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# Perception and use of Pap smear screening among rural and urban women in Romania

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**Background:** In 2012 the National Screening Program for all women between 25 and 64 years of age was launched in Romania. Public awareness is an important factor in the success of a screening program. For this reason, we intended to assess the perception and the level of awareness of Romanian women regarding the Pap test in the prevention of cervical cancer. **Methods:** A cross-sectional study was conducted among 454 women from rural and urban areas. For our study, we used a questionnaire covering general characteristics, awareness, knowledge and practices regarding cervical cancer and Pap smear. **Results:** 431 participants (95%) had heard of cervical cancer and Pap smear but only 71.8% knew the exact role of it. Bivariate analysis showed that knowledge about the importance of the Pap smear, early detection and treatment of early-stage cervical cancer was reduced among women with low socio-economic status, mainly living in rural area. The most frequent reasons for avoiding Pap smear screening were: lack of money, embarrassment or fear of gynaecological consultation and pain, the feeling that they don't need it, misconceptions about cervical cancer, fatalistic attitude, perceived low susceptibility to cervical cancer. **Conclusions:** Because the uptake and the success of cervical cancer screening are determined by women's knowledge and awareness of Pap smear, it is critical to improve these perceptions in the near future especially in rural area characterized by a low socio-economic status.

## Introduction

Cervical cancer is a leading cause of cancer mortality among women and a major health threat. It is the fourth most common cancer among women worldwide with an estimated 528 000 new cases and 266 000 deaths in 2012.[1] About 80% of cases occur in developing countries, and about 87% of cervical cancer deaths occur in less-developed regions.[1] Epidemiological evidence clearly indicates that the high-risk human papilloma virus (HPV) is the principal cause of cervical cancer and its precursor lesions. Cervical cancer can be effectively controlled through primary (prophylactic HPV vaccination) and secondary prevention (cervical screening). The Papanicolaou (Pap) test is widely used as a cancer-screening test.[2]

For the last 30 years, Romania has had the highest cervical cancer mortality rate in Europe at six times higher than the average European Union country. Cervical cancer is the second highest cause of cancer death among Romanian women, after breast cancer and the first cause of death by cancer in the 25–44 years age group. Besides mortality rates steadily increasing during the last two decades, cervical cancer incidence rates have also risen from 15.7 cases/100 000 in 1982–28.7 in 2012.[3] Most of the cases are diagnosed in the advanced stages of the disease because there was a lack of organized screening opportunities until 2012 and a deterioration of the medical system. As a consequence of these epidemiological data, in 2008, an HPV vaccination campaign was introduced in Romania targeting 10- to 11-year-old girls. Statistics from 2008 revealed that only 2.5% of the 110 000 eligible girls in the target group were vaccinated. Even though a re-launch of the vaccination campaign was planned for 2009–10, parents categorically rejected the vaccine and the national program for primary prevention has been cancelled.[4] The main reasons for not vaccinating their daughters was the belief that the vaccine is risky and represents an experiment using their daughters as guinea pigs and also the belief that the vaccine embodies a conspiracy theory aimed at reducing the world's population.[4]

In 2012, the National Screening Program for cervical cancer was launched for all women aged 25–64. A conventional Pap test is done

within a 5-year interval, free of charge and available for all women (medically insured or not). After the end of these 5 years, the Ministry of Health must decide how this program will continue and schedule the follow-up. The general practitioner (GP) or gynaecologist collects the Pap smear, and a consultant pathologist or cytologist evaluates the slide. All results are reported according to the Bethesda system.

Because public awareness is an important factor for the success of a screening program, our study aimed to assess the knowledge of Romanian women regarding the perception and awareness level of Pap test use for the prevention of cervical cancer.

## Methods

This cross-sectional study was conducted among 454 women from rural and urban areas from April to July of 2015. The women completed the questionnaire at a GP's office in rural areas and at a gynaecologist's or GP's office in urban areas.

Written consent was obtained from all participants after they were informed about the study. An internal review board for ethics approved the study.

The questionnaire regarding cervical cancer and Pap smear included questions grouped in three parts: (i) Socio-demographic and socioeconomic factors like age, marital status, level of education, number of children, income—six questions; (ii) Awareness and knowledge about Pap smear—eight questions; and (iii) Source of information—three questions. A pilot study was performed on 20 women to assess the clarity of the questions.

Data were analysed using the Statistical Package for Social Science (SPSS) 18.0 Standard Version. After the information was collected using the questionnaire, data were entered into SPSS and checked for accuracy. Descriptive statistics were performed on all variables (means and frequencies). Chi-square test was performed to explore the relationship between socio-demographic and economic factors and the study outcome variables (awareness and knowledge).

## Results

We performed a quantitative study on 454 women from rural (212 cases—46.7%) and urban areas (242 cases—53.3%). Statistics from 2016 showed that, in Romania, 56.41% of the population lived in urban areas while 43.59% lived in rural areas, and the female proportion was 51.2%. Because the target population for cervical screening in Romania is represented by women aged 25–64, we included women of this age in our study. All patients asked to participate completed the questionnaire. The mean age of the study population was 33.4 years ($33.4 \pm 7.8$); 35.9% of the women were under 30 years old while 3.1% were over 50 years old without a significant difference between rural and urban areas($\chi^2 = 7.58$; df = 5; $P = 0.181$).

Regarding education level, the patient distribution showed a significantly higher percentage of women with a low educational level in rural areas (77.4% of patients with grade 10 or lower education) while, in urban areas, there was a predominance of women with an increased educational level (43.4%—bachelor degree and 46.3%—high school) ($\chi^2 = 225.2$; df = 3; $P = 0.001$) (table 1).

The distribution of participants according to occupation reveals a significantly higher percentage of women with no occupation in rural areas (72.2%) while urban areas had an increased report of employed women ($\chi^2 = 219.2$; df = 4; $P = 0.001$) (table 2).

According to monthly income, the distribution of patients showed a significantly higher percentage of women with no income or less than minimum wage—58.5% of participants addressed the family doctor in rural areas while in urban areas had higher report of women with monthly average income (46.7%) or above-average income (25.2%) ($\chi^2 = 134.1$; df = 4; $P = 0.001$) (table 2).

Patient access to healthcare services was more difficult among those from rural areas (26.9% vs. 12.8%) ($\chi^2 = 13.4$; df = 1; $P = 0.001$).

Among the studied cases, it was noted that approximately 95% of the responding women had heard about the Pap test. From these, 92% were in rural areas, and 97.5% were in urban areas ($\chi^2 = 6.1$; df = 1; $P = 0.013$). There were significant differences regarding education, occupation, monthly income, and access to free healthcare services between women who were aware and those who were not regarding Pap smear ($P < 0.01$) (table 2). These findings reflect a poor level of knowledge regarding Pap smear and cervical cancer screening among women with low socioeconomic factors.

Although 95% had heard of the Pap test, only 71.8% of the study participants (326 women) correctly knew the role of the Pap test in detecting cervical cancer. Of the respondents, 13.8% (63 women) believed that the role of the Pap test is to detect genital diseases denoting vague information in this regard while 14.3% (65) did not know the role of the test. The epidemiological profile of women who do not know the aim of a Pap test included the following features: age between 30 and 39 years (45.2%), less than grade 10 education (88.1%), no occupation (61.9%), married (81%), with a monthly income below the minimum wage (57.1%), with

**Table 1** The distribution of study groups by level of education, occupation and monthly income

| Characteristic | Rural area ($n = 212$) | | Urban area ($n = 242$) | | Total ($n = 454$) | |
|---|---|---|---|---|---|---|
| | *n* | % | *n* | % | *n* | % |
| Level of education | | | | | | |
| 8 grades | 86 | 40.6 | 4 | 1.7 | 90 | 19.8 |
| 10 grades | 78 | 36.8 | 21 | 8.7 | 99 | 21.8 |
| High school | 41 | 19.3 | 112 | 46.3 | 153 | 33.7 |
| Bachelor degree | 7 | 3.3 | 105 | 43.4 | 112 | 24.7 |
| Occupation | | | | | | |
| Unemployed | 153 | 72.2 | 26 | 10.7 | 179 | 39.4 |
| Social aid | 18 | 8.5 | 4 | 1.7 | 22 | 4.8 |
| Retired | 3 | 1.4 | 1 | 0.4 | 4 | 0.9 |
| Employed | 35 | 16.5 | 193 | 79.8 | 228 | 50.2 |
| Student | 3 | 1.4 | 18 | 7.4 | 21 | 4.6 |
| Monthly income | | | | | | |
| Less than the minimum-wage | 124 | 58.5 | 36 | 14.9 | 160 | 35.2 |
| The minimum wage | 45 | 21.2 | 32 | 13.2 | 77 | 17.0 |
| Average income | 38 | 17.9 | 113 | 46.7 | 151 | 33.3 |
| Above average income | 5 | 2.4 | 54 | 22.3 | 59 | 13.0 |
| Well above average income | — | — | 7 | 2.9 | 7 | 1.5 |

**Table 2** The correlations between the demographic characteristics and the knowledge regarding the Pap test

| **Age (years)** | | | | | **Education** | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **($\chi^2$ = 0.07; df = 1; *P* = 0.788)** | Yes | | No | | **($\chi^2$ = 8.75; df = 1; *P* = 0.003)** | Yes | | No | |
| | ***n*** | **%** | ***n*** | **%** | | ***n*** | **%** | ***n*** | **%** |
| < 20 | 5 | 1.2 | 3 | 13.0 | 8 grades | 82 | 19.0 | 8 | 34.8 |
| 20–29 | 148 | 34.3 | 7 | 30.4 | 10 grades | 90 | 20.9 | 9 | 39.1 |
| 30–39 | 198 | 45.9 | 6 | 26.1 | High school | 149 | 34.6 | 4 | 17.4 |
| 40–49 | 67 | 15.5 | 6 | 26.1 | Bachelor degree | 110 | 25.5 | 2 | 8.7 |
| 50–59 | 12 | 2.8 | 1 | 4.3 | | | | | |
| 60–69 | 1 | 0.2 | | | | | | | |
| **Occupation** | | | | | **Marital status** | | | | |
| ($\chi^2$ = 8.03; df = 1; ***P* = 0.005**) | Yes | | No | | **($\chi^2$ =0.15; df = 1; *P* = 0.700)** | Yes | | No | |
| | ***n*** | **%** | ***n*** | **%** | | ***n*** | **%** | ***n*** | **%** |
| Unemployed | 163 | 37.8 | 16 | 69.6 | Single | 69 | 16.0 | 6 | 26.1 |
| Social aid | 20 | 4.6 | 2 | 8.7 | Married | 335 | 77.7 | 14 | 60.9 |
| Retired | 4 | 0.9 | | | Divorced | 9 | 2.1 | | |
| Employed | 225 | 52.2 | 3 | 13.0 | Widow | 5 | 1.2 | 1 | 4.3 |
| Student | 19 | 4.4 | 2 | 8.7 | Concubinage | 13 | 3.0 | 2 | 8.7 |
| **Monthly income** | | | | | **Number of births** | | | | |
| **($\chi^2$ = 6.79; df = 1; *P* = 0.009)** | Yes | | No | | **($\chi^2$ = 0.29; df = 1; *P* = 0.589)** | Yes | | No | |
| | ***n*** | **%** | ***n*** | **%** | | ***n*** | **%** | ***n*** | **%** |
| Less than the minimum-wage | 146 | 33.9 | 14 | 60.9 | 0 | 153 | 35.5 | 9 | 39.1 |
| The minimum wage | 74 | 17.2 | 3 | 13.0 | 1 | 115 | 26.7 | 3 | 13.0 |
| Average income | 146 | 33.9 | 5 | 21.7 | 2-3 | 138 | 32 | 8 | 34.8 |
| Above average income | 58 | 13.5 | 1 | 4.3 | >3 | 25 | 5.8 | 3 | 13.0 |
| Well above average income | 7 | 1.6 | | | | | | | |

| **Health services access** | | | | |
|---|---|---|---|---|
| ($\chi^2$ = 8.98; df = 1; *P* = 0.003) | Yes | | No | |
| | ***n*** | **%** | ***n*** | **%** |
| Easy | 353 | 81.9% | 13 | 56.5% |
| Difficult | 78 | 18.1% | 10 | 43.5% |

**Table 3** The distribution of subjects according to the reasons for non-participating on Pap test

| **The reason for non-participating on Pap test** | **Rural area (*n* = 212)** | | **Urban area (*n* = 242)** | | **Total (*n* = 454)** | |
|---|---|---|---|---|---|---|
| | ***n*** | **%** | ***n*** | **%** | ***n*** | **%** |
| Lack of time | 22 | 18.6 | 16 | 38.1 | 38 | 23.8 |
| Lack of financial resources | 58 | 49.2 | 5 | 11.9 | 63 | 39.4 |
| Embarrassment against gynaecological examination | 16 | 13.6 | 6 | 14.3 | 22 | 13.8 |
| Others | 22 | 18.6 | 15 | 35.7 | 37 | 23.1 |

difficulty accessing healthcare services (42.9%) and with two to three previous births (45.2%). In addition, knowing someone with cervical cancer and visiting a healthcare institution were significant predictors for knowledge.

Knowledge about how often this test should be performed showed significant differences according to education level, occupation, monthly income, access to healthcare services and number of births ($P < 0.05$). In our study, the majority of patients evaluated in a gynaecologist's office pointed out that the Pap test should be performed annually (83.4%) compared with those assessed in a GP's office (63.1%) ($\chi^2 = 24.6$; df = 3; $P = 0.001$).

Of the women in this study, 59.9% (270) said they underwent a Pap test at least once. The epidemiological profile of women who said they had undergone a Pap test ($n = 270$) included the following characteristics: age between 30 and 39 (50.4%), high school education and bachelor degree (74.9%), employed (66.7%), married (80.4%), with a monthly average income (37.4%), with easy access to healthcare services (85.9%) and with at least one birth (73.9%).

Of women who responded to the questionnaire, 40.5% did not undergo a Pap test, the various reasons given being lack of time or financial resources (39.4% and 23.8%, respectively), embarrassment regarding gynaecological examination (13.8%), or various other reasons (the feeling that they do not need a Pap test, fatalistic attitude towards the disease, or misconceptions about cervical cancer) (table 3). The correlations between reasons for not doing a Pap smear and demographic characteristics are presented in table 4.

Healthcare professionals remain the main source of information about the Pap test and the HPV vaccine in both rural and urban areas (25.5% and 33.5%, respectively) ($P = 0.079$).

## Discussion

The current study is the first to explore the level of knowledge and awareness of Pap smear testing among Romanian women. This research provides a detailed picture of both rural and urban areas, two regions characterized by both educational and economic differences.

**Table 4** Correlations between not doing Pap smear and demographic characteristics

| Demographic characteristics | Lack of time ($n = 38$) | | Lack of financial resources ($n = 63$) | | Embarrassment against gynaecological council ($n = 22$) | | Others ($n = 37$) | |
|---|---|---|---|---|---|---|---|---|
| | *n* | % | *n* | % | *n* | % | *N* | % |
| Age (years) ($\chi^2 = 3.09$; df = 3; $P = 0.378$) | | | | | | | | |
| < 20 | 1 | 2.6 | 1 | 1.6 | 1 | 4.5 | 1 | 2.7 |
| 20–29 | 16 | 42.1 | 23 | 36.5 | 10 | 45.5 | 19 | 51.4 |
| 30–39 | 15 | 39.5 | 26 | 41.3 | 9 | 40.9 | 12 | 32.4 |
| 40–49 | 6 | 15.8 | 11 | 17.5 | 1 | 4.5 | 4 | 10.8 |
| 50–59 | | | 2 | 3.2 | 1 | 4.5 | 1 | 2.7 |
| Education ($\chi^2 = 20.64$; df = 3; $P = 0.001$) | | | | | | | | |
| 8 grades | 9 | 23.7 | 30 | 47.6 | 5 | 22.7 | 10 | 27.0 |
| 10 grades | 10 | 26.3 | 24 | 38.1 | 7 | 31.8 | 7 | 18.9 |
| High school | 15 | 39.5 | 9 | 14.3 | 8 | 36.4 | 13 | 35.1 |
| Bachelor degree | 4 | 10.5 | | | 2 | 9.1 | 7 | 18.9 |
| Occupation ($\chi^2 = 25.76$; df = 3; $P = 0.001$) | | | | | | | | |
| Unemployed | 15 | 39.5 | 52 | 82.5 | 10 | 45.5 | 18 | 48.6 |
| Social aid | 3 | 7.9 | 4 | 6.3 | 2 | 9.1 | | |
| Employed | 15 | 39.5 | 6 | 9.5 | 7 | 31.8 | 16 | 43.2 |
| Student | 5 | 13.2 | 1 | 1.6 | 3 | 13.6 | 3 | 8.1 |
| Marital status ($\chi^2 = 5.44$; df = 3; $P = 0.142$) | | | | | | | | |
| Single | 11 | 28.9 | 9 | 14.3 | 6 | 27.3 | 7 | 18.9 |
| Married | 27 | 71.1 | 51 | 81 | 14 | 63.6 | 24 | 64.9 |
| Divorced | | | | | 1 | 4.5 | 3 | 8.1 |
| Widow | | | | | | | 1 | 2.7 |
| Concubinage | | | 3 | 4.8 | 1 | 4.5 | 2 | 5.4 |
| Monthly income ($\chi^2 = 10.32$; df = 3; $P = 0.016$) | | | | | | | | |
| Less than the minimum-wage | 13 | 34.2 | 43 | 68.3 | 10 | 45.5 | 17 | 45.9 |
| The minimum wage | 10 | 26.3 | 6 | 9.5 | 3 | 13.6 | 8 | 21.6 |
| Average income | 13 | 34.2 | 13 | 20.6 | 8 | 36.4 | 9 | 24.3 |
| Above average income | 2 | 5.3 | 1 | 1.6 | | | 2 | 5.4 |
| Well above average income | | | | | 1 | 4.5 | 1 | 2.7 |
| Health services access ($\chi^2 = 0.50$; df = 3; $P = 0.919$) | | | | | | | | |
| Easy | 29 | 76.3 | 47 | 74.6 | 17 | 77.3 | 26 | 70.3 |
| Difficult | 9 | 23.7 | 16 | 25.4 | 5 | 22.7 | 11 | 29.7 |
| Number of births ($\chi^2 = 15.73$; df = 3; $P = 0.001$) | | | | | | | | |
| None | 12 | 31.6 | 8 | 12.7 | 6 | 27.3 | 17 | 45.9 |
| 1 birth | 8 | 21.1 | 14 | 22.2 | 5 | 22.7 | 11 | 29.7 |
| 2 to 3 birth | 14 | 36.8 | 33 | 52.4 | 10 | 45.5 | 6 | 16.2 |
| More than 3 birth | 4 | 10.5 | 8 | 12.7 | 1 | 4.5 | 3 | 8.1 |

The research found a good awareness of Pap smear among the participants; 92% and 97.5% of the women from rural and urban areas, respectively, declared that they had heard about Pap smear. Despite the overall good awareness regarding Pap smear, only 71.8% (326 women) knew its exact role. Several socio-demographic variables, such as higher income, education, older age and being married, were found to be predictors of a good level of knowledge about Pap smear, its role, and how often it should be done. Our results are in accordance with similar papers from the literature. The importance of educational status on knowledge of cervical cancer has been mentioned in several studies in the literature and all reflect a good correlation between high level of education and good level of awareness regarding Pap smear and cervical cancer.[5,6]

The current study showed that socio-demographic characteristics of individuals such as age, marital status, occupation and level of education have significant effects on knowledge regarding Pap smear. The gap of knowledge regarding Pap smear and its benefits observed among women with low socioeconomic status in our study was in agreement with studies from the literature.[7,8] In the light of these studies, the overall status of knowledge in low- and middle-income countries was estimated to be low.

Although 71.8% of the participants in our study knew the benefits of Pap smear, only 59.9% declared that they had already done it. Analyzing the socio-demographic parameters has revealed that women with low status refused to have a Pap test done. The main reasons for not participating in the screening test included lack of money, fear of gynaecological consult and pain, the feeling that they do not need it, misconceptions about cervical cancer, fatalistic attitude, perceived low susceptibility to cervical cancer and embarrassment. Our results were similar to those of other studies from the scientific literature that described the following as the main barriers to Pap test: lack of time, financial difficulties, fear of the test's result and lack of awareness. Other mentioned reasons for not doing the test are lack of any symptoms, lack of counselling, physician not requesting it and fear of vaginal examination.[9–12]

Regarding the source of information and trust, the participants in our research stated that healthcare professionals along with television and Internet provided most of the information. To increase the knowledge among women, it is important to motivate healthcare professionals to be active in education of women. Although the Internet is a powerful source of information, it does not always provide the most accurate information. Penta studied the mass media coverage of HPV vaccination in Romania by newspapers, magazines, videos and informational websites. The overall results showed a suboptimal and incomplete media coverage of the HPV vaccination.[13]

The ignorance about cervical cancer and the HPV vaccine can be a serious barrier to a successful screening program. Even if the screening is offered to all women no matter if they are insured or not, several factors are needed to make the program successful: developed healthcare services, easy access to healthcare for all categories of the population, good technical and laboratory expertise, and, last but not least, strong public awareness. Romania already had a failed attempt at implementing the HPV vaccination. In 2012, the screening program for cervical cancer was introduced in Romania, and the main sources of information regarding

the program were healthcare professionals (especially GPs and gynaecologists) and the media. To be successful, it is important to continuously improve the population's knowledge regarding the importance and benefit of the screening program and Pap smear. At the same time, an extended fee-free strategy, which proved to be beneficial in some countries, could be useful considering that, at the moment, cervical screening in Romania comprises only one free Pap test.[14]

Our study showed that, in Romania, there are significant differences between women characterized by low and high socioeconomic factors in terms of the knowledge and acceptance of a Pap smear. This highlights the need for improving cervical health behaviour through education and social empowerment especially in women with low socioeconomic factors. Because the population characterized by a low socioeconomic status is present mainly in rural areas, it is important to improve education regarding cervical cancer and its prevention especially in this area.

While the HPV vaccination program failed due to a lack of information and negative publicity for the vaccine among all categories of parents (with low or high economic status), for a cervical cancer-screening program, the focus should be especially on women with low socioeconomic factors. When promoting education to less-educated women, it is necessary to find the best way to communicate and to adapt communication skills to deliver the right message in the right form.[15] To increase cancer screening among low-income women, programs should be oriented to identify facilitators and eliminate the barriers toward Pap smear sampling. A good strategy is to involve both healthcare professionals and the media. Another suggestion would be to perform proper medical education in school by healthcare professionals or different non-profit organizations, considering that, in Romania, education is mandatory for at least 11 years. At the same time, it is important to educate women to promote correct information to their family, friends, or community.

The uniqueness of this study is that it includes a large sample of women with different socioeconomic statuses, allowing for a reliable assessment of Pap smear knowledge among the studied population.

The study shows a low level of knowledge and acceptance of screening among low-educated women mainly living in rural areas. Because the key to reducing cervical cancer morbidity and mortality is still early detection, customized multi-level educational interventions are needed to improve uptake of cervical screening among women with low socioeconomic status.

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## Key points

- For the last 30 years, Romania has had the highest cervical cancer mortality rate in Europe at six times higher than the average European Union country.
- From a public health perspective, the high level of mortality due to cervical cancer is directly related to the stage of the disease at the moment of diagnosis.
- The study shows a low level of awareness and acceptance of screening among low-educated women.
- In rural areas, characterized by low socioeconomic status, the need for education is greater than in urban areas with high socioeconomic status.
- To increase cancer screening among low-income women, programs should be oriented to identify facilitators and eliminate the barriers toward Pap smear sampling.

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