



MEDICAL UNIVERSITY – PLEVEN
FACULTY OF PUBLIC HEALTH

**SOCIAL MEDICINE AND HEALTH MANAGEMENT
DEPARTMENT**

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**ORGANIZATIONAL MODEL OF MIDWIFERY
ACTIVITIES FOR HPV-ASSOCIATED DISEASES
PREVENTION**

ABSTRACT

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The dissertation thesis contains 175 standard typewritten pages and the text is illustrated with 36 figures, 17 tables and 8 appendices.

The references include 193 titles, of which 47 in Cyrillic and 146 in Latin alphabet.

In connection with the dissertation thesis 3 publications and 6 scientific announcements have been made at national and international scientific forums.

USED ABBREVIATIONS:

DNA	Deoxyribonucleic Acid
USR	Uniform State Requirements
HEA	Higher Education Act
LBONMAMP	Law on the Branch Organization of Nurses, Midwives and Associate Medical Professionals
MRE	Medical Rehabilitation and Ergotherapy
NSI	National Statistical Institute
NCPHA	National Center for Public Health and Analysis
EQD	Educational-Qualification Degree
PHPC	Public Health Protection and Control
PAP	Cervical screening method, PAP smear
CC	Cervical cancer
WHO	World Health Organization
HPV	Human Papilloma Virus
CIN	Cervical Intraepithelial Neoplasia
FIGO	International Federation of Gynecology and Obstetrics
HPV	Human Papilloma Virus
IARC	International Agency for Research on Cancer
ICM	International Confederation of Midwives
LLETZ	Large Loop Excision of the Transformation Zone
mRNA	Messenger Ribonucleic Acid
PIN	Penile Intraepithelial Neoplasia
VAIN	Vaginal Intraepithelial Neoplasia
VIN	Vulvar Intraepithelial Neoplasia

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INTRODUCTION

Human Papilloma Virus (HPV) causes the most common sexually transmitted infections and diseases worldwide, making it a socially significant problem. It has been estimated that over 80% of sexually active female and male would be infected with the virus at least once.

Good health literacy and prevention have been the key methods to reduce the spread of the Human Papilloma Virus and the development of HPV-associated diseases. The awareness of individuals at a young age of the risk factors and ways to prevent infection has been the basis of primary prevention. Despite the availability of HPV vaccines, it has been still difficult to be controlled globally and is followed by severe complications. That has been evidenced by the high number of newly diagnosed malignant diseases associated with the virus. Each year, over 560,000 female all over the world have been diagnosed with cervical cancer.

The high prevalence rates of HPV and its associated diseases, worldwide, have defined it as a “burden” on public health. In low- and middle-income countries, where there is lack of access to quality health care, higher incidence rates of HPV have been recorded. In developed countries, a lack of confidence in midwives providing preventive health care has been identified as a reason for increasing prevalence rates.

In Bulgaria, the midwife has been mainly associated with the act of delivery, but she has a key role in organizing and conducting preventive measures related to a number of gynecological problems and diseases. However, its role in health promotion and preventive activities related to HPV has not been the subject of research in our country.

The dissertation thesis was worked out in response to the in-depth analysis of the preventive activity related to HPV-associated diseases and the established need to develop an organizational model of midwifery actions.

CHAPTER I OBJECTIVE, TASKS AND METHODOLOGY OF THE RESEARCH

1. Objective of the Research

By finding out the awareness of the covered groups of respondents, regarding the risk factors and HPV-associated diseases prevention, an organizational model to be worked out for midwifery activities in the prevention of these diseases.

2. Tasks of the Research

To achieve the goal, the following main tasks have been formulated:

1) The awareness of the first-year students, Bulgarian language studies at MU-Pleven regarding HPV-infections and the risk factors related to them to be investigated.

2) The knowledge of the first-year students, Bulgarian language studies at MU-Pleven regarding the vaccine prevention of HPV-associated diseases to be studied.

3) Adult female awareness regarding HPV and its associated diseases, their related risk factors and their vaccine prophylaxis to be analyzed.

4) Factors with a positive and negative effect on HPV infection and development of its associated diseases to be identified.

5) The needs for continuing education among midwives working in hospitals and outpatient medical facilities for obstetrical-gynecological care in the town of Pleven, regarding midwifery activities for the prevention of HPV-associated diseases to be studied and analyzed.

6) Organizational model for midwifery activities for efficient prevention of HPV-associated diseases to be drawn up.

3. Hypotheses

1. Midwives' confidence to apply their theoretical knowledge and practical skills in independent activities for HPV-associated diseases prevention has been insufficient.

2. Midwives have not been recognized by community as specialists with a key role in preventive measures regarding HPV-associated diseases.

3. There has been a demand for an organizational model for midwifery activities and care in the prevention of HPV-associated diseases.

4. Object of the Research

- 284 first-year students, Bulgarian-language studies at MU-Pleven
- 100 female patients with HPV-associated disease
- 100 female patients, clinically healthy or with another gynecological disease
- 50 midwives working in inpatient and outpatient medical facilities for obstetric and gynecological care

5. Subject of the Research

The subject of the research was activities related to HPV-associated diseases prevention and the midwife's participation in their implementation.

6. Technical Units for Monitoring

- Medical University – Pleven
- Medical facilities for inpatient and outpatient obstetric and gynecological care
 - ✓ St. Marina University Hospital LTD – Pleven
 - ✓ Dr. G. Stranski University Hospital EAD
 - ✓ Hinkomed Medical Center EAAD – Pleven
 - ✓ Saint Marina Medical Center LTD – Pleven

7. Logical Units for Monitoring

- First-year students, Bulgarian-language studies at MU-Pleven
- Midwives working in inpatient and outpatient medical facilities for obstetric and gynecological care
- Female patients with HPV-associated disease
- Adult women, without HPV-associated disease

8. Setting of the Research

The research covered the period September 2019 – July 2022.

A combined epidemiological medical-social research was carried out, including two cross-sectional and one case-control study, which was implemented in the following stages:

Stage I – study preparation and planning, analysis of the issue, formulation of working goals, hypotheses, tasks and design of the study. Selection of proper research material and methods. Holding meetings with the heads of the medical institutions involved in the project to explain the objective of the study and obtaining their consent. Presentation of the scientific idea to the Committee on Research Ethics at MU-Pleven for statement. That stage was carried out in the period January 2019 – October 2021.

Stage II – organization and implementation of the survey of the intended groups of respondents:

- Survey of first-year students, Bulgarian-language studies at MU-Pleven (January 2020 – March 2020)
- Survey of midwives working in inpatient and outpatient medical facilities for obstetric and gynecological care in the town of Pleven (February 2020 - May 2022)

Stage III – organizing and carrying out a case-control study among patients with HPV-associated disease (cases) and women with other gynecological diseases or clinically healthy women (controls). The medical facilities covered in the study were visited on site by the PhD student (January 2020 – May 2022).

Stage IV – Processing and analysis of the results of the questionnaire surveys, working out an “Organizational Model for Midwifery Activities in the Prevention of HPV-Associated Diseases” (May 2022 - December 2023)

Stage V – Analysis of the obtained data, summarization of the results and drawing up conclusions and recommendations (September 2022 – December 2023).

9. Characteristics of the Surveyed Persons

9.1. Selection of the Formed Groups

- **First year students**, Bulgarian language studies at MU-Pleven. The study was comprehensive, covering all students studying various medical specialties at MU-Pleven – a total of 445 students. Only students who voluntarily responded were included in the study.
- **Midwives** – Out of a total of 57 midwives working in inpatient and outpatient obstetrics and gynecological care facilities in Pleven, the study included 50 of them who volunteered.
- **Female patients/cases** – with diagnosed HPV-associated disease
 - **Inclusion criteria:**
 - clinically diagnosed HPV-associated disease,
 - age over 18 years,
 - voluntary responding.
 - **Exclusion criteria:**
 - under 18 years of age,
 - unwillingness to participate in the study
- **Women/controls** – clinically healthy or diagnosed with another gynecological disease, matched to cases by medical facility and randomly selected among those who visited it on the same day with a case of HPV-associated disease covered in the study.
 - **Inclusion criteria:**
 - clinically healthy or diagnosed with another gynecological disease
 - age over 18 years,
 - voluntary responding.

- **Exclusion criteria:**
 - under 18 years of age,
 - unwillingness to participate in the study

9.2. Main Features of the Covered Persons

The COVID-19 pandemic made surveying difficult however the respondents were as follows:

- **1st year students** – total respondents – 284.
- **Practicing midwives** – total respondents – 50.
- **Female patients (cases)** – covered – 100 women.
- **Women (controls)** – covered – 100 women.

10. Research Methods

To achieve the objective of the research, the following methods were applied:

10.1. Sociological Methods

10.1.1. Survey Method

The sociological data were collected in the period January 2020 – May 2022. They were used as follows:

- Anonymous direct group survey among students, held after the end of a lecture session;
- Anonymous direct one-to-one survey of working midwives conducted at their workplace.

The filled in survey cards were collected in an urn prepared in advance for the purpose and were kept by the doctoral student.

Two types of survey cards had been developed.

1. For the purposes of the study, a questionnaire with 25 questions was drawn up for the group of the **students**, consisting of three parts:
 - Introductory part – an address to the respondents with a presentation of the objectives of the study, the method of collecting

and using the information, assurance of anonymity and thanks for responding to the survey;

- Main part – contained 21 questions related to the objectives of the study about HPV, HPV-associated diseases and their prevention;
- Final part – consisting of 4 identification questions.

The questionnaire's goals were:

- To find out the students' awareness about HPV-infections;
- To find out the students' awareness about HPV-associated diseases;
- To find out the awareness of the ways of HPV protection;
- To find out the awareness about HPV vaccines.

The average time to retrieve the information was 40 minutes (20-60).

2. For the purposes of the study, an original questionnaire with 34 questions was used for the group of the **midwives, consisting of three parts:**

- Introductory part – an address to the respondents with a presentation of the objectives of the study, the method of collecting and using the information, assurance of anonymity and thanks for responding to the survey;
- Main part – contained 30 questions related to the objectives of the study about the midwifery activities in HPV-associated diseases and their prevention;
- Final part – consisting of 4 identification questions.

The questionnaire's goals were:

- To find out the midwives' awareness about HPV-infections;
- To find out the awareness of the respondents about HPV vaccines;
- To find out the awareness about the midwife's role in the prevention of HPV-associated diseases

- To find out the need of additional training of midwives

The average time to retrieve the information was 45 minutes (30-60).

10.1.2. Sociological Interview

A standardized face-to-face individual interview of the doctoral student was conducted with the respondents at a time convenient for them, during their visit to the medical facility.

For the purposes of the study, a questionnaire with 47 questions was worked out, **consisting of three parts:**

- Introductory part – an address to the respondents with a presentation of the objectives of the study, the method of collecting and using the information, assurance of anonymity and thanks for responding to the survey;
- Main part – contained 21 questions related to the objectives of the study about HPV, HPV-associated diseases and their prevention;
- Final part – consisting of 5 identification questions and 3 questions regarding the respondents' attitude to visit the midwife in connection with the prevention and diagnosis of HPV infection and/or HPV-associated disease.

The questionnaire's goals were:

- To find out the respondents' awareness about HPV-infections;
- To find out the awareness of the respondents from this group about HPV-associated diseases and the risks related to them;
- To find out the awareness of the female patients about HPV vaccines;

The answers to the questions were recorded by the doctoral student, after obtaining consent from the covered person. The average time to retrieve the information was 50 minutes (30-60).

10.2. SWOT Analysis

After analyzing the results obtained through the rest of the methods, SWOT analysis was prepared, a classic method for strategic analysis and planning. The following elements of the internal and external environment were considered when developing the organizational model of midwifery activities for effective prevention of HPV-associated diseases:

- Strengths;
- Weaknesses;
- Opportunities;
- Threats.

The strengths and weaknesses of the model were reviewed and discussed. The threats that might hinder its implementation were also described.

10.3 Statistical Methods

The statistical processing of the primary data was performed with MS Office Excel 2019 and SPSS v.28.

A set of classic statistical methods were used to present and analyze the collected quantitative and qualitative data.

The discussed responses from the collected questionnaires were reviewed and recoded according to the requirements of the statistical program.

Depending on the type of variable and the type of data distribution, the following parametric tests for verification of the hypotheses with normal and near-normal distribution of cases were applied in the analysis of the results: t-test, ANOVA and non-parametric tests with non-normal distribution of cases: Pearson' χ^2 - test, Mann-Whitney, Kruscal-Wallis H-test.

The significance of the results, findings and conclusions was determined at $p < 0.05$.

A comparative analysis was applied to statistically compare the results to present the differences between the groups of traits studied.

For qualitative data analysis, the COREQ (Consolidated Criteria for Reporting Qualitative Research) method: a 32-question checklist and an inductive manual coding method with hierarchical framework/cloud construction were applied.

The results were presented by means of tables, diagrams and numerical indicators for structure, frequency, mean values, correlation coefficients, etc.

Permission by the Committee on Research Ethics at MU-Pleven

For carrying out the complex medico-social research, permission was obtained from the Committee on Research Ethics at the Medical University – Pleven: Decision No. 375 KENID/08.02.2016.

CHAPTER II RESULTS AND DISCUSSION

1. AWARENESS OF THE FIRST-YEAR STUDENTS, BULGARIAN LANGUAGE STUDIES AT MU-PLEVEN REGARDING HPV-INFECTIONS AND THE RISK FACTORS RELATED TO THEM

To the question “Are you aware of the Human Papilloma Virus infection?” 77.9% (219 people) responded positively and the share of negative answers was 22.1% - 62 persons from all students who responded to the survey. The results obtained were in correlation with the insufficient health education in schools and in particular education on sexual and reproductive health.

According to the type of secondary education and the school profile, those who answered positively were distributed as follows: 66 of them (23.5%) graduated from a vocational school, 74 (26.2%) graduated from a secondary school with a class with advanced biology studies and 79 (28.1%) graduated from secondary school without a class studying biology. The respondents who were unaware of the virus infection were distributed according to the secondary school they had completed as follows: 22 (7.8%) of them had completed vocational school, 18 (6.4%) had completed secondary school with a class with advanced biology study and 22 (7.8%) graduated from secondary school without a class with biology study (Table 1).

The research did not find a significant correlation between respondents' education and their awareness of HPV ($\chi^2=0.780$, $df=2$, $p=0.677$, *Cramer`s $v=0.053$*).

Table 1 Distribution of students per type of secondary school and their awareness of HPV

Answer	Vocational school	School with advanced biology study	School without advanced biology study	Total number
Yes	66 (23.5%)	74 (26.2%)	79 (28.1%)	219 (77.9%)
No	22 (7.8%)	18 (6.4%)	22 (7.8%)	62 (22.1%)
Total	88 (32.2%)	92 (32.7%)	101 (35.9%)	281 (100.0%)

We had analyzed the respondents' awareness of the risk factors for HPV infection. Those who stated that they had knowledge were 43.6% (122 persons); while over half or 56.4% (158 persons) of the respondents said they were not aware of the risk factors for HPV infection.

To check the confidence of the declared knowledge, the students were given the opportunity to list three factors that increase the risk of HPV infection. Of those familiar with the risk factors for getting the virus 89 persons responded, or 73.0%. The answers were divided into three main groups: risky sexual life, low health culture and weak immunity (table 2).

Table 2 Risk factors for HPV infection

	Risky sexual life	Low health culture	Weak immunity	Total
Number of persons	58 (58.6%)	37 (37.4%)	4 (4.0%)	99* (100%)

**The total number exceeds 89 persons because the respondents were given the opportunity to indicate 3 answers each.*

From the data thus presented, we could claim that the majority of the students were aware of the main risk factor for HPV infection, namely promiscuous sexual life.

In order to determine the risk behavior of sexually active respondents, information was sought regarding the use of contraception during sexual

contact. Of the sexually active 218 students, 78.0% (170 persons) declared the use of contraceptives against sexually transmitted infections. The obtained data showed that the ratio of the respondents who had a good health and sexual culture was satisfactory.

The data analysis found statistical significance between sexual activity and contraceptive use ($\chi^2=42.489$, $df=1$, $p=0.00$, Cramer`s $v=0.412$). That had proved that sexually active respondents were responsible both for their own protection and the protection of their partners.

In order to analyze the sources and information confidence about HPV, the respondents were asked the question: “What is your main source of information about HPV infection?”, and the answers were distributed as follows: for 135 students (61.6%) the main source of information was Internet, 57 of them (26.0%) indicated health professionals as the main source of information, 15 respondents (6.8%) used information brochures, and for 12 (5.5%) the main source of information was friends (Fig. 1).

Analyzing the data, it should be noted that the study was carried out during a pandemic situation. With a view of this, the respondents had to use Internet dynamically and constantly, which also led to its determination as the main source of information.

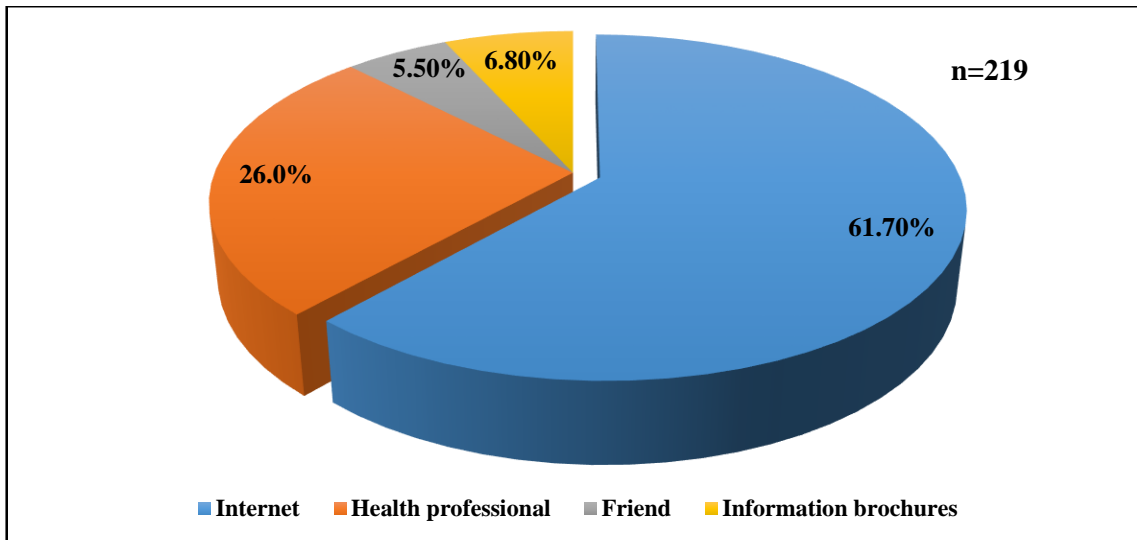


Fig. 1 Distribution of sources used by students for information about HPV

The finding that the respondents' ratio that used health professionals as the main source of information on the problem was approximately a quarter (26.0%) of them, was of concern. Despite the fact that in the future the students might become members of authors' teams of research publications, this main source of objective information was insufficiently known and used by the students covered in the study.

2. KNOWLEDGE OF THE FIRST-YEAR STUDENTS, BULGARIAN LANGUAGE STUDIES AT MU-PLEVEN REGARDING THE VACCINE PREVENTION OF HPV-ASSOCIATED DISEASES

To the question “Are you aware of the availability of a vaccine against HPV infection?” 281 students responded. The answers were distributed as follows: 115 (40.9%) students gave a positive answer while 166 (59.1%) students a negative one. The results showed a high relative share of first-year students, Bulgarian language studies, who were unaware of the HPV vaccine. The distribution of the respondents according to their answers to this question and the secondary school they graduated from was presented in the table. 3

Table 3 Distribution of students per type of secondary school and their awareness of HPV vaccine availability

Answer	Vocational school		School with advanced biology study		School without advanced biology study		Total number	
	number	%	number	%	number	%	number	%
Yes	38	13.5%	35	12.5%	42	14.9%	115	40.9%
No	50	17.8%	57	20.3%	59	21.0%	166	59.1%

**the calculations were made at n=281*

In an attempt to establish the awareness of students regarding the supply of HPV vaccine in Bulgaria, we found that one third (93 persons) of the respondents were well informed, and the majority 67.0% (189 persons) declared their ignorance. The results showed that 75.7% (87 persons) of the students who knew about HPV vaccine existence were also aware of its availability in Bulgaria. The share of the students 24.3% (28 persons) who declared knowledge of the vaccine existence, but insufficient awareness of its availability in Bulgaria, was significantly lower (Fig. 2).

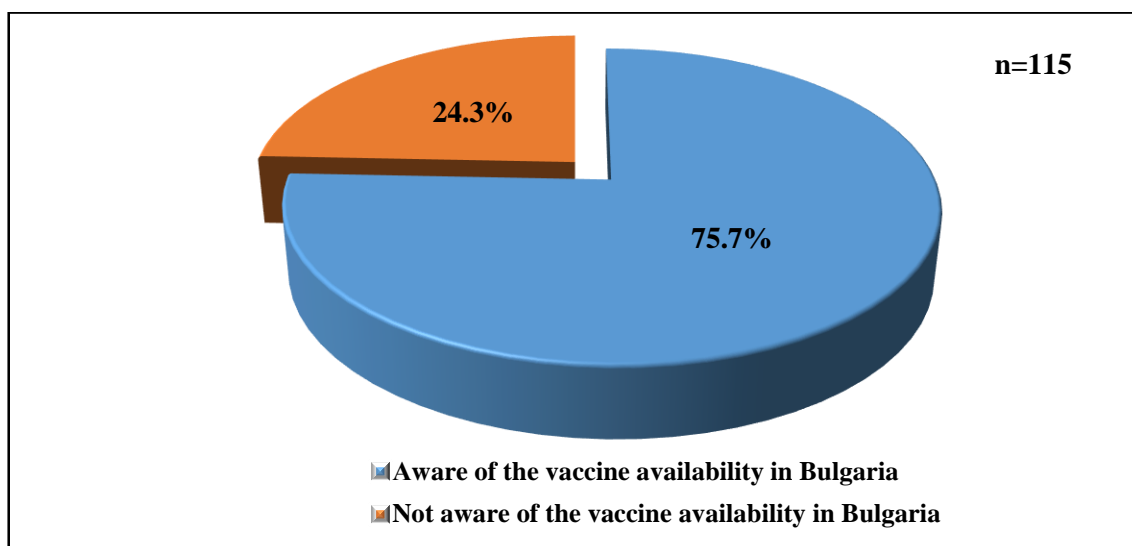


Fig. 2 Distribution of the respondents regarding their awareness of the vaccine availability in Bulgaria

Taking into consideration the low levels of awareness among the respondents regarding the availability of HPV vaccine in Bulgaria, their attitude to receive additional information was further investigated. The results revealed that 250 students (88.0% of the respondents n=284) had a positive attitude, and 28 (9.9%) declared a categorical refusal.

The respondents were surveyed about their preferred source of information about HPV-associated diseases vaccines. As it could be seen from fig. 3, the students gave the highest confidence rate to university professors (42.0%) and the lowest to midwives (0.8%).

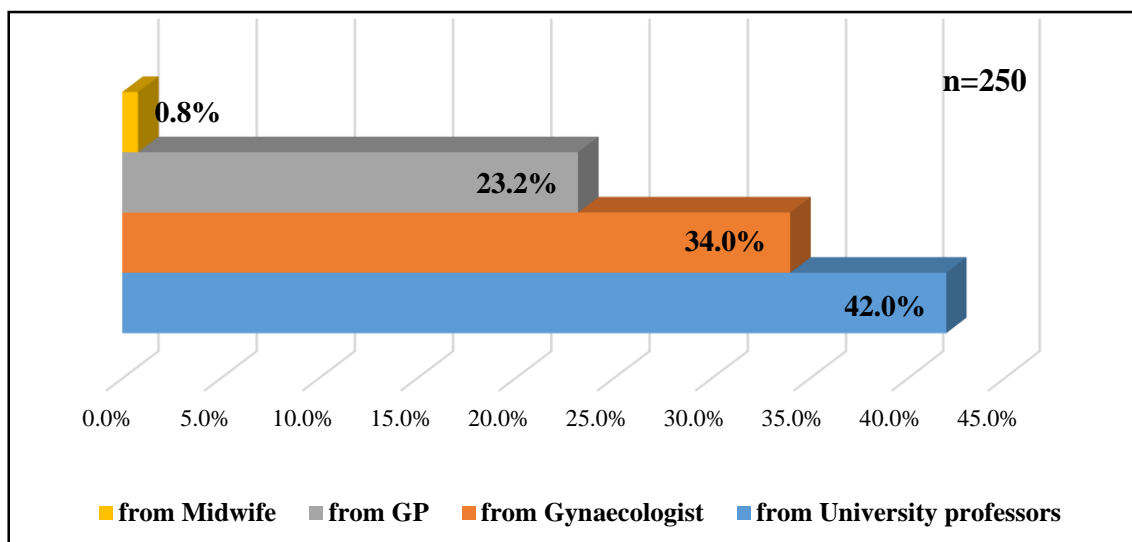


Fig. 3 Source of information on additional knowledge about the HPV vaccine

The vaccination coverage among the respondents was of interest to the researchers. The results demonstrated that only 6.4% (18 students) stated they were vaccinated. The individuals who definitely indicated they were not vaccinated were 56.0% (158 students). The ratio of the respondents who did not know whether they had been vaccinated was also considerable, 37.6% (106 students). The data were presented in Fig. 4.

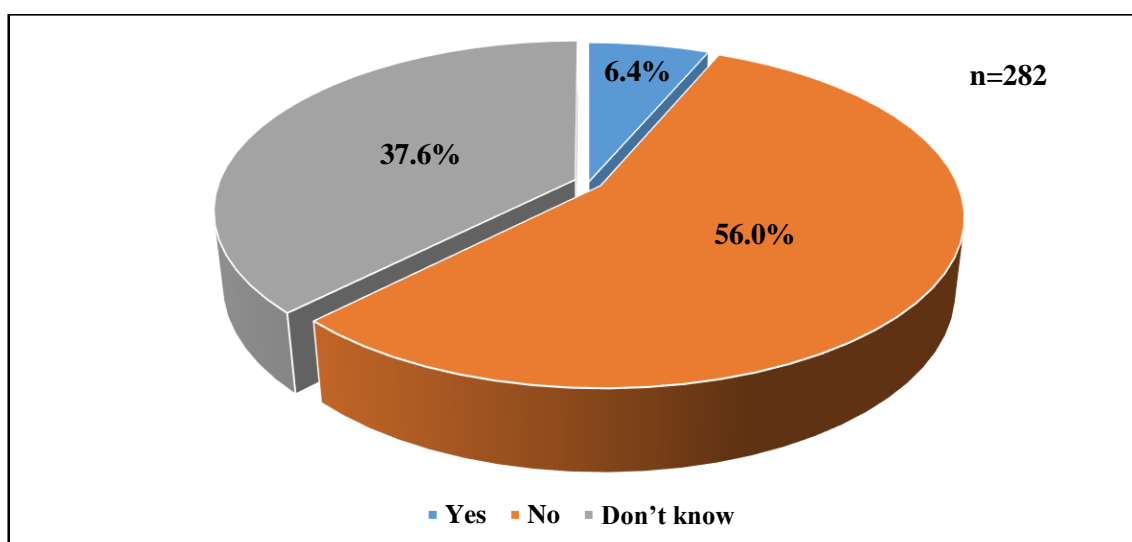


Fig. 4 Distribution of vaccinated and non-vaccinated

The correlation between the respondents' awareness of the HPV vaccine supply in Bulgaria and vaccination coverage with such vaccine was

sought. The data revealed that 5.3% of those informed about the offer of vaccination preparation in Bulgaria were also vaccinated with it (Fig. 5). The data analysis found a significant correlation between both variables ($\chi^2=32.473$, $df=2$, $p<0.05$, *Cramer`s v=0.340*).

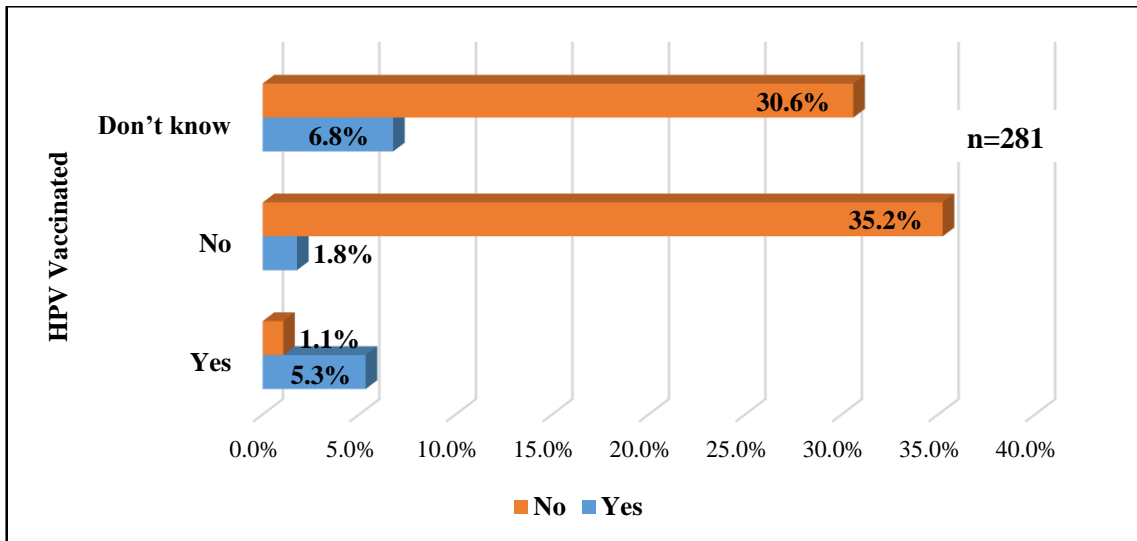


Fig. 5 Distribution of respondents regarding awareness of the supply of HPV vaccine in Bulgaria and vaccination coverage

3. ADULT FEMALES AWARENESS REGARDING HPV AND ITS ASSOCIATED DISEASES, THEIR RELATED RISK FACTORS AND THEIR VACCINE PROPHYLAXIS

To the question “Are you aware of human papilloma virus infection (HPV infections)?” higher awareness rate was found in the group of “cases”. Positive response was given by 63.0% (63 persons) of the group of patients with HPV-associated disease, while in the control group the positive answers were indicated by 57.0% (57 persons). The negative responses showed that the respondents unaware of HPV infection were distributed as follows: 37 (37.0) women from of group of “cases” group and 43 (43.0%) women from the control group. The data were presented graphically in Fig. 6.

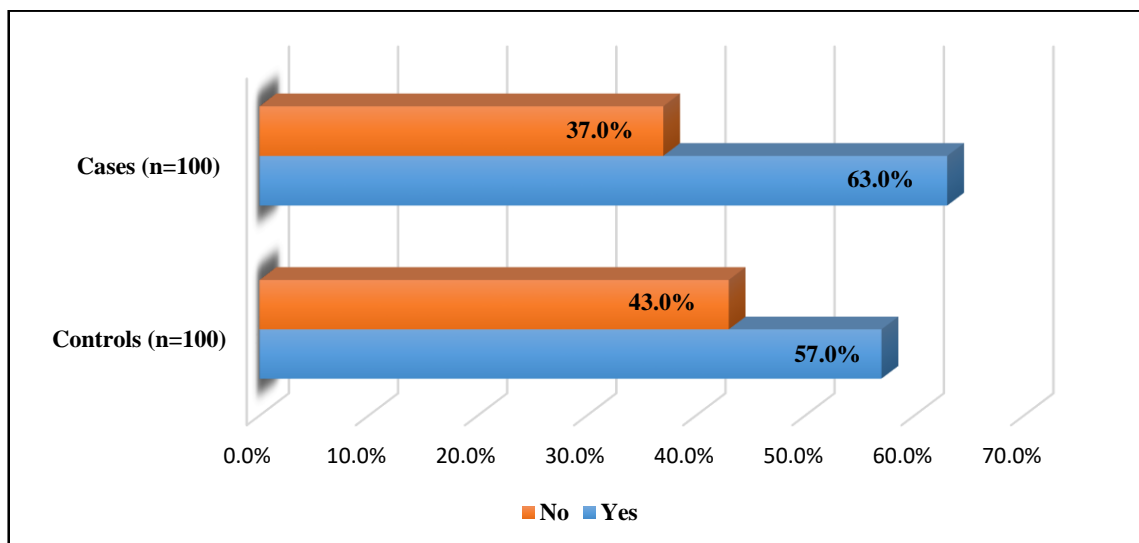


Fig. 6 Patient awareness of HPV infection

For verification the reliability of the respondents’ knowledge related to HPV infection, they were provided the opportunity to indicate a group of diseases caused by the virus. The obtained data showed that the highest ratio of respondents from both groups chose the answer in which all listed nosological units were caused by HPV (condylomas, skin papillomas, cervical/penile cancer). From those who declared knowledge related to HPV

infection, in the group of “cases” (63.0%), the majority 55.6% (35 patients) selected the correct group of HPV-associated diseases. In the control group, from the informed persons (57.0%), a higher ratio indicated properly the nosological units associated with the virus (75.4%). Thus, these results revealed higher ratios of awareness among females in the control group.

In order to analyze the respondents’ awareness, their health literacy was also studied regarding risk factors for HPV infection. The resulting data were distributed as follows:

➤ **Aware of the risk factors**

- Group of the cases – 34.0% (34 persons);
- Control group – 45.0% (45 persons).

➤ **Not aware of the risk factors**

- Group of the cases – 66.0% (66 persons);
- Control group – 54.0% (54 persons).

Analyzing the obtained results, it might be concluded that the group of the cases was less familiar with the risk factors for HPV infection.

A comparison was made between both groups and their stated awareness of HPV infection and the risk factors for infecting with the virus. The data were presented graphically in Fig. 7.

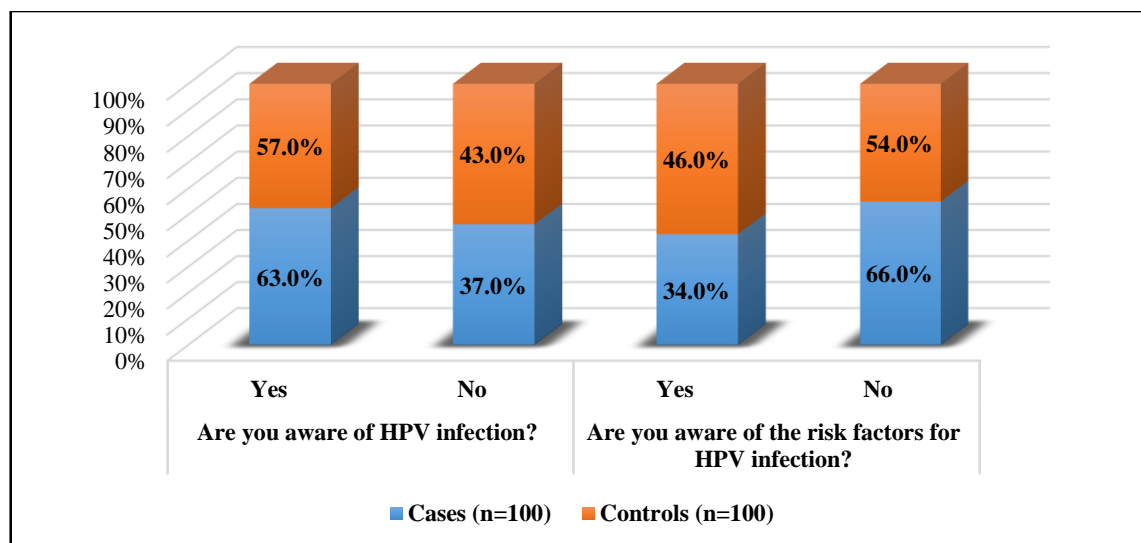


Fig. 7 Distribution of the respondents referring their awareness of HPV infection and the risk factors for infection

The key method in the primary prevention of HPV and its associated diseases had been vaccination. Therefore, the knowledge of adult women was analyzed regarding the availability of HPV vaccine and its supply in Bulgaria.

In order to ascertain the patients' knowledge, it was asked: "Are you aware of the availability of vaccine against HPV infection?". The obtained results were distributed as follows (Fig. 8):

- Group of the cases – 49.0% (49 persons) of the respondents in the group were familiar while low health literacy was registered in 50.0% (50 persons) of the female patients.
- Control group – 45 persons or 45.0% of the group declared knowledge, low health literacy was stated by 54 patients (54.0%);

There was one missing response in both patient groups.

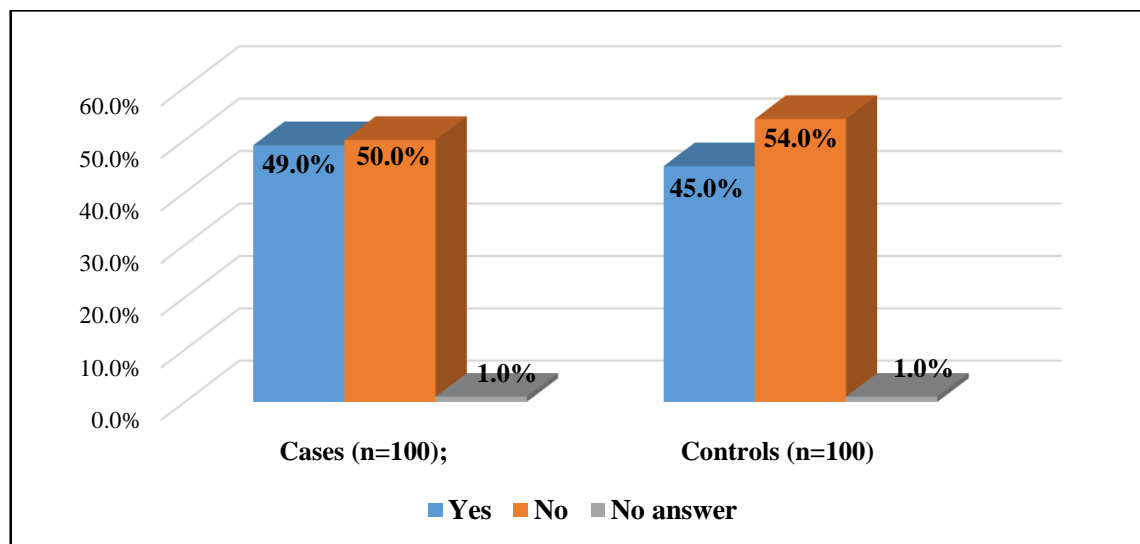


Fig. 8 Patient awareness of the HPV vaccine availability

The results regarding the vaccination coverage among both compared groups showed a lower coverage rate in the group of the cases – only 9 women (9.0%), while in the control group their number was almost double – 17 patients (17.0%). The number of unvaccinated persons was of concern,

as among the cases they were 74.0% (74 women), and in the control group – 68.0% (68 persons). It should be noted that the share of persons who declared they did not know whether they were vaccinated was also considerable – 17.0% of the group of the cases and 15.0% of the control group (Fig. 9). The analysis of the obtained results showed a low rate of vaccination coverage in both groups of respondents.

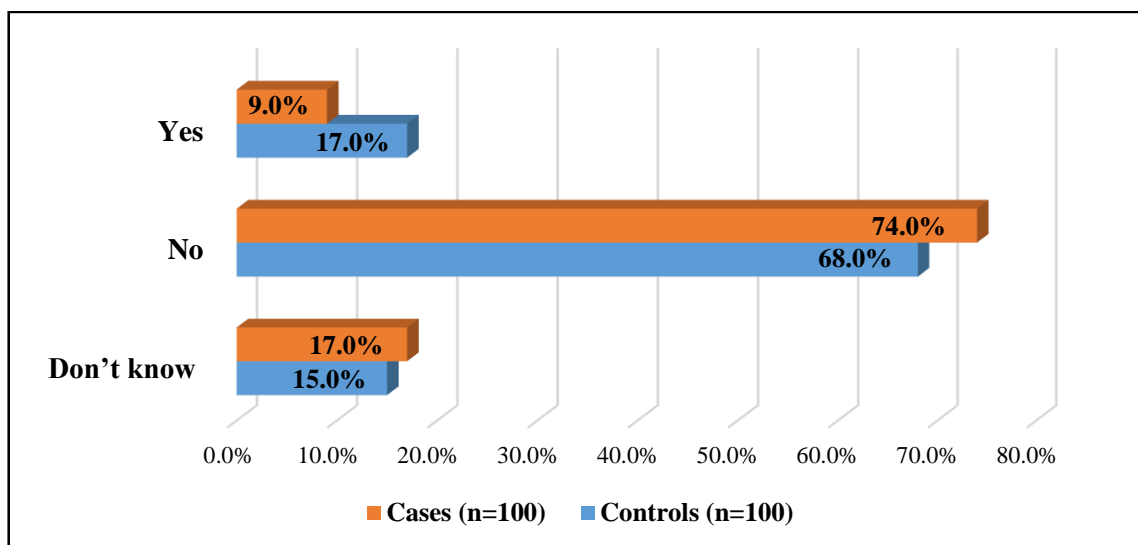


Fig. 9 Distribution of the respondents according to their vaccination

The respondents' attitudes regarding getting additional information about the HPV vaccine were investigated. Of all female, 196 responded (98.0%) distributed equally in both compared groups: 98 from the “cases” and 98 from the “controls”. The obtained results established high levels of desire among both groups for additional knowledge related to the vaccine 78.6% (77 women) from the cases and 74.5% (73 women) from the control group (Fig. 10).

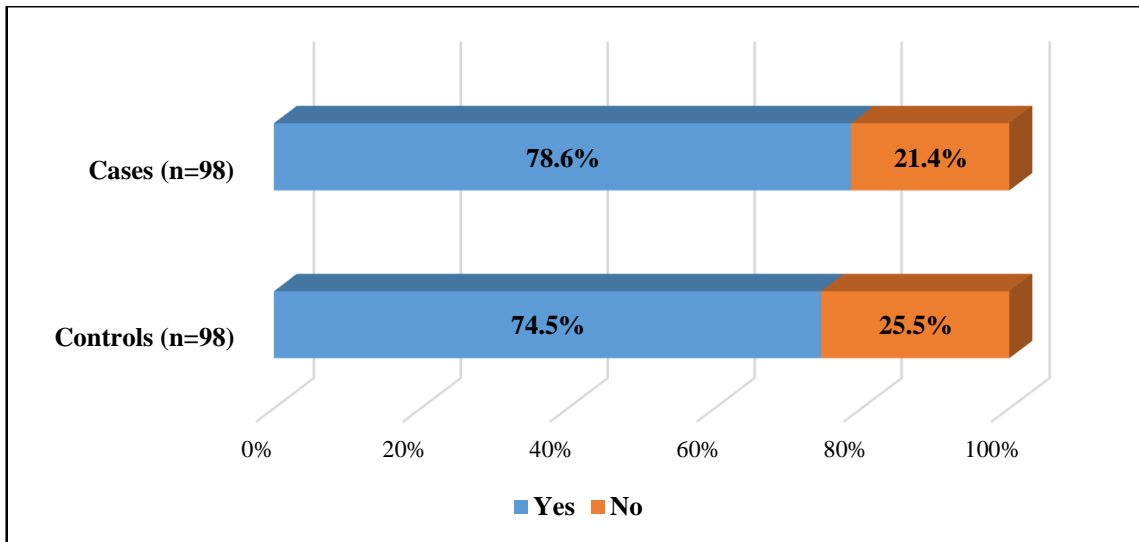


Fig. 10 Distribution of respondents according to their willingness to get additional information related to the HPV vaccine

4. FACTORS WITH A POSITIVE AND NEGATIVE EFFECT ON HPV INFECTION AND DEVELOPMENT OF ITS ASSOCIATED DISEASES

The respondents' distribution in terms of basic demographic factors, factors related to their lifestyle and their obstetric history were presented in table 4.

Table 4 Characteristics of the respondents in relation to their lifestyle

No.	Indicator	Group of the cases (n=100)	Control group (n=100)
1.	Place of residence		
	City/Town	67.0%	87.0%
	Village	33.0%	13.0%
2.	Marital status		
	Married	62.0%	64.0%
	Single	38.0%	36.0%
3.	Frequency of gynecological examinations		
	Twice a year	15.0%	17.0%
	Once a year	42.0%	37.0%
	Every 2-3 years	27.0%	27.0%
	Only in case of a problem	15.0%	19.0%
4.	Delivery		
	Yes	64.0%	74.0%
	No	36.0%	26.0%
5.	Abortions*		
	Yes	26.0%	36.0%
	No	73.0%	62.0%
6.	Smoking		
	Yes	45.0%	52.0%
	No	55.0%	48.0%
7.	HPV vaccinated		
	Yes	9.0%	17.0%
	No	74.0%	68.0%
	Don't know	17.0%	15.0%

** responses are not 100%,as three of the respondents did not give an answer.*

In both compared groups, the urban residence predominated – 67% of the women in the group of cases and 87.0% from the controls. The relative

share of the “cases” who declared a rural residence was two and a half time higher (33.0%) compared to that of the “controls” (13.0%). Among the “cases” the ratio of smokers prevailed (55.0%), while the ratio of non-smokers prevailed among the “controls” - (52.0%). Although low in general, the ratio of the vaccinated among the “controls” (17.0%) was almost twice as high as that among the “cases” (9.0%).

The factors increasing the risk of HPV infection and the development of a HPV-associated disease were presented in table 5.

Table 5 Factors increasing the risk of HPV infection and the development of HPV-associated disease

No.	Factor	OR	CI	P
1	Age 18-30	1.12	0.64 – 1.95	NS
2	Education (primary and secondary)	2.36	0.97 – 5.74	0.05
3	Place of residence –city/town	1.29	1.11 – 1.52	0.001
4	Smoking – yes	1.16	0.86 – 1.54	NS
5	HPV vaccination – no	2.05	0.86 – 4.92	NS
6	Frequency of gynecological examinations - 2-3 times per year or only in case of a problem	1.16	0.66 – 2.02	NS
7	Sexual contacts – yes	1.03	0.88 – 1.20	NS
8	Use of contraceptives – no	1.55	0.86 – 2.79	NS
9	Use of hormonal contraceptives, “IUD” and interrupted sexual intercourse	1.21	0.59 – 2.45	NS
10	Deliveries – no	1.16	0.96 – 1.4	NS
11	Birth by normal mechanism	1.13	0.85 – 1.45	NS
12	Abortions – yes	1.39	0.92 – 2.13	NS
13	Gynecological surgeries – yes	1.38	0.96 – 2.03	NS
14	Concomitant gynecological diseases – yes	1.42	0.82 – 2.45	NS
15	Relatives with oncological gynecological disease – yes	1.04	0.70 – 1.54	NS

Of the 15 studied factors, 3 were significant, incl.

- primary and secondary education OR=2.36; 95% CI (0.97 – 5.74);
- no HPV vaccination OR=2.05; 95% CI (0.86 – 4.92);
- place of residence in a city/town OR=1.29; 95% CI (1.11- 1.52).

The factors that have a protective effect on HPV infection and the development of an associated disease were presented in the table 6.

Table 6 Factors having a protective effect on HPV infection and development of virus-associated disease

No.	Factor	OR	CI	P
1	Age 31-49	0.95	0.78 – 1.16	NS
2	Education (secondary and higher)	0.43	0.17 – 1.03	0.05
3	Place of residence – rural	0.39	0.22 – 0.73	0.001
4	HPV vaccination – yes	0.46	0.19 – 1.00	NS
5	Preventive gynecological examinations – once or twice per year	0.85	0.49 – 1.51	NS
6	Smoking – no	0.87	0.66 – 1.14	NS
7	Sexual contacts – no	0.92	0.56 – 1.50	NS
8	Use of contraceptives – yes	0.64	0.36 – 1.17	NS
9	Use of condoms	0.82	0.40 – 1.68	NS
10	Deliveries – no	0.72	0.47 – 1.10	NS
11	Operative delivery	0.76	0.43 – 1.33	NS
12	Abortions – no	0.86	0.71 – 1.03	NS
13	Gynecological surgeries – no	0.82	0.66 – 1.04	NS

From the investigated 13 factors having a protective effect on HPV infection and development of HPV-associated diseases only 2 were of statistical significance:

- education (secondary and higher) (p=0.05)
- residence in rural areas (p=0.001).

Analyzing the data, it was found that 57.0% of the cases were in the age group of 31-49 years. In the control group, the highest ratio (52.0%) was in the same age group (31-49 years). The study had identified that individuals in the 18-30 age group had a 1.12 times higher risk of HPV infection (OR= 1.12; 95% CI=0.64 – 1.95).

Based on the obtained data, the study specified education as a risk factor for the development of HPV-associated disease. Female patients who

had completed elementary or primary education (8% of the controls and 19% of the cases) had a twice higher risk of becoming infected with HPV and developing a virus-associated disease (OR=2.35 95% CI 0.97-5.75).

The participants in the research were distributed as follows according to whether they had been vaccinated against HPV: only 17.0% (17 women) of the group of the cases and 9.0% (9 women) of the control group were vaccinated. The data had proven that vaccination rates among adult women were low. The study identified non-vaccination as a factor that increased the risk of HPV infection and the development of HPV-associated disease (OR=2.05; 95% CI: 0.86 – 4.92; p=0.11).

Prophylactic gynecological examinations had been of great importance for carrying out secondary prevention. The percentage ratio of the respondents according to the frequency of visiting a gynecologist was as follows: 42.0% (42 persons) from the group of the cases and 37.0% (37 persons) from the control group had preventive examinations once a year. The fact that there were respondents who visited a specialist only in the event of a problem was worrying, that was 15.0% of the cases and 19.0% of the control group.

The study found that having a prophylactic gynecological examination once or twice a year had a protective effect on women (OR = 0.85; 95% CI: 0.49-1.51).

5. ANALYSIS OF THE NEEDS FOR CONTINUING EDUCATION AMONG MIDWIVES WORKING IN HOSPITALS AND OUTPATIENT MEDICAL FACILITIES FOR OBSTETRICAL-GYNECOLOGICAL CARE IN THE TOWN OF PLEVEN, REGARDING MIDWIFERY ACTIVITIES FOR THE PREVENTION OF HPV-ASSOCIATED DISEASES

Midwives' knowledge about the nature of prevention and the prevention levels were analyzed. From the midwives 42 of them (84.0%) stated to have knowledge about the prevention levels. To check the confidence of the declared knowledge, the respondents were given the opportunity to enter the prevention levels they knew. 64.3% (27 persons) of the midwives responded and indicated that they have knowledge related to the prevention levels. The obtained results were distributed as follows (Fig. 11): The predominant part of the surveyed 57.1% (24 midwives) responded they were familiar with all three levels of prevention (primary, secondary and tertiary), as with the core of primary prevention – 4.8% (2 midwives) and only 2.4% (1 midwife) indicated secondary prevention as a level they knew.

An unsatisfactory degree of knowledge related to the levels of preventive activity was found.

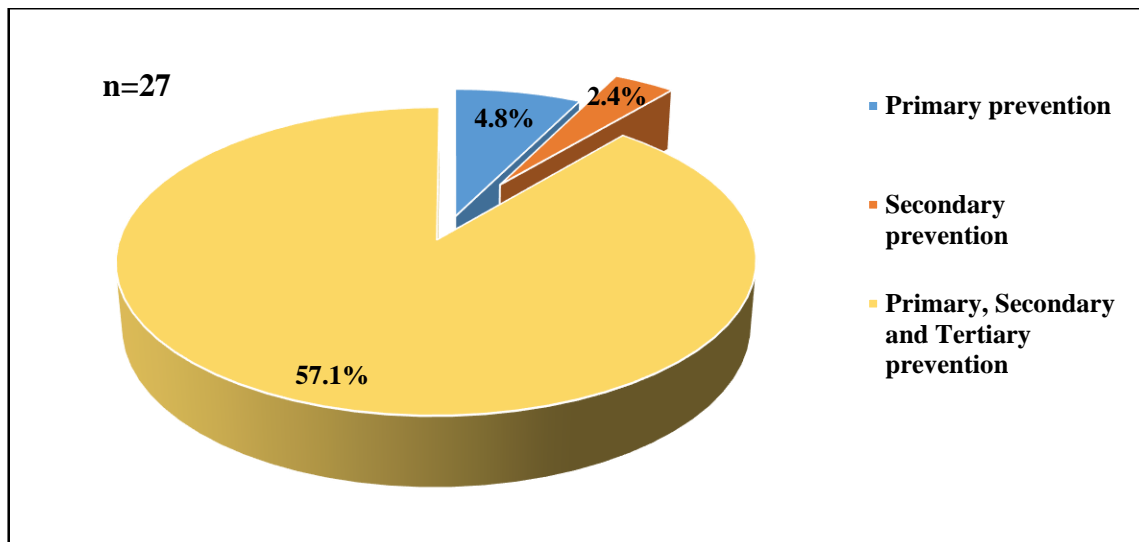


Fig. 11 Distribution of respondents according to the levels of prevention they know

Another focus of analysis in the study was also the respondents' level of knowledge regarding the prevention of HPV-associated diseases. 92.0% (46 midwives) declared to have knowledge. The results showed that midwives working in medical facilities for inpatient and outpatient obstetric and gynecological care had excellent knowledge related to the prevention of HPV-associated diseases. The ratio of respondents who stated not to have knowledge was very small (8.0%).

Taking into consideration the high levels of knowledge declared by the respondents, it was investigated the main source of information related to the prevention of HPV-associated diseases. The highest ratio (65.2%) of the respondents indicated that studying at the Medical University was the main source of information. The lowest was the percentage of midwives who used scientific forums (4.3%) and scientific sources and literature (4.3%) to obtain knowledge related to the prevention of HPV-associated diseases. The training in the disciplines in which topics related to prevention in general and the prevention of the studied group of diseases were considered sufficient by over half of the surveyed midwives.

In order to establish the need for continuing education related to the prevention of HPV-associated diseases, the opinion of midwives working in medical facilities for inpatient and outpatient obstetric and gynecological care in the town of Pleven was studied. The data obtained revealed that only 14.0% (7 midwives) of the respondents had attended continuing education courses. To identify the reason for the high rate of non-attendance (86.0%), the respondents were given the opportunity to point out the reason. Of those who declared that they did not attend continuing education courses (43 midwives), only 14 (32.6%) indicated the reasons. The answers were divided into four groups:

- ✓ lack of time;
- ✓ lack of information;
- ✓ impossibility of absence from work;
- ✓ no specific reason.

The highest percentage of the respondents indicated the lack of time (50.0%), followed by the lack of information among 35.8% (5 midwives). The ratio distributions of the respondents who indicated the impossibility of absence from work and those who have no specific reason for not attending continuing education courses were equal – 7.1% (one midwife each).

The level of the respondents' awareness regarding continuing education courses related to the risk factors and the prevention of HPV-associated diseases was also investigated. The data obtained demonstrated that only one midwife (14.3%) of the seven who declared that they attended continuing education courses indicated that she was familiar with holding courses related to HPV-associated diseases. The analysis indicated low awareness among midwives, which was explained by the different nature of their work: narrow specialization in midwifery activities related to pregnancy, childbirth and the postpartum period; in gynecological practice; in the preventive activity. The low levels of awareness also explained the

low rates of attending such continuing education courses – only one midwife (14.3%) out of seven attending continuing education courses declared that she attended such courses related to HPV-associated diseases.

The respondents' attitudes regarding attending continuing education courses on "Prevention of HPV-Associated Diseases" were also of interest to the authors. Of 100% (50 midwives) who answered this question, 90% (45 midwives) of the respondents are willing to attend such a course (Fig. 12).

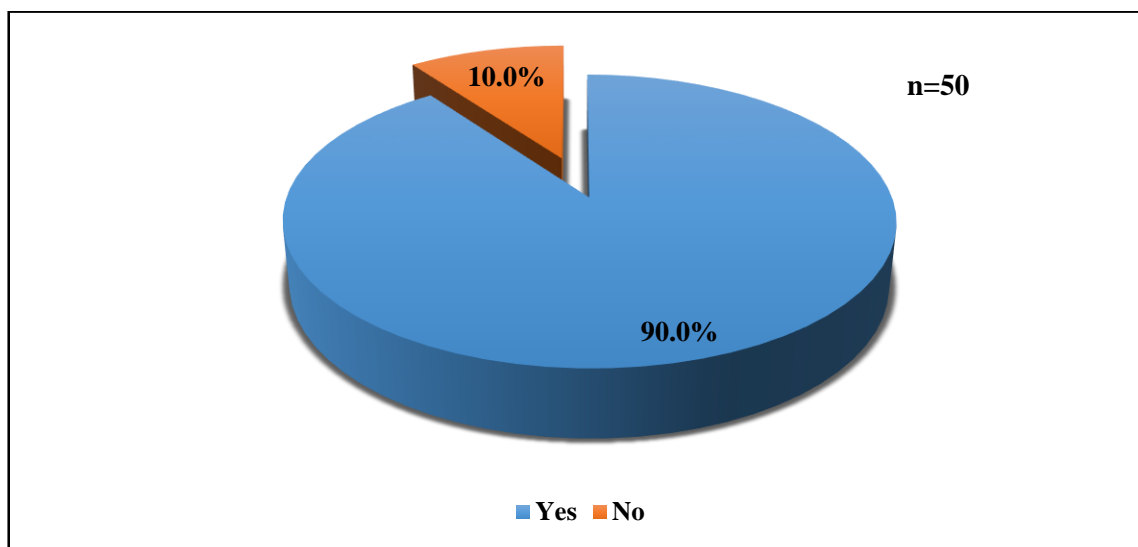


Fig. 12 Midwives' willingness to enroll in a postgraduate training course

To find out the needs and nature of continuing education courses related to the prevention of HPV-associated diseases, the respondents' views on the level of prevention to be addressed were analyzed. Forty-two midwives responded (93.3%), who declared a desire to participate in a course, of which 23 midwives (54.8%) would like to pay attention to all levels of prevention, 8 midwives (19.0%) preferred primary prevention, the secondary prevention was preferred by 2 of the respondents (4.8%) and 9 midwives (21.4%) indicated tertiary prevention (Fig. 13).

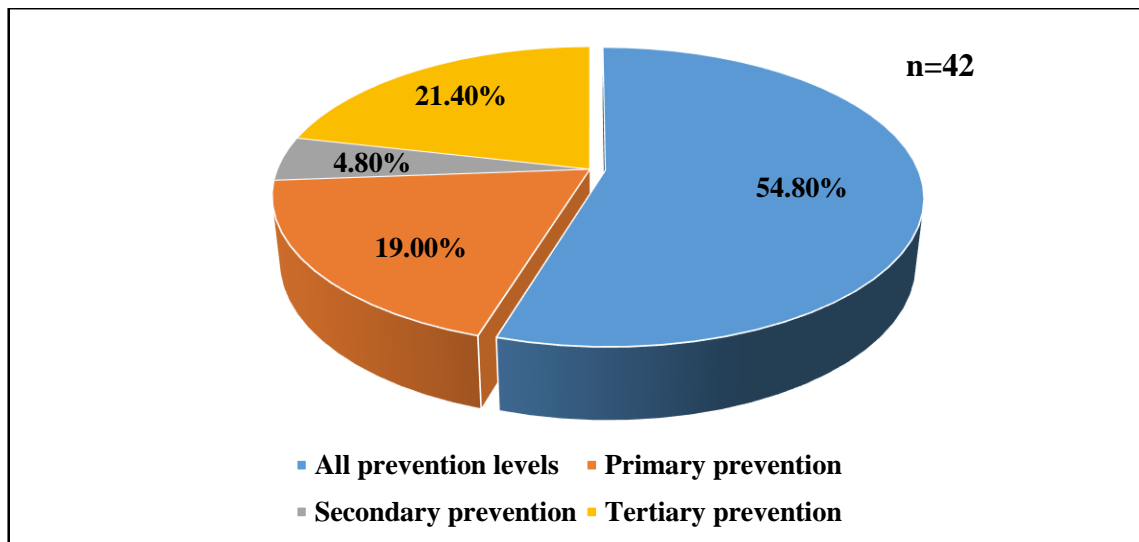


Fig. 13 Distribution of respondents by necessity of training in the different levels of prevention

The analysis of the results showed that the midwives working in medical facilities for inpatient and outpatient obstetric and gynecological care in the town of Pleven were willing to attend postgraduate training courses (90.0%), which included all three levels of prevention (54.8%). With a view of the data obtained, a continuing education program for midwives on the topic “Obstetric Activities in the Prevention of HPV-Associated Diseases” was worked out.

6. ORGANIZATIONAL MODEL FOR MIDWIFERY ACTIVITIES FOR EFFICIENT PREVENTION OF HPV-ASSOCIATED DISEASES

Those included in the case-control study were asked the question “Would you consult a midwife for advice on HPV infections prevention?” Over half of the patients in the group of cases (61.0%) declared consent. The majority (54.0%) of women in the control group gave the same answer. Over a quarter of both groups could not say whether they would consult a midwife for advice on how to prevent HPV infection. In the group of cases, their number was 35, which was equal to 35.0%, and in the control group – 30 women, or 30.0% of the respondents in the group of the female patients. A definite refusal to seek a midwife was declared by 4.0% (4 patients) from the group of the cases and 16.0% (16 female) from the control group (Fig. 14).

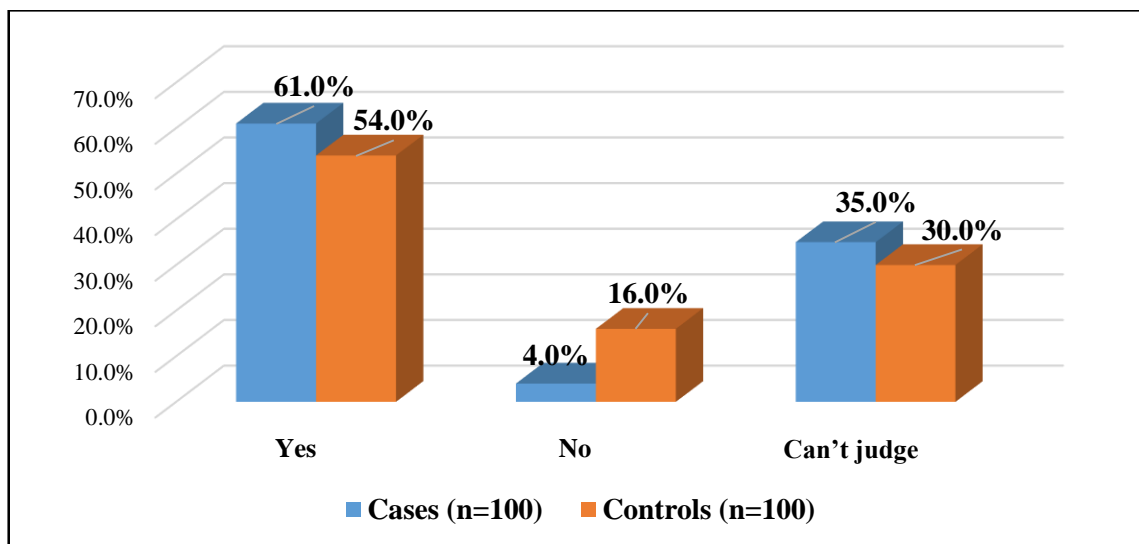


Fig. 14 Patients' trust in midwives regarding advice on HPV prevention advice

Based on the results obtained, a relatively low level of trust in midwives was found in terms of providing advice on preventing one of the most common sexually transmitted infections (HPV infection).

A statistical correlation was found between adult women's trust in midwives and the education the respondents ($\chi^2=30.744$, $df=6$, $p=0.00$, Cramer's $V=0.277$). That proved that education was of importance for the trust respondents would vote for the midwife.

The surveyed adult women were asked whether they would consult a midwife for early diagnosis/screening of HPV-associated diseases. All respondents gave a response: 100 patients from the group of the cases and 100 female from the control group. The results revealed that the majority, 51.0% (51 women) from the group of the cases and 54.0% (54 women) of the control group, respectively, declared that they would seek a midwife also in connection with HPV diagnosis. A high ratio of the female in the group of cases (48.0%) indicated that they could not decide whether they would seek a midwife for early diagnosis or screening, and in the control group it was 45 women (45.0%). The share of women who definitely refused to seek a midwife was insignificant – only one from both groups of respondents, or that was 1.0% of the control group and 1.0% of the cases.

The respondents from the group of adult women were asked for their opinion on the possibility of turning to a midwife for advice on health status follow-up after treatment for HPV-associated disease. The results obtained were as follows: 49 individuals (49.0%) from the group of the cases and 55 women from the control group (55.0%) responded positively. The ratio of respondents who cannot decide whether they would seek advice from a midwife after treatment was not low either. In the group of the cases, there were 50 patients (50.0%), and in the control group – 44 (44.0%).

The respondents from the group of midwives were asked “Do you feel theoretically ready to work independently in the prevention of HPV-associated diseases?” The highest ratio (40.0%, or 20 midwives) declared hesitation, indicating the answer “I cannot judge”. A positive attitude, 38.0%

(19 persons) declared their theoretical training, and the respondents who felt insufficiently prepared were 11 persons (22.0%). The difference in the percentage distribution of positive and neutral (“I can’t judge”) responses was 2.0%, which confirmed the respondents’ indecisiveness.

The dependence between the work experience and the theoretical preparation of the respondents for independent activities in the prevention of HPV-associated diseases was analyzed. Among all possible answers, the ratio of respondents with 1-10 years of work experience who could not assess their theoretical background was the highest – 10 midwives or 20.0%, while 16.0% (8 midwives) with experience from 1 to 10 years had declared that they were theoretically competent. The answers of the respondents with 11-20 years of work experience were the same in terms of percentage. The distribution of the obtained data was presented in detail in table. 7

Table 7 Percentage distribution of respondents by work experience and theoretical training for independent activities

Work experience	Do you feel theoretically prepared to work independently in the prevention of HPV-associated diseases?			Total
	Yes	No	I can’t judge	
Below 1 year	0 (0.0%)	0 (0.0%)	2 (4.0%)	2 (4.0%)
1 – 10 years	8 (16.0%)	6 (12.0%)	10 (20.0%)	24 (48.0%)
11 – 20 years	8 (16.0%)	3 (6.0%)	2 (4.0%)	13 (26.0%)
21 – 30 years	2 (4.0%)	1 (2.0%)	4 (8.0%)	7 (14.0%)
Over 30 years	1 (2.0%)	1 (2.0%)	2 (4.0%)	4 (8.0%)
Total	19 (38.0%)	11 (22.0%)	20 (40.0%)	50 (100%)

The study did not find a significant correlation between the theoretical training for independent activities in the prevention of HPV-associated diseases and the work experience of the midwives ($\chi^2=8.282$, $df=8$, $p=0.407$, Cramer’s $v=0.288$). That had proven that the gained work experience was not in direct correlation with the theoretical training of the

midwives in the preventive activity of the studied group of diseases. Although no significant correlation was found between both variables (work experience and theoretical training), the results confirmed a lack of sufficient theoretical training on the studied problem among the surveyed respondents (44.0%). That substantiated the need to develop and attend continuing education courses related to the prophylactic activity of midwives in HPV-associated diseases.

The respondents from the latter group were also asked the question “Do you feel prepared in a practical direction, to work independently in the prevention of HPV-associated diseases?” The results were presented graphically in fig. 15.

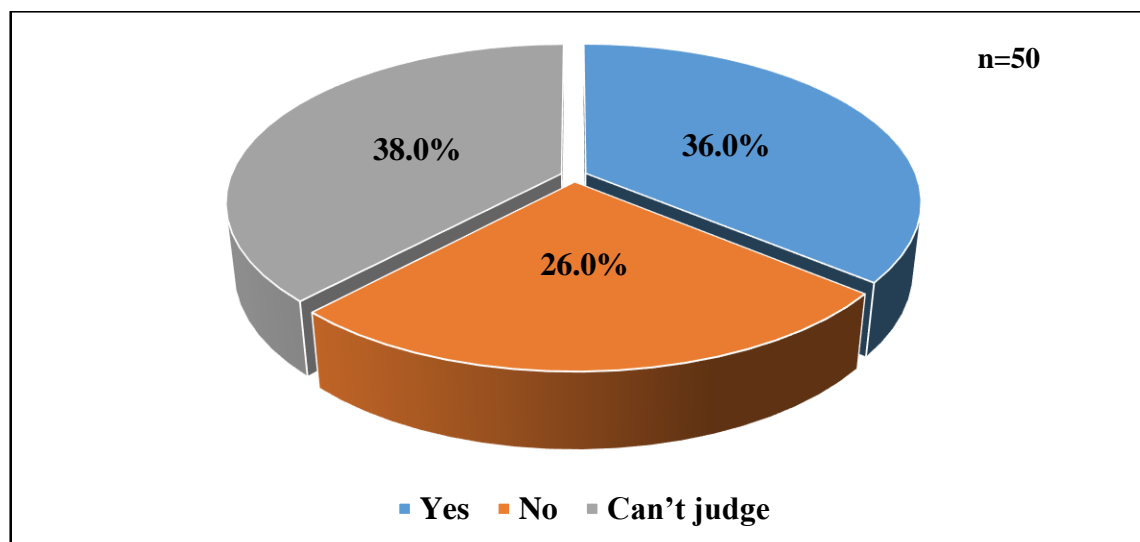


Fig. 15 Practical preparation for independent activities for the prevention of HPV-associated diseases

The obtained results showed that midwives who felt practically ready for independent activities for the prevention of HPV-associated diseases and those who could not judge had an almost equal ratio with a difference between both of 2.0%. That confirmed that among the respondents there was uncertainty in their practical skills for independent activities in the preventive activity of the studied group of diseases.

A comparison was made between the answers and the work experience of the respondents. The data were presented in detail in the table 8.

Table 8 Percentage distribution of respondents by work experience and practical training for independent activities

Work experience	Do you feel prepared in a practical way to work independently for the prevention of HPV-associated diseases?					
	Yes		No		I can't judge	
	Number	%	Number	%	Number	%
Below 1 year	0	0.0%	0	0.0%	2	4.0%
1 – 10 years	10	20.0%	7	14.0%	7	14.0%
11 – 20 years	5	10.0%	4	8.0%	4	8.0%
21 – 30 years	2	4.0%	1	2.0%	4	8.0%
Over 30 years	1	2.0%	1	2.0%	2	4.0%
Total	18	36.0%	13	26.0%	19	38.0%

According to the results presented in this way, midwives with work experience of 1 to 10 years (20.0%) were practically better trained for independent activities for the prevention of HPV-associated diseases (20.0%), followed by those with work experience of 11 – 20 years (10.0%). This was due to the fact that the education of recent graduates and practicing midwives included training for midwives' independent competencies and independent practices.

A comparative analysis was made of the willingness of midwives to answer questions of patients with a diagnosed HPV-associated disease and the work experience they had. The data were distributed as follows: midwives with 1 to 10 years of work experience - 24.0% (12 midwives) - had the highest relative share among those who answered positively. The ratio (22.0%) of respondents from the same group (work experience from 1 to 10 years) who declared uncertainty in their readiness for this type of communication ("I can't judge") was also significant. Those who declared a definite lack of readiness were 2.0% (1 midwife) with work experience from

1 to 10 years and 4.0% (2 midwives) with work experience from 11 to 20 years. The data were presented in Fig. 16

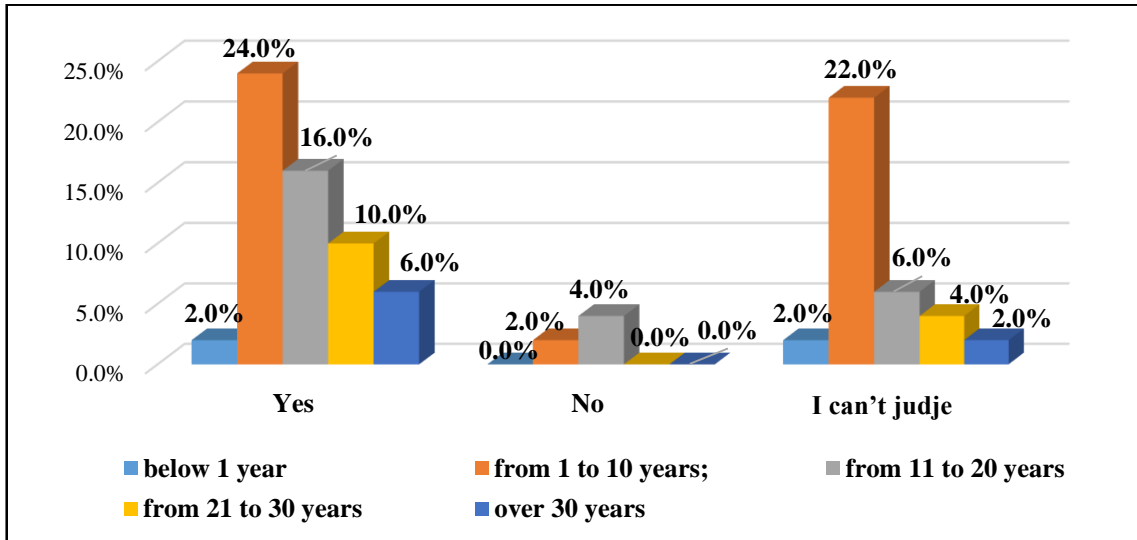


Fig. 16 Distribution of respondents by length of service and willingness to answer questions of female patients with HPV-associated disease

No statistically significant differences were found between work experience and the willingness of midwives to communicate effectively with patients ($\chi^2=5.153$, $df=8$, $p=0.741$, Cramer`s $v=0.227$). That proved that communication skills were not acquired with increasing work experience, but could only be improved.

Based on the statistical analysis of the study results and the current normative documents related to the obstetric activities in the preventive activity, a SWOT analysis was made of the proposed organizational model of midwifery activities for effective prevention of HPV-associated diseases (Table 9).

Table 9 SWOT-analysis of the organizational model implementation for midwifery activities for effective prevention of HPV-associated diseases.

<p>Strengths</p> <ul style="list-style-type: none"> ✓ Availability of normative documents allowing independent activities in the prevention of sexually transmitted infections; ✓ Quick access to a specialist for screening; 	<p>Weaknesses</p> <ul style="list-style-type: none"> ✓ Lack of funding from the NHIF; ✓ Lack of trained midwives for VIA test; ✓ Lack of independent midwifery practices.
<p>Opportunities</p> <ul style="list-style-type: none"> ✓ Inclusion of midwives in the National Program for Primary Prevention of Cervical Cancer; ✓ Active participation of midwives in preventive activities; 	<p>Threats</p> <ul style="list-style-type: none"> ✓ Small number of certified midwives in the country; ✓ Lack of active monitoring of risk groups of patients; ✓ Lack of effective population screening; ✓ Lack of trust in the midwife to carry out preventive activities; ✓ Small number of midwives working in outpatient medical care facilities

Based on the performed literature review, the results obtained from the study and the presented SWOT-analysis, an organizational model of midwifery activities for effective prevention of HPV-associated diseases was worked out. The model was in line with the world recommendations and practices, which made it applicable in Bulgaria as well.

In the proposed organizational model, the midwife would have a role in all three levels of prophylactic activity.

At the level of **primary prevention**, the midwife was to organize and carry out the following activities:

✓ *Information campaigns* – they would be focused to broaden the knowledge of students aged 11-18 and parents of adolescent children. The midwife has the knowledge, skills and competences to carry out information campaigns

✓ *Education related to the risk factors* for HPV infection and the development of an associated disease - the knowledge of persons at a young age would lead to an increase in the conscious choices for prevention and limiting the risk factors. Good health literacy is the foundation of a healthy society;

✓ *Vaccination* – the activity is aimed at adolescents of the appropriate age for vaccination, as well as their parents. The midwife can organize a vaccination campaign as well as conduct it.

At the level of **secondary prevention**, the midwife carries out and organizes early screening to diagnose the viral infection before there were any signs of it or before HPV-associated disease had developed.

✓ *Population screening* – following theoretical models, this screening targets the entire female population. The periodicity in each country is different and is discussed in detail in chapter 5 of the literature review. In the proposed organizational model for preventive activities, the midwife is entitled to organize and carry out population screening. Her competencies include taking sample for a conventional pap smear (PAP test) and interpreting the results. Due to the technology advancement, the midwife can perform colposcopic visualization of the cervix. To the present, the midwife did not have the right to interpret the obtained results, but through the pocket colposcope, a quick connection is made with a doctor, who can explain the image and, if necessary, order additional tests.

✓ *Targeted screening* – aimed at patients in a risk group for HPV infection and the development of an associated disease. The midwife is entitled to organize and carry out DNA typing, through a vaginal test. She is also competent enough to interpret the obtained results. If the test is positive, the patient is referred for a colposcopic investigation (VIA test) and assessment for treatment.

At the level of **tertiary prevention** – the actions are focused at patients with proven HPV-associated disease. The goal of this level of prevention is to keep the disease or HPV infection from recurring. The midwife is competent to:

✓ Give advice and recommendations related to hygiene and dietary regimen, it is extremely important that patients with a diagnosed HPV-disease to eat well so that their immunity can be at a good level (Weakened immunity is a risk factor for the development of HPV-associated disease. This was discussed in detail in Chapter 3 of the literature review);

✓ Give advice related to sexual life, emphasizing the prevention methods and the risk factors for the disease recurrence;

✓ Explain the frequency of check-ups by making an appointment for the next visit.

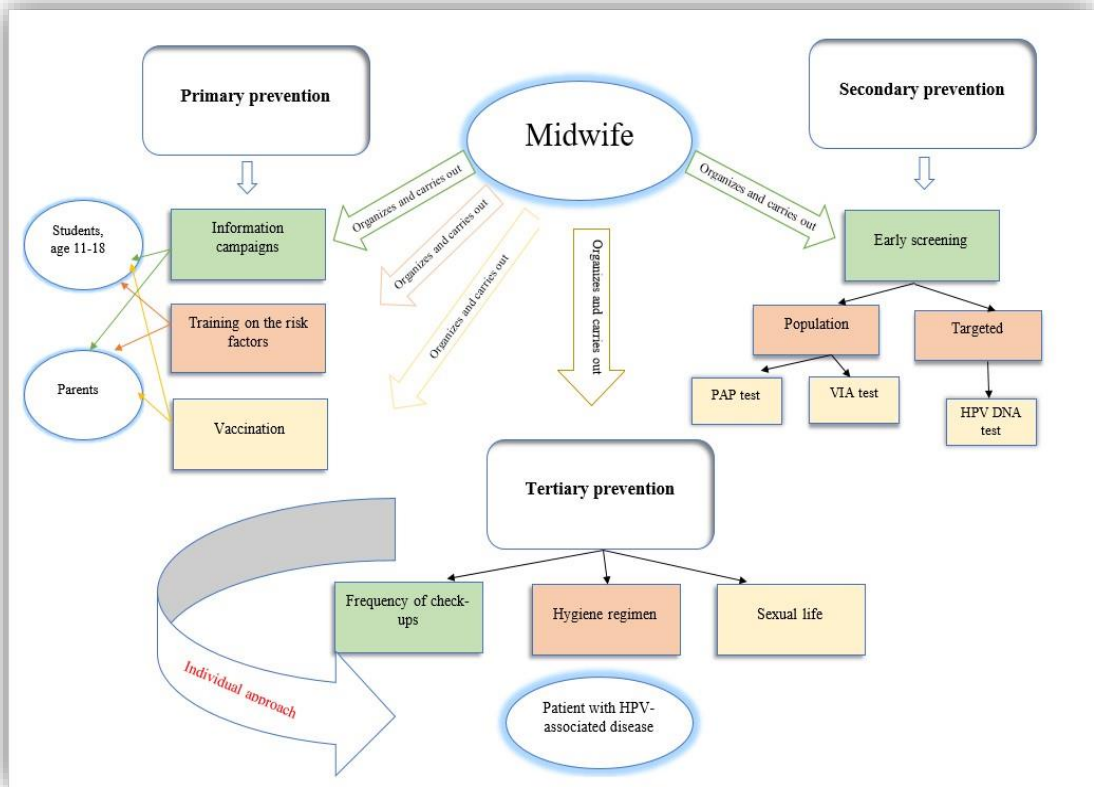


Fig. 17 Organizational model of midwifery activities for effective prevention of HPV-associated diseases

III CONCLUSIONS, RECOMMENDATIONS AND CONTRIBUTIONS

1. CONCLUSIONS

1.1. First-year students at MU-Pleven, Bulgarian-language studies, have been well informed about the infection caused by the HPV virus (77.9%), but have low awareness about the risk factors for HPV infection (56.4% of the respondents). 59.1% of the surveyed were insufficiently informed about the vaccine prophylaxis of the diseases associated with the studied virus.

1.2. Slightly more than half (52.5%) of the adult women included in the case-control study would visit a midwife regarding the diagnosis/screening of HPV-associated diseases. The ratio of women in the control group was similar, 55.0% (55 women) who would consult a midwife regarding health follow-up in the post-treatment period. From the group of cases, 49.0% (49 patients) declared confidence in the midwife. That proved that the midwife had a role in the tertiary prevention of HPV-associated diseases.

1.3. The study found a low level of confidence (38.0%) of midwives to apply their theoretical knowledge in independent activities related to the prevention of HPV-associated diseases.

1.4. Small ratio of midwives (36.0%) who were confident of applying their practical skills in independent activities related to the prevention of HPV-associated diseases.

1.5. The surveyed midwives were interested and would participate in continuing education courses related to midwifery activities in the prevention of HPV-associated diseases (90.0%).

The study confirmed the following hypotheses:

Hypothesis 1. Midwives' confidence to apply their theoretical knowledge and practical skills in independent activities in the prevention of HPV-associated diseases was low.

Hypothesis 2. Midwives were not recognized by community as specialists with a key role in preventive activities regarding HPV-associated diseases.

Hypothesis 3. There had been a need for an organizational model for midwifery activities and care in the prevention of HPV-associated diseases.

2. RECOMMENDATIONS

2.1. To the Ministry of Education

- ✓ Topics related to HPV-associated diseases and risk factors should be included in the Biology and Health Education training;
- ✓ In the Framework requirements for the school hour with the class supervisor, topics related to the risk factors and the way of HPV infection to be included;

2.2. To the Ministry of Health

- ✓ Screening programmes related to HPV and its associated diseases should be mandatory.
- ✓ To organize courses for continuing education of midwives related to the colposcopy method of diagnosis;
- ✓ Midwives should be included in the National Cervical Cancer Prevention Program.

2.3. To the Medical Universities

- ✓ Midwifery students should be trained theoretically and practically in colposcopy diagnostics;
- ✓ To include more academic hours of training related to preventive activities for students of all majors;

- ✓ To be included in the schedules for continuing education, the programme for “Midwifery activities for effective prevention of HPV-associated diseases”;

3. CONTRIBUTIONS

3.1. Of theoretical nature

- ✓ The readiness of midwives for independent activities in the prevention of HPV-associated diseases had been established;
- ✓ The need for continued training of midwives related to preventive activities had been confirmed;
- ✓ The need to supplement the curriculum in Biology and Health Education had been proven;

3.2. Of practical and applied nature

- ✓ A curriculum for continuing education of midwives was developed, on the topic “Obstetric Activities in the Prevention of HPV-Associated Diseases”;
- ✓ An organizational model for midwifery activities for effective prevention of HPV-associated diseases was proposed;

PUBLICATIONS AND SCIENTIFIC ANNOUNCEMENTS RELATED TO THE DISSERTATION PAPER

Publications:

1. Stoyanova E., E. Mineva, M. Kamburova, Awareness of the first-year students from MU - Pleven about HPV - associated diseases and their related risk factors, Proceedings from the Twentieth Jubilee National Scientific Session for students and teachers; TWENTIETH Jubilee National Scientific Session for Students and Teachers, 27-28 Oct. 2022, pp. 65-71; ISBN: 978-954-756-301-8

2. Stoyanova E., M. Kamburova, Need of prophylactic programs for HPV-associated diseases, Proceedings from the jubilee scientific conference with international participation “New Approaches in Public Health and Health Policy”, 26-28 November, 2020, Pleven, pp. 128 -133; ISBN: 978-954-756-254-7.

3. Stoyanova E., M. Kamburova, Impact of risk and protective factors for human papillomavirus infection and the associated diseases among adult women – accepted for publication in JBCR.

Scientific Announcements

1. Stoyanova E, Kamburova M, Mineva E. Confidence in midwives in prevention of HPV - associated diseases in Bulgaria. 17th World Congress on Public Health, Rome, Italy, May 2-6 2023, Population Medicine. 2023;5(Supplement):A1815. doi:10.18332/popmed/165376

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