportunistic cervical screening according to accepted rules and noCC.*

Awareness of women of different ages is the most direct route to primary and secondary prevention. Knowledge, their dissemination and the imposition of a new health culture, especially among young girls, would have long-term health, economic and social consequences for society, the family and each of its members.

**The practical aspect** of the development is aimed at examining disease awareness, to clarify the social and personal myths related to primary prevention, to the assessment of the risk and behavioural factors that hinder mass screening.

The fact that CC can be prevented 100% through screening programmes is reason to assume that women's awareness is the first step towards health. The increase in the health culture and

motivation of Bulgarian women for prophylactic gynecological examinations and administration of HPV vaccines would inevitably dethrone Bulgaria from the top of the morbidity rankings.

## **II. PURPOSE, TASKS, METHODS AND ORGANISATION OF THE STUDY**

### **2.1. PURPOSE, TASKS AND HYPOTHESES OF THE STUDY**

**PURPOSE:** To establish the level of awareness about cervical cancer and to identify the factors and causes influencing the knowledge of Bulgarian women about the methods and means of prevention and early detection of cervical cancer.

Main research **these:**

- Young women's awareness of cervical cancer, as well as the factors and causes associated with this disease, are of paramount importance for the prevention and reduction of the incidence of morbidity.
- It is essential for the prevention of CC that work among adolescents begins with raising awareness of sexually transmitted diseases, risky sexual behaviour and its results.

#### **TASKS**

To achieve our goal, we set the following tasks:

1. To analyze the awareness of students, healthy women of sexually active age and women sick with CC on the methods and means of prevention of CC;
2. To assess the level of health culture of the women studied with regard to cervical cancer screening;
3. Analyze the factors influencing the motivation of the women studied to use the available HPV vaccines;
4. To study and analyze the knowledge and attitude of students and healthy women of sexually active age about CC.
5. To develop and propose a strategy to raise women's awareness and health behaviour regarding the prevention of CC
6. healthy habits of children.

#### **STUDY WORK HYPOTHESES**

Women in Bulgaria are poorly informed about the causes, prevention and treatment of CC. This is a prerequisite for low motivation and lack of interest in HPV vaccination, the non-glycemic care of own health and screening programs related to CC.

### **2.2. SUBJECT MATTER, SUBJECT MATTER AND VOLUME OF THE STUDY**

**The** subject of this study is the health knowledge (awareness) of students, healthy women of sexually active age and patients of RCC about the risk factors and causes of the disease, the methods and means associated with its prevention.

**Three** selected groups of respondents – female students, healthy women of sexually active age and cervical cancer patients – were the subject of the survey. The group of students was examined because of their definitively younger age and the possibility of primary prevention (vaccination).

**Survey volume:**

- **First group of respondents:** 200 students from the following universities:
  - Shumen University "Ep. Konstantin Preslavski" – Shumen;
  - University of Rousse "Angel Kanchev" – Razgrad Branch;
  - Medical University "Prof. Dr.Sc.(Econ.) Paraskev Stoyanov, M.D." – Varna, Veliko Tarnovo Branch.
- **Second group of respondents:** 200 sick women with cervical cancer, treated and hospitalized in:
  - KOC – Shumen EOOD;
  - KOC – Veliko Tarnovo EOOD;
  - SBALOV "Dr. Marko Markov" – Varna.
- **Third group of respondents:** 200 healthy women randomly selected from cities:
  - Noisy.
  - Veliko Tarnovo
  - Varna

#### **Logical units of the study:**

- Every student studying at the University of Sofia Shumen, Razgrad and Veliko Tarnovo.
- Every woman diagnosed with cervical cancer who visited koc in the town of Sofia Shumen, Veliko Tarnovo and Varna.
- Healthy woman of sexually active age from the city of Sofia Shumen, Veliko Tarnovo and Varna.

#### **Technical units:**

- For group 1:
  - Shumen University "Ep. Konstantin Preslavski" – Shumen;
  - University of Rousse "Angel Kanchev" – Razgrad Branch;
  - Medical University "Prof. Dr.Sc.(Econ.) Paraskev Stoyanov, M.D." – Varna, Veliko Tarnovo Branch.
- For group two:
  - KOC – Shumen EOOD;
  - KOC – Veliko Tarnovo EOOD;
  - SBALOV "Dr. Marko Markov" – Varna
- For a third group:
  - Town of Shumen;
  - Veliko Tarnovo;
  - City of Varna;

#### **Eligibility criteria in the study**

- **First group of respondents:**
  - Students from higher education institutions in the respective cities;
  - Persons over 18 years of age;
  - Persons who have signed informed consent;
- **Second group of respondents:**
  - Women diagnosed with cervical cancer, underwent treatment and hospitalized in the areas under consideration;
  - Over 18 years of age;
  - Signatories informed consent;

➤ **Third group of respondents:**

- Healthy women;
- Over 18 years of age;
- Signatories informed consent;

**Monitoring bodies**

A significant part of the study is conducted by the PhD student, and in these structures for collaborators are attracted chief nurses and teachers, pre-familiar with the purpose, methodology for conducting the study and trained to work with the toolkit (survey cards).

**2.3. TIME AND STAGES OF CONDUCT**

**Time and place of studies:**

Study of:

- The students' opinion on their awareness and attitudes about cervical cancer took place in January 2020 – December 2021.
- The opinion of sick women withCC on their awareness and attitudes about cervical cancer took place in January 2020 – December 2021.
- Healthy women's views on their awareness and attitudes about cervical cancer took place in January 2020 – December 2021.

**STAGES OF THE SCIENTIFIC STUDY**

Stage	Description of the activity	Tool	Weather	Place
First	Formulating the problem, defining the purpose, tasks and design of the study, developing hypotheses, toolkit and organizational plan.	Study of literature on the problem.	July – December 2019	Mu-Varna
Second	After kenny's permission of MU-Varna, a survey was conducted with students, sick women withCC and healthy women.	Informed consent No1 poll for students Poll #2 for sick women withCC No3 poll for healthy women	January 2020 – December 2021	Shumen, Razgrad, Veliko Tarnovo, Varna
	Analysis of the results obtained.	Statistical processing of data.	January – March 2022	Mu-Varna
Third	Preparation of conclusions and recommendations. Shaping the dissertation work.		April – May 2022	Mu-Varna

**2.4. SURVEY METHODS**

- **Documentary method** – study of government documents, manuals, dissertations
- scientific developments, reports, programmes, recommendations, scientific publications, etc.
- **Survey method** – to study the opinions of students, sick women withCC and healthy women on their awareness and attitudes about cervical cancer.
- **Statistical methods** -the statistical presentation of the results are used:

**A. Descriptive methods and methods of evaluation:**



- Variational analysis of quantitative variables – average, standard deviation, minimum, maximum.
- Frequency analysis of qualitative variables, which includes absolute frequencies, relative frequencies (as a percentage), cumulative relative frequencies (as a percentage).
- Graphic images.

B. **Methods for checking hypotheses** – non-parametric methods – chi-square test method

C. **Correlation analysis** – Spierman coefficient.

Data processing was performed with SPSS v. 20.0 for Windows, and the level of significance of the results is <0.05

## 2.5. STUDY TOOLKIT

### ➤ Survey cards

To achieve the purpose and tasks of the survey, 3 survey cards are produced, containing closed and open questions.

**Questionnaire #1 on student opinion on awareness and attitudes about** cervical cancer. The survey contains 44 questions, of which 3 are open and 41 closed, divided into 4 groups:

1. group of questions – demographic and general data – question Nos 1, 2, 3, 4, 5, 6, 7, 8;
2. a group of questions – including assessment of risk factors and behaviour – issue Nos 9, 10, 11, 12, 13, 28;
3. group of health behaviour issues – issue Nos 14, 15, 18, 32, 33, 35;
4. a group of issues related to the awareness of the CC – question 16, 17, 19, 20, 21, 22, 23, 24, 25, 26, 27, 29, 30, 31, 34, 36, 37, 38, 39, 40, 41, 42, 43, 44;

- **Questionnaire No2** on the opinion of sick women with CC on their awareness and attitudes about cervical cancer. The survey contains 42 questions, of which 2 are open and 40 closed, divided into 4 groups:

1. group of questions – demographic and general data – question Nos 1, 2, 3, 4, 5, 6, 7, 42;
2. a group of issues including assessment of risk factors and behaviour – question 8, 9, 10, 11, 12, 25;
3. a group of health behaviour issues – issue Nos 13, 14, 17, 29;
4. a group of questions 15, 16, 18, 19, 20, 21, 22, 23, 24, 26, 27, 28, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41.

- **Questionnaire #3 on the opinion of sick women with CC on their awareness and attitudes about** cervical cancer. The survey contains 43 questions, of which 2 are open and 41 closed, divided into 4 groups:

1. group of questions – demographic and general data – question 1, 2, 3, 4, 5, 6, 7;
2. a group of issues including an assessment of risk factors and behaviour – question 8, 9, 10, 11, 12, 27;
3. a group of health behaviour issues – issue Nos 13, 14, 17, 22, 31, 34;
4. a group of questions 15, 16, 18, 19, 20, 21, 23, 24, 25, 26, 28, 29, 30, 32, 33, 35, 36, 37, 38, 39, 40, 41, 42, 43.

The survey was conducted after received permission from the Committee on The Ethics of Research at Mu-Varna – Protocol/Decision No87, meeting on 24.10.2019.

### III. RESULTS AND DISCUSSION

#### 3.1. Characteristics of the persons surveyed

600 persons were surveyed, which are divided into three main groups, the main characteristics being presented in table one. 1.

**Tabl. 1. Characteristics of the persons surveyed**

Indicator		Student (n=200)	Sick women withCC (n=200)	Healthy women (n=200)
Age	18-25 g.	84/42,0 %	6/3,0%	16/8,0%
	25-30 g.	22/11,0%	16/8,0%	19/9,5%
	31-40 g.	65/32,5%	51/25,5%	30/15,0%
	41-50 g.	24/12,0%	63/31,5%	59/29,5%
	51-60 g.	5/2,5%	64/32,0%	76/38,0%
Education	Basically	-	9/4,5%	42/21,2%
	Average	120/60,3%	38/19,2%	66/33,3%
	Higher (Bachelor)	50/25,1%	87/43,9%	37/18,7%
	Higher (Master)	29/14,6%	64/32,3%	53/26,8%
Domicile	Regional City	100/50,8%	131/76,6%	132/70,2%
	Municipal City	63/32,0%	32/18,7%	24/12,8%
	Village	34/17,3%	8/4,7%	32/17,0%
Marital status	Married	78/39,6%	102/51,0%	99/49,5%
	Single	78/39,6%	35/17,5%	40/20,0%
	Divorced	10/5,1%	31/15,5%	19/9,5%
	Widow	2/1,0%	1/0,5%	14/7,0%
	Cohabitation without marriage	29/14,7%	31/15,5%	28/14,0%
Occupation	Private sector worker	53/27,2%	71/37,0%	73/37,2%
	Public sector worker	14/7,2%	74/38,5%	58/29,6%
	Freelancers	10/5,1%	12/6,2%	13/6,6%
	Unemployed	36/33,8%	8/4,2%	27/13,8%
	Learner	66/33,8%	2/1,0%	13/6,6%
	Other	16/8,2%	25/13,0%	12/6,1%
Material condition	That's very good	26/13,2%	12/6,0%	13/6,8%
	Good	163/82,7%	153/76,9%	127/66,5%
	Bad	8/4,1%	29/14,6%	43/22,5%
	Very bad	-	5/2,5%	8/4,2%
Kids	YES I DO	111/55,8%	162/81,0%	149/75,3%
	NOT	88/44,2%	38/19,0%	49/24,7%

The results of the comparative analysis carried out show that that there was a significant age difference in the surveyed groups of women ( $p < 0.001$ ), with females in the 18-25 age group (42.0 %), women withCC prevalent in the age group over 41 (63.5 %), and healthy women dominated by those

aged 51-60 (38.0%). A moderate relationship was also found between the age of the women and the study group ( $r=0.466$ ;  $p<0.001$ ). This is an explanatory age difference given the age at which higher education is usually obtained. The average age of the sick follows the indicated average age for the development of CC.

From an education perspective, there was also a significant difference in the three groups ( $p<0.001$ ), with females and healthy women predominantly with secondary education (60.3% and 33.3% respectively) and sick women dominated by those with higher education (bachelor's) (43.9%).

Although all three groups of women found a high relative share of those living in regional cities, a significant difference was also found ( $p<0.001$ ).

A significant difference was also found in teCC of marital status, with female students being married and unmarried having the same distribution (3.6%), while sick women with RCC and healthy women dominated by married women (51.0% and 49.5% respectively) ( $p<0.001$ ).

Interestingly, only a third (33.8%) of students indicated that they are currently studying and over 2/3 combine learning with work. Combining tuition with work has been a trend among students in recent times, which is mainly necessary for financial and economic reasons. In sick women with CC, only 4.2% are unemployed and 13.0% have ALC ( $p<0.001$ ). Given the overwhelming percentage in the 41-60 age group, these are women of active working age and professional realization.

A significant difference ( $p<0.001$ ) was found and a slight correlation between material condition and the study group ( $r=0.246$ ;  $p<0.001$ ), although all three groups were dominated by women with good material condition.

Additionally, students are assigned to two subgroups: health care students (nurse and midwife), who are 30.5%, and students from other non-medical specialties (69.5%). This distribution allows to make a more detailed analysis of the awareness and health behavior associated with cervical cancer.

No difference is found as to age, domicile and material condition. On the other hand, there is a significant difference in teCC of educational degree ( $p<0.001$ ), with a significant proportion of health care students having a secondary education (91.7%), while over half of students from other specialties already have one completed higher education (53.2%). A moderate counter-proportional relationship between the two groups of studied students and the educational degree ( $r=-0.425$ ;  $p<0.001$ ) was also found. This is presumed by the legislative prohibition on state-commissioned training of persons who have the same or higher level of education. If a student candidate has already acquired a bachelor's or master's degree, he/she can train in specialties in the same educational degrees only for a fee.

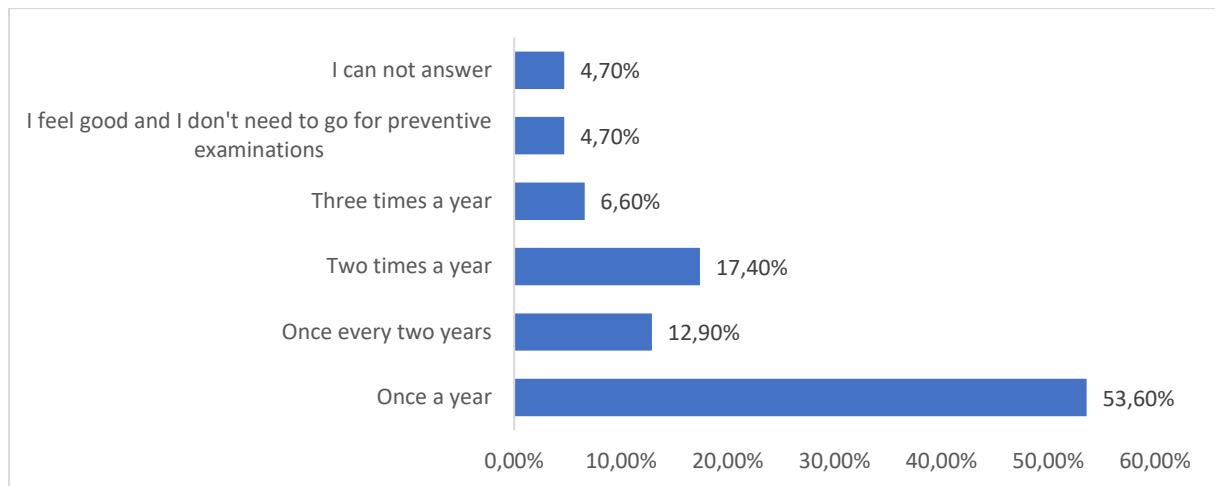
According to marital status, there is also a significant difference ( $p=0.001$ ), with students in other specialties predominating those who are married (47.4%), and for health care students, more than half are unmarried (56.7%). It is noticed the increasing trend in the last years of cohabitation without marriage.

About half (46.7%) of students in other specialties are in work, while 67.2% of health care students are only trained without combining this with additional employment ( $p<0.001$ ). This is explained by the requirements for students from the health care department for full-time training, inability to attend practical training and weekly workload over 30 hours. This makes combining training and work difficult to achieve.

About 2/3 (63.0%) of students with other specialties have children, while just over 1/3 (39.3%) of health care students report having children ( $p=0.002$ ).

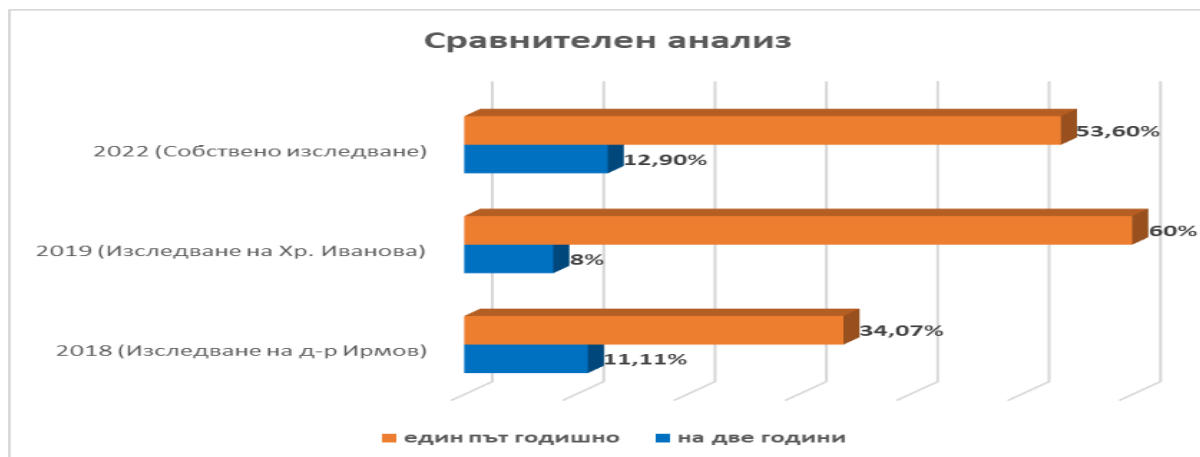
### 3.2. Analysis of the awareness of students, healthy women of sexually active age and women sick with CC on the methods and means of prevention of CC

Prophylactic examinations were identified as one of the shortcuts for early detection and timely treatment of CC. In this survey, more than half of the women surveyed (53.60%) said they should go to a preventive examination at least once a year (Fig. 1).



**Fig. 1. Frequency of prophylactic gynecological examination**

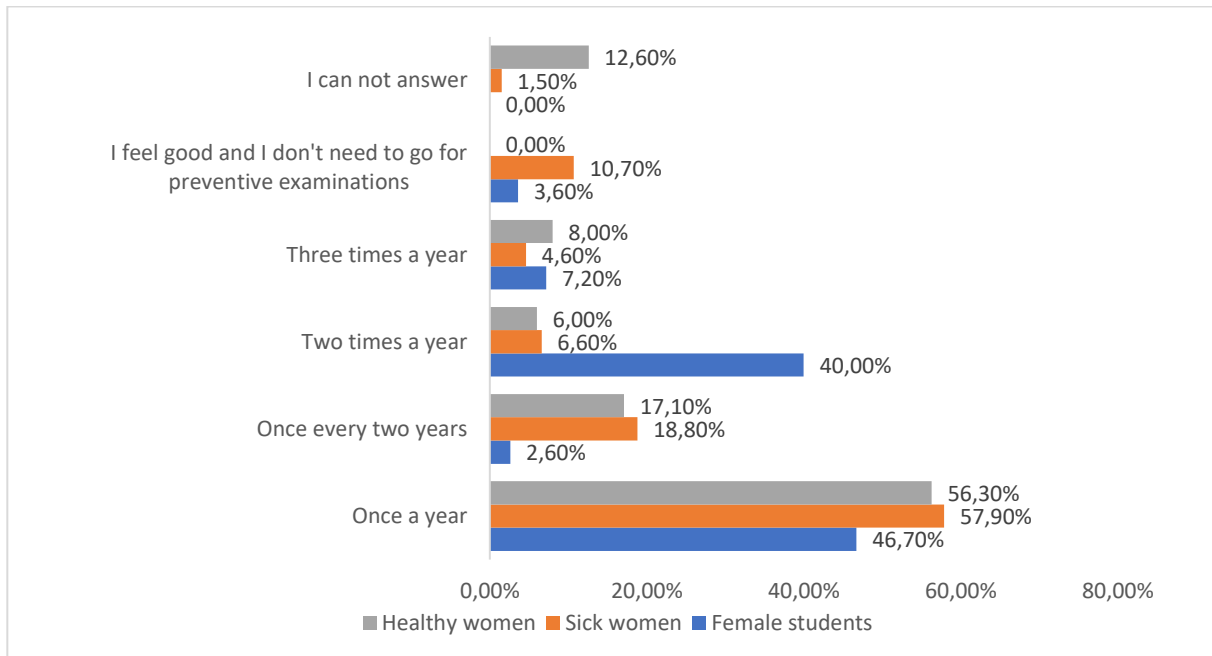
Unfortunately, one in three women think it is acceptable to go to a preventive examination once every two years, and 4.7% of all respondents can not answer this question. The same proportion assume that after feeling good – it is not necessary to visit a gynecologist. This shows a low health culture regarding the development of RPM and the role of prevention.



**Fig. 2. Comparative analysis of the results of the surveys carried out in 2018, 2019 and 2022**

A comparative study of the results of this study and those of other authors found that there was no significant difference in the incidence of women who indicated that a prophylactic gynecological examination could be carried out once every two years. On the other hand, there was a difference in the incidence of women who conducted a prophylactic gynecological examination once a year in 2018 (34.07%) in a study by Dr. Irmov (14) and those surveyed in 2019 (60%) by Hr. Ivanova (13) and 2022 (53.60 %) (Fig. 2).

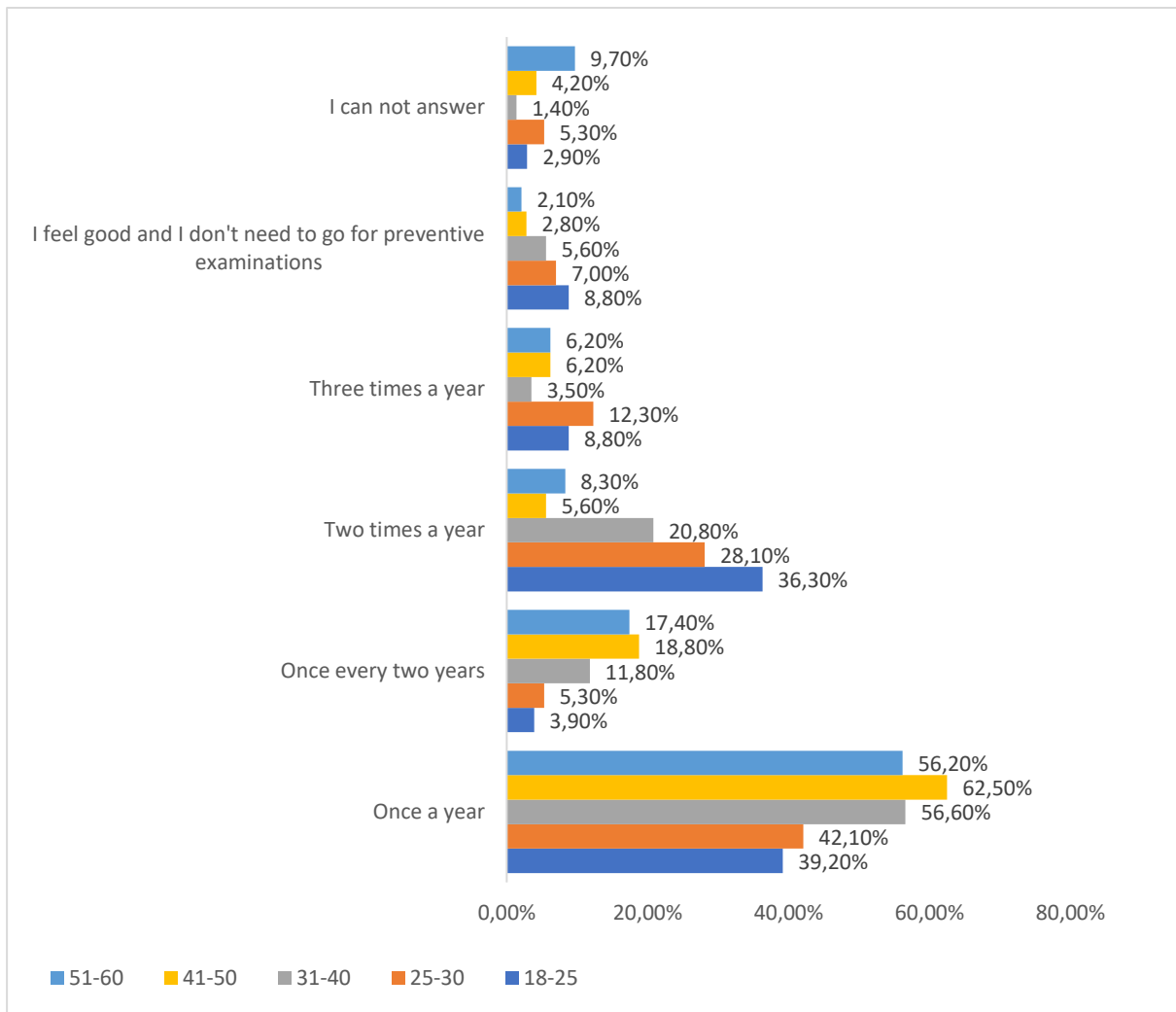
On the other hand, a significant difference was found as regards awareness of the frequency of prophylactic examinations according to the study group ( $p < 0,001$ ). Students are of the opinion that preventive examinations should be conducted at least one (46.7 %) or twice a year (40.0%), while over half of healthy and sick women are of the opinion that a preventive examination is sufficient ( Fig. 3).



**Fig. 3. Frequency of prophylactic gynecological examination according to the groups studied**

It is noticed that in the group of women diagnosed with CC, one in ten women is of the opinion that if she is feeling well – prophylactic gynecological examination is not necessary. The disease (disease) in many people's health systems is only associated with the presence of suffering, pain or symptoms that are already sufficiently pronounced to seek help. Neglect of preventive examinations (in this case funded by the NHIF) is ignored.

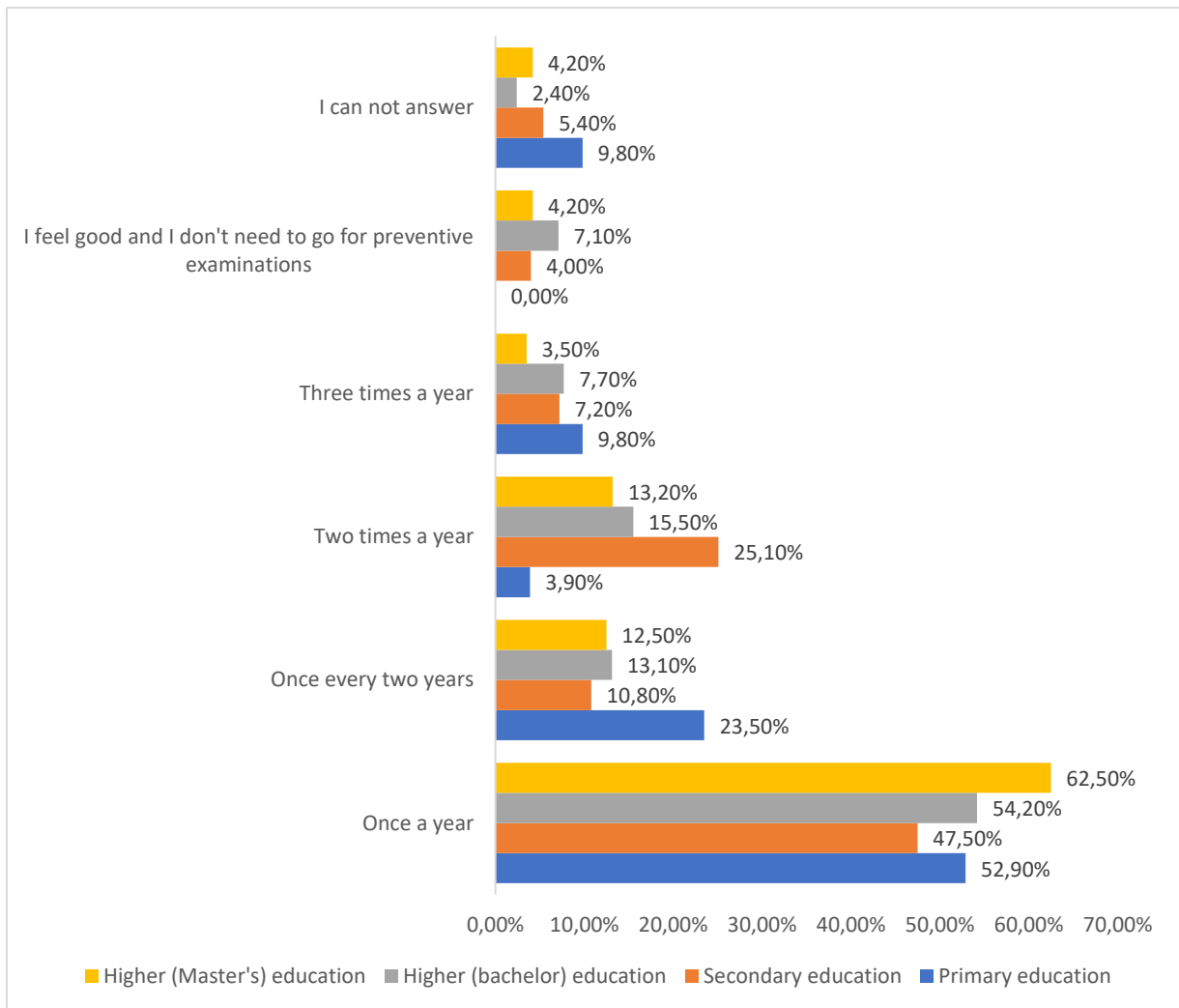
A significant difference was also found in teCC of the age of respondents ( $p < 0.001$ ), with the youngest (18-25) of the opinion that the reviews should be one (39.2 %) or two (36.3 %) times a year. As we get older, the opinion of respondents about conducting a preventive examination once a year increases (Fig. 4). This confiCC the thesis that information campaigns should be targeted at all age groups.



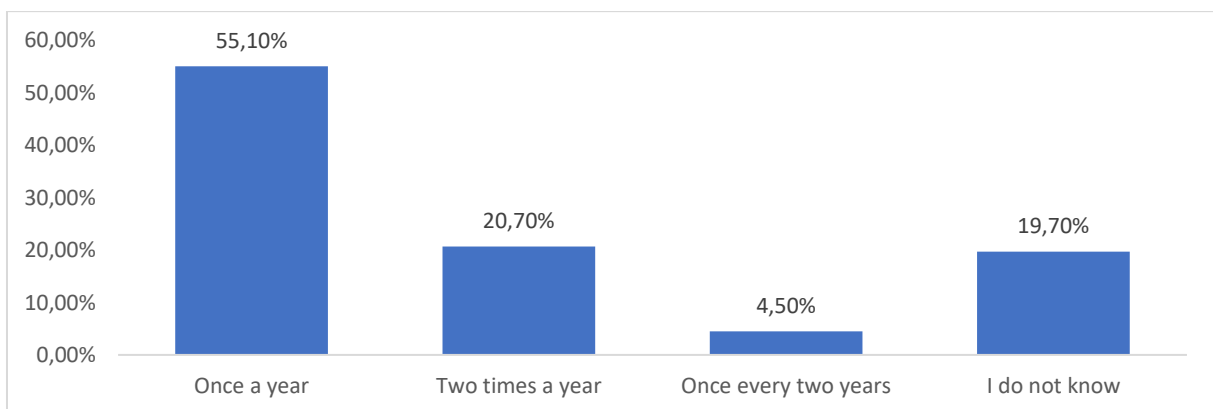
**Fig. 4. Frequency of prophylactic gynecological examination according to age groups**

A significant difference in the opinion of respondents on the frequency of prophylactic examinations is also found from the point of view of education ( $p < 0,001$ ) (Fig. 5). Although all groups predominate the responses to conduct a prophylactic gynecological examination once a year, the difference is established in teCC of the study of the frequency of respondents two and three times a year. Higher education (Bachelor and Master) does not correlate with the frequency of visits to a gynecologist.

More than half of those surveyed said a pap smear should be done at least once a year (55.1%). This is an unsatisfactory outcome and gives rise to question respondents' health knowledge of the significance of this survey. Furthermore, it is clear from this survey that one in five women surveyed cannot answer this question (Fig. 6). This suggests that the role of this type of non-invasive research is underappreciated and neglected.



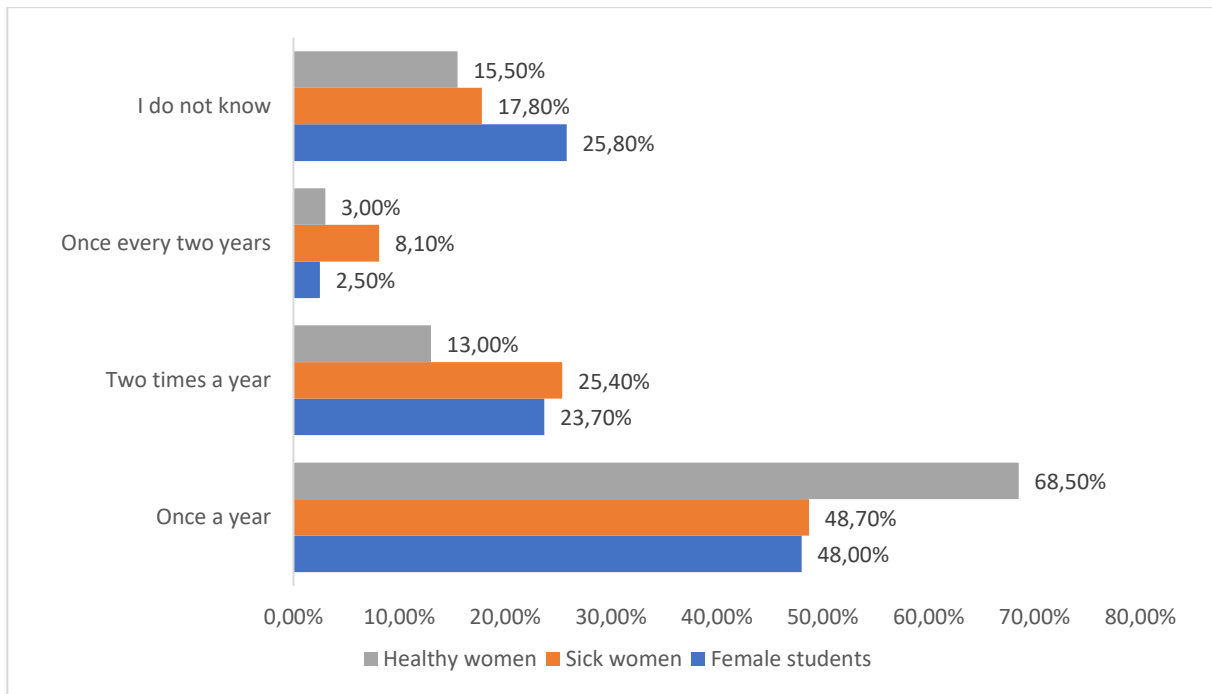
**Fig. 5. Frequency of prophylactic gynecological examination according to the educational degree**



**Fig. 6. Frequency of the pap smear**

A significant difference ( $p < 0,001$ ) and low dependence was established in teCC of the frequency of the pap smear according to the study group ( $r = -0,161$ ;  $p < 0,001$ ) (Fig. 7). Healthy women

are most aware of the need for preventive examination with pap smear, and the least knowledge is reflected in the student responses. One in four students can't answer that question. This fact reinforces the view that there should be a strong awareness campaign among young women about the nature, role and importance of the pap smear.

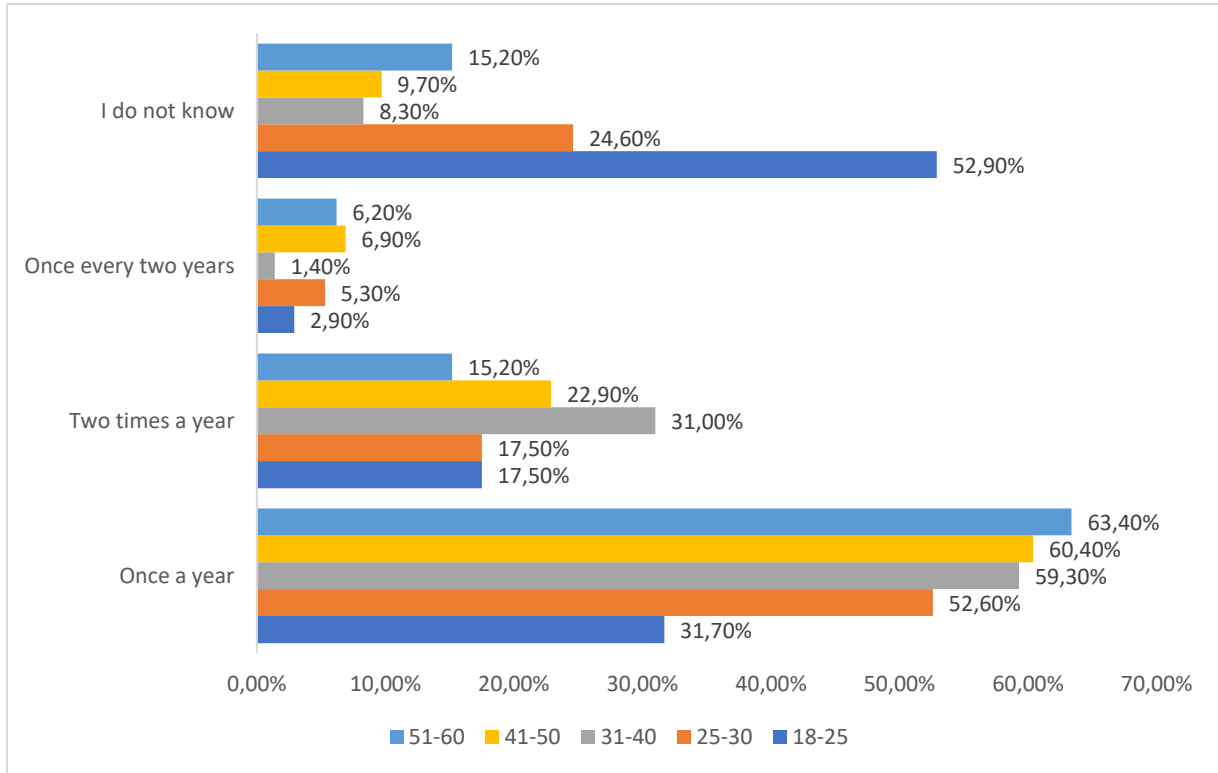


**Fig. 7. Frequency of pap smear according to the study group**

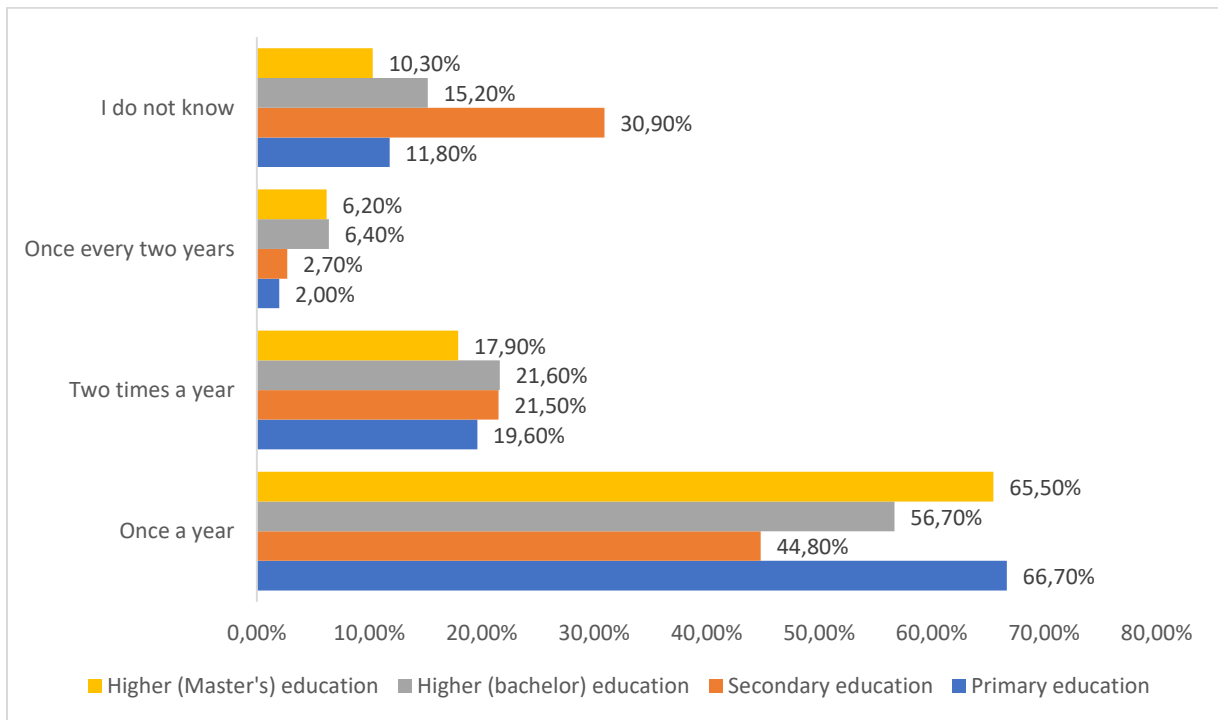
This is also confirmed by the comparative analysis in relation to the age group. More than half of young women that they do not know how often a pap smear should be **carried out**, while as they age, the relative proportion of women who indicate that the pap smear should be carried out at least once a year ( $p < 0,001$ ) has been found. (Fig. 8). The greater frequency of gynecological examinations with a study with pap smear in the older age is due to the fact that personal doctors direct once a year for pap smear testing all women over the age of 21 for the purpose of early prevention of CC.

Women's opinion on the frequency of conducting a pap smear also differs in teCC of the educational level of women ( $p < 0,001$ ) (Fig. 9). The most uninformed are women with secondary education (30.90%), while once a year it is indicated by 66.7% of women with primary education and 65.5% of women with higher education. This seems illogical at first glance, given that a higher level of education is associated with a higher overall, respectively. culture and more knowledge. In the context of this survey, it should be pointed out that the largest group of respondents who indicated secondary education were the students. This is also the youngest age group. On the other hand, the high percentage of respondents with basic education who conduct a once-a-year review with a pap smear is mainly formed by representatives of the group of sick women who already have personal experience with the disease and are well aware of measures to prevent complications and progression of CC.





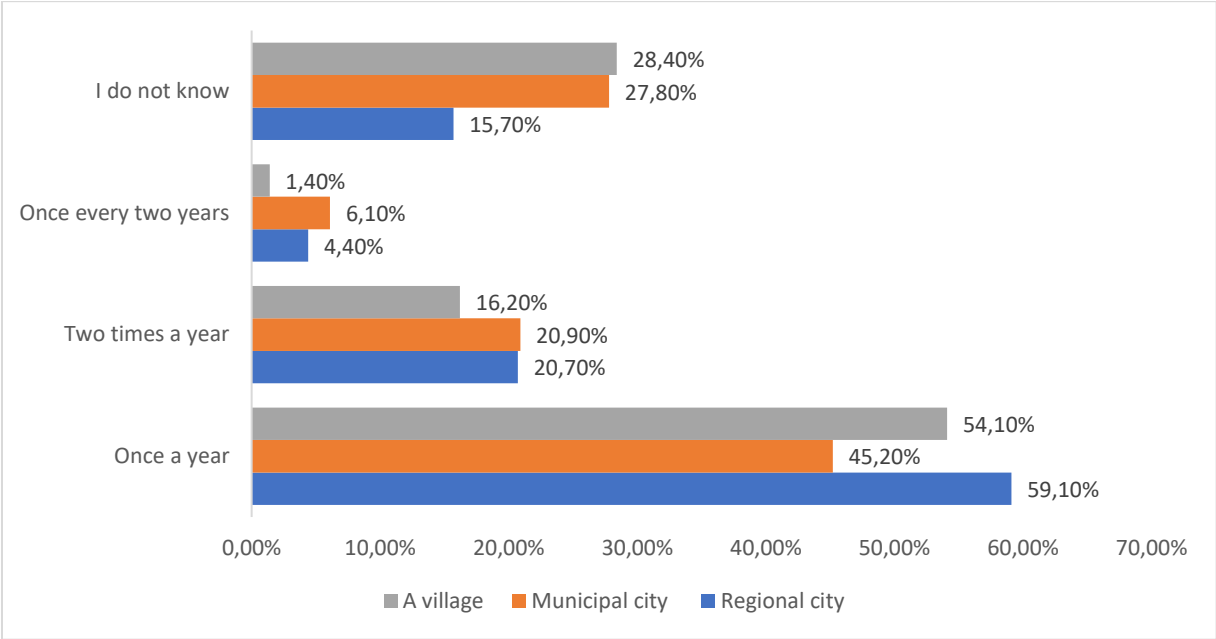
**Fig. 8. Frequency of pap smear by age group**



**Fig. 9. Frequency of pap smear according to educational degree**

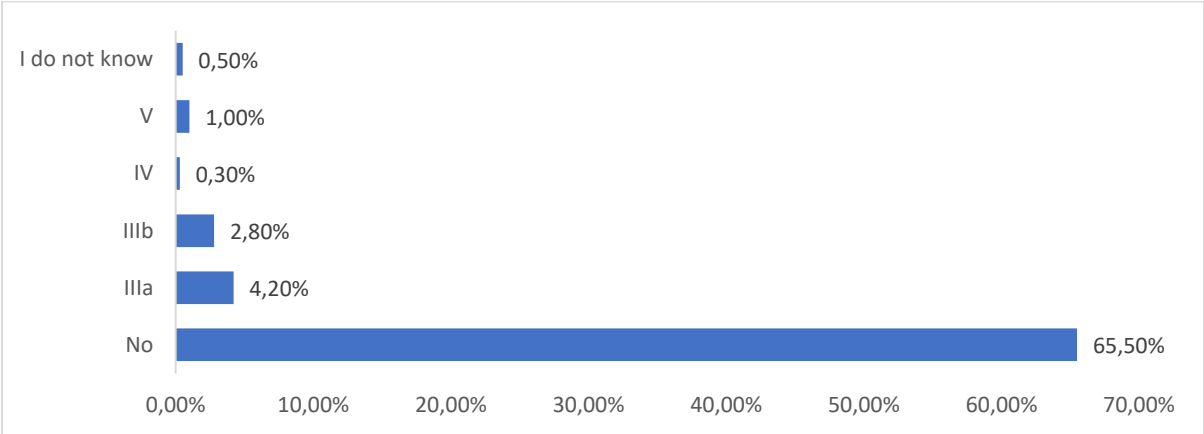
Our study identified domicile as a factor influencing their opinion on the frequency of the pap smear ( $p=0.017$ ) (Fig. 10). The least informed are women from smaller settlements. The lack of equal access to health care in recent years is a serious problem facing health authorities and government

policies. Women living in rural areas are the least informed – one in three women does not know how many times a year it is desirable to conduct a prophylactic cytological examination.



**Fig. 10. Frequency of pap smear according to domicile**

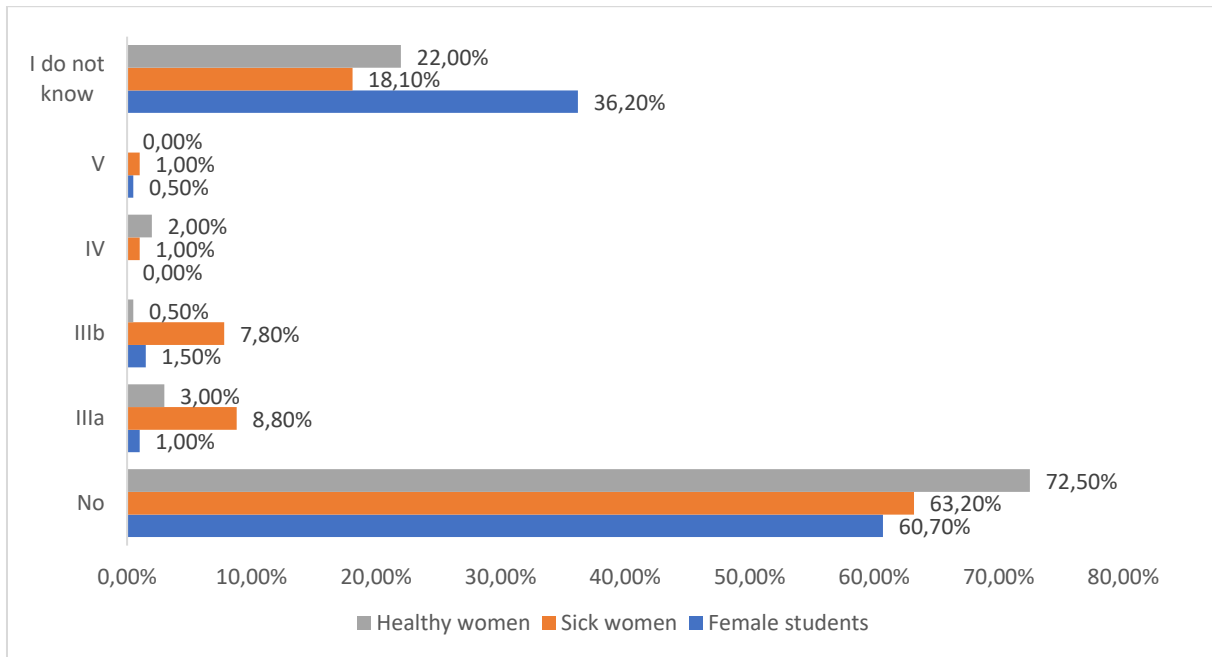
When asked "Do you have a pap smear score higher than the II group on Papanicolaou?" the majority of women said they had no higher score than a second group on Papanicolaou (Fig. 11).



**Fig. 11. Result of pap smear higher than second group on Papanicolaou**

On the other hand, a significant difference was found with regard to the groups studied and the result of the pap smear ( $p < 0,001$ ) (Fig. 12). The question we addressed to the surveyed persons shows that the women surveyed are in good health, with mainly from the group of patients having a higher relative share in results III group of Papanicolaou, which normally for their condition indicate that there is a change and further research is required. Despite the minimum percentage, the impression is made that there are healthy women who have indicated a result of the IV and V group

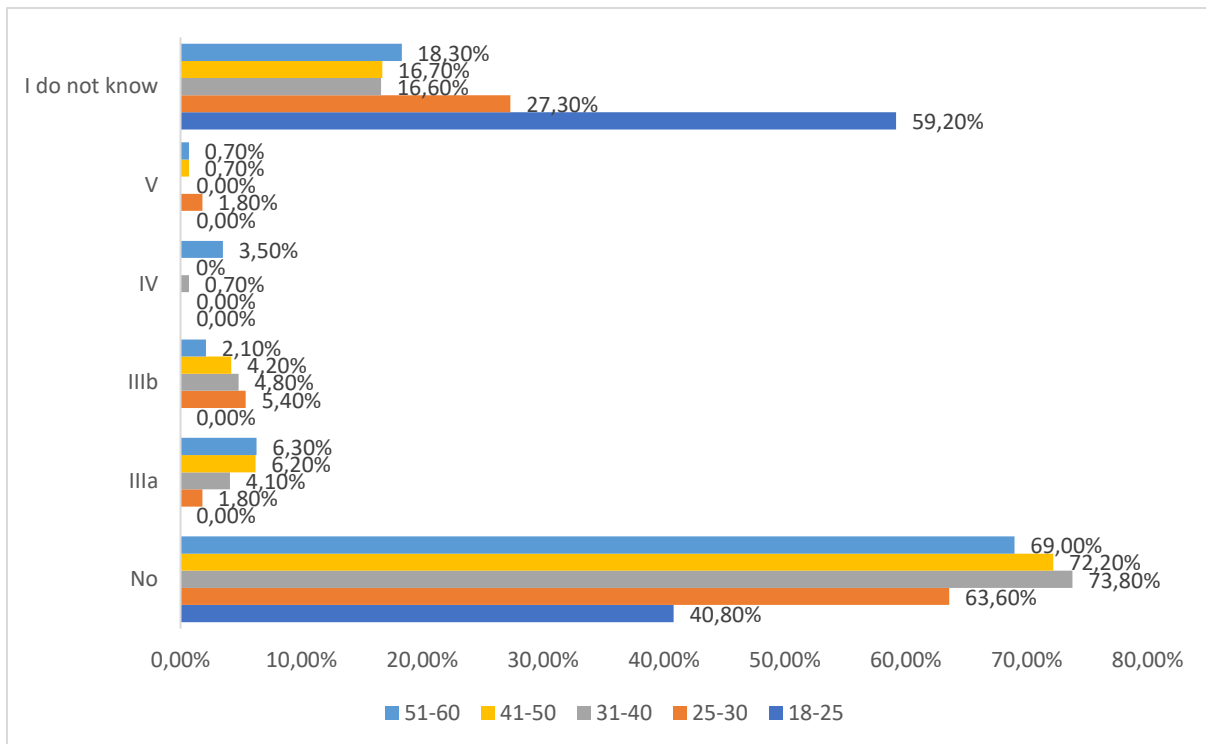
on Papanicolaou, indicating the presence of atypical cells already associated with the development of oncological disease. This result can be explained by the lack of prophylactic examinations, which leads to a delay in the diagnosis and therefore complications in the process of treatment.



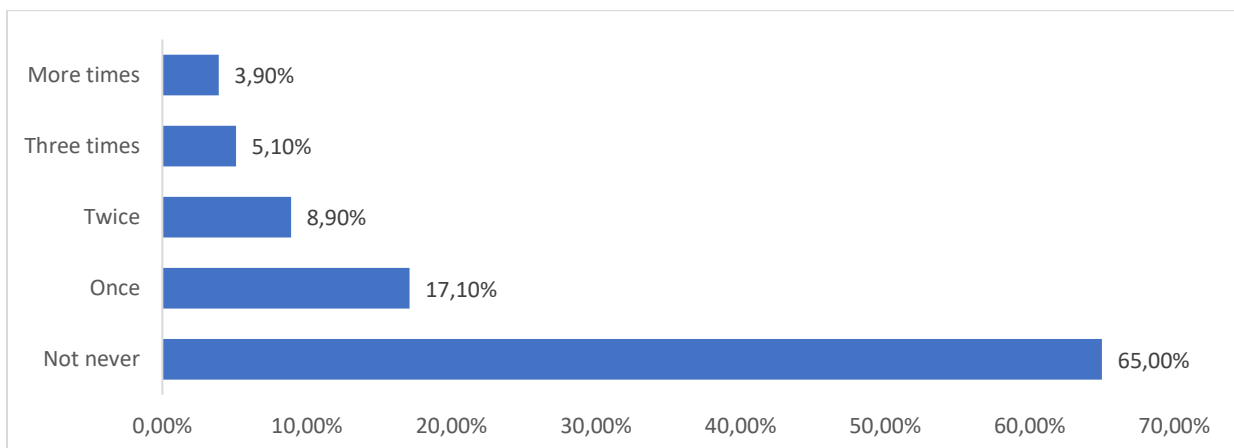
**Fig. 12. Result of a pap smear higher than the second group of Papanicolaou according to the study group**

The age of the women studied correlates slightly, inclined to moderate with the result of the pap smear ( $r=-0,263$ ;  $p<0,001$ ) (Fig. 13). As we get older, a lower relative proportion of women with iv and V group is found. These results, in turn, show that despite poor health culture, few women are diagnosed at a later stage of the disease.

About 2/3 (65%) of women said they had never experienced extramenstrual genital bleeding in their lifetime (Fig. 14). Extramenstrual genital bleeding is one of the signs of cancer, and the presence of this symptom should be like a "red light" for women to have a health problem, making it disturbing that 35% of women indicate that they have experienced a similar type of bleeding.

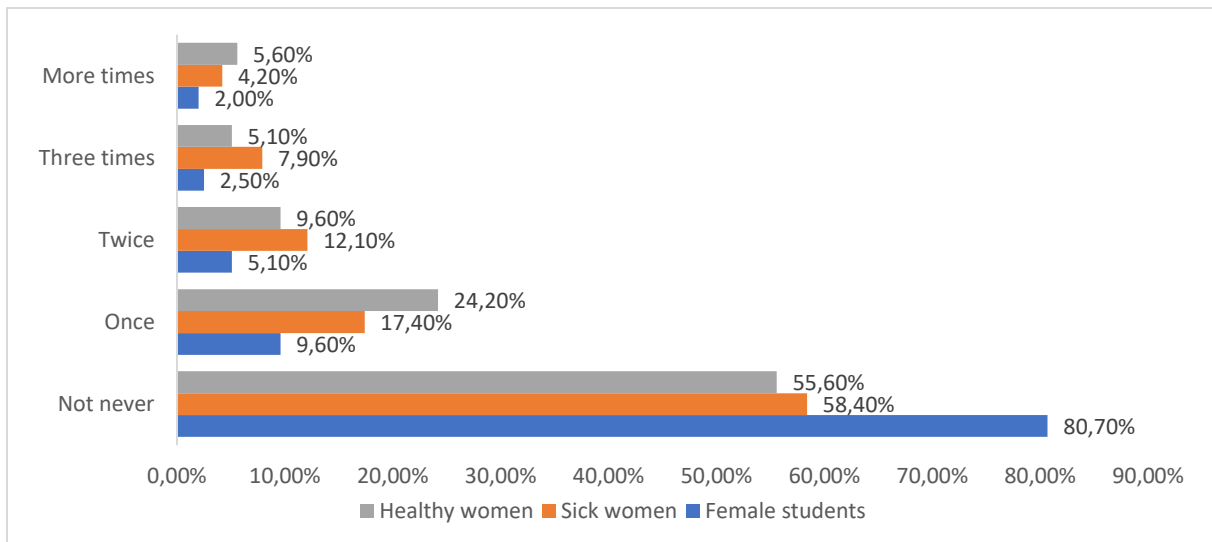


**Fig. 13. Result of a pap smear higher than the second panicolau group according to the age group**



**Fig. 14. Frequency of extramenstrual genital bleeding**

There was a significant difference in the incidence of extramenstrual genital bleeding according to the studied groups ( $p < 0.001$ ), with the majority of students not observing extramenstrual bleeding. There was also a slight correlation between the study group and the incidence of extramenstrual bleeding ( $r = 0.204$ ;  $p < 0.001$ ) (Fig. 15). It is disturbing that extramenstrual genital bleeding is a common symptom not only in sick women, but also in female students (19.30 %) and healthy women (44.40%). This shows that women are not informed that extramenstrual genital bleeding is a symptom of cancer, which necessitates the need to conduct an educational program.



**Fig. 15. Frequency of extramenstrual genital bleeding according to the study group**

A significant difference was also observed with regard to extramenstrual genital bleeding according to the age group of the women studied ( $p=0.020$ ). It is most common in women in the 41-50 age groups (41.0%) and 31-40 years. (40.4%), indicating that these are the riskiest groups for the development of RPM. Conducting regular prophylactic gynecological examinations with a pap smear examination is necessary for the early identification of inflammatory and infectious changes of the female genital tract. This is precisely what necessitates the need to carry out educational campaigns to raise awareness among this age group about the awareness of young women of sexually active age about the methods and means of prevention of CC.

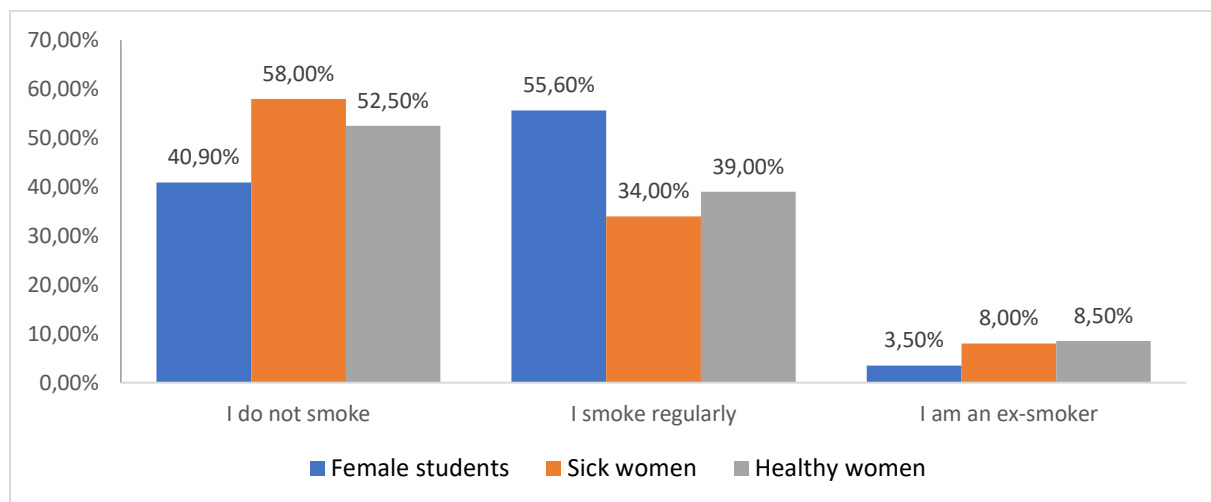
**Tabl. 2. Comparative analysis of the opinion of the student groups surveyed**

Ordered		Students from other specialties	Health care students	P value
Frequency of prophylactic gynecological examination	Once a year	64/47.4 %	27/45.0%	0.568
	Once every two years	3/2.2%	2/3.3%	
	Twice a year	56/41.5%	22/36.7%	
	Three times a year	7/5.2%	7/11.7%	
	I feel good and do not need to go to preventive examinations	5/3.7%	2/3.3%	
Frequency of the pap smear	Once a year	64/46.7%	31/50.8%	0.328
	Twice a year	32/23.4%	15/24.6%	
	Once every two years	2/1.5%	3 /4.9%	
	Not knowing	39/28.5%	12/19.7%	
Frequency of extramenstrual genital bleeding	No, never	109/80.1%	50/82.0%	0.985
	Once	13/9.6%	6/9.8%	
	Twice	7/5.1%	3 /4.9%	
	Three times	4/2.9%	1/1.6%	
	More times	3/2.2%	1/1.6%	

On tab. 2 presented the results of the comparative analysis of the opinion of the student groups surveyed on the frequency of prophylactic gynecological examinations, pap smear and extramenstrual bleeding. No significant difference was found between the two groups studied.

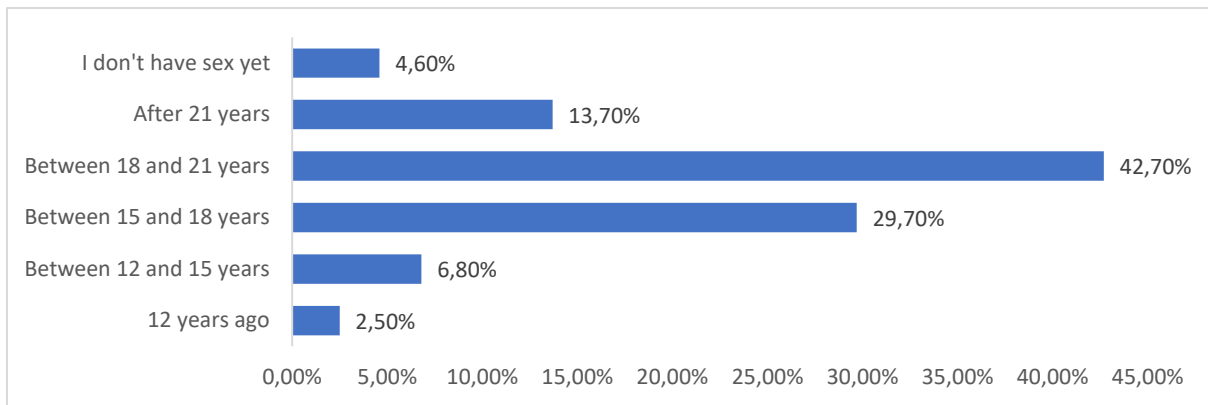
### 3.3. Assessment of the level of health culture of the women surveyed with regard to cervical cancer screening

Health culture is associated with a healthy lifestyle and a reduction in harmful habits. In our survey, half of those surveyed said they were non-smokers, while 42.8% were regular smokers. The results show a large proportion of women who continue to practice this harmful habit, which from the point of view of RPM becomes a risk factor. According to numerous literary data, smoking is associated with a moderately high risk of HPV infection, increasing the risk with the number of smoked cigarettes per day. A significant difference was found with regard to smoking between the three study groups ( $p < 0,001$ ) (Fig. 16), and this harmful habit is most common in students, with an average number of cigarettes daily being  $10.4 \pm 5.9$  (2-20 units of cigarettes daily). The high smoking rate among students (55.60%) indicates that this age group has the most risky behavior. On the other hand, this age is key in the conduct of primary prophylaxis of CC. It should not be forgotten that people with a harmful habit such as smoking have less motivation to follow the recommendations of health prevention specialists and are among the risk groups for a number of diseases, including CC.



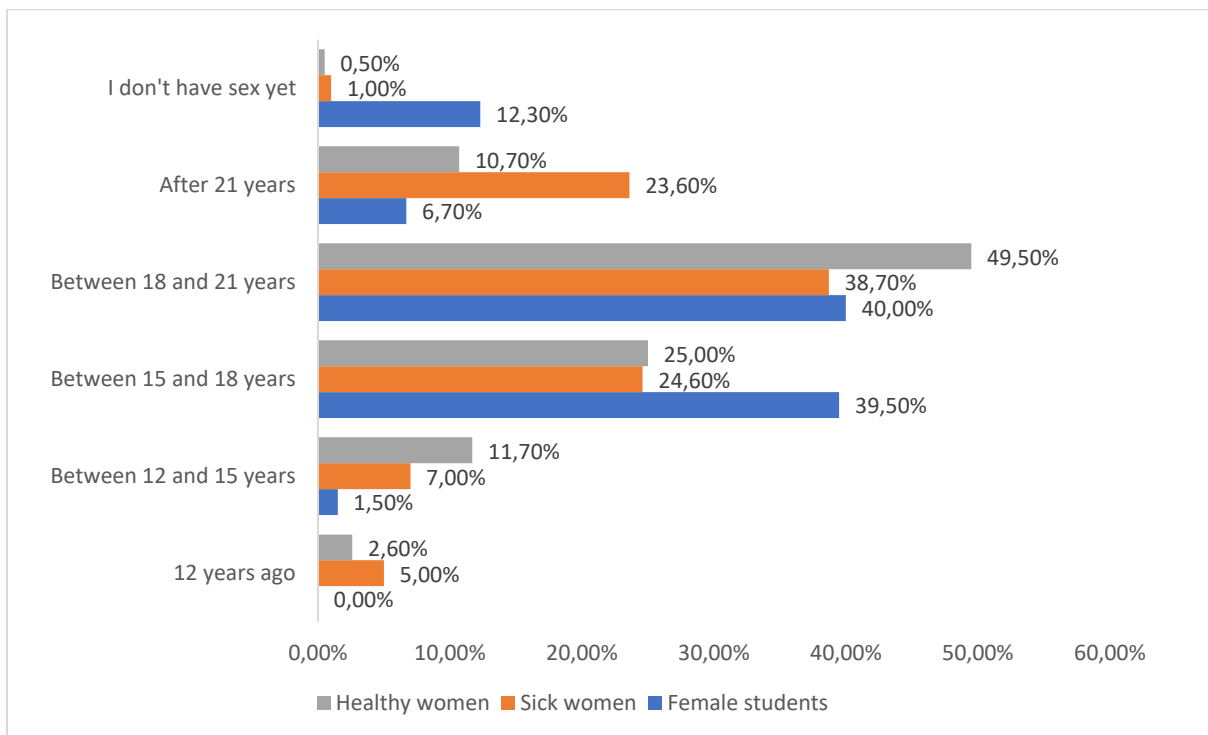
**Fig. 16. Smoking according to the groups studied**

In the current study, we found that the majority of women began to lead sex lives between the ages of 18 and 21 (42.7%), and for 29.7% the sexual debut was between the ages of 15 and 18 (Fig. 17). Early age in first sexual intercourse is an important risk factor for CC. These results once again demonstrate the need for early health education and an increase in sexual culture in the young population.



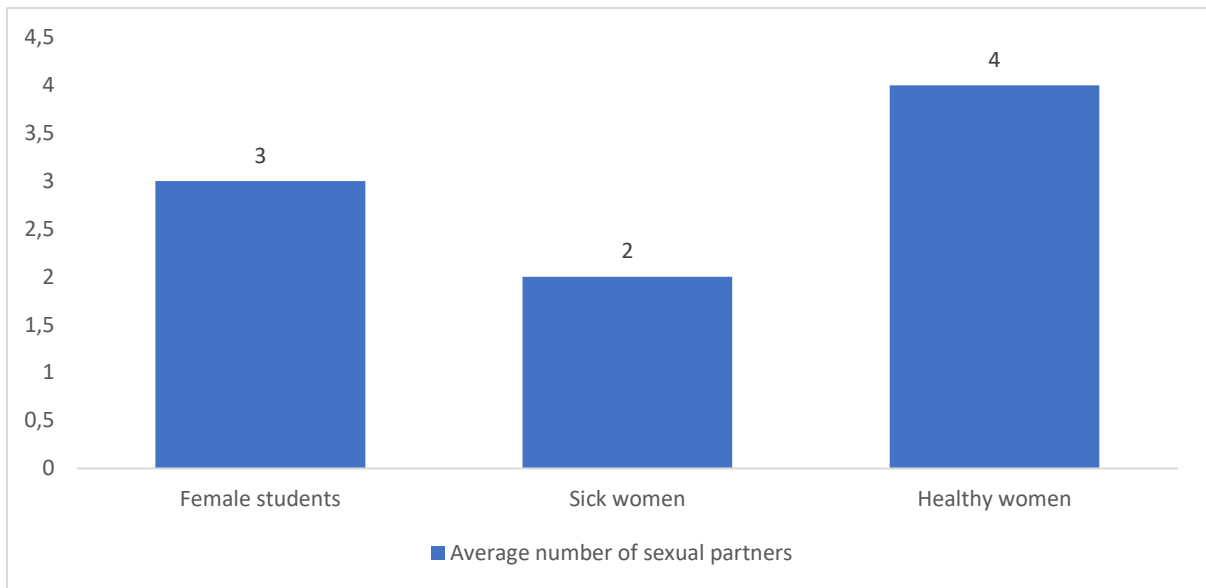
**Fig. 17. Beginning of sex life**

A significant age difference was found in the first sexual intercourse in the three groups studied ( $p < 0.001$ ) (Fig. 18). As evidence to the already described literary data, it can be said that the group of sick women began to lead sexual lives at the earliest.



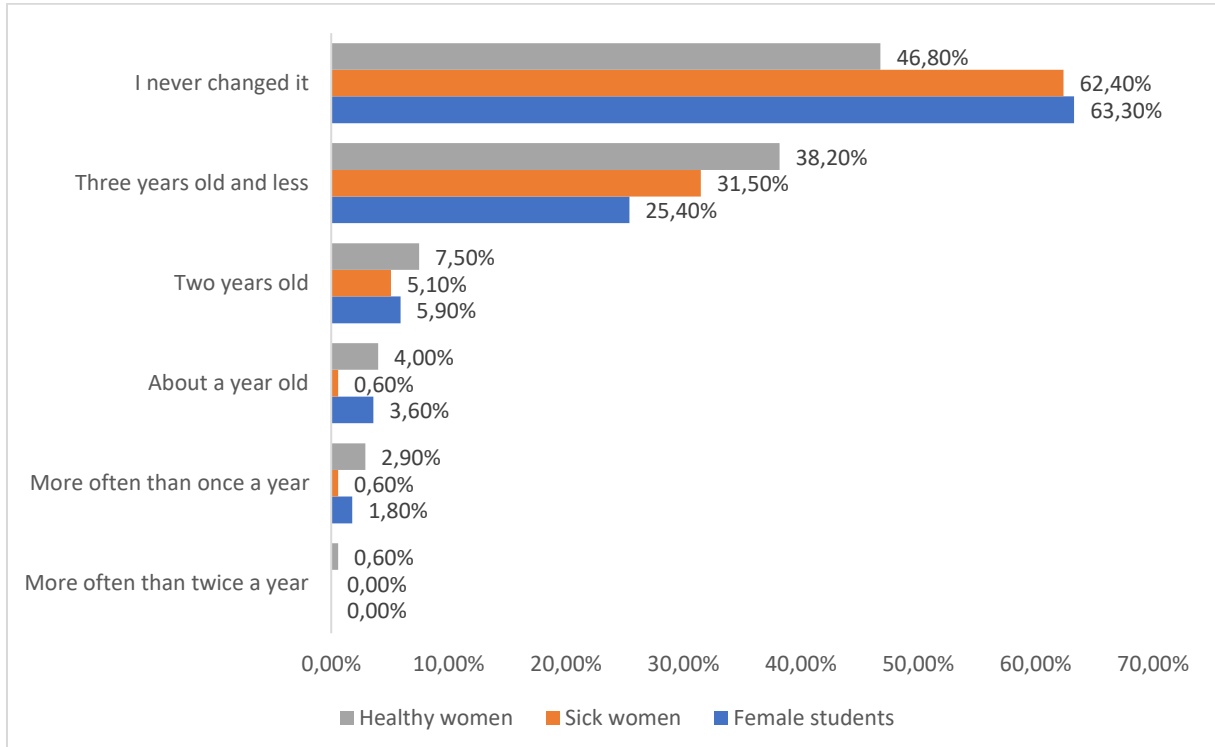
**Fig. 18. Beginning of sex life according to the groups studied**

A significant difference was found in the average number of sex partners in the three groups studied ( $p < 0.001$ ), with the highest number observed in the healthy women's group (Fig. 19). The number of sexual partners over 3 is considered as a risk. In the current study, more than 3 partners had 50.5% of the women surveyed in the three groups surveyed. A link was found between the marital status of the groups studied and the number of sex partners ( $r = 0.371$ ;  $p < 0.001$ ), with a difference in the three groups studied. In the group of students, the most partners had divorces, while sick women were the ones who coexisted with their partner without marriage. On the other hand, healthy women find that unmarried women have a significantly higher number of sexual partners than others.



**Fig. 19. Average number of sex partners according to the study group**

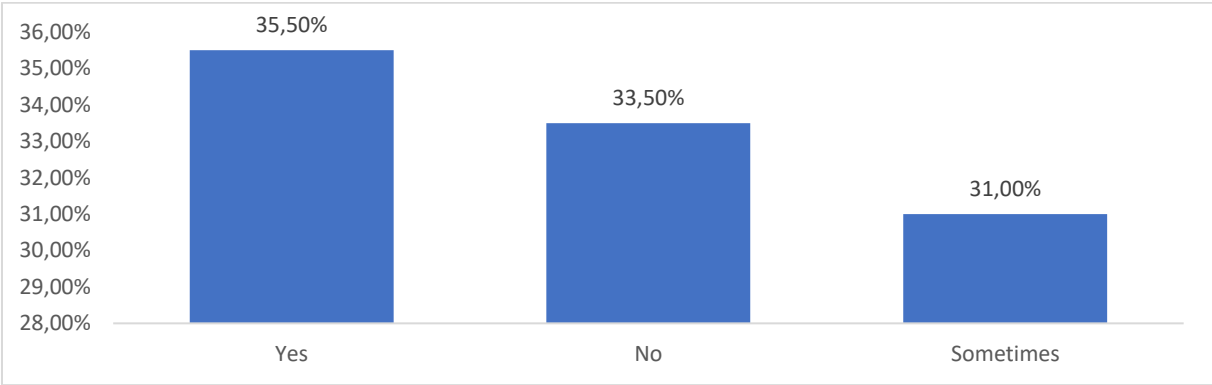
More than half of those surveyed said they had never changed their gender partner. A significant difference in the frequency of change of sex partners ( $p=0.031$ ) was found, with healthy women finding a higher relative proportion of those who indicated they had a smaller change of partner (Fig. 20).



**Fig. 20. Frequency of change of sexual partner according to the study group**

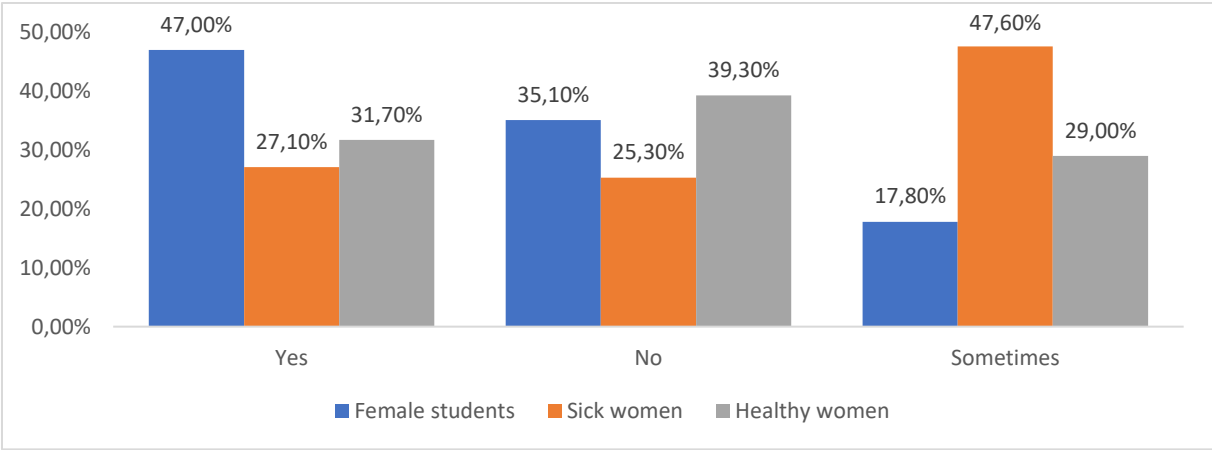


About 1/3 (35.5%) indicate that they regularly use a condom as a means of preventing infection with sexually transmitted diseases (Fig. 21). This result is disturbing for several reasons. First, a large percentage of women lead risky sex lives, which increases the likelihood of infection not only with sexually transmitted infections and HPV, but also the risk of developing RPM. Condoms have a protective role not only in teCC of transmission of infection, but also in teCC of re-infection. Therefore, it is essential to inform the community about the benefits of regular use of condoms – not only for the prevention of unwanted pregnancies, but also in teCC of infection and reinfection with sexually transmitted diseases.



**Fig. 21. Use of a condom as a means of preventing infection with sexually transmitted diseases**

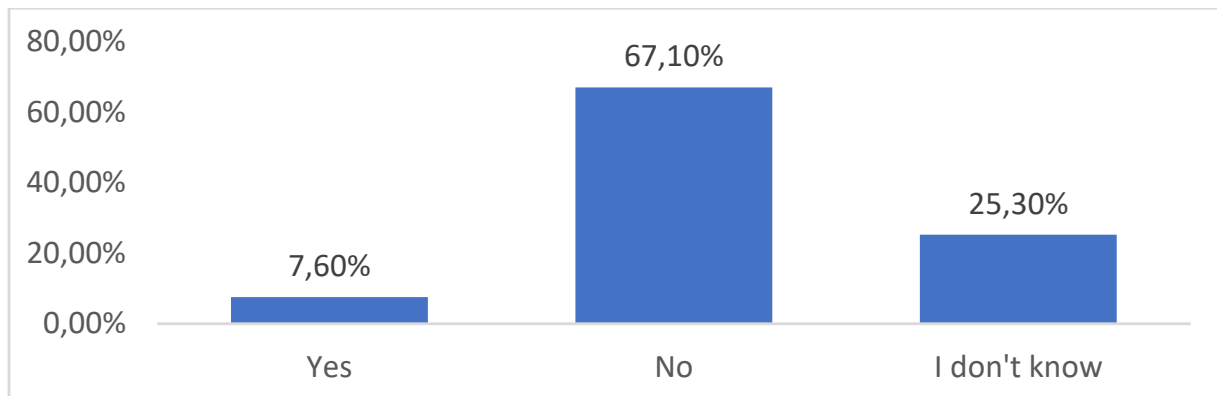
A significant difference ( $p < 0.001$ ) was found and a slight correlation between condom use and the women's groups studied ( $r = 0.136$ ;  $p = 0.002$ ) (Fig. 22).



**Fig. 22. Use of a condom as a means of preventing infection with sexually transmitted diseases according to the study group**

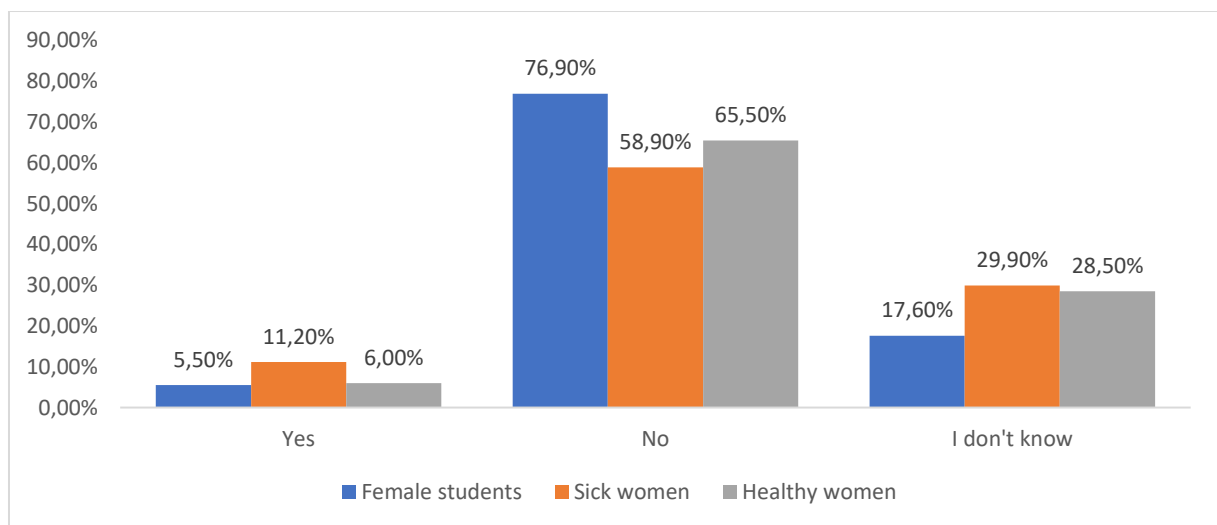
Most often used a condom students, and a negative response was given by 39.30% of healthy women. In the group of irregular use of condoms, the highest proportion fell to sick women in the sample (47.60%). On the other hand, it is disturbing that women who indicate that they sometimes use a condom have the highest number of sexual partners.

Regarding family encumbrity, only 7.6% of respondents said they had a family burden for CC (Fig. 23).



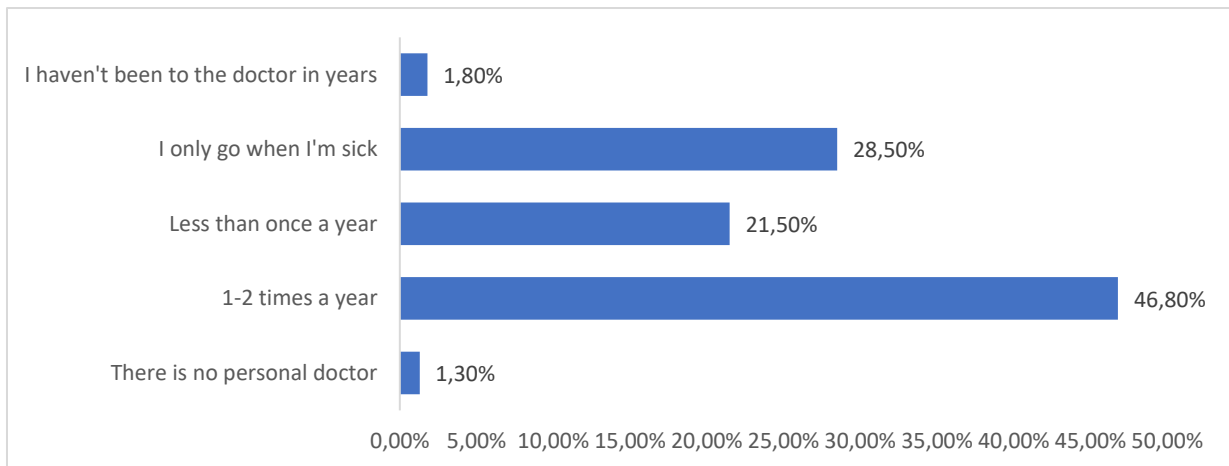
**Fig. 23. Family encumbrity for CC**

A significant difference was found with regard to familial encumbrity from CC between the study groups ( $p=0.002$ ), with the highest percentage in the group of sick women (Fig. 24). This result once again proves the importance of timely information on CC-related risk factors.

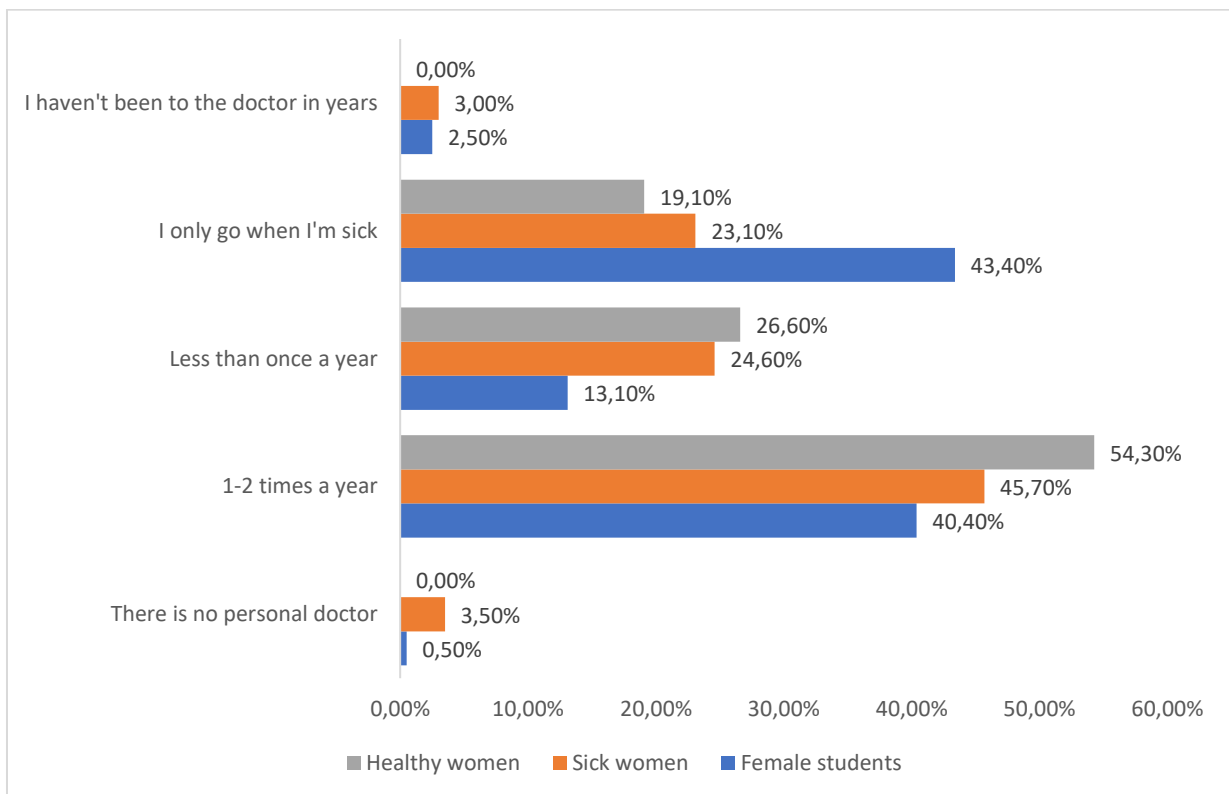


**Fig. 24. Family encumbrity for CC according to the study group**

The current survey shows that only 46.8% of respondents indicated that they had visited their GP about 1-2 times a year (Fig. 25). The result correlates with the overall picture of the country in teCC of disparaging attitudes towards the prevention of reproductive health. Unfortunately, this trend has not changed significantly in recent years, despite the state's efforts to prevent diseases in the form of various screening programs.



**Fig. 25. Frequency of visit to the GP**

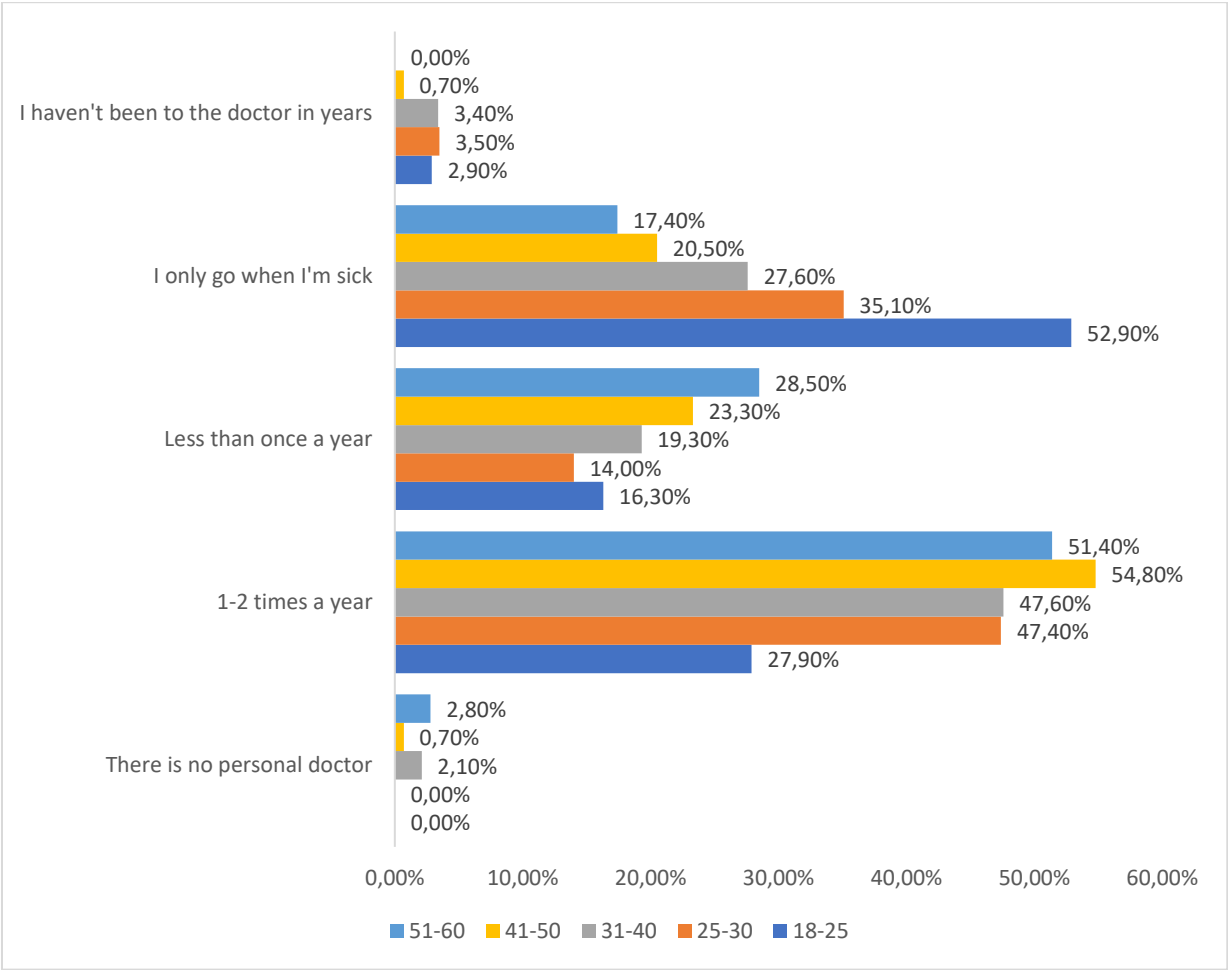


**Fig. 26. Frequency of visit to the GP according to the study group**

A significant difference was identified in teCC of the behaviour of the groups surveyed regarding the conduct of preventive examinations at the GP ( $p < 0,001$ ), with students visiting their GP only when they are ill, while the groups of sick and healthy women do so between 1 and 2 times a year (Fig. 26). This result is related to a lack of information on the possibilities of preventive examinations, as well as a gap between health knowledge and health behavior.

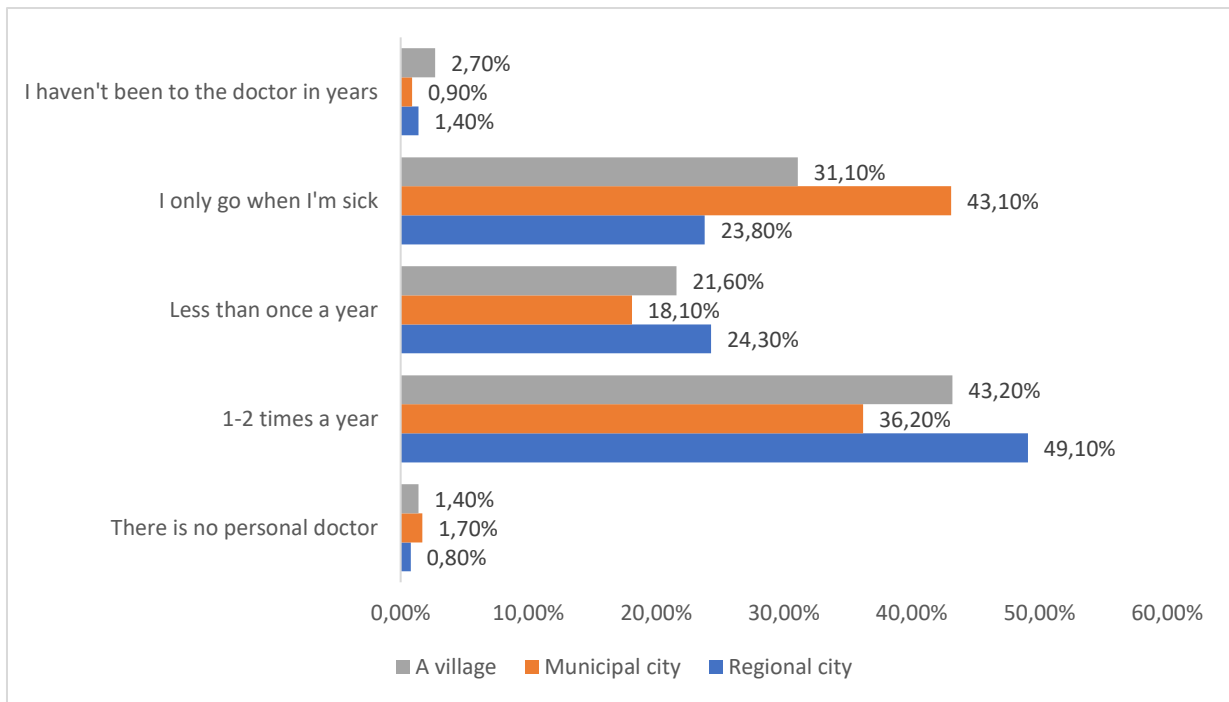
A difference in the behavior of the surveyed groups in teCC of conducting preventive examinations was also found in teCC of the age of the women surveyed ( $p < 0,001$ ), with young women aged 18-25 visiting their personal doctors mainly when sick, while about 50% of the rest visited their

personal doctors at least 1-2 times a year. A reverse proportional weak, inclined to moderate, relationship between the age of the women studied and the frequency of prophylactic examinations ( $r=-0,257$ ;  $p<0,001$ ) (Fig. 27).

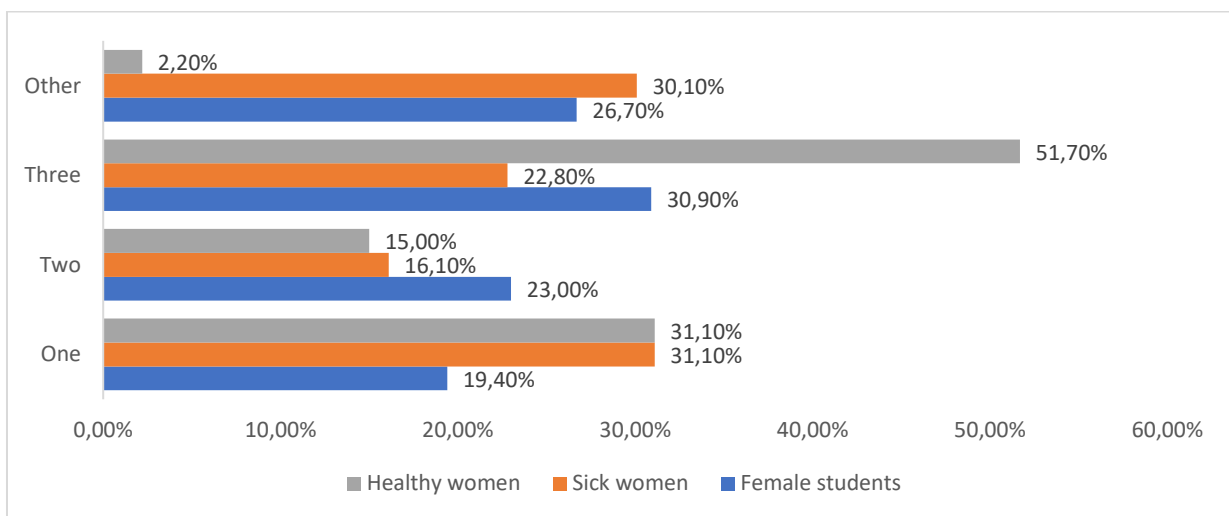


**Fig. 27. Frequency of visit to the GP according to the age group**

A significant difference was also found in teCC of the behaviour of respondents according to residence ( $p=0.018$ ), where women from the district town and villages visit their GP at least 1-2 times a year (49.7% and 43.2% respectively), while women from municipal towns visit a doctor only when they are sick (43.1%) (Fig. 28). The results of this study show that the problem of prevention is not only related to access to healthcare professionals, but there are other factors such as low health culture or lack of awareness among the sample studied.



**Fig. 28. Frequency of visit to the GP according to the place of residence**

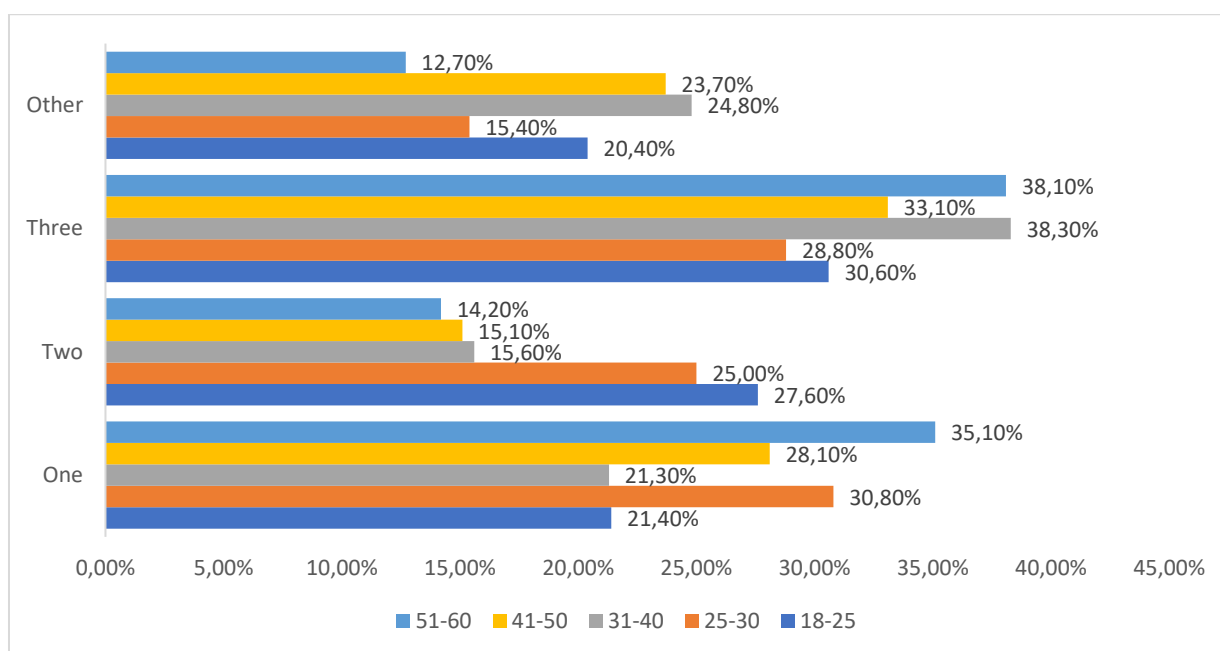


**Fig. 29. Frequency of prophylactic examinations over the last five years according to the groups surveyed**

The highest percentage were women who had three examinations in the last five years (34.8%), with those who had more preventive examinations being 20.0%.

The analysis of the number of preventive examinations conducted according to the three groups studied showed that students and healthy women had at least three examinations over the study period (30.9% and 51.7%, respectively), while sick women had only one preventive examination (31.1%) ( $p < 0.001$ ) (Fig. 29).

A significant difference was also found in teCC of the number of preventive examinations carried out according to the age group ( $p = 0.022$ ), with young women aged (18-25) and those over 31 having conducted mainly three examinations in the last 5 years (Fig. 30).



**Fig. 30. Frequency of prophylactic examinations over the past five years according to age groups**

In teCC of material condition and frequency of preventive examinations carried out, it was found that women with very good material condition conducted at least two prophylactic examinations, while those with good and bad visited their personal doctors three times. The majority of women with very poor material condition visited their GP only once for the study period ( $p=0.025$ ).

The results of the analysis regarding the conduct of prophylactic examinations by the women surveyed show that there are significant gaps in their knowledge and awareness of the prevention of diseases that affect their behaviour.

On tab. 3 a comparative analysis of the risk factors between the two groups of students was presented. No significant difference was found with regard to the behaviour of the two groups, which gives us reason to assume that the type of education does not have as strong an impact as the young age.

**Tabl. 3. Comparative analysis of risk factors in the student groups studied**

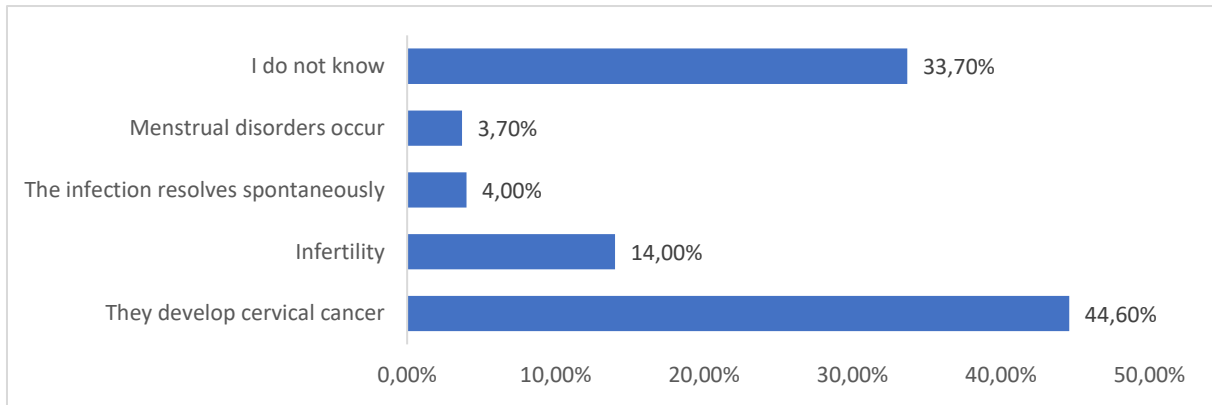
Indicator		Students from other specialties	Health care students	P value
Smoking	I don't smoke	59/42.8%	22/36.7%	0.707
	I smoke regularly	74/53.6%	36/60.0%	
	I'm an ex-smoker	5/3.6%	2/3.3%	
Beginning of sex life	12-15 g.	2/1.5%	1/1.6%	0.351
	15-18 g.	47/35.1%	30/49.2%	
	18-21 g.	56/41.8%	22/36.1%	
	After 21 years.	11/8.2%	2/3.3%	
	I still don't lead sex life	18/13.4%	6/9.8%	

Frequency of change of sexual partner	More often than once a year	3/2.7%	-	0.137
	About one year old	3/2.7%	3/5.4%	
	Two years old	4/3.5%	6/10.7%	
	Three years and less often	24/21.2%	19/33.9%	
	I've never changed it.	79/69.9%	28/50.0%	
Using a condom	Yes I do	56/44.1%	31/53.4%	0.338
	Not	49/38.6%	16/27.6%	
	Occasionally	22/17.3%	11/19.0%	
Family encumbrivity forCC	Yes I do	7/5.1%	4/6.6%	0.780
	Not	108/78.3%	45/73.8%	
	I don't know	23/16.7%	12/19.7%	
Frequency of visit to the GP	I don't have a GP	1/0.7%	-	0.845
	1-2 times a year	58/42.3%	22/36.1%	
	Less often than once a year	18/13.1%	8/13.1%	
	I only walk when I'm sick	57/41.6%	29/47.5%	
	I didn't see a doctor.	3/2.2%	2/3.3%	

### 3.4. Analysis of factors influencing the motivation of the women studied to use the available HPV vaccines

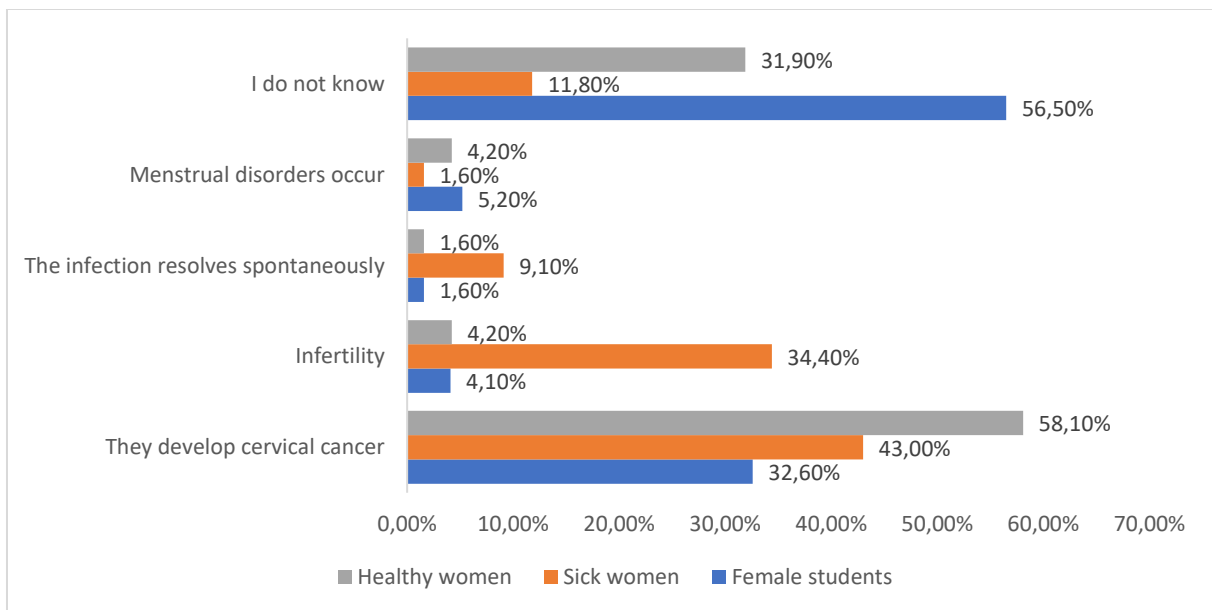
According to the National Cervical Cancer Prevention Program, the lowest vaccination age group is 10-11 years of age. The vaccine is free, but by March 2021 only 15-20% of the target group in Bulgaria has been vaccinated. According to world health organization goals, 90% of girls up to the age of 15 must have completed immunization with an HPV vaccine; 70% of women up to 35-40 years of age are covered by screening (tests and cytology); 90% of women receive timely treatment of pre-cancerous lesions.

The attitude towards vaccination is directly related to knowledge of the main causative agent of RCC. In the current study, 44.6% of respondents indicated that women infected with the human papilloma virus develop cervical cancer (Fig. 31). On the other hand, over 1/3 (33.7%) do not know what the result of HPV infection is, and the rest point to wrong answers. This indicates a serious lack of knowledge about the consequences of HPV infection. HPV is transmitted mainly through sexual intercourse, through direct contact with infected skin or mucous membrane. Despite the importance of this problem, this infection is little discussed among women.



**Fig. 31. Result of infection with human papilloma virus**

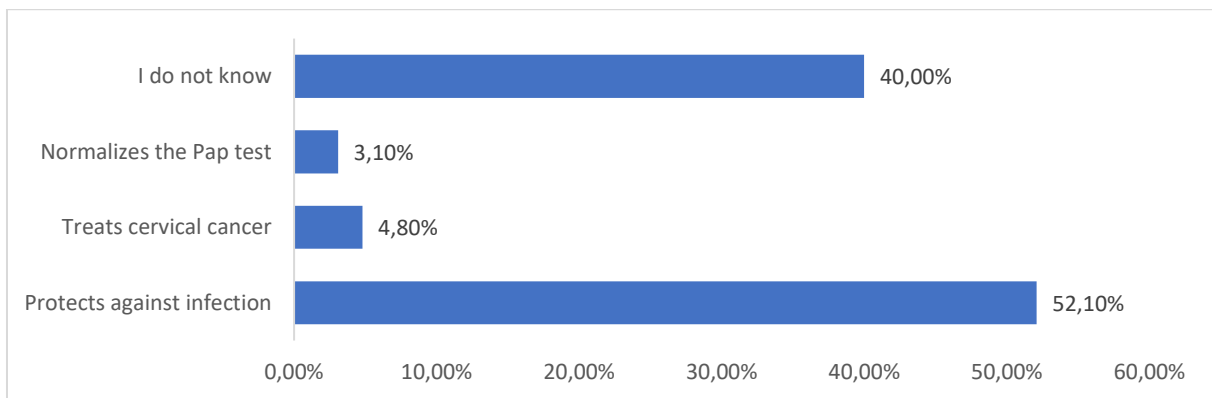
A significant difference of opinion was found in the survey groups ( $p < 0.001$ ), with over half of the students not aware of exactly what changes occurred when contracting the human papillomavirus (56.5%), while according to the majority of women in the other two groups studied, CC (43.0% for sick women and 58.1% for healthy women, respectively) was developing Fig. 43.0% for sick women and 58.1% for healthy women. ( Fig.32). It is disturbing that in the group of sick women there are still those who are not familiar with the consequences of infection with the human blood virus. This shows a significant gap in primary health care about women's awareness of the risks that HPV infection brings to their health.



**Fig. 32. Result of human papilloma virus infection according to the groups studied**

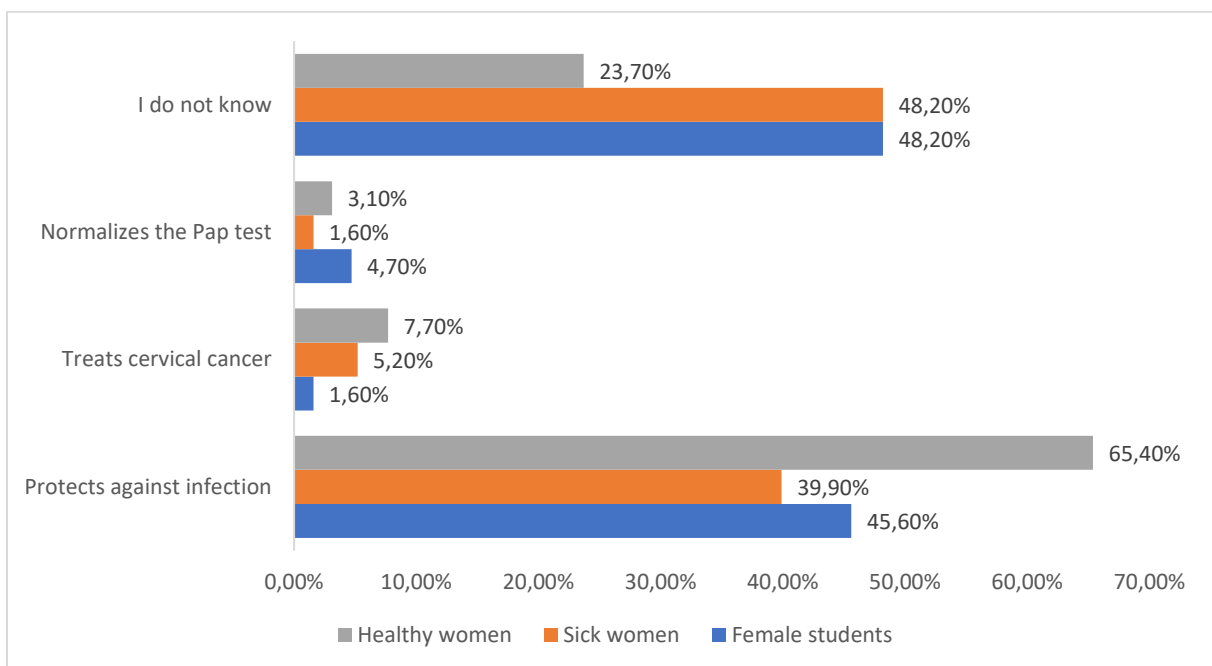
According to half of the women studied, the HPV vaccine protects against infection. On the other hand, it is disturbing that 40.0% of women do not know what the action of the HPV vaccine is (Fig. 33). This result confiCC that there is a significant gap in informing the public about the need for the HPV vaccine.





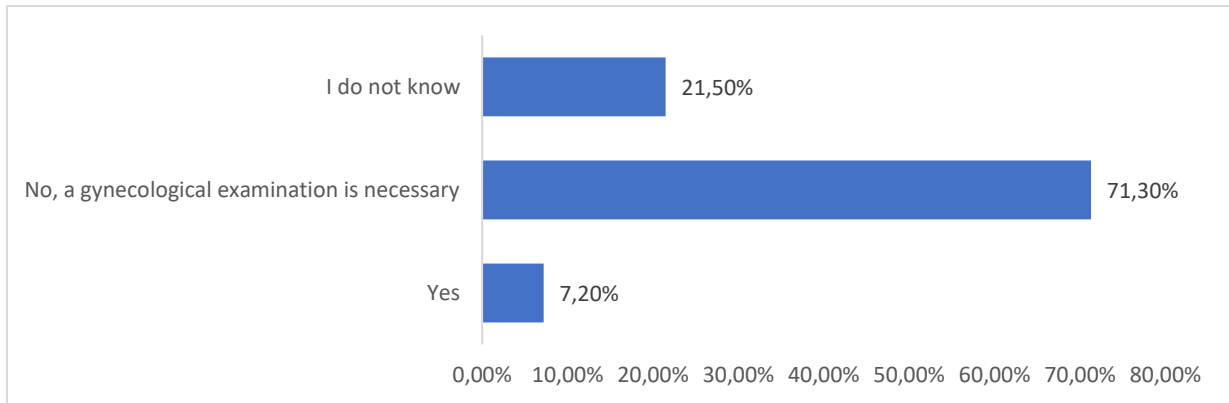
**Fig. 33. Action of the vaccine against human papillomavirus**

There was a significant difference in women's opinion in the three groups studied on the effects of the HPV vaccine ( $p < 0.001$ ). The relative proportion of women who do not know what the action of the vaccine is remains high in the group of students and sick women (Fig. 34).



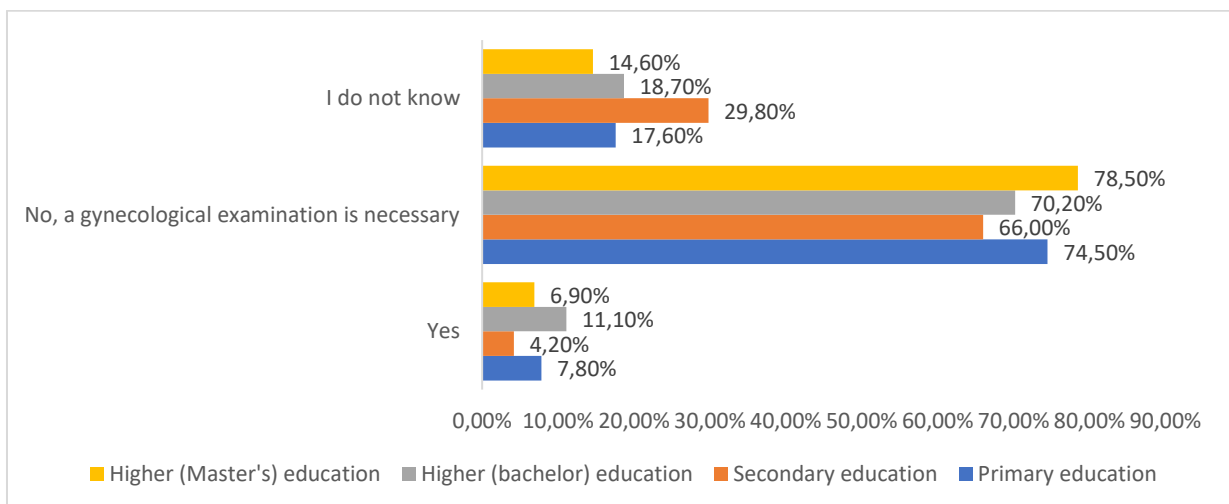
**Fig. 34. Action of the vaccine against human papillomavirus according to the groups studied**

A significant difference in respondents' opinion on the action of the HPV vaccine was also seen according to the age group ( $p = 0.005$ ), and no trend was found. The knowledge that the vaccine protects against infection is supported most by women aged (41-50), while those aged 18-25 are the most uninformed. The majority of the women surveyed are of the opinion that the placement of the HPV vaccine does not replace gynecological examination with a pap smear (71.3%) (Fig. 35).



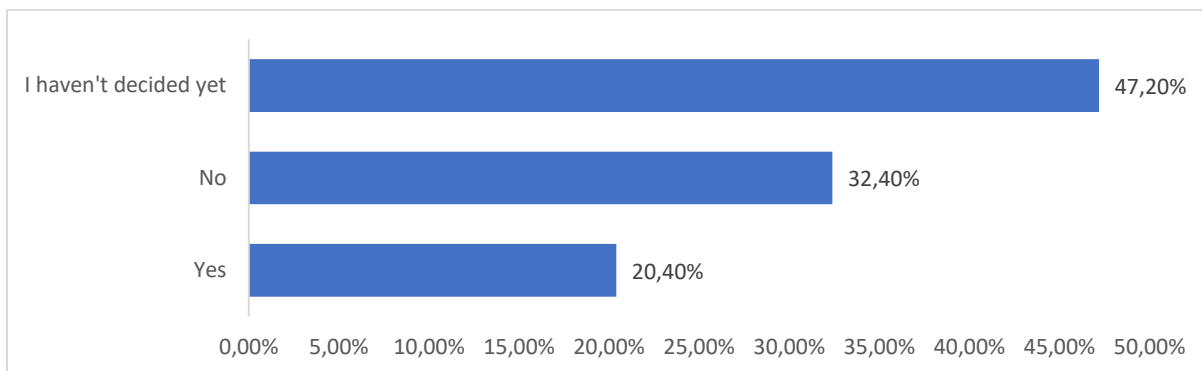
**Fig. 35. Does it replace gynecological examination with a pap smear vaccine against CC**

A significant difference of opinion was found between the three groups of women surveyed ( $p < 0.001$ ), with 72.8% of sick women not replacing gynecological examination, but rather complementary. This opinion was that 75.3% of healthy women and 65.8% of students, and in these groups the relative share of respondents who said the two procedures were mutually expendable was significantly lower than for sick women. There was a difference in women's opinion on the relationship between cervical cancer vaccination and gynecological examination with pap smear ( $p < 0.001$ ), as well as low dependence ( $r = -0.219$ ;  $p < 0.001$ ). The difference was also found in the opinion of the respondents according to the educational degree ( $p = 0.004$ ), with women with higher education the proportion of those who felt that the two activities complemented each other was highest (Fig. 36).



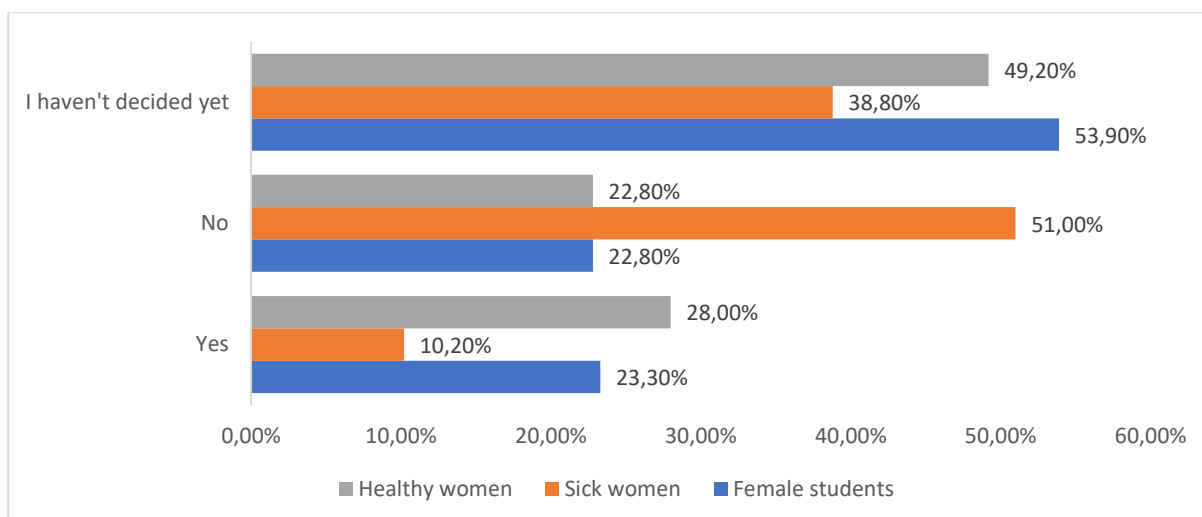
**Fig. 36. Does the gynecological examination replace the CC vaccine with a pap smear (according to the educational degree)**

The answer to the question related to the vaccination decision is extremely indicative. Just under half of those surveyed said they had not yet decided whether they wanted to get vaccinated against cervical cancer (47.2%), and one in three women would not get vaccinated (Fig. 37).



**Fig. 37. Decision on vaccination against CC**

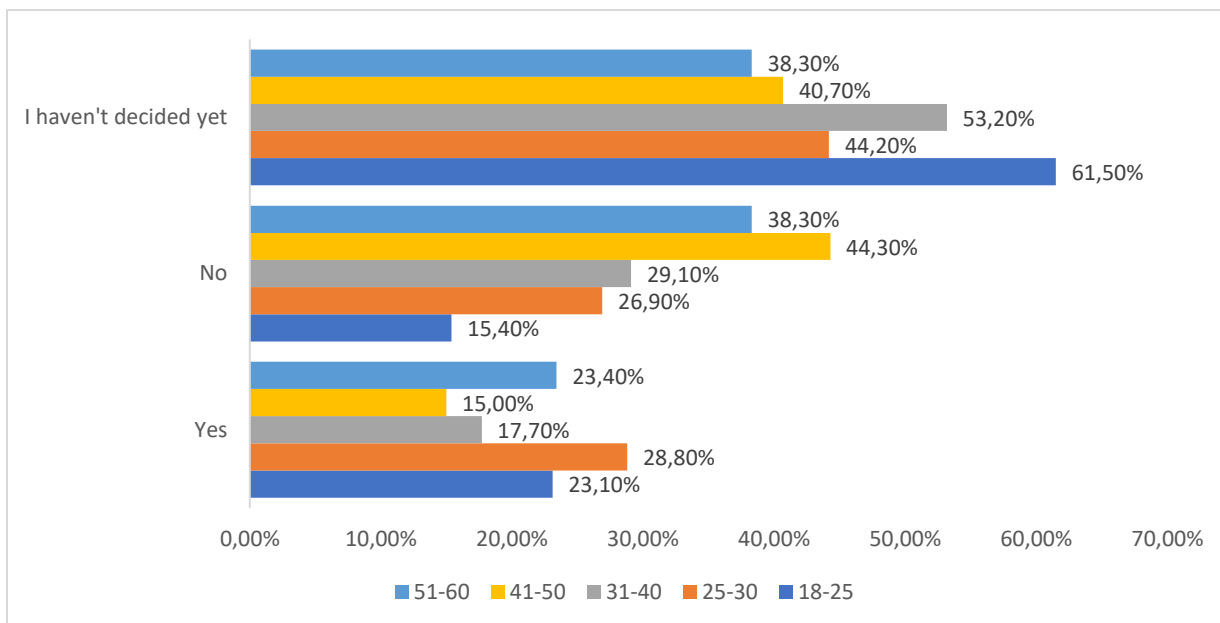
This percentage differed significantly in the three groups studied ( $p < 0.001$ ). Over half of the students have not yet decided, and the largest share of sick women have responded negatively (Fig. 38).



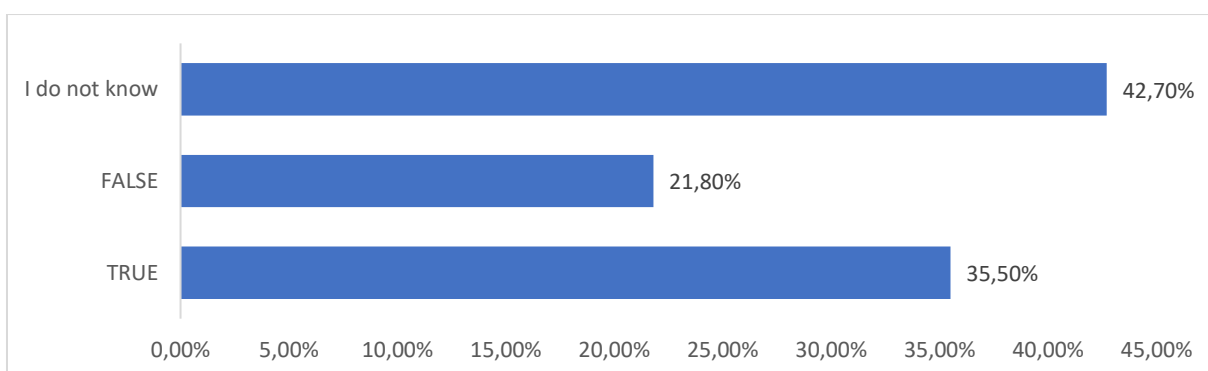
**Fig. 38. Decision on vaccination against CCH (according to the groups studied)**

An interesting fact is that as the age increases, the relative share of women who have not decided whether they want to get vaccinated decreases, but the one to which women are adamant that they do not wish to undergo this procedure ( $p < 0,001$ ) (Fig. 39) is increasing.

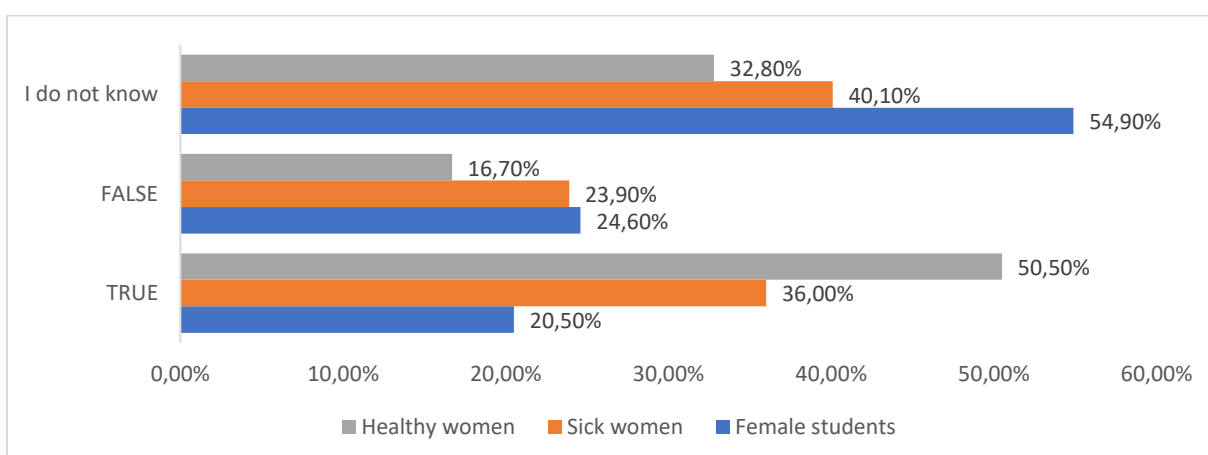
A variation in the opinion of the women surveyed was also observed in the educational degree, noting that the increase in educational attainment decreased the relative share of those who wanted to get vaccinated ( $p = 0.033$ ). The majority of respondents do not know whether vaccination against cervical cancer is done only to girls before the beginning of sex life (42.7%) (Fig. 40). This is a serious lack of knowledge that reflects on the decision to decide on vaccination.



**Fig. 39. Decision on vaccination against CCH (according to age groups)**



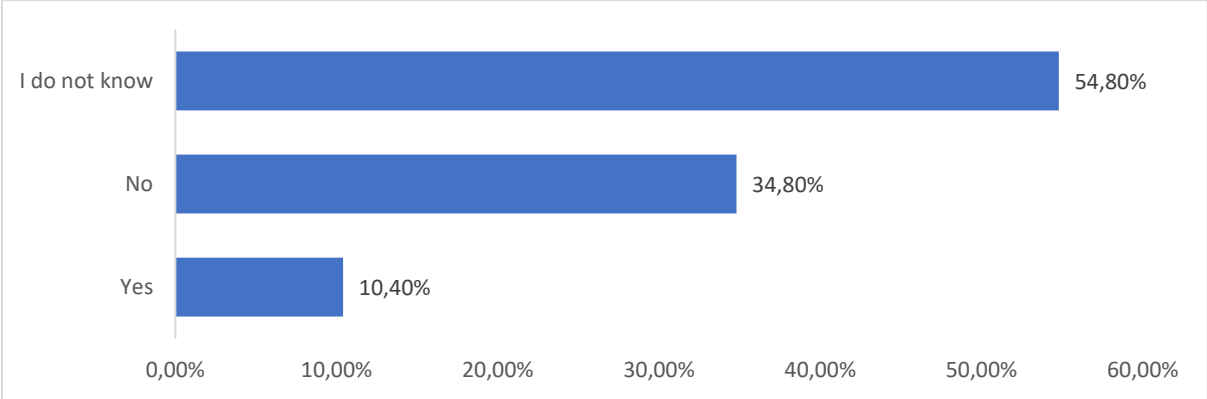
**Fig. 40. Vaccination against cervical cancer can only be done in girls before the onset of sex life**



**Fig. 41. Vaccination against cervical cancer can only be done in girls before the onset of sex life (according to the groups studied)**

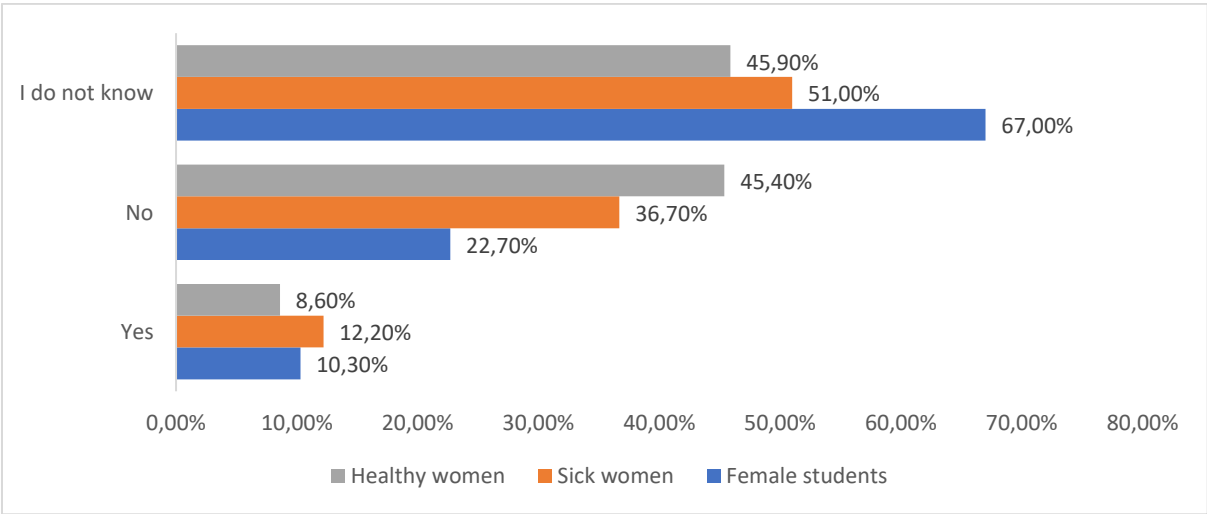
There was a significant difference in women's opinion on vaccination against CC in the three groups studied ( $p < 0.001$ ). A weak counter-proportional dependency ( $r = -0,240$ ;  $p < 0,001$ ) (Fig. 41) has also been established. The least well-informed were students (54.90%), followed by sick women 40.10%.

More than half of the women surveyed indicated that they were unaware of the risk of contracting human papillomavirus when vaccinated (54.8%) (Fig. 42).



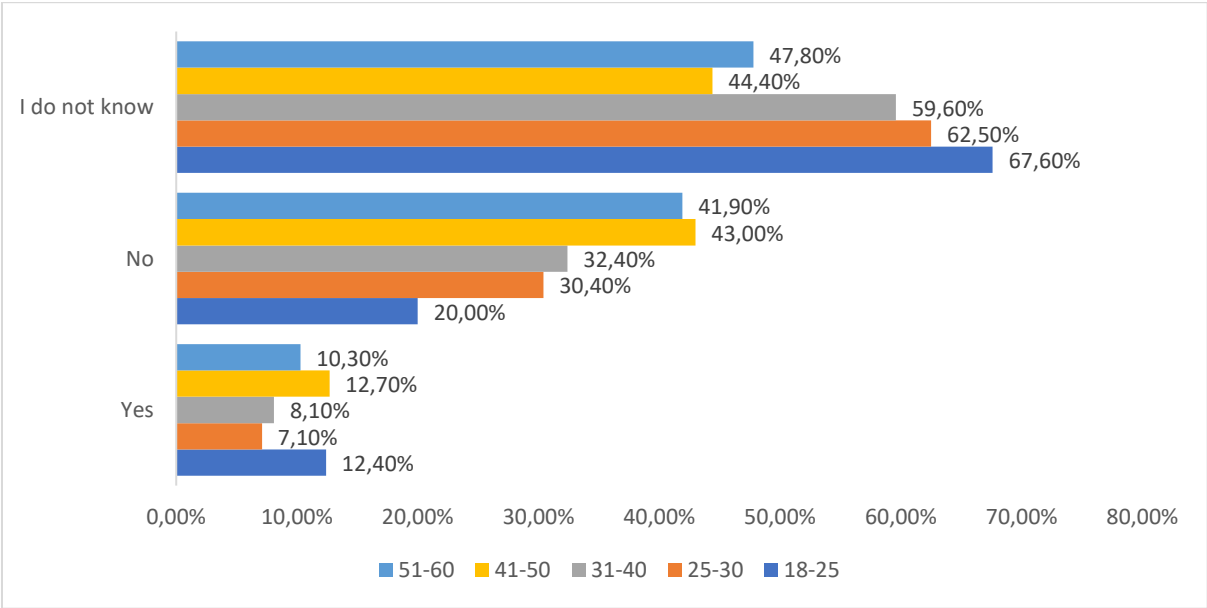
**Fig. 42. Danger of contracting human papillomavirus when vaccinating against cervical cancer**

The difference was found in the opinion of women in the three groups studied ( $p < 0.001$ ), with 22.7% of students saying vaccination did not pose a risk of contracting the human papillomavirus, with this rate significantly increasing in healthy women (45.4%) (Fig. 43). Unfortunately, in the group of students is the largest share of the answer "do not know" (67%). In the context of the covid-19 pandemic, attention deserves the view that 10.40% of women respond that vaccines pose a danger of infection with HPV, with the highest proportion among sick women (12.20%) and 12.70% in the 41-50 age group.



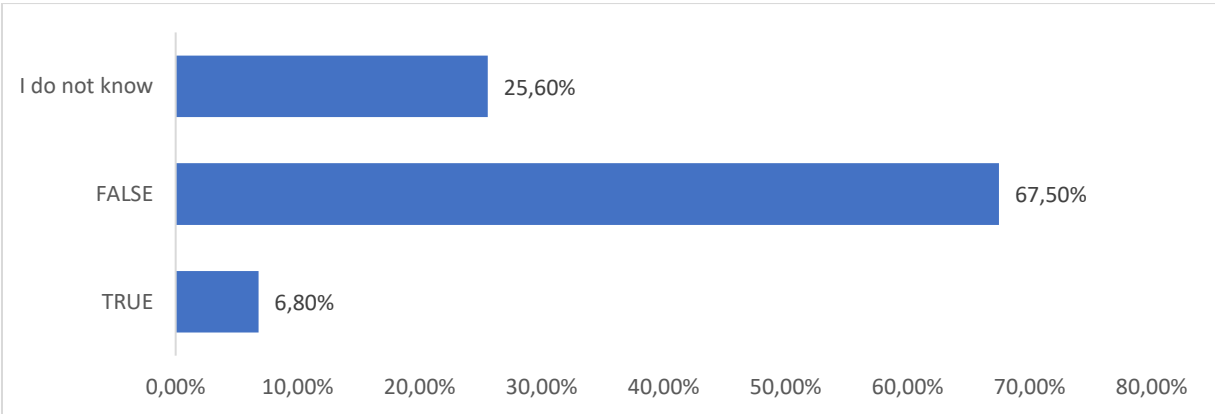
**Fig. 43. Danger of contracting human papillomavirus when vaccinated against cervical cancer (according to the groups studied)**

As we get older, the relative proportion of women who are unaware of the risk of contracting human papilloma virus when vaccinated decreases, increasing the relative share of those who are adamant that the vaccination procedure does not carry the risk of such infection ( $p=0,004$ ) (Fig. 44).



**Fig. 44. Danger of infection with human papillomavirus when vaccinated against CC (according to age groups)**

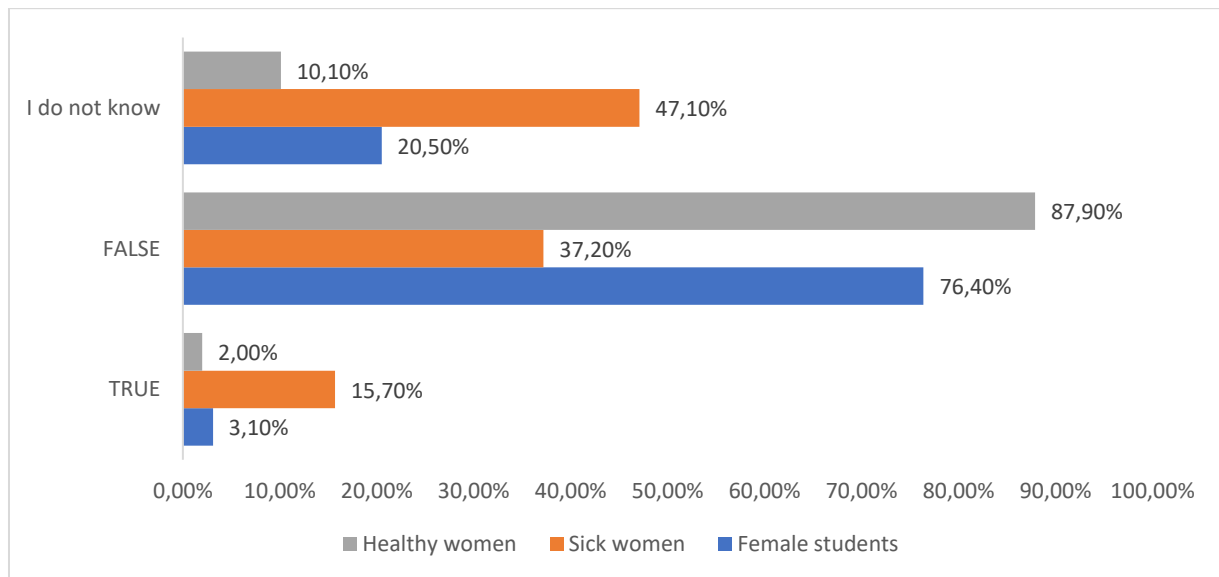
About 2/3 (67.5%) of the women surveyed indicated that the cervical cancer vaccine did not eliminate the need for a gynecological examination (Fig. 45). Unfortunately, a quarter of respondents cannot answer this question as they are not sure of their knowledge.



**Fig. 45. When a vaccine against CC is given, the woman does not need to go to a gynecological examination**

On the other hand, there was a difference of opinion between the three groups of women on prophylactic gynecological examination and vaccination against RRM ( $p<0.001$ ), with 47.1% of sick women not informed whether the two procedures were interchangeable and 37.2% only pointing out

that the statement "vaccination cancels the conduct of a review with an AG specialist" is not true (Fig. 3). 46).



**Fig. 46. When a vaccine against CC is given, the woman does not need to go to a gynecological examination (according to the groups studied)**

The results of this study show that women have a lack of knowledge about the HPV vaccine. Despite the efforts of health institutions and campaigns, a large proportion of women still remain out of reach of planned and targeted impact.

On tab. 4 a comparative analysis of the student awareness of HPV vaccines was found. Infection with the virus leads to the development of CC. The results showed a moderate correlation between student awareness of human papillomavirus infection and the professional direction ( $r=0.304$ ,  $p<0.001$ ).

Another significant difference identified is related to the action of the vaccine against human papillomavirus ( $p=0.001$ ). More than half of students from other specialties (55.2%) were unaware of the vaccine's action, while 52.5% of health care students said the vaccine protects against infection (52.5%).

**Tabl. 4. Comparative analysis of students' views on HPV vaccines**

Ordered		Students from other specialties	Health care students	P value
Result of infection with human papilloma virus	DevelopCC	29/21.4%	28/48.3%	< 0.001
	Infertility	5/3.7%	4/6.9%	
	Infection resolves spontaneously	-	3/5.2%	
	Menstrual disorders occur	12/9.6%	3/5.2%	
	Not knowing	89/65.9%	20/34.5%	
	Protects against infection	57/42.5%	31/52.5%	0.001

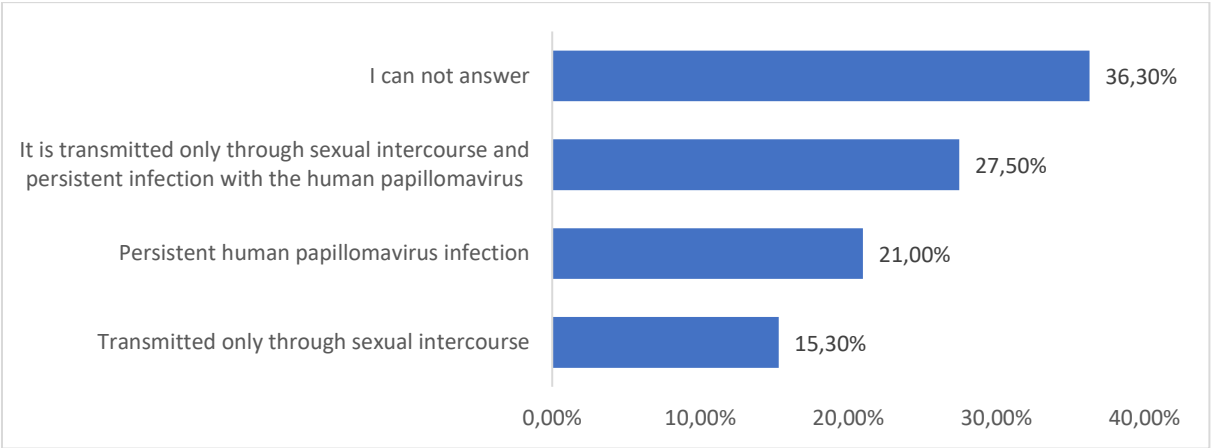
Action of the vaccine against human papillomavirus	HealsCC	1/0.7%	2/3.4%	
	Normalizes the PAP test	2/1.5%	7/11.9%	
	Not knowing	74/55.2%	19/32.2%	
Does it replace gynecological examination with a pap smear vaccine against CC	Yes I do	1/0.7%	2/3.4%	0.012
	No, gynecological examination is necessary	81/60.4%	46/78.0%	
	I dunno	52/38.8%	11/18.6%	
Decision on vaccination against CC	Yes I do	25/18.8%	20/33.3%	0.024
	Not	28/21.1%	16/26.7%	
	I haven't decided yet.	80/60.25	24/40.0%	
Vaccination against cervical cancer can only be done in girls before the onset of sex life	Faithfully	20/14.7%	20/33.9%	0.005
	False	33/24.3%	15/25.4%	
	I dunno	83/61.0%	24/40.7%	
Danger of contracting human papillomavirus when vaccinating against cervical cancer	Yes I do	10/7.4%	10/16.9%	0.014
	Not	26/19.3%	18/30.5%	
	I dunno	99/73.3%	31/52.5%	
When a vaccine against CC is given, the woman does not need to go to a gynecological examination	Faithfully	5/3.7%	1/1.7%	0.040
	False	97/71.3%	52/88.1%	
	I dunno	34/25.0%	6/10.2%	

Although both groups of students dominated the relative proportion of those who indicated that the administration of the CC vaccine could not replace the gynecological examination, a difference was found with regard to the other responses ( $p=0.012$ ). Students from other specialties in 38.8% of cases were not informed about replacing gynecological examination with the vaccine, while for health care students this rate was 18.6%. The vast majority of students from other specialties (60.2%) did not decide whether they would get vaccinated, but categorically denied vaccination 21.1%. On the other hand, 26.7% of health care students were against vaccination and 40.0% had not yet decided to take a specific action ( $p=0.024$ ). Awareness of the appropriate age for vaccination against CC also differs significantly between the two groups of students ( $p=0.005$ ), with 61.0 % of students from other specialties not familiar with this information. Although in both groups of students the relative proportion of those who are not aware of whether vaccination against CC poses a risk of contracting human papilloma virus, it can be argued that health care students are more informed (30.5 %) than the other group of students (19.3 %) ( $p=0.014$ ) that vaccination does not pose a risk of infection. In both groups of students, it is noticed that the significant proportion of them are of the opinion that it is not true that after the vaccine against CC is given, a woman does not need to go to a gynecological examination (71.3% for students from other specialties and 88.1% for health care students respectively). On the other hand, 1/4 (25.0 %) of students from other specialties are not aware of the fact that the vaccine cancels visits to obstetrics and gynecology specialists, while for health care students this share is 10.2 % ( $p=0.040$ ). The findings suggest that health care students are better informed than their counterparts outside this educational direction.



**3.5. Study and analysis of the knowledge and attitude of students and young healthy women (in sexually active age) related toCC**

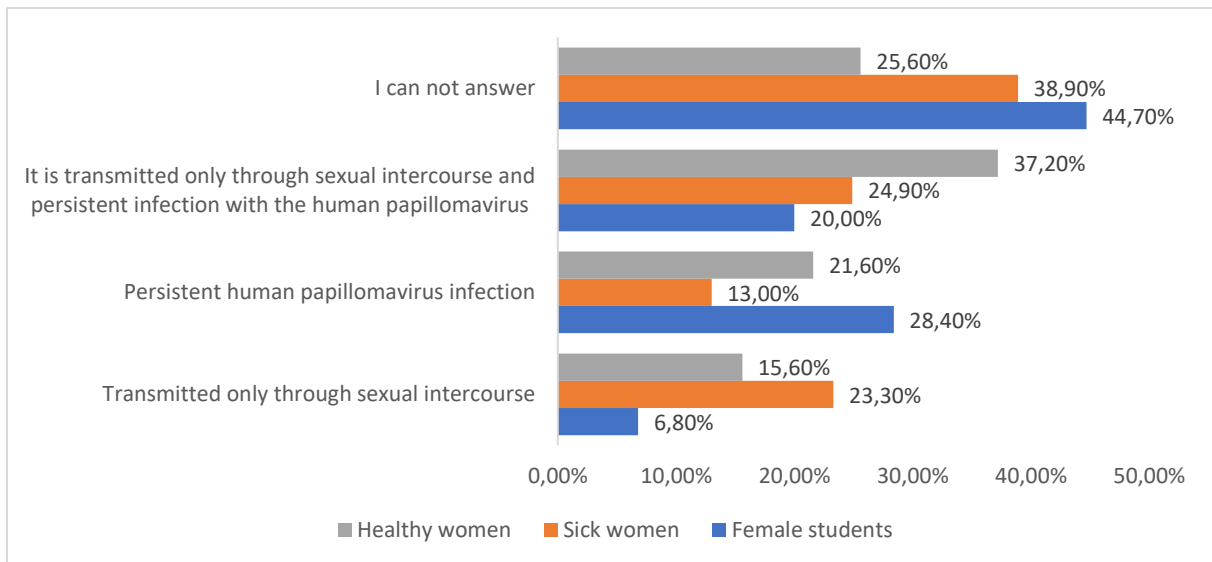
About 1/3 (36.3%) of respondents indicated that they did not know how cervical cancer was transmitted, and 27.5% indicated that CC is transmitted through intercourse and constant infection with human papilloma virus (Fig. 47). This means that one in three women interviewed (out of a total of 600 respondents) is unaware of the distribution pathways of RPM.



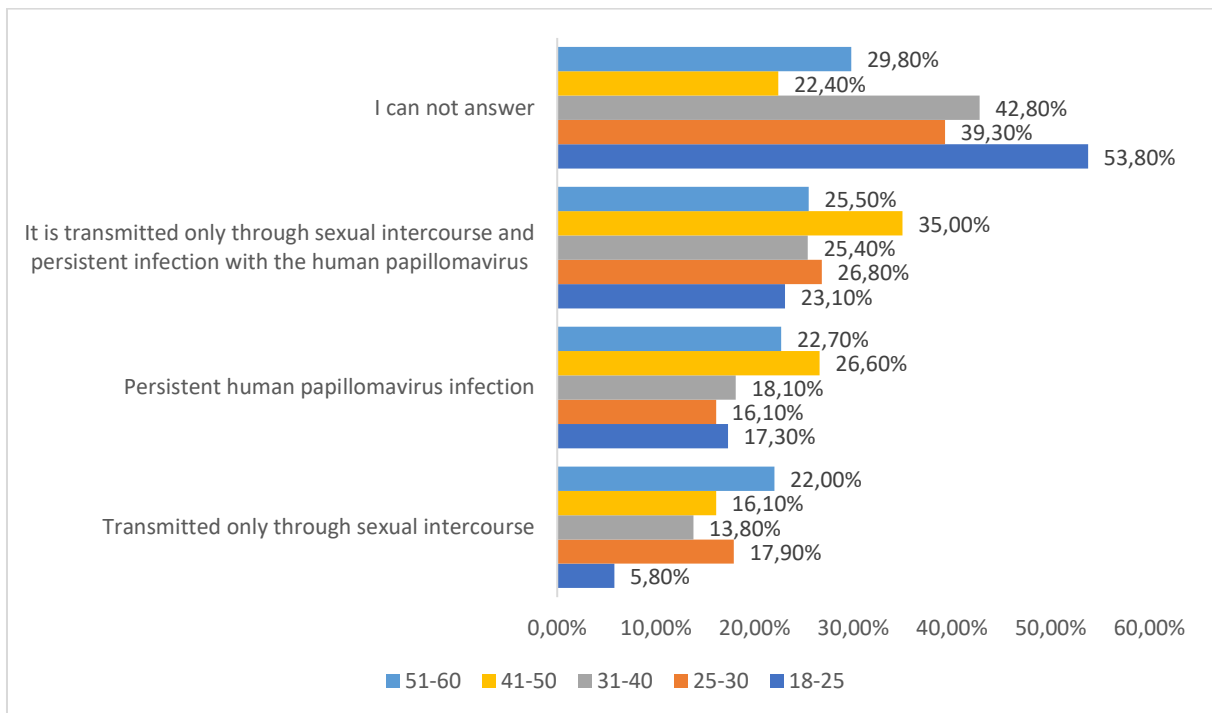
**Fig. 47. Knowledge of how to transmitCC**

The analysis of information about the route of transmission ofCC according to the study group showed that the most uninformed were the students and sick women (44.7% and 38.7% respectively) ( $p < 0.001$ ) (Fig. 48).

From the point of view of the age indicator, it can be said that as we age, the relative proportion of women who are not informed about the way CC is being broadcast decreases ( $p < 0,001$ ) (Fig. 49). This suggests that the age group most in need of scientific information on the prevalence of RPM are young, sexually active women.

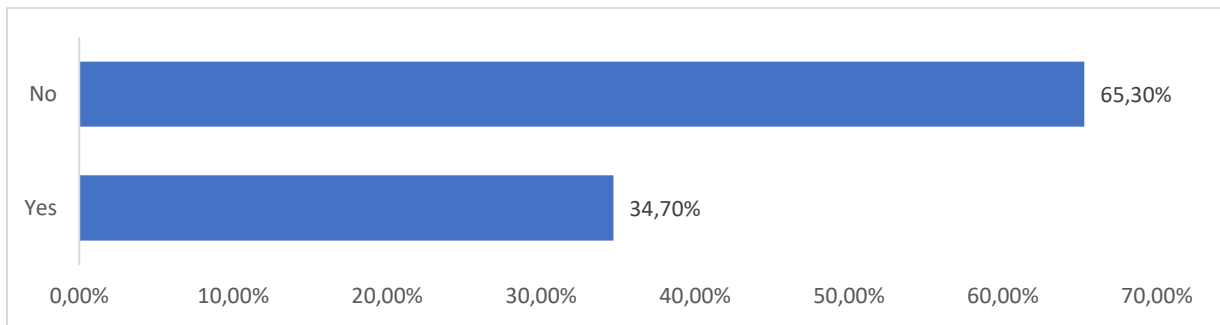


**Fig. 48. Method of transmission ofCC according to the study group**



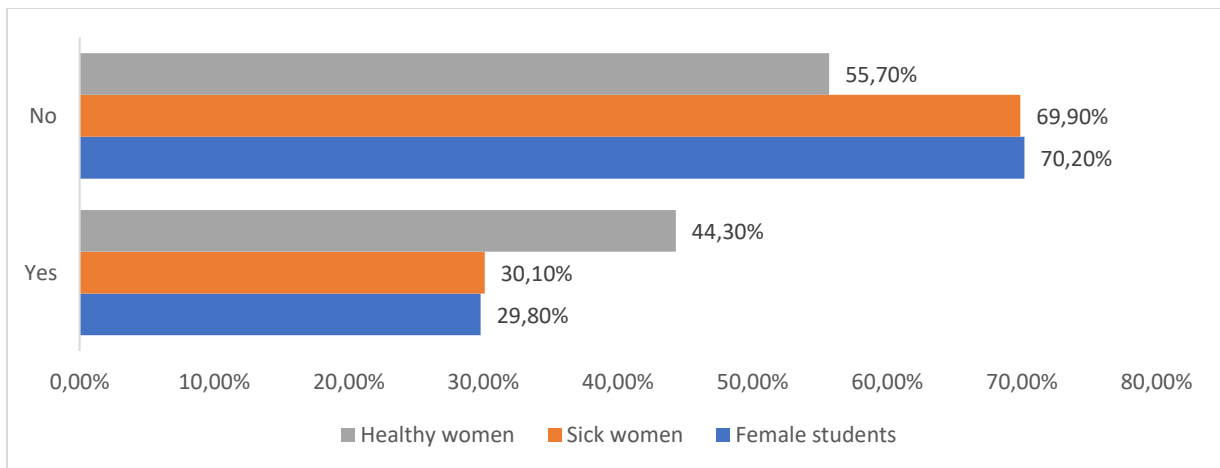
**Fig. 49. Method of transmission ofCC according to the age group**

Worryingly, 65.3% of women are not informed about the risk factors for the disease (Fig. 50). This is a worrying finding given the extensive information campaigns and medical advice women receive. Perhaps personal disinterest and the belief "it won't happen to me" are a major source of ignorance. On the other hand, the information provided must be targeted and personal.



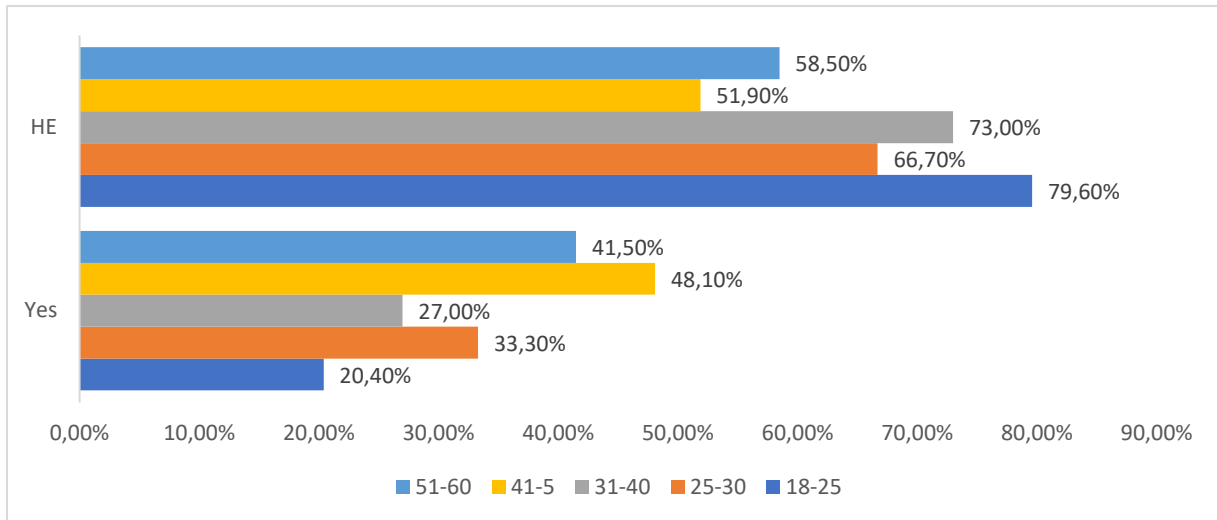
**Fig. 50. Awareness of disease risk factors**

The highest relative share of uninformed women for CC risk factors was found in the group of students (70.2%), especially among those whose education was not in the field of health care. Sick women were the second group with the highest relative share of the uninformed ( $p=0.004$ ) (Fig. 51). This, unfortunately, may turn out to be a foreman for the way the disease progresses and its outcome.



**Fig. 51. Awareness of disease risk factors (according to the groups studied)**

Worryingly, in all three groups of respondents, those unfamiliar with risk factors were over half, reaching two-thirds among students and sick women. And if for sick women it can be assumed that it is the ignorance of risk factors that contributed to the late detection of infection and the development of the disease, then for young people this result is extremely alarming. Our study found that as we get older, the relative share of women who are already familiar with risk factors ( $p<0.001$ ) (Fig. 52).



**Fig. 52. Awareness of disease risk factors according to age groups**

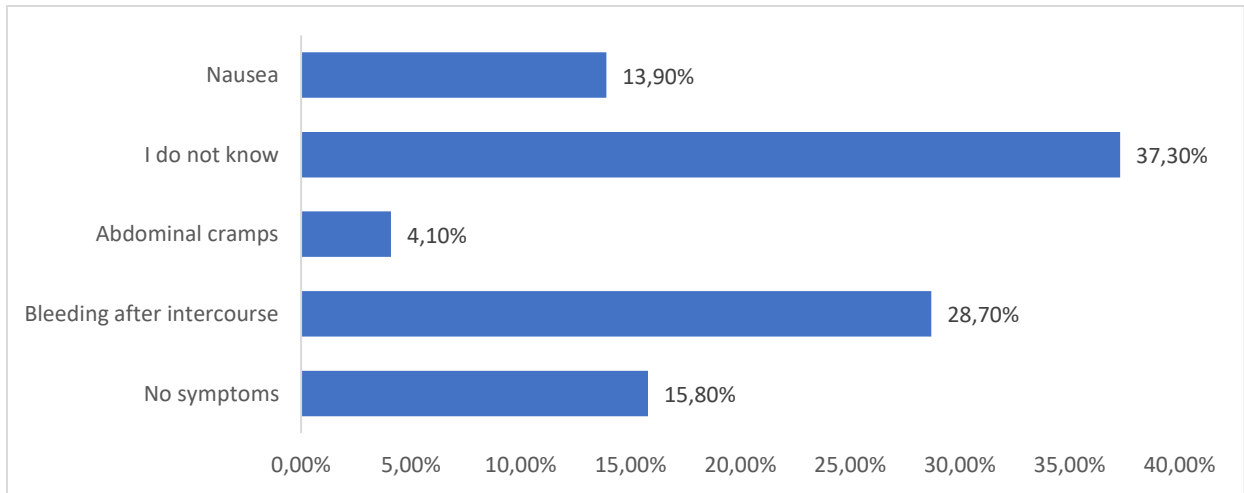
On the other hand, it was found that 49.1% of women who were aware of the risk factors for RPM used a condom during their sexual contact ( $p < 0.001$ ), with a slight positive correlation between condom use and awareness of RPM risk factors ( $r = 0.214$ ;  $p < 0.001$ ) (tabl. 5). This result satisfies the assertion that knowledge and awareness are at the heart of prevention and responsible health behaviour.

**Tabl. 5. Study of condom use based on the awareness of the risk factors of RPM**

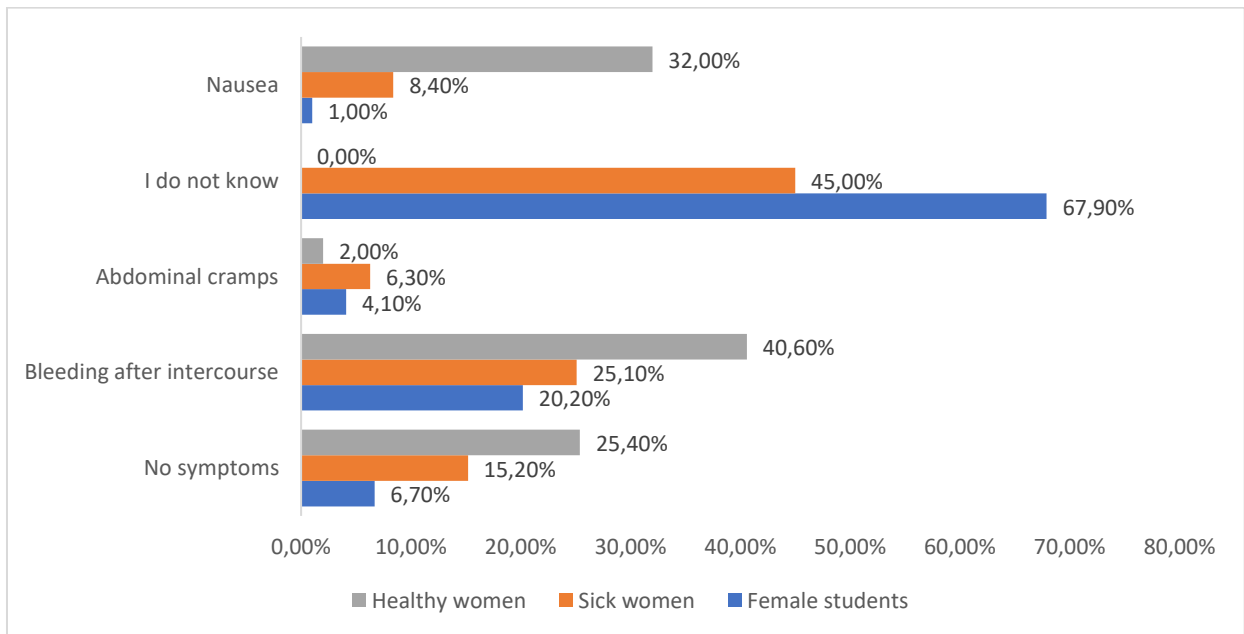
		Do you use a condom as a means of preventing sexually transmitted diseases?			Total
		Yes I do	Not	Occasionally	
Are you aware of the risk factors of the disease?	Yes I do	85 49,1%	53 32,9%	38 24,2%	176 35,8%
	Not	88 50,9%	108 67,1%	119 75,8%	315 64,2%
Total		173 100,0%	161 100,0%	157 100,0%	491 100,0%

Over 1/3 (37.3%) of the women surveyed did not know what the symptoms of CC were, and 28.7% indicated that bleeding after intercourse could be considered a symptom (Fig. 53).

Analysis of the results according to the surveyed groups showed that the highest rate of misinformability about the symptoms of CC were the students (67.9%), followed by sick women (45.0%). On the other hand, according to 40.6% of healthy women, the leading symptom is bleeding after intercourse (40.6 %) ( $p < 0.001$ ) (Fig. 54).

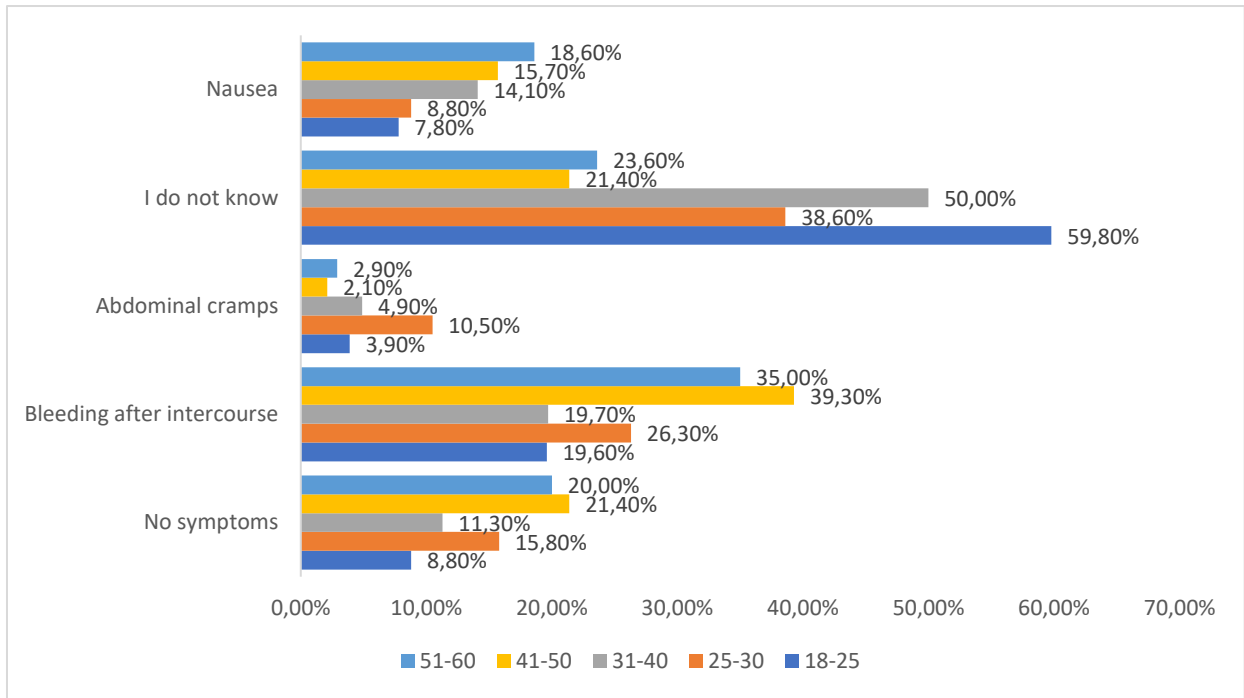


**Fig. 53. Symptoms of CC**

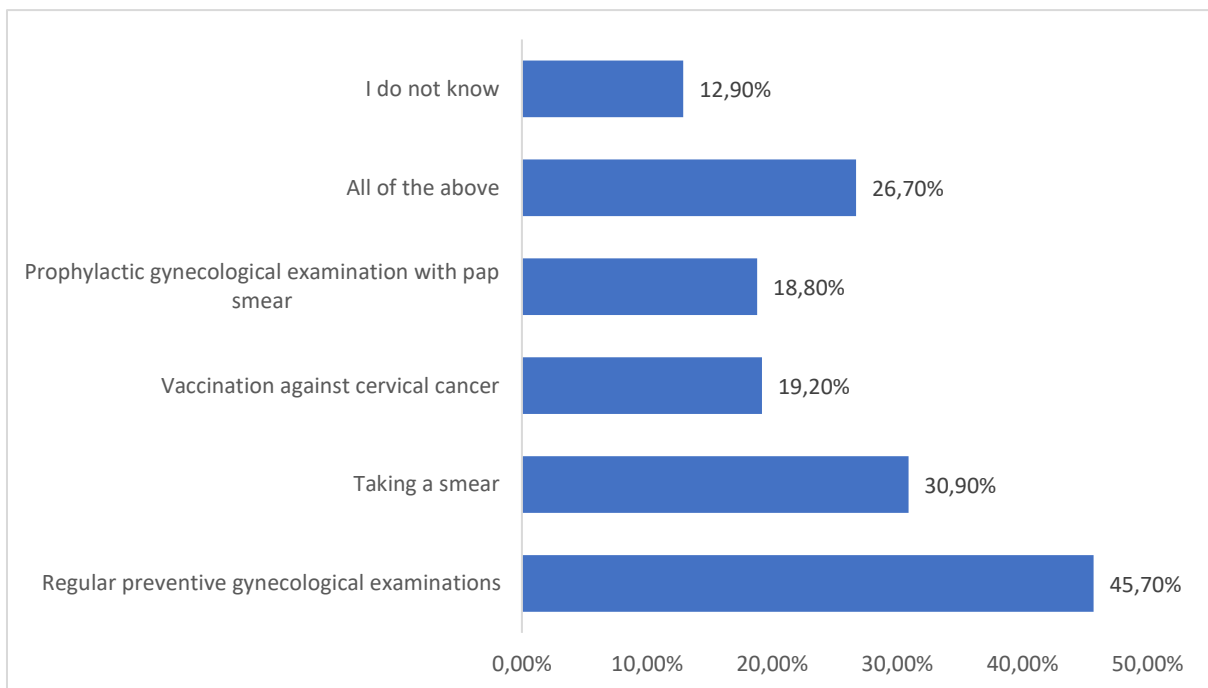


**Fig. 54. Symptoms of CC (according to the study group)**

The found difference in the knowledge of the women surveyed according to the age group did not show a specific trend, with the youngest (18-25 years) the most uninformed. ( $p < 0,001$ ) (Fig. 55).



**Fig. 55. Symptoms of CC (according to age group)**



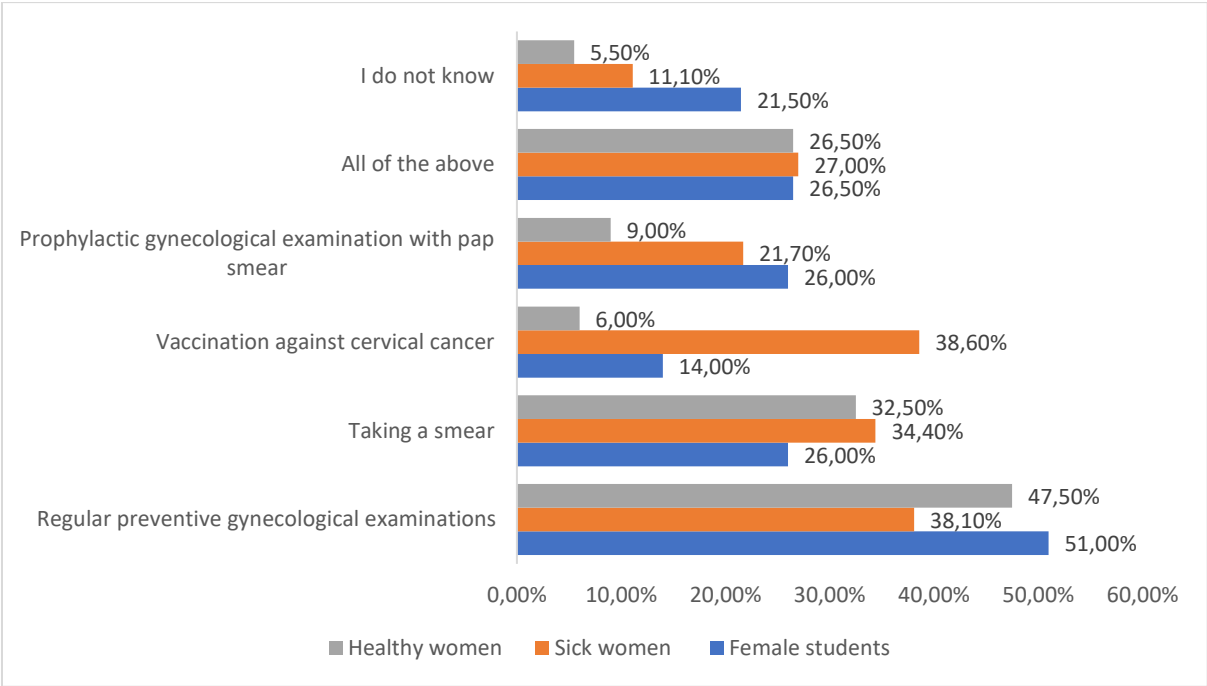
**Fig. 56. Effective measures for the prevention of cervical cancer**

According to 45.7% of respondents, the main effective measure for the prevention of CC is regular prophylactic examinations, followed by taking a pap smear (30.9%) (Fig. 56).

The impression is that vaccination and prophylactic examination with pap smear have the lowest relative share, which corresponds to the previously described results. Given the frequency of gynecological examinations examined above, it can be assumed that there is an over-reliance on the organization of prophylactic programs. In addition, there is a paternalistic attitude towards health –

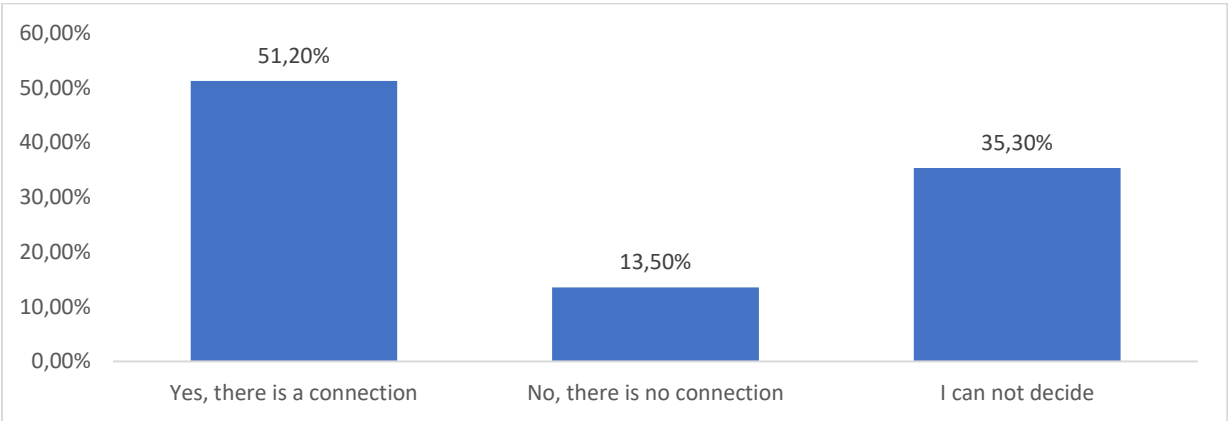
others (the system/doctor) take care of my health. Personal responsibility with active prohealth behavior remains in the background.

From the point of view of the groups studied, a significant difference in women's opinion on effective measures for the prevention of CC ( $p < 0.01$ ) was found. According to students and healthy women, regular prophylactic gynecological examinations (51.0% and 47.5% respectively) were the first%), while in sick women there was vaccination (38.6%), followed by regular prophylactic gynecological examinations (38.1%) (Fig. 57).



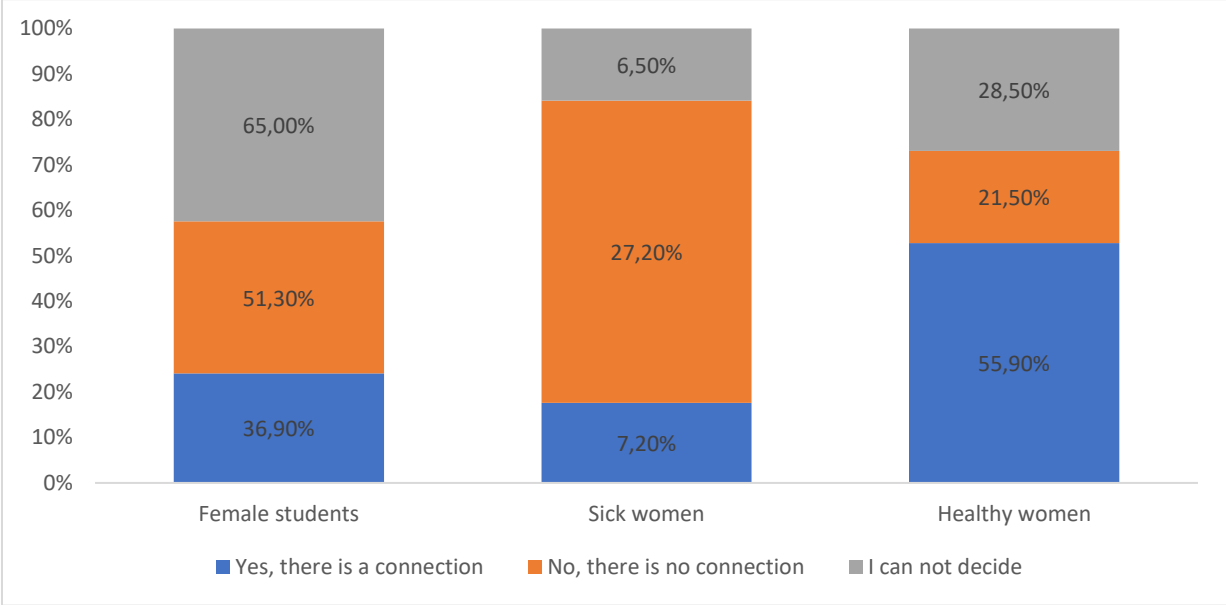
**Fig. 57. Effective measures for the prevention of cervical cancer according to the groups studied**

Just over half of the women surveyed indicated that there was a link between the human papilloma virus and cervical cancer (Fig. 58). However, the proportion of those who did not know remained significantly high (35.3%).



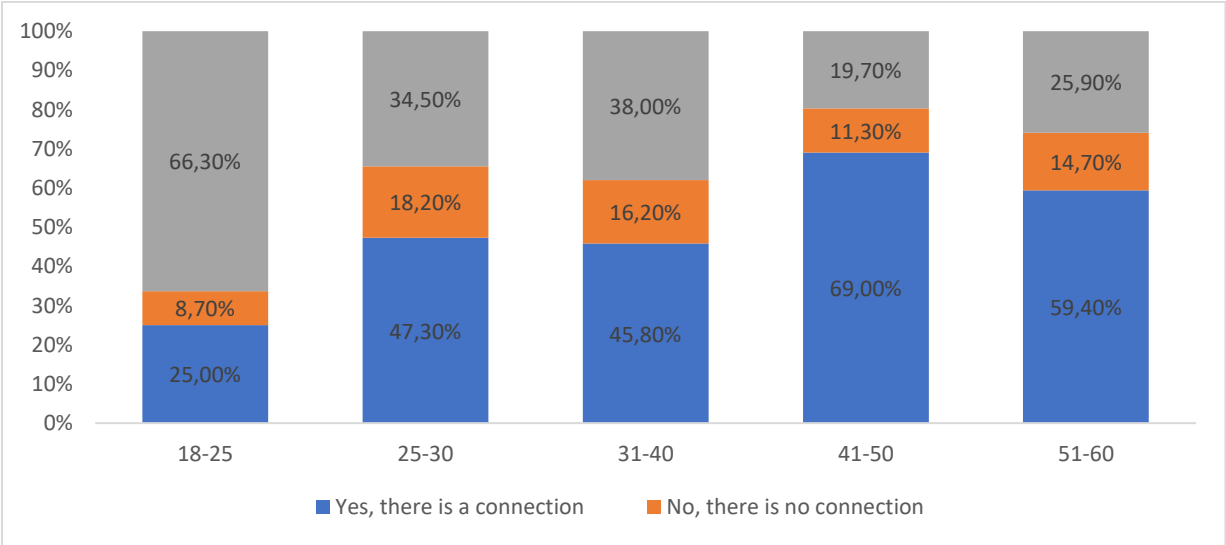
**Fig. 58. Link between human papilloma virus andCC**

One in three women is not familiar with the etiology of CC, and the lack of this information distances her from primary prophylaxis. A significant difference ( $p < 0.001$ ) and low dependence ( $r = -0.247$ ;  $p < 0.001$ ) was found between the opinion of the study groups on the human papillomavirus relationship –CC (Fig. 59).



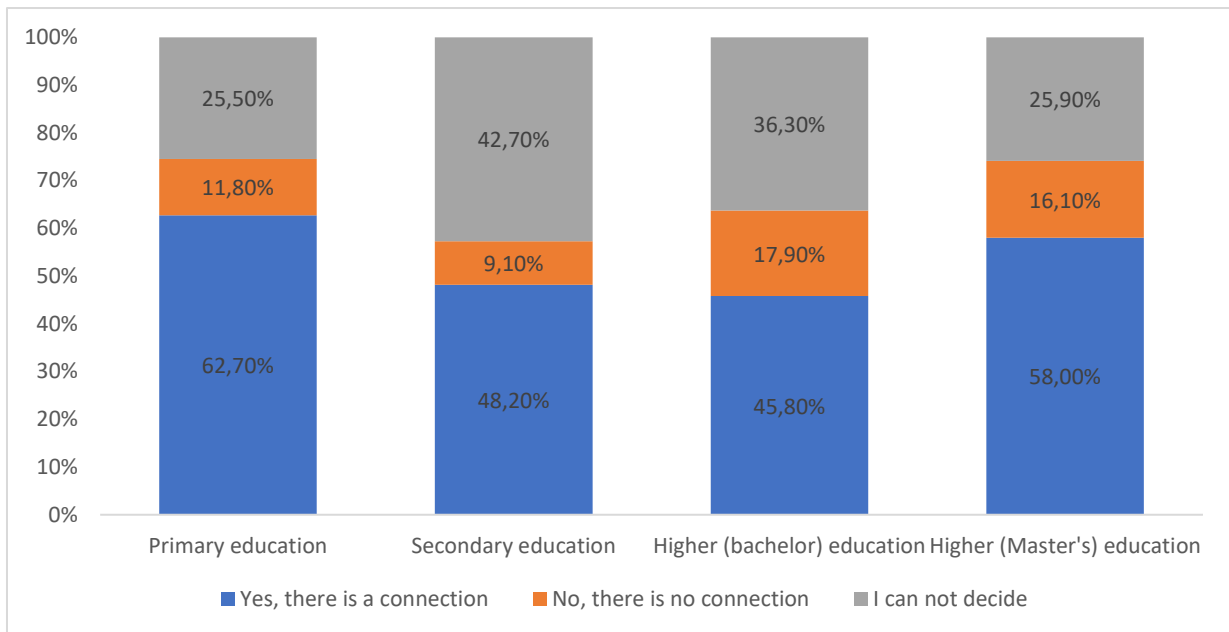
**Fig. 59. Relationship between human papilloma virus and CC (according to the groups studied)**

Healthy women showed the highest levels of awareness, followed by the sick. Unfortunately, the group of students has the highest share of lack of information. Moreover, over half of young women have stated that there is no such relationship. A difference and a weak, inclined to moderate dependence ( $r = -0.292$ ;  $p < 0.001$ ) was also found in women's opinion of the relationship between HPV and CC according to the age group. As we get older, women who give a positive answer increase (Fig. 60).



**Fig. 60. Relationship between human papilloma virus and CC (according to age group)**

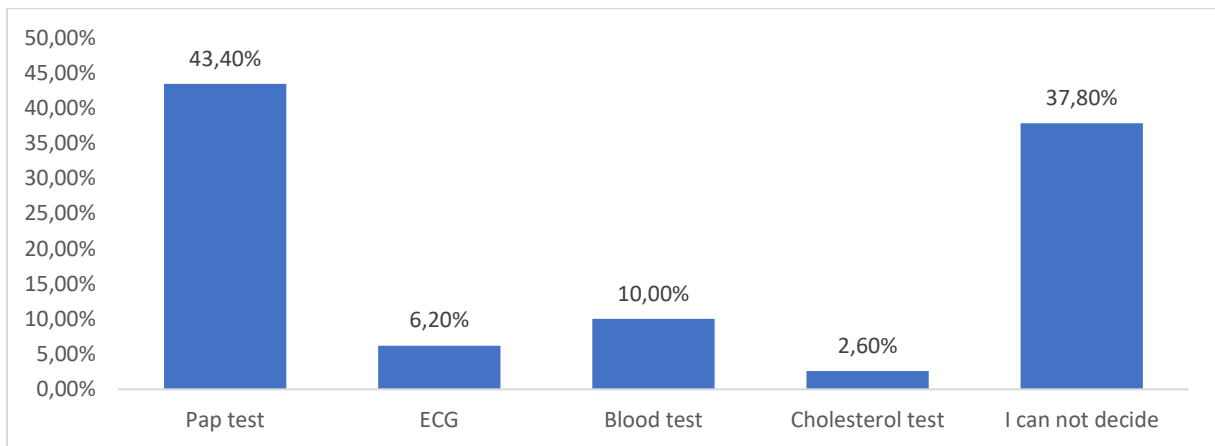




**Fig. 61. Relationship between human papilloma virus and CC (according to educational degree)**

In teCC of educational degree and women's opinion of the relationship between HPV and CC, there is also a significant difference ( $p < 0,001$ ) with fluctuations in the responses of women with different educations (Fig. 61).

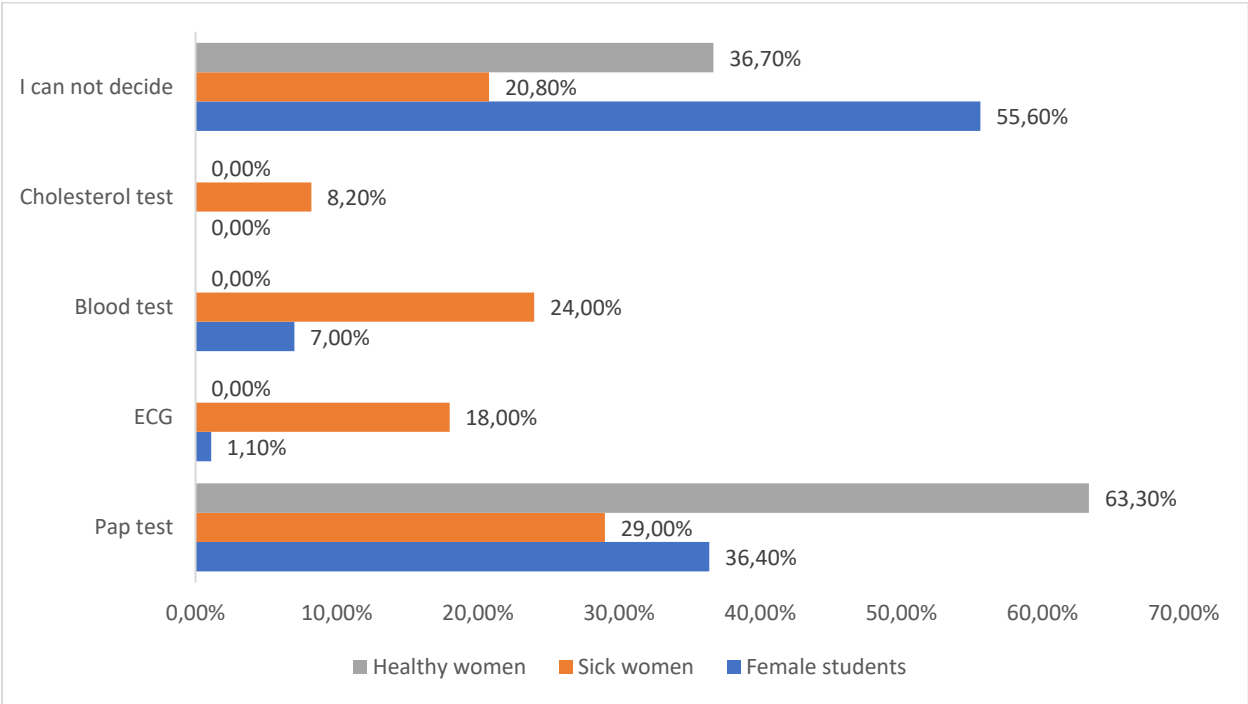
Only 43.4% of respondents were aware of which tests were effective for screening for RPM. Another 37.8% said they could not judge, and the most worrying was the fact that 18.8% did not know at all what diagnostics the different studies were for (Fig. 62).



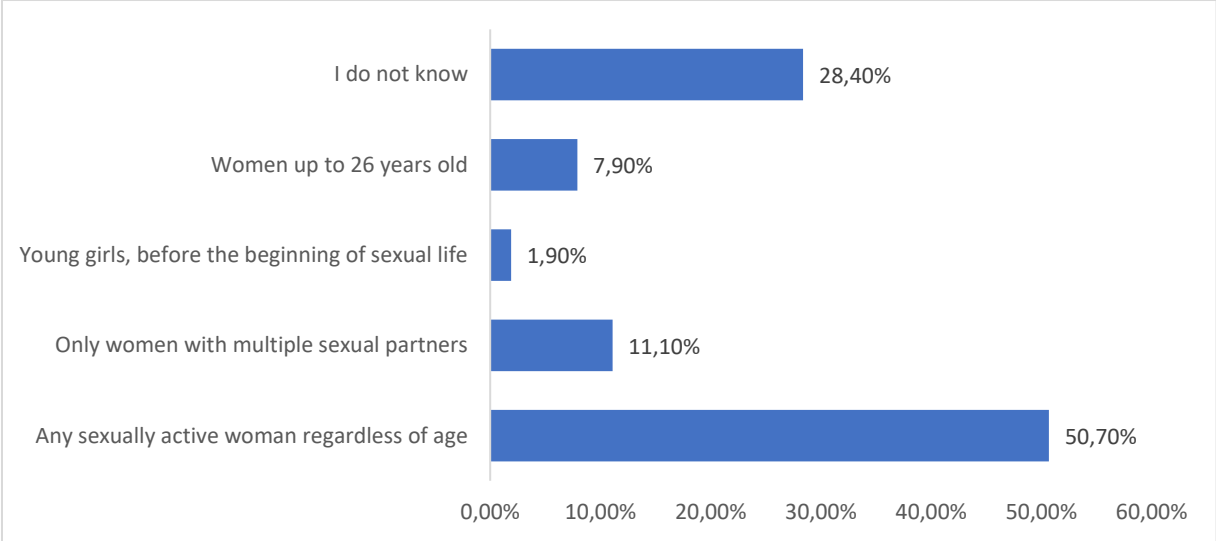
**Fig. 62. Effective CC screening tests**

Ignorance of screening tests for CC is associated with ignorance of the etiology of the disease. Raising awareness of the PAP test would lead to a more active search for this study, provided it is offered free of charge.

Interesting results were found in teCC of the knowledge of the groups studied for the screening tests for CC ( $p < 0,001$ ) according to the study group. The least informed were the women in the sick group (29.0%) (Fig. 63).



**Fig. 63. Effective RPM screening tests (according to the study group)**

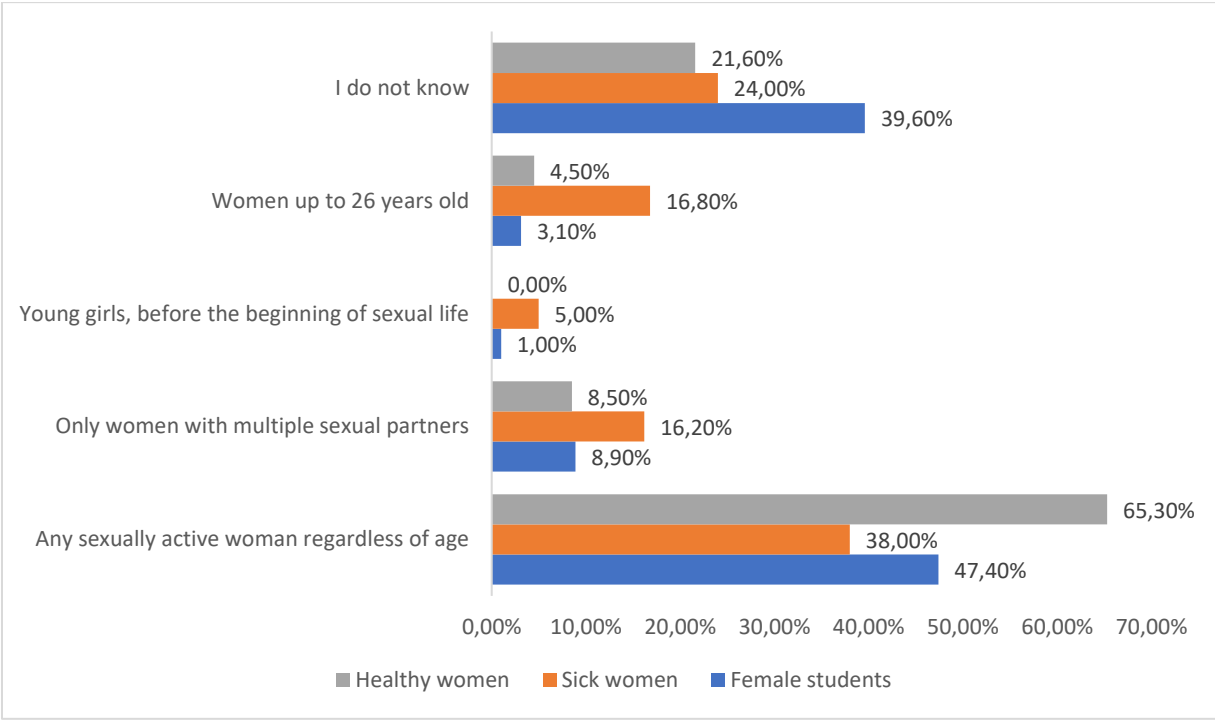


**Fig. 64. Groups of women who are more at risk of developing CC (according to the groups surveyed)**

A difference in women's awareness of CC screening tests is also found in teCC of age ( $p < 0,001$ ), with the relative proportion of women being informed of the diagnostic value of the PAP test increasing. According to half of women, every sexually active woman is exposed more often to the risk

of developing CC regardless of age (50.7%) (Fig. 64). Unfortunately, approximately a third of respondents (28.40%) could not answer this question. Only 11.10% of respondents said that women with many sexual partners were a risk group. Not knowing promiscuity (more than three sexual partners) as a risk factor is a worrying fact that deserves special attention from healthcare providers.

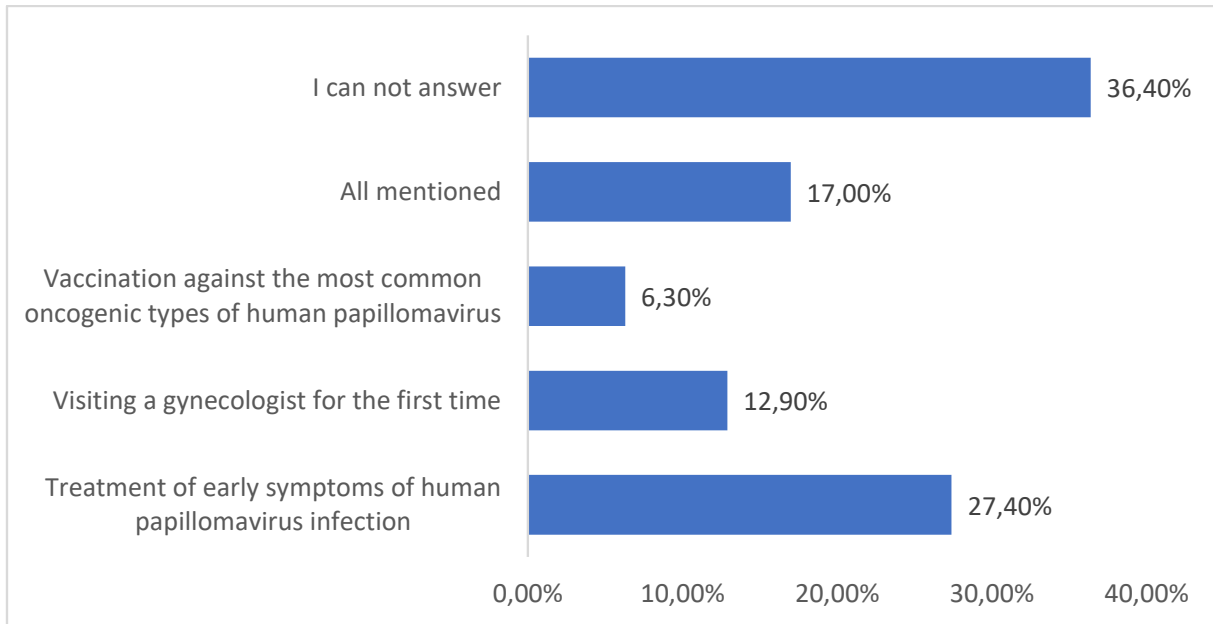
Although the view prevails that every sexually active woman is at risk, there is a variation in the analysis of results between the studied groups ( $p < 0,001$ ) (Fig. 65).



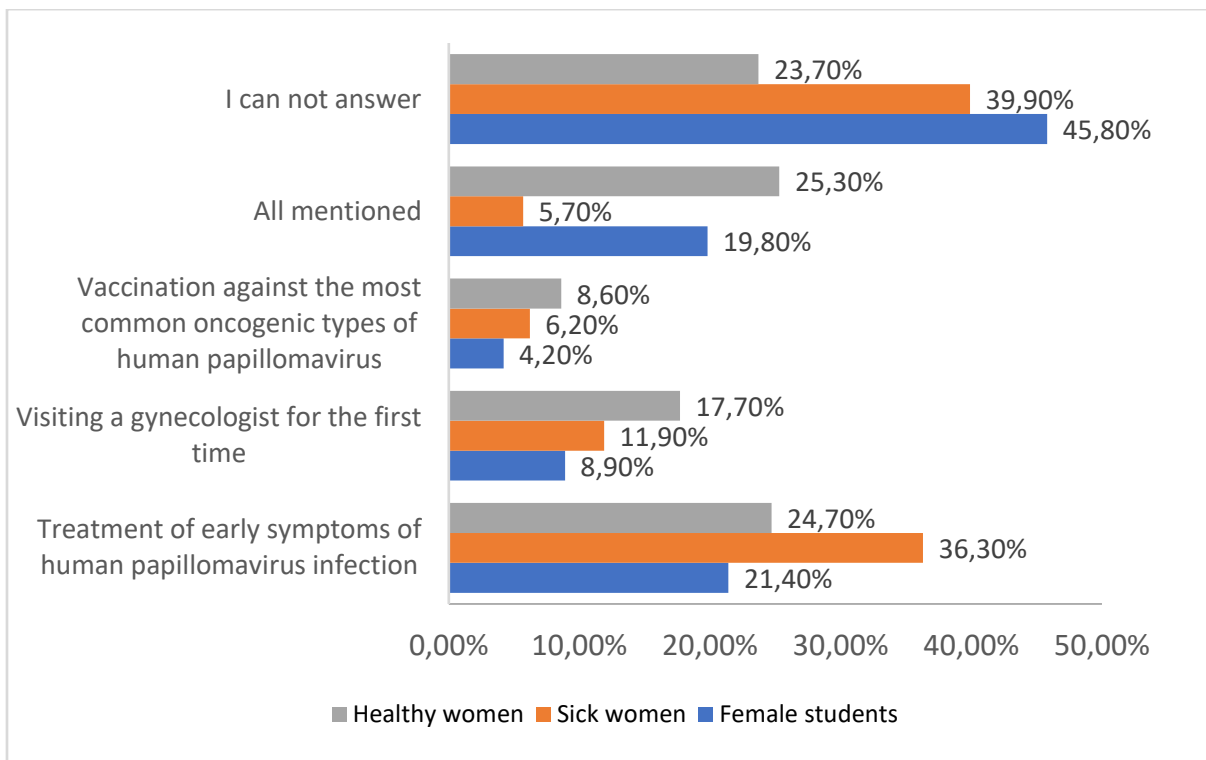
**Fig. 65. Groups of women who are more at risk of developing CC according to the study groups**

The highest share of lack of knowledge was again observed in the group of young women (39.60%). No healthy woman has identified the group of young girls before the beginning of sex life as a risk group.

Most women surveyed were not able to answer the question of what primary prophylaxis of CC (36.4%). Another 27.4% are of the opinion that primary prevention of CC involves curing early symptoms of infection with human papilloma virus. The summary of these responses can be expressed by the assertion that 63.8% are not familiar with primary prophylaxis of CC (Fig. 66).



**Fig. 66. Knowledge related to primary prophylaxis for CC**

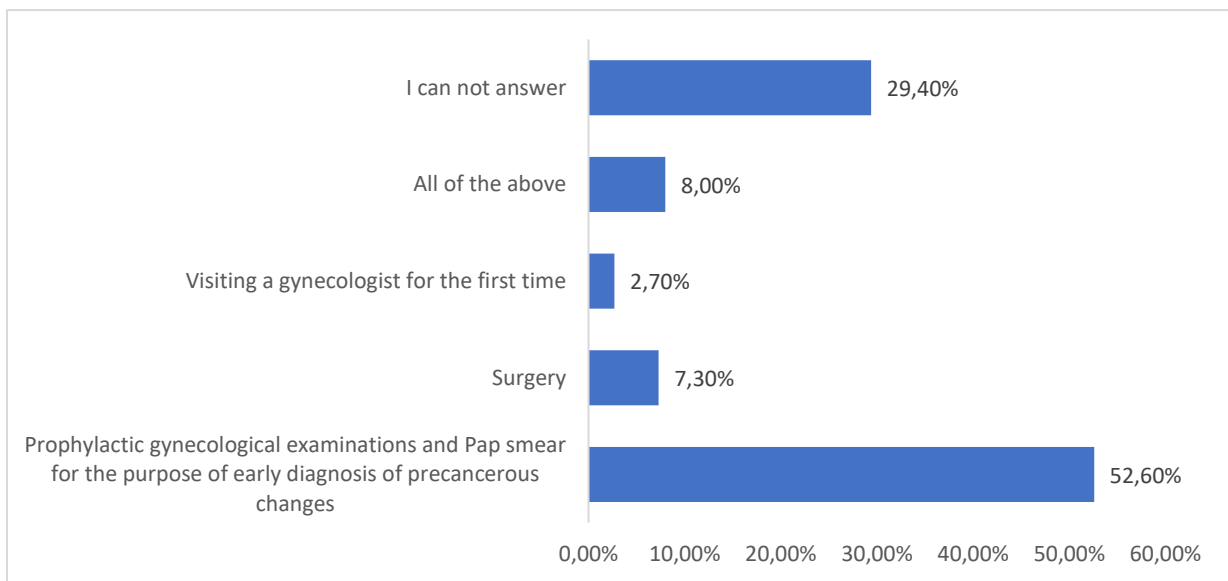


**Fig. 67. Knowledge related to primary prophylaxis for CC (according to the groups studied)**

Only 6.30% of respondents recognized vaccination as a method of primary prevention of this disease. The analysis of knowledge of primary prophylaxis shows the existence of a significant difference between the groups studied ( $p < 0.001$ ). The majority of students said they could not respond (45.8%). According to 36.3% of sick women, primary prophylaxis includes the cure of early symptoms of infection with human papilloma virus, and 25.3% of healthy women indicate that all the answers provided go into the primary prevention of CC (Fig. 67). Primary prophylaxis includes all actions aimed

at preventing the interaction between the risk factor and the susceptible individual, respectively. prophylactic vaccines against CC. Unrecognising of vaccination as the main means of prevention of the first line proves a serious lack of knowledge.

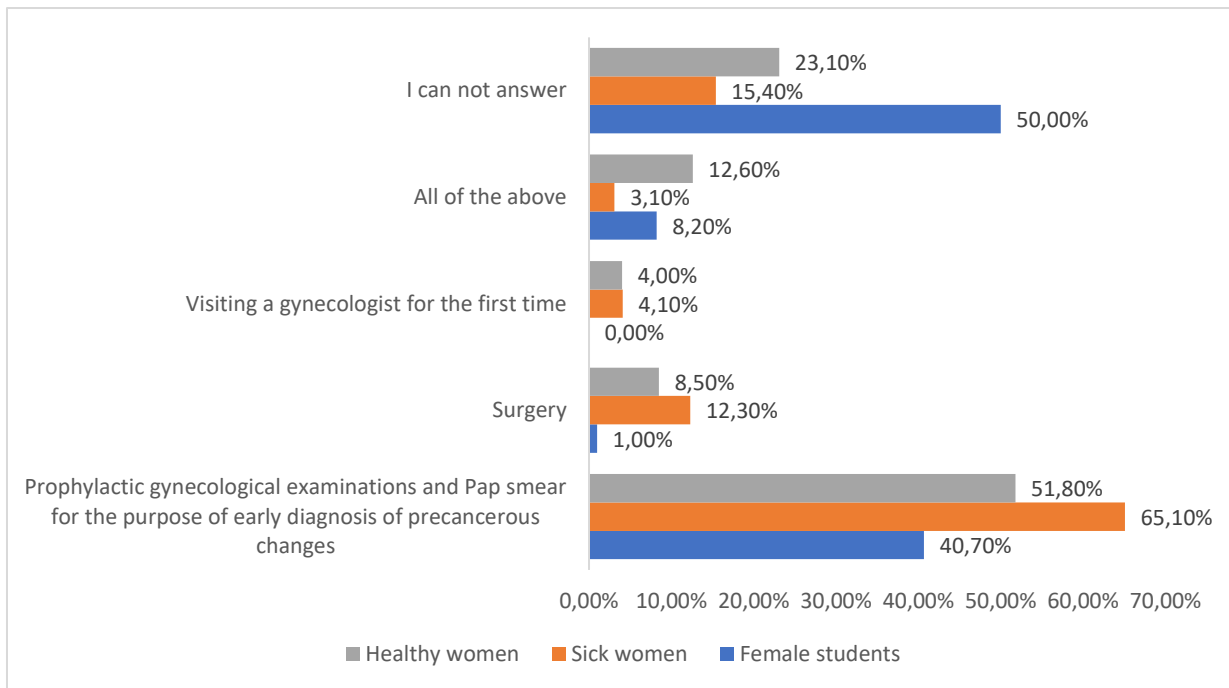
Again, the highest proportion of lack of information was identified among the student group of young women (45.8%). Healthy women in the highest proportion referred to vaccination as primary prophylaxis, yet this proportion was only 6.2%. Over half of respondents (52.6%) answered the question of secondary prophylaxis, that it includes prophylactic gynecological examinations and pap smear. The cytological (PAP test) and HPV typing followed by a specificational diagnosis by colposcopy with taking material for microscopic examination (biopsy) are not recognized by 29,40 % (Fig. 68).



**Fig. 68. Knowledge related to secondary prophylaxis of CC**

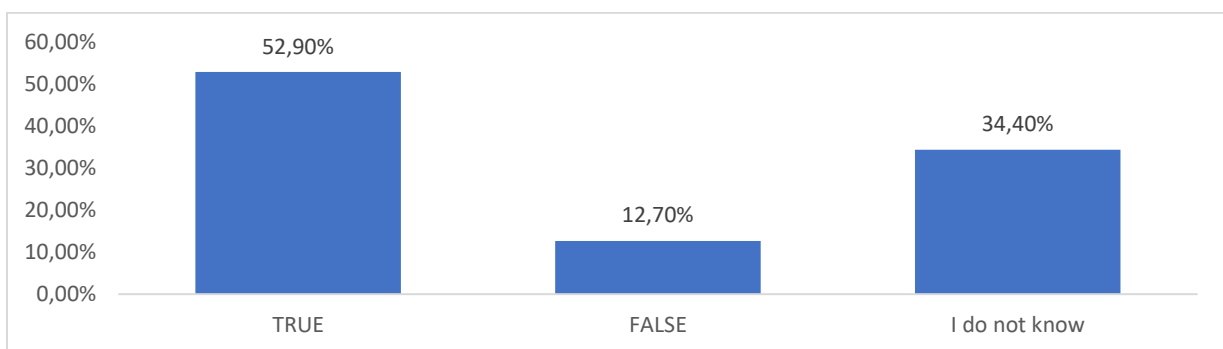
The analysis of the knowledge of the study groups for the secondary prevention of CC showed the existence of a significant difference ( $p < 0,001$ ). Half of the students said they were unaware of what secondary prophylaxis included, and 40.7% were of the opinion that it included prophylactic gynecological examinations and pap smear to diagnose pre-cancer changes early. This opinion supports 65.1% of sick women and 51.8% of healthy women (Fig. 69).

The best informed are the women belonging to the group of the sick. Probably, going down the path of the disease, they are informed about the decursus of procedures related to proving and confirming the diagnosis.



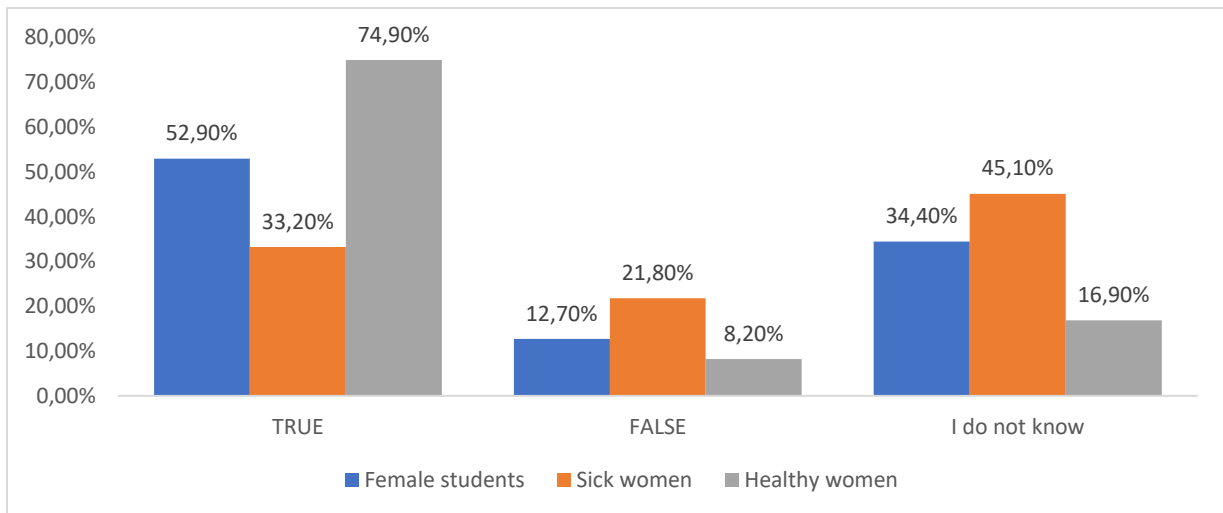
**Fig. 69. Knowledge related to secondary prophylaxis of CC (according to the groups studied)**

Health behavior is related to personal motivation and attitudes towards the disease as a life event. The conviction that timely detection of pre-cancer changes can save human life should be a leading motive for conducting preventive examinations. In our study, just over half of the women surveyed were of the opinion that timely detection of pre-cancer changes led to their treatment (52.9%). This is too low a partition, given the postulating medical truth about the relationship between early diagnosis and the outcome of the disease. Moreover, 12.70% deny this claim and 34.40% cannot respond (Fig. 70). This result can also be interpreted as a lack of confidence in medicine and its capabilities.



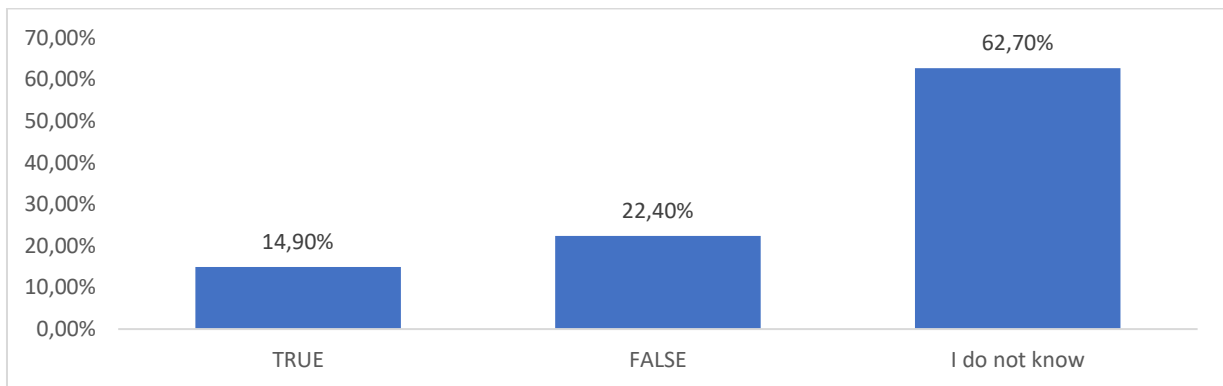
**Fig. 70. Timely detection of pre-cancer changes is associated with their complete cure**

The analysis, carried out according to the surveyed groups, showed that this opinion was supported by 52.90% of students, 33.20% of sick women and 74.90% of healthy women (Fig. 71). Unfortunately, the highest proportion of sick women who indicated they did not know (45.10%). Their share was the highest among respondents negatively – 21.80%.



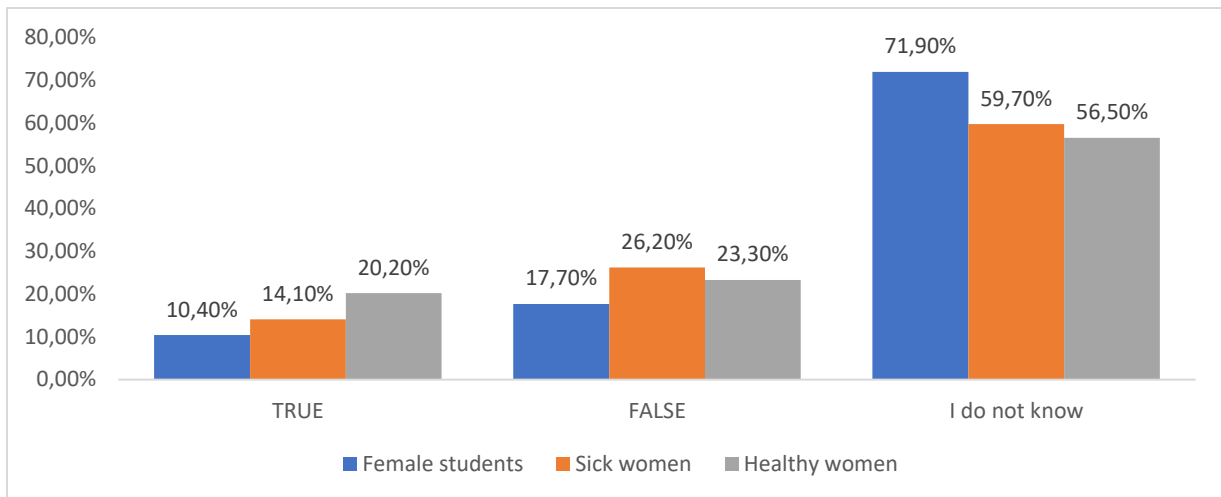
**Fig. 71. Timely detection of pre-cancer changes is associated with their complete cure (opinion according to the groups studied)**

Another important information deficit was identified with regard to the link between HPV and the development of the disease. 62.7% of the women surveyed did not know whether infection with an oncogenic type of human papillomavirus always leads to the development of CC (Fig. 72). Only 22.40% gave an answer that was correct. This trend is also maintained in the analysis of the results according to the surveyed groups, with the most uninformed being the students (71.90%) ( $p=0.009$ ) (Fig.72).



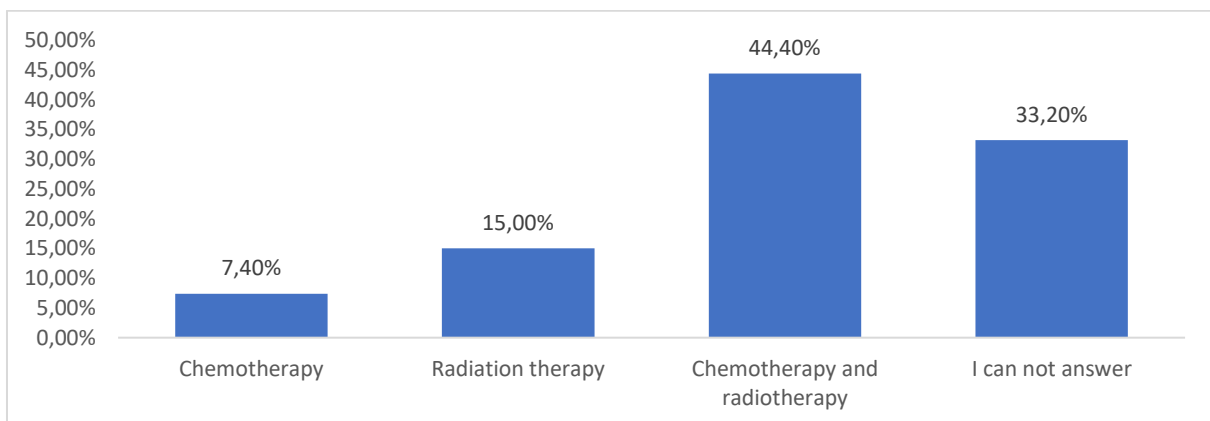
**Fig. 72. Infection with an oncogenic type of human papillomavirus always leads to the development of CC**

The highest proportion of sick women who are aware that infection with HPV does not always lead to the development of the disease. The most wrong answers (answer true) were given by women in the healthy group. This overestimation and predestination of HPV infection may be a motivator for strict self-monitoring and regular prophylactic examinations.



**Fig. 73. Infection with an oncogenic type of human papillomavirus always leads to the development of CC – opinion according to the studied groups**

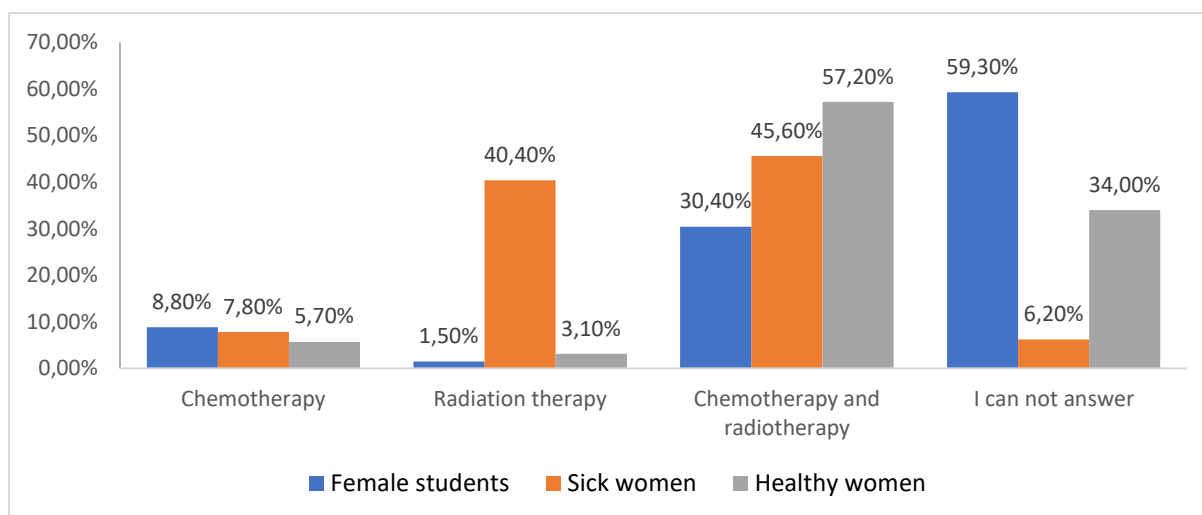
Relatively good awareness of the treatment options of CC share 44.40% of the women surveyed. One in three women cannot answer this question (Fig. 74).



**Fig. 74. Treatment options for CC**

The most informed about treatment options were healthy women (57.2%), followed by sick women (45.6%) and students (30.4%) ( $p < 0.001$ ) (Fig. 75).





**Fig. 75. Treatment options for CC according to the groups studied**

It should be expected that the largest share of information related to treatment will be identified among the sick women currently being treated. In our study, this has not been confirmed. It turns out that the most informed is the group of healthy women. This may be due to the assumption that these women monitor their health status, have more information and are able to make informed decisions about their personal health.

Infection with human papillomavirus in most cases predates CC, and factors associated with immunity and sexual behavior influence the mechanisms that determine the persistence of infection, as well as evolution to lesions preceding cancer. In table one, the company's 6 presented the results of the analysis of changes in women's behaviour in relation to the cyto smear study according to their awareness of how RPM was given.

**Tabl. 6. Awareness of how the CC is transmission and the conduct of a study with a pap smear**

Do you know what the way to transmit cervical cancer is?	How often should a pap smear be made?				Total
	Once a year	Twice a year	Once every two years	Not knowing	
It is transmitted only by sexual intercourse	56 62,9%	16 18,0%	2 2,2%	15 16,9%	89 100,0%
Persistent infection with human papillomavirus HPV	78 63,9%	34 27,9%	5 4,1%	5 4,1%	122 100,0%
It is transmitted only by intercourse and constant infection with human papillomavirus HPV	109 68,1%	28 17,5%	9 5,6%	14 8,8%	160 100,0%
I can't answer that.	77 36,5%	42 19,9%	11 5,2%	81 38,4%	211 100,0%

On tab. 7 presents the awareness of students from both groups about CC. More than half of students from other specialties were unaware of the way CC was broadcast (56.4%;  $p < 0.001$ ). The results showed a moderate correlation between students' awareness of how CC was transmission - health care professionals were better informed ( $r = 0.317$ ;  $p < 0.001$ ).

Although both groups of students predominate the relative share of those who are not informed of the risk factors (74.4% for students from other specialties respectively and 61.0% for health care students), which is also evident from the risky lifestyle they lead, it can be said that in the second group of students the relative share of the informed is slightly higher ( $p=0.046$ ). However, students' awareness of risk factors does not correspond to a healthier lifestyle, which can be attributed to young age and lack of information.

**Tabl. 7. Comparative analysis of students' views onCC**

Ordered		Students from other specialties	Health care students	P value
Knowledge of how to transmitCC	It is transmitted only by sexual intercourse	6/4.5%	7/12.3%	< 0.001
	Persistent infection with human papillomavirus	33/24.8%	21/36.8%	
	It is transmitted only by intercourse and constant infection with human papillomavirus	19/14.3%	19/33.3%	
	I can't answer that.	75/56.4%	10/17.5%	
Awareness of the risk factors of the disease	Yes I do	33/25.6%	23/39.0%	0.046
	Not	96/74.4%	36/61.0%	
Symptoms of CC	No symptoms	9/6.7%	4/6.9%	< 0.001
	Bleeding according to sexual intercourse	13/9.6%	18/31.0%	
	Abdominal cramps	6/4.5%	10/17.2%	
	Nausea	1/0.7%	1/1.7%	
	I dunno	106/78.5%	25/43.1%	
Effective measures for the prevention of cervical cancer	Regular prophylactic gynecological examinations	63/46.0%	38/62.3%	0.024
	Making a pap smear	29/20.9%	23/37.7%	0.011
	Vaccination against cervical cancer	10/7.2%	18/29.5%	< 0.001
	Prophylactic gynecological examination with pap smear	32/23.0%	20/32.8%	0.102
	All listed above	26/18.7%	27/44.3%	< 0.001
	I dunno	40/28.8%	3/ 4.9%	< 0.001
Link between human papilloma virus andCC	Yes, there is a connection	44/32.4%	28/47.5%	0.128
	No, there's no connection.	10/7.4%	4/6.8%	
	I can't judge	82/60.3%	27/45.8%	
Effective RPM screening tests	PAP test	34/25.6%	31/57.4%	0.001
	EKG	2/1.5%	-	
	Blood testing	10/9.0%	4/7.5%	
	Cholesterol test	-	-	
	I can't judge	63.9%	19/35.2%	

Knowledge related to primary prophylaxis for CC	Cure of early symptoms of infection with human papilloma virus	25/18.8%	15/25.4%	< 0.001
	Visiting a gynecologist for the first time	11/8.3%	6/10.2%	
	Vaccination against the most common oncogenic types of human papillomavirus	1/0.8%	8/13.6%	
	All of the	21/15.8%	17/28.8%	
	I can't answer that.	75/56.4%	13/22.0%	
Knowledge related to secondary prophylaxis of CC	Prophylactic gynecological examinations and pap smear for early diagnosis of pre-cancerous changes	43/31.9%	35/59.3%	<0.001
	Operative treatment	1/0.7%	-	
	Visit to a gynecologist for the first time	-	-	
	All listed	8/5.9%	9/15.3%	
	I can't answer that.	83/61.5%	14/23.7%	
Timely detection of pre-cancer changes is associated with their complete cure	Faithfully	62/45.9%	36/61.0%	0.153
	False	12/8.9%	4/6.8%	
	I dunno	61/45.2%	19/32.2%	
Infection with an oncogenic type of human papillomavirus always leads to the development of CC	Faithfully	9/6.7%	11/19.0%	0.012
	False	21/15.7%	13/22.4%	
	I dunno	104/77.6%	34/58.6%	

Over 3/4 (78.5 %) of students from other specialties are not aware of the symptoms of CC ( $p < 0.001$ ).

Regular preventive examinations as effective measures for the prevention of CC are indicated in a higher proportion of health care students (46.0% for students from other specialties, respectively, to 62.3% for health care students;  $p = 0.024$ ).

A significant difference was also found with regard to the taking of pap smear as part of effective measures against RRM, again establishing a preponderance among health care students (20.9% for students from other specialties, respectively, to 67.7% for health care students;  $p = 0.011$ ).

Vaccination against CC is a preferred measure for the prevention of CCh by health care students (7.2% for students from other specialties, respectively, to 29.5% for health care students;  $p < 0.001$ ).

Prophylactic gynecological examination with pap smear as an effective measure against CC is recommended by both groups of students, and no significant difference in their opinion is found.

On the other hand, more than 1/4 (28.8 %) of students from other specialties indicated that they had not been informed of the effective measures against RPM ( $p < 0.001$ ), with a lack of information on this subject correlated slightly to moderate with non-health care education ( $r = 0.267$ ;  $p < 0.001$ ).

There was no significant difference in student opinion on the relationship between human papillomavirus and CC, with both groups being dominated by the relative proportion of those who could not assess whether there was such a dependence.

A significant difference was found in teCC of student awareness of CC effective screening tests ( $p=0.001$ ), with 63.9% saying in the group of students with other specialties that they were not informed at all. The group of health care students also had those who indicated that they were not informed (35.2 %), as well as those with incorrect answers, indicating the need to focus in the basic training programmes on CC prevention.

More than half of students from other specialties are not aware of what primary prophylaxis of CC (56.4 %), while for health care students this share is 22.0 % ( $p<0.001$ ). The results showed that in both groups there were gaps in awareness about primary prevention of CC, with more distinct in the group of students from other specialties.

Similar results were found with regard to awareness of secondary prevention of CC ( $p<0.001$ ), where 61.5% of students from other specialties were not informed at all what it included, while for health care students this proportion was 23.7%.

There is a moderate correlation between awareness of secondary prophylaxis of RPM and the type of education of the students surveyed ( $r=0.320$ ;  $p<0.001$ ), with health care students being more informed.

There was no significant difference in students' opinion on the statement "When pre-cancer changes are found in a timely manner, they are completely treatable," with both groups overwhelmingly supporting it.

Although in both groups the relative share of students who do not know whether infection with oncogenic type of human papillomavirus always leads to the development of CC, a significant difference in their opinion is found ( $p=0.012$ ).

#### IV. STRATEGY TO RAISE WOMEN'S AWARENESS AND HEALTH BEHAVIOUR ON THE PREVENTION OF CC

On the basis of the literature review and the results obtained, a proposal has been made for a strategy to raise women's awareness of the prevention of CC. Cervical cancer is still the fourth most common cancer affecting women around the world with large geographic variations in incidence and mortality. There are huge differences in the global control and prevention efforts of CC. According to world health organization goals, by 2030, 90% of girls up to the age of 15 must have completed immunization with an HPV vaccine; 70% of women up to 35-40 years of age are covered by screening (tests and cytology); 90% of women receive timely treatment of pre-cancerous lesions.

**The proposed strategy is based on the fact that the natural history of the disease provides opportunities for prevention throughout the life cycle.** For the purposes of this proposal, women are a division of three target groups: school ages 11-18; women aged 19-45; women aged 45 and over.

The proposal aims ultimately at raising awareness across age groups depending on known and already described risk factors (table 8).

**Tabl. 8. Risk factors for HPV and cervical cancer according to the age group**

Age group	Risk factors
Age group of girls 11-18 years (school age)	<ol style="list-style-type: none"> <li>1) First intercourse &lt;18 years</li> <li>2) First snitch pregnancy before the age of 17</li> <li>3) Multiple sexual partners or contact with a partner who has multiple partners</li> <li>4) Smoking</li> <li>5) Diet low in fruits and vegetables</li> <li>6) Overweight</li> <li>7) Immunosuppression from drugs or disease</li> </ol>
Age group 19-45 years (active reproductive age)	<ol style="list-style-type: none"> <li>1) Past or current chlamydia infection</li> <li>2) Инфекция с Herpes Simplex Virus (HSV-2)</li> <li>3) Use of combined oral contraceptives</li> <li>4) Three or more tolerable pregnancies</li> <li>5) Low income or limited access to healthcare</li> <li>6) Positive family history of cervical cancer</li> <li>7) Multiple sexual partners or contact with a partner who has multiple partners</li> <li>8) Smoking</li> <li>9) Diet low in fruits and vegetables</li> <li>10) Overweight</li> <li>11) Immunosuppression from drugs or disease</li> </ol>
Age group of women over 45 years of age	<ol style="list-style-type: none"> <li>1) Инфекция с Herpes Simplex Virus (HSV-2)</li> <li>2) Smoking</li> </ol>

	<ul style="list-style-type: none"> <li>3) Overweight</li> <li>4) Immunosuppression from drugs or disease</li> <li>5) Low income or limited access to healthcare</li> <li>6) Multiple sexual partners or contact with a partner who has multiple partners</li> <li>7) Diet low in fruits and vegetables</li> </ul>
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#### 4.1. Awareness-raising strategy among girls of school age (11-18) years.

The main task in this age group is health information and health education related to the prevention of CC according to risk factors. Fig. 86 shows the three main steps to be taken. This age group is very heterogeneous as it is a stage of rapid physical growth combined with fluctuating psycho-emotional and cognitive development. behaviour. A sexually healthy young person is able to realize his individual potential around critical tasks related to the development of sexuality, prevention of sexually transmitted diseases, unwanted and early pregnancy. The main highlights of preventive information work with adolescents should be focused precisely on these tasks.



**Fig. 76 Three-step model for raising awareness of RPM in the age group 11-18 years**

In table one, the company's 9 lists the main activities, their content and the contractors.

**Tabl. 9 Activities, content and implementations of the information strategy aimed at the 11-18 age group**

Activity	Content	Contractors
Exploring the beliefs, awareness and needs of adolescents	Identification of the level of awareness through surveys, consultations and direct talks/meetings	RZI, the school doctor; the school nurse; NGOs working in this field

Provision of health information related to sexual debut and PPPs	Development of integrated information addressing common risk factors. Use of social media, internet resources and platfoCC	Ministry of Education, Ministry of Health, School Doctor; NGOs working in this field; RZI
Working with families on promoting girls' vaccination	Establishment of a single internet portal related to vaccination againstCC. Establishment of facilitated access to vaccination againstCC	Ministry of Health, RSI, personal physicians, pediatricians and obstetricians and gynecologists

Mass media campaigns must be scheduled for the end of summer before the start of the school year. This time is coordinated with parents who prepare their children for schools.

#### 4.2. Awareness-raising strategy among the 19-45 age group (active reproductive age)

The age group implies sexual activity, changing sexual partners, experiencing one or more pregnancies and births. This is a period of academic and labor careers. Given the most prevalent risk factors at this stage of life, awareness ofCC-related research (screening and diagnostics) comes into consideration. This group is heterogeneous in teCC of sociocultural, *economic*, religious, educational status and ethnicity.

**Tabl. 10 Activities, content and contractors of the information strategy aimed at the 19-45 age group**

Activity	Content	Contractors
Provision of health information on access and relevance of cytological screening	Development of information targeting health structures where screening can be carried out Information campaigns related to the need for CC research	Ministry of Health; professional organisations of doctors, midwives and nurses; mediators in the community (where necessary)
Conducting cytological screening (Pap test)	Organizing free cytological screening closest to users (by place of residence)	LPS, ASMP, doctors, midwives, nurses, nurses, nurses

Information campaigns targeting this group must address misinformation and rumours that hinder HPV vaccination, promote screening, raise awareness of the signs and symptoms of cervical cancer, tackle ignorance, fear, inconvenience and stigma associated with HPV and cervical cancer.

#### 4.3. Awareness-raising strategy among women over the age of 45

In this age group, women who have already realised their reproductive potential are most often found. With age, the general morbidity and frequency of malignancies increases. Individual differences imply different health *and socio-economic status*, employment, religious and ethnicity.

**Tabl. 11. Activities, content and implementations of the information strategy among women over 45**

Activity	Content	Contractors
Screening with a high-performance test equivalent to or better than an HPV test for pre-cancerous lesions of the cervix	Development of information targeting health structures where screening can be carried out. Information campaigns related to the need for CC research	Ministry of Health; professional organisations of doctors, midwives and nurses; mediators in the community (where necessary)
Immediate treatment after HPV molecular positive test	Adoption of a single treatment algorithm that refers to evidence-based science and consistent with the latest scientific advances	Ministry of Health, academic medical community, specialized medical institutions and university hospitals

In the age of over 60, it is possible to introduce innovative communication reminders such as text messages or phone calls related to preventive examinations and research. Reaching these women can be realized through all known media channels: radio, TELEVISION, internet platfoCC, flyers and brochures, personal conversations. The factors with which the news feeds must comply are several:

- Demographic factors – age, gender, education, place of residence
- Environmental factors – population, access to health care, ecology
- Social determinants – income, access to social resources
- Policies – state policies related to health and management of resources in healthcare.

On Fig. 13, 201 7 7 shows the main elements of the strategy to raise awareness of the RRM.



**Fig. 77. Key elements of an RRM awareness-raising strategy**



**In conclusion**, we can argue that health information and education campaigns need to be strengthened according to the specific information needs of individuals and communities. Developing integrated **information and materials that address common risk factors** are an effective and meaningful path way that can reach the most people.

## **V. CONCLUSIONS, CONTRIBUTIONS, RECOMMENDATIONS**

### **5.1 . EXCERPTS**

On the basis of the analysis of literary sources and the survey conducted, the following conclusions can be drawn:

1. In the current survey, only 53.60% of respondents said that prophylactic gynecological examination is desirable to take place at least once a year, and in the group of women diagnosed withCC, one in ten women (10.70%) is of the opinion that if she is feeling well, prophylactic gynecological examination is not necessary.
2. Higher education (Bachelor and Master) does not correlate with the frequency of visits to a gynecologist.
3. Women living in rural areas are the least informed.
4. The lowest level of awareness aboutCC is observed in the group of young women (students).
5. One in five women surveyed (19.70%) did not know how many times it was desirable to do a pap smear, and one in four students (25.80%) could not answer this question.
6. The study of the level of health culture in teCC of risk factors associated with RPM shows that women lead risky lifestyles, with 42.8% smoking regularly, 39.0% starting to lead sex life before 18, 64.5% not using or only occasionally using a condom, and 53.1% having no practice of regularly conducting preventive examinations.
7. About half of women (44.6%) associate infection with human papilloma virus with the development of cervical cancer, and 52.1% know that the vaccine against this virus protects against infection.
8. Negative attitude towards vaccination against CC was found: 32.40% of women would not get vaccinated, with the highest proportion of the 41-50 age group (44.30%); 10.40% believe that when vaccinated they can become infected with HPV.

9. According to 71.3% of respondents, the placement of the HPV vaccine does not replace gynecological examination with a pap smear, with the majority of respondents (42.70%) not knowing whether vaccination against cervical cancer is done only to girls before the beginning of sex life.
10. About 1/3 (36.3%) of respondents said they did not know how cervical cancer was transmission, with 65.3% not informed of risk factors and 37.3% not knowing what the symptoms of RPM were.
11. According to 45.7% of respondents, the main effective measure for the prevention of CC is regular preventive examinations, with vaccination and preventive examination with pap smear being the most neglected.
12. About 1/4 (23.3%) of women are not familiar with what primary and secondary prophylaxis includes.
13. The detailed analysis of the group of students shows that those who train in the health care department are better informed about CC and vaccination against CC.

## 5.2 . YIELDS

### **Contributions of a scientific and theoretical nature**

1. The main barriers related to women's awareness of cervical cancer and problems related to access to health information have been identified and analysed.
2. The competence of the midwife in the context of the prevention of malignancies of the reproductive system and raising awareness among young women are examined.
3. A strategy has been developed to raise women's awareness of reproductive and sexual health and the prevention of CC.
4. It found that the scientific direction of education of students influences their awareness of CC, which supports the need to implement strategies to raise their awareness.

### **Contributions of a practical nature**

1. The awareness and behaviour of young women, sick and healthy women has been studied, analysed and compared.
2. Gaps in women's awareness of risk factors, prevention and treatment of cervical cancer have been assessed.
3. Strategic guidelines and an action plan have been proposed to raise women's awareness and health behaviour regarding the prevention of RPM.

## 5.3. RECOMMENDATIONS

### **To the Ministry of Health**

- ✓ To include as mandatory HPV vaccines of girls 10 years of age in Ordinance No 15 of 2005 on immunizations in the Republic of Bulgaria.

- ✓ Annually to organize free mass screening of women over 30 years with taking a pap smear.
- ✓ To develop brochures in accessible language on the prophylactic effect of vaccines against CC and disease risk factors.

#### **Go to Regional Health Inspections**

- ✓ To carry out educational information campaigns to raise the level of awareness of students, teachers and parents about the risk of the disease and the prophylactic effect of vaccines against CC.

### **PUBLICATIONS IN CONNECTION WITH THE DISSERTATION WORK**

1. **Sabri, M., J. Margosian, I. Dimitrov.** The need for preventive examinations for cervical cancer – Varna Medical Forum, item 7, 2018, ad. 4. Jubilee Scientific Conference "Modern Trends in Health Care", 21-22.09.2018 Sliven: Mu-Varna, 151–155.
2. **Sabris, M.** Awareness of cervical cancer prevention in different groups of women. – C: Health care – contribution to quality of life. –C: Compendium of reports from the second conference with international participation. 07-08 June 2019 Varna, 2019, 104–109.
- 3 . **Sabris, M.** The attitude of women to the prevention of cervical cancer. "For" and "against" the vaccine. – C: Compendium of reports from the national practical (on-line) conference with international participation, 29-30 October 2020, "Nurses and midwives – a key resource in modern healthcare". Thracian University, Stara Zagora, 57–65.
4. **Sabri M.** Preventive examinations for cervical cancer – mandatory prevention that can save a life. – Varna Medical Forum, 2021, annex 1, 26.03.2021 IX Scientific session for teachers and students of medical college – Varna, 443–448.