

## Health awareness among young women vaccinated against human papillomavirus infections

### *Świadomość zdrowotna młodych kobiet zaszczepionych przeciwko wirusowi brodawczaka ludzkiego*

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**Słowa kluczowe:** zdrowie, rak, szczepienia.

#### Abstract

**Introduction:** Genital human papillomavirus (HPV) infections are essential factors in the development of cervical cancer. Human papillomavirus vaccines can contribute to reducing the high incidence of this disease, provided that this form of prophylaxis is commonly accepted. Participation in vaccinations is restricted by the belief that their implementation and consequent feeling of safety will reduce women's participation in other forms of cervical carcinoma prophylaxis and will encourage them to be sexually promiscuous.

**Aim of the research study:** To determine the awareness of cervical carcinoma prophylaxis among young women vaccinated against HPV by comparing them with a group of unvaccinated women.

**Material and methods:** The survey covered a group of 210 young women in the age range 18 to 20 years, who were vaccinated against HPV. Within the framework of comparison, the survey covered a group of 255 young HPV-unvaccinated women, adequately selected in respect of age and education.

**Results:** The HPV-vaccinated women declared participation in medical check-ups and cytological tests no less frequently than the unvaccinated women. In both groups, the usage of condoms, sexual partners hygiene, monogamy and smoking abstinence were determined as behaviours limiting the occurrence of cervical carcinoma.

**Conclusions:** Awareness of the application of supplementary prophylaxis of cervical carcinoma was high among the HPV vaccinated woman and did not differ from the unvaccinated woman's awareness. Young women did not show a tendency for promiscuous behaviours, and were more likely to use condoms in the prevention of cervical carcinoma than were the unvaccinated woman.

#### Streszczenie

**Wstęp:** Genitalne zakażenia wirusem brodawczaka ludzkiego (*human papillomavirus* – HPV) są przyczyną rozwoju raka szyjki macicy. Szczepionki przeciwko HPV przyczynią się w przyszłości do obniżenia zachorowalności na raka szyjki macicy pod warunkiem powszechnej akceptacji tej formy profilaktyki. Udział w szczepieniach ograniczają przekonania, głównie rodziców nastolatków, dla których szczepionka jest przeznaczona, że jej implementacja i wpływające z tego faktu poczucie bezpieczeństwa spowoduje, że kobiety nie będą stosowały innych form zapobiegania rakowi szyjki macicy, oraz zachęci je do promiskuitycznych zachowań seksualnych.

**Cel pracy:** Określenie świadomości konieczności stosowania profilaktyki w zakresie raka szyjki macicy wśród młodych kobiet zaszczepionych przeciwko HPV poprzez porównanie jej ze świadomością kobiet niezaszczepionych.

**Materiał i metody:** W badaniu zastosowano ankietę. Grupę badaną stanowiło 210 młodych kobiet w wieku 18–20 lat zaszczepionych przeciwko HPV. Ponadto ankietowano 255 młodych kobiet niezaszczepionych, odpowiednio dobranych pod względem wieku i wykształcenia.

**Wyniki:** Kobiety szczepione przeciwko HPV deklarowały udział w badaniach lekarskich i cytologicznych nie rzadziej niż te niezaszczepione. Stosowanie prezerwatyw, higiena partnerów seksualnych, monogamia oraz abstynencja nikotynowa zostały uznane w obu grupach kobiet za zachowania ograniczające występowanie raka szyjki macicy.

**Wnioski:** Świadomość konieczności stosowania uzupełniającej profilaktyki raka szyjki macicy jest wśród kobiet szczepionych przeciwko HPV wysoka i nie różni się od świadomości kobiet niezaszczepionych. Młode kobiety nie przejawiają tendencji do zachowań promiskuitycznych, a używanie prezerwatyw ma dla nich większe znaczenie w zapobieganiu rakowi szyjki macicy niż dla kobiet niezaszczepionych.

## Introduction

Cervical carcinoma is the second (after breast cancer) most frequently occurring malignant cancer among women in global statistics. In spite of the downward tendency in cervical carcinoma incidence and mortality observed in Poland over the last dozen or so years, these rates are still high in comparison with other countries [1].

Genital infections with human papillomavirus (HPV) are regarded as the most frequently occurring infections that are transmitted sexually [2]. Chronic infection in the uterine cervix epithelium is commonly regarded as an essential element of cancer development in this area, together with additional factors (high parity, nicotinism, long-lasting hormonal contraception, co-infections with other pathogens, immunity deficits and other poorly specified co-factors) may initiate cervical intraepithelial neoplasia (CIN). Loss of repressive control over the activity of viral oncogenes (E6 and E7) relates as a rule to the creation of a pre-cancer epithelial phenotype (CIN2/3) with a high potential for stroma invasion [3, 4]. A multi-stage epithelial transformation lasting at least a dozen or so years is initiated most commonly (in ca. 70% of cases) by only 2 out of 15 oncogenic types of HPV virus – types 16 and 18 [5, 6]. The vaccines currently available on the market are directed against these HPV types (bivalent vaccine – Cervarix) and additionally against types 6 and 11 (quadrivalent vaccine – Silgard) that are responsible for the formation of genital warts. The high effectiveness of prevention of intraepithelial uterine cervix changes connected with HPV infections of type 16, 18, 6 and 11 and a favourable safety profile – frequently shown in clinical tests – constitute a basis for recommending their use in programmes of active, primary cervical carcinoma prophylaxis in young teenage girls who have not started sexual relations yet [7]. However, there are limitations to actions of this type. Apart from factors of an economic nature, participation in vaccinations is lowered by serious reservations expressed by teenage girls' mothers and other environments engaged in youth education, according to which the vaccine's acceptance and the unjustified feeling of safety following the vaccination might reduce young women's participation in elementary forms of cervical cancer prophylaxis (cytological screening tests) and may also trigger risky sexual behaviours. Such opinions effectively contribute to the hampering of the development of vaccination programmes and constitute a starting point for many public debates [8–10].

## Aim of the research study

A direct stimulus for conducting research was the conviction that improper behavioural patterns concerning pro-health behaviours may thwart the

positive prophylactic effect of immunisation against HPV infections. It was assumed that HPV vaccination may trigger such unfavourable behavioural changes through generating an unjustified feeling of oncological safety.

The aim of the research was to determine the awareness of cervical carcinoma prophylaxis among young women vaccinated against HPV by comparing them with a group of unvaccinated women. The aim of the research was to ascertain whether HPV vaccinated women who were covered by the pre-vaccination education campaign in the field of cervical cancer prophylaxis are characterised, in comparison with the unvaccinated women, by a greater degree of promiscuity, revealing itself in earlier sexual initiation, having casual sexual relations and a greater number of sexual partners in life, lower motivation for participation in classical forms of secondary prophylaxis of cervical cancer (cytological tests) and a greater conviction about the health benefits resulting from smoking abstinence, a partner's intimate hygiene and the use of condoms. It was assumed that the obtained results would make it possible to evaluate the effects of the education campaign that accompanied vaccinations and identify the prophylactic areas that require modification.

## Material and methods

A survey was used to examine a group of 210 young women aged 18–20 years from the municipality of Polkowice (Dolnośląskie Voivodeship) who received, at the age of 16 years, a quadrivalent HPV vaccine. The surveyed women were covered by the teenage girls vaccination program financed by the local government. The implementation vaccine was accompanied by an informative-educational campaign about protection against cervical carcinoma and promotion of such elements of a healthy lifestyle as abandoning stimulants, proper diet and avoiding sexually transmitted illnesses. Up to now, it has been the most homogeneous group of HPV vaccinated women in Poland. Within the framework of comparison, the survey covered a group of 255 young HPV unvaccinated women from Kielce, adequately selected in respect of age and education.

The project received approval from the Bioethical Commission of the Jan Kochanowski University in Kielce. In the statistical analysis the  $\chi^2$  test was used.

## Statistical analysis

The accepted level of significance was  $\alpha = 0.05$ . The values of statistics with bilateral probability  $p < \alpha$  were regarded as statistically significant.

## Results

Results were presented on Figures 1–8.

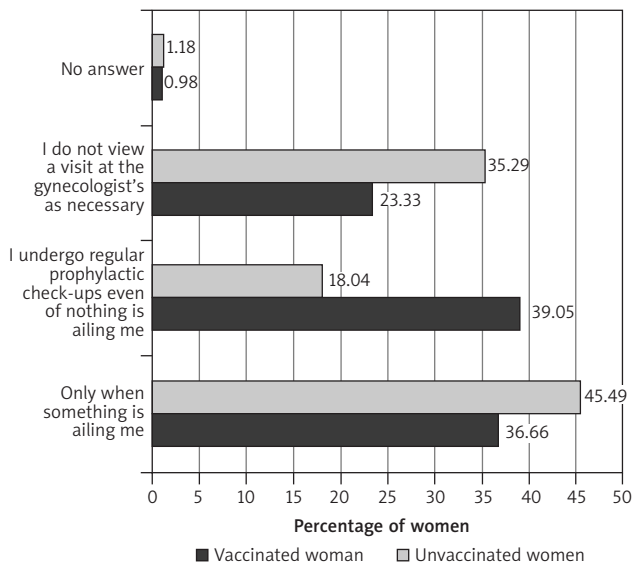


Figure 1. Frequency of visits to gynaecologist ( $p < 0.05$ )

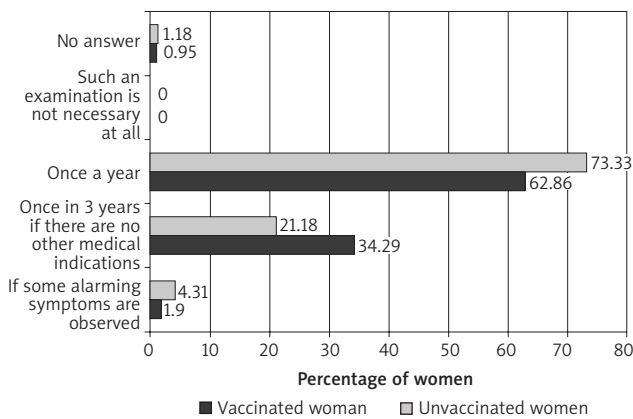


Figure 3. "In your opinion, how frequently should a mature woman go for a cytological examination for cervical cancer?" ( $p < 0.05$ )

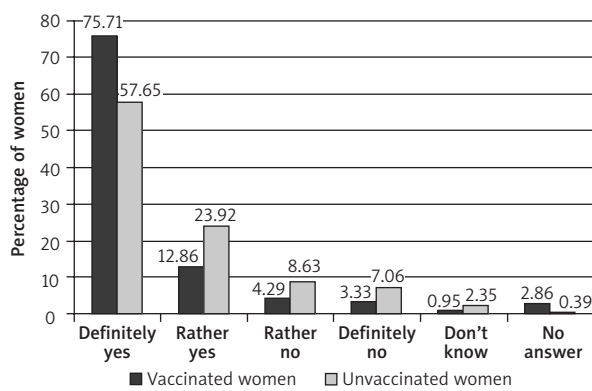


Figure 5. "In your opinion, does avoiding adventurous sexual intercourse limit the occurrence of cervical cancer?" ( $p < 0.05$ )

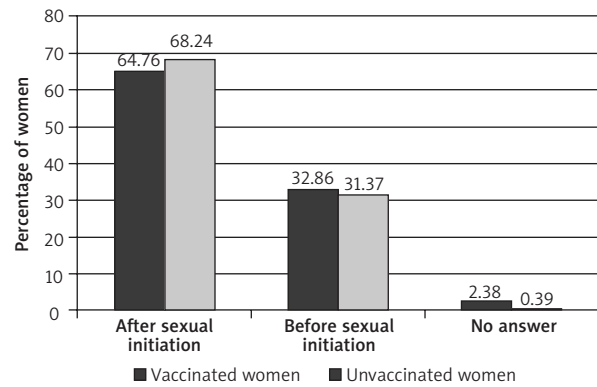


Figure 2. Percentage of women before and after sexual initiation ( $p > 0.05$ )

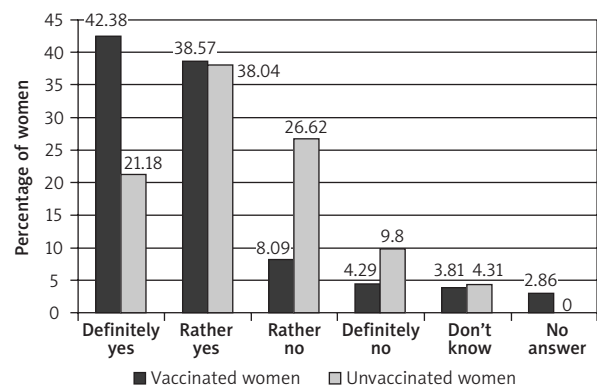


Figure 4. "In your opinion, does the use of condoms limit the occurrence of cervical cancer?" ( $p < 0.05$ )

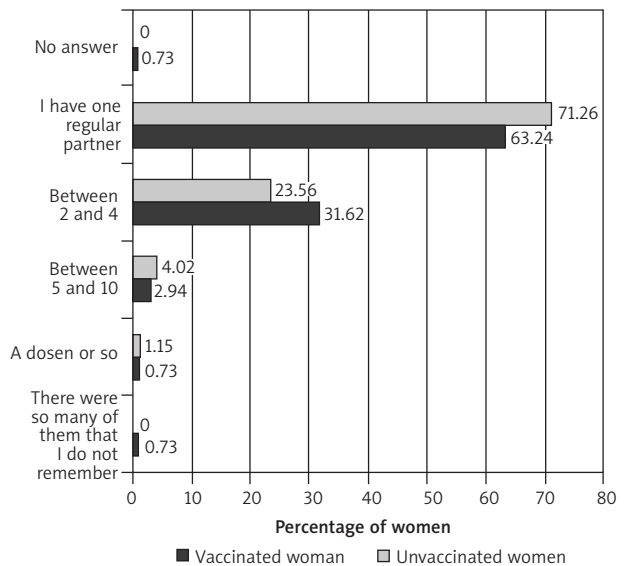


Figure 6. The number of sexual partners at the time of the survey ( $p > 0.05$ )

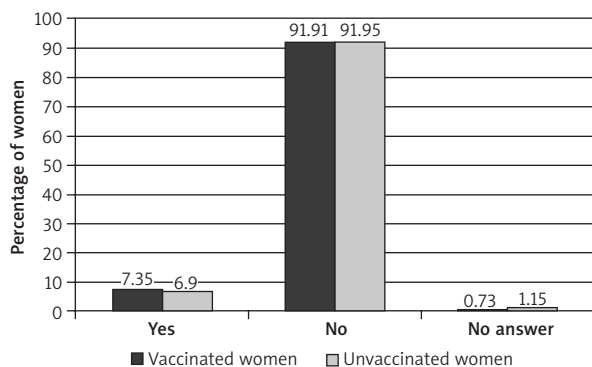


Figure 7. "I have sexual intercourse with a man other than my regular partner" ( $p > 0.05$ )

## Discussion

Cervical carcinoma prophylaxis is implemented by regular gynaecological examinations. The results (Figure 2), confirmed statistically, showed that young HPV vaccinated women are more aware of this fact than are unvaccinated women. This translates into a readiness to undergo a prophylactic test – even in the case of no existing ailments. It is a positive phenomenon in view of the fact, as Izdebski presents, that in Poland only 56% of women aged 15–59 years visit a gynaecologist at least once a year [11]. However, it should be noted that in both groups the percentage of women who did not see the necessity of a gynaecological check-up is approximately equal to the percentage of those women who have not started their sex life yet (Figure 1). This might be the reason why these women do not take advantage of gynaecological tests which they should also have undergone before sexual initiation.

It has been proven that vaccine implementation does not appear in women's consciousness as a sufficient cervical carcinoma prophylaxis (Figure 3), which is of major importance, bearing in mind the fact that even effective immunisation against HPV leaves the vaccinated persons in the incidence risk group, even though this risk is decreased by about 70–80%. Understanding the necessity for ongoing cytological supervision for the vaccinated persons plays a key role in preparing educational programmes that accompany teenage girls' immunisation [12].

The HPV vaccinated women present themselves quite well against a background of the general population of Polish women, who still participate insufficiently in prophylactic gynaecological tests. It should be noted that most of the surveyed women, both vaccinated and unvaccinated, would willingly make cytological tests once a year, despite the fact that answers compliant with specialists' recommendations (once in 3 years if there are no other indications) prevailed among the vaccinated women. It is difficult to

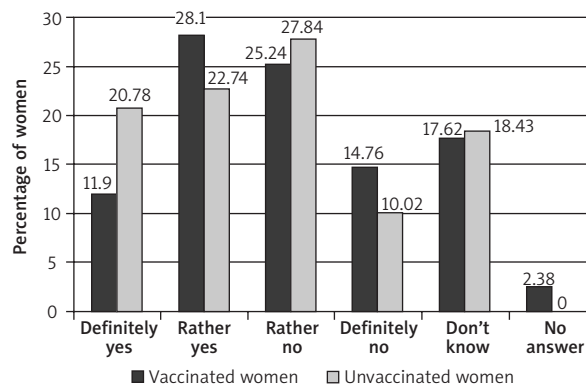


Figure 8. "In your opinion, does a non-smoking lifestyle limit the occurrence of cervical cancer?" ( $p > 0.05$ )

assess health attitudes unambiguously in this case as the willingness to make a cytological check-up once a year is not a drawback; it is rather evidence of insufficient knowledge.

According to many specialists, conventional, regular cytological tests reduce the risk of becoming ill from cervical cancer by ca. 70% over the course of a woman's life, in the event she has not been HPV vaccinated. This result is comparable with the benefits of the HPV immunisation itself. If the tests are accompanied by routine vaccinations covering at least 80% of the population, it could, in the opinion of specialists, result in a decrease in the incidence rate of ca. 90% [13]. Combining cytology with colposcopy increases the effectiveness of screening tests by up to 99% on average, hence some wealthy European countries have decided not to implement common prophylactic HPV vaccinations. An example of this is Finland, where a system of cytological screening tests has been functioning well for many years. After economic analysis, it was shown in this country that the costs of prospective common vaccinations would be equal to the costs of screening, hence they were abandoned [14]. According to Spaczyński *et al.*, in Poland, as a moderately wealthy country, focus should be placed on conducting active and well-organised screening, while free vaccinations could be organised at local levels [15]. Common and compulsory vaccinations, possibly in the future, would not cause exemption from screening tests; they could only force modification of prophylactic programmes. Franco *et al.* proposed a model of a DNA HPV molecular test, whereas a cytological test in prolonged time intervals would be reserved for women with a positive HPV test result. The register of infected people, with increased risk of CIN development, would facilitate long-term cytological monitoring of women with a positive HPV test result [16].

It is interesting to note how the protective value of condoms is perceived in view of HPV infection risk.

Global test results in this field are not explicit. A group of specialists are of opinion that although the application of condoms during sexual contact does not reduce the frequency of DNA HPV detection, it reduces the occurrence rate of genital warts, CIN2 and CIN3 changes, and an invasive type of cervical cancer [17]. Tests conducted in a population of couples, in which the women, as well as asymptomatic HPV infection, also CIN was found, and in the men, as well as asymptomatic infection, also genital warts were found, showed an important influence of consistent application of condoms both on the speed of morphological change regression in both partners and on shortening the duration of asymptomatic infection. The cumulated 2-year CIN regression rate and the remission rate of HPV infections in women in the group of couples using condoms, in comparison with couples not using them, was 53% relative to 35%, and 23% relative to 4%, respectively [18]. On this basis, it is a promising sign that the HPV vaccinated women stated, significantly statistically more frequently than the unvaccinated women, that the application of condoms is a behaviour contributing to a reduction in cervical cancer occurrence (Figure 4), taking account of the fact that three-quarters of young persons in Poland and in the world treat this type of barrier as protection against unwanted pregnancy [19]. The vaccinated women present themselves better than Swedish students, whose sexual behaviours in 2009 and their evolution since 1999 are presented by Tyden *et al.* According to the said authors, during this decade the percentage of women who had their first sexual contact without a condom double and was 65%. As many as 24% of respondents declared that they did not use a condom in their first contact with a new partner. Such behaviours have resulted in a 50% rise in sexually transmitted infections in comparison with 1999 [20].

The HPV vaccinated women strongly declared, statistically more frequently than the unvaccinated women, that avoiding casual sexual contact contributes to a reduction in the cervical carcinoma incidence rate (Figure 5). Monogamic preferences dominated in both groups up to the time of the survey. Thus, the research did not show an impact of combined vaccination with the accompanying educational campaign that would generate promiscuous behaviours (Figures 6 and 7). In the above-mentioned research results of Tyden *et al.*, 99% of women were sexually active, out of whom only 57% remained in stable relationships. The average number of former sexual partners was as many as 11 and was double the number of partners from 10 years before.

Apart from behavioural factors, nicotine use is a co-factor of a lasting HPV infection, having a documented importance in the development of pathological changes in the uterine cervix. The results of the presented research showed that the HPV vaccinated

young women do not have sufficient knowledge that nicotine contributes to the increase in cervical cancer occurrence risk, a factor in which they do not differ from the unvaccinated women (Figure 8). Thus it is necessary to increase emphasis on the issue of nicotine in the educational programmes that accompany vaccination implementation.

Since prophylactic HPV vaccinations concern teenage girls, it is the parents' decision whether or not to vaccinate their child. Taking into account the fact that the home is the first source of knowledge and the place where attitudes to health matters are formed, attention should be paid to parents as possible recipients of information, not only regarding the skill of conducting discussions on intimate matters but also on widening and updating their knowledge. It is also necessary to train gynaecologists, general practitioners, paediatricians, teachers and medical workers who most often deal with young patients and their parents.

## Conclusions

The awareness and declared willingness to use the cervical carcinoma prophylaxis that accompanies HPV vaccination (regular cytological tests) are high in the group of vaccinated women and do not differ from the unvaccinated women's attitudes. The HPV vaccinated young women do not show any tendency for promiscuous sexual behaviour that is expressed by early sexual initiation, having casual sexual contact or a larger number of sexual partners, in comparison with the unvaccinated women. The HPV vaccinated women are more aware of the importance of using condoms in cervical carcinoma prophylaxis than were the unvaccinated women. The HPV vaccinations must be accompanied by health information and education that does not cause a false sense of safety.

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