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Professionals' role in implementing a cervical cancer screening program

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Abstract

The objectives of this study were to investigate the awareness, motivation, and readiness of medical staff to take part in a cervical cancer screening program (CSP), with the ultimate aim of increasing the response rate to invitation letters and improving CSP effectiveness and coverage. Certified gynecologists (GYNs) and general practitioners (GPs) practicing in the national and private healthcare systems in Latvia were given specially designed multiple-choice questionnaires. Of 213 questionnaires distributed to GYNs, 74% were completed (32% response rate of all 486 GYNs in Latvia). GPs were sent 933 questionnaires, 24% were returned (15% response rate of all 1,455 GPs in Latvia). GPs registered for 10 years or more knew significantly less about prevention and screening for cervical cancer compared to GYNs registered for the same amount of time ($p = 0.05$). This finding was not seen among the GYNs ($p = 0.782$). In the entire study group, the average score for correct answers was 5.97 (SD 2.602). Knowledge in the GP group was significantly lower (5.03, SD 2.243) than in the GYN group (7.22, SD 2.527, $p < 0.001$). Irrespective of specialization and place of work, knowledge was evaluated as poorer with an increase in age (RR = 0.950; $p < 0.001$). The knowledge, awareness, and perception of GYNs regarding cervical cancer prevention and screening in Latvia is sufficient but not good, and that of GPs is poor. Doctors would like to learn more about preventing cervical cancer.

Keywords: cervical cancer, screening, general practitioners, gynecologists, Latvia

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Introduction

Cervical cancer remains a topic of international interest. Although the pathogenesis and natural history of cervical cancer is well explored, it remains a leading cause of female mortality in developing countries (1–3).

In Europe, of the 52,000 new cases of cervical cancer diagnosed each year approximately 27,000 women will die from the disease (4, 5). However, the mortality rate varies widely between individual European countries, with up to a five-fold difference reported. Over the last 15 years, Latvia has been among the eastern European countries with the highest reported rates of cervical cancer morbidity and mortality (6–9).

An organized cervical cancer screening program (CSP) was reintroduced in Latvia on January 1st, 2009. In the first screening period, 128,206 women responded to 614,824 invitation letters representing a coverage rate of 20.1%. One of the outcomes identified from analysis of this first screening round was that the participation of certified gynecologists (GYNs) and general practitioners (GPs) and their help in facilitating compliance with the CSP invitation letters were not fully utilized (10, 11).

Prior to launching this CSP, a dedicated multi-disciplinary Screening Program Planning and Development team was created in 2007 focusing on the role of healthcare professionals in ensuring compliance with screening. This provided access to detailed information and helped GPs facilitate the involvement of women registered in the program. In the run-up to the CSP start date, several instructive seminars were held and information was distributed electronically on the program structure, operation principles, and required involvement of GPs and GYNs (10, 11).

Despite all of these mechanisms integrated into the CSP implementation plan, the response to the invitation letters sent in 2009/2010 did not exceed 15%, falling far short of the target of 75%. Both GPs and GYNs were shown not to engage with the screening program. Private GYNs were found to have sent only 3% of the tests performed, despite the fact that approximately 40% of all GYNs work in private practices, according to the Latvian Society of Physicians.

Methods

The first objective of the study was to investigate medical staff's awareness, motivation, and readiness to take part in the CSP, with the ultimate aim of increasing the response rate to invitation letters and improving the effectiveness and screening coverage in Latvia. The second objective was to identify issues and problems preventing medical staff's involvement in implementing the CSP. The third objective was to provide recommendations to the CSP administrators on how to optimize cooperation of medical staff in implementing the screening program in Latvia. Ethical approval was granted for the study by Riga Stradiņš University Ethics Committee on January 3rd, 2011.

The study population was certified GYNs and GPs currently practicing in the national and private healthcare systems in Latvia involved in carrying out the CSP. A questionnaire was designed containing multiple-choice questions in three areas: 1) the socio-demographic background of the medical professional and his or her daily activities in cervical cancer screening, 2) the medical professional's perception of cervical cancer screening and cervical cancer prevention, and 3) the medical professional's perception of the Latvian CPS model and assessment of his or her own screening-related knowledge.

The questionnaires were distributed to GYNs during the general meeting of the Latvian Association of Gynecologists and Obstetricians in May 2011. GPs were randomly selected from a list of all registered Latvian GPs that have contracts with the National Health Service (NHS; *Nacionālais veselības dienests*). They were sent the questionnaire by mail or it was delivered to their mailboxes at the NHS premises with a prepaid return-addressed envelope.

The data were analyzed using the x^2 test independent samples,

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t-test, and Mann–Whitney U test. Logistic regression analysis was used for multi-factor analysis. In the comparison of data, $p < 0.05$ was considered statistically significant. Consistency was tested with Cronbach's alpha reliability test, and, when analyzing data, $\alpha > 0.7$ was selected as acceptable.

Based on the results of the descriptive analysis in the study group, a scale was designed to evaluate practitioners' knowledge of the principles of the Latvian CSP. The reliability of the scale was tested with the Cronbach alpha coefficient. When testing the questions included, it was found that Cronbach's alpha is 0.707, and so the questions could be used to assess doctors' knowledge because they were reliably consistent and could be added up for further analysis on the evaluation scale. When tallying the questions answered correctly, the maximum possible score was 12. For a score up to 5 points, knowledge was evaluated as poor, and from 6 to 12 points the knowledge was sufficient or good.

Logistic regression analysis was used to analyze various factors such as doctors' ages, specializations, and places of work that might be related to and have an effect on knowledge about the Latvian CSP.

Results

Study population

During the conference, 213 questionnaires were distributed and 158 of those (74%) were completed, representing a response rate of 32% of all 486 GYNs in Latvia that had a valid practice certificate on January 1st, 2011. GPs were sent 933 questionnaires, of which 213 were returned (23%), representing a response rate of 15% of all 1,455 GPs in Latvia that had a valid practice certificate on January 1st, 2011; out of these, 1,399 had a contract with the NHS. The characteristics of the study population are shown in Table 1.

Knowledge about cervical cancer prevention and screening

The questionnaire results and a comparison between the GYN group and GP group are shown in Tables 2, 3, and 4.

There was a significant association between clinical workload and knowledge among doctors that advised fewer than 10 women per week, who had significantly lower knowledge scores (Mann-Whitney U test, $p = 0.002$). This finding was not confirmed when analyzing the GYNs' scores alone ($p = 0.49$), but was shown to be significant for the GPs alone ($p = 0.05$). GPs that had been registered for 10 years or more knew significantly less compared to GYNs registered for the same length of time ($p = 0.05$), but this finding was not seen among GYNs ($p = 0.782$). Doctors practicing in urban areas knew significantly less compared to those based in rural areas (Mann–Whitney U test, $p < 0.001$). Separately in specialist groups, this difference disappeared ($p = 0.460$; $p = 0.317$); however, there was a trend for GPs working in urban areas to be more knowledgeable, but the reverse was seen among GYNs.

In the entire study group, the average score for correct answers was 5.97 (SD 2.602). The knowledge in the GP group was significantly lower (5.03, SD 2.243) than in the GYN group (7.22, SD 2.527, $p < 0.001$).

Table 1 | **Socio-demographic background of the study groups and group comparison.**

Characteristic	GYNs	GPs	p-value (test)
Average age (years)	51 (in Latvia: 52.9)	52.3 (in Latvia: 51.5)	0.203 (t) 0.14 (t)
Sex (%)			0.534 (x^2)
Females	93.7	92.0	
Males	6.3	8.0	
Place of work (%)			
Urban area	96.3	79.3	< 0.001 (x^2)
Rural area	15.0	37.1	< 0.001 (x^2)
Average work experience (years)	24.8	20.5	< 0.001 (Mann–Whitney U)
Advises on cervical cancer prevention (%)	98.1	44.1	< 0.001 (x^2)
Advises once a week or up to three times a month	3.8	32.6	< 0.001 (x^2)
Advises 2–10 times a week	59.7	60.0	< 0.001 (x^2)
Advises 11 and more times a week	36.4	7.4	< 0.001 (x^2)

Table 2 | **Perception of primary and secondary cervical cancer prevention within study groups and group comparison (%).**

Response	GYNs	GPs	p-value (x^2 test)
Correct answer about the concept of organized screening	58.1	34.3	< 0.001
Correct answer that the screening test is a cytology test, mammography, and the fecal occult blood test (all of these)	52.5	84.5	< 0.001
Knows that the cytology test is a screening test	86.9	91.1	0.194
Knows that the mammography is a screening test	95.6	97.7	0.272
Knows that the fecal occult blood test is a screening test	56.9	92.5	< 0.001
Correct answer that not smoking is a component of primary prevention	17.0	15.0	0.609
Correct answer that condom use is a component of primary prevention	28.8	25.8	0.529
Correct answer that vaccination against HPV is a component of primary prevention	75.6	73.7	0.674
With confidence, acknowledges vaccination against HPV as useful	56.9	36.6	< 0.001
Not sure, but tends to acknowledge vaccination against HPV as useful	32.5	46.5	< 0.05
Correct answer that screening is a component of secondary prevention	53.1	58.5	0.302
Believes that screening helps reduce both morbidity and mortality	74.0	62.9	0.458
Believes that screening will not have an impact on mortality, but will reduce morbidity	5.6	2.3	0.099
Believes that screening will not reduce morbidity, but will reduce mortality	18.1	24.9	0.119
Believes that screening will not reduce morbidity or mortality	0	2.3	0.051
Believes that it is possible to avoid cervical cancer by combining cytological screening and vaccination against HPV	69.4	63.8	0.264
Believes that it is possible to avoid cervical cancer by either screening or vaccination	24.4	26.3	0.674
Believes that it is not possible to avoid cervical cancer	3.2	5.2	< 0.001

Table 3 | **Study group knowledge of the principles and conditions of the Latvian CSP and group comparison (%).**

Correct answer	GYNs	GPs	p-value (x^2 test)
The program covers women age 25–70	85.5	66.2	< 0.001
Cervical cancer screening must be performed every 3 years	82.5	75.4	0.099
A woman receives an invitation letter from the NHS to take part in the program	88.8	93.2	0.131
A woman may perform screening with a doctor that has no contract with the NHS	54.4	19.8	< 0.05
The NHS pays for cytological exam and a visit to a doctor that has a contract with the NHS	78.1	85.4	0.067
The NHS pays for the visit to a doctor that has no contract with the NHS	57.5	20.2	< 0.001
The woman receives the result from the doctor who took the sample	85.0	74.2	< 0.05
The GP sees the examination result in the NHS data system	21.2	36.2	< 0.05
Believes that vaginal inflammation affects the test result	82.1	53.1	< 0.001
Believes that cervical inflammation affects the test result	72.3	66.7	< 0.001
Believes that use of a lubricant affects the test result	41.3	17.4	< 0.001
Believes that current menstruation affects the test result	71.8	35.7	< 0.001
Believes that the postnatal period affects the test result	35.5	17.8	< 0.001
Is aware that cytological examination must be repeated in 6 months if the cytological result was CIN I	65.0	21.1	< 0.001

Table 4 | **Respondents' assessment of the CSP and self-assessment of own knowledge (%).**

Response	GYNs	GPs	p-value (x^2 test)
Information must be widespread in mass media	82.4	85	0.502
GPs must actively monitor and contribute to the response rate (coverage) of the registered population	75.6	51.2	< 0.001
Private practice doctors must actively engage in carrying out the program	48.1	45.1	0.558
Financial penalties must be imposed on doctors that discredit carrying out the program	6.2	3.3	0.174
Financial rewards must be introduced for GPs whose practices have high response rates	12.5	28.8	< 0.001
All examinations performed based on personal initiative beyond the program must be included	23.8	37.6	< 0.05
The role of the GYN in preventing cervical cancer is very significant	80.0	76.1	0.365
The role of the GP in preventing cervical cancer is very significant	49.4	30.5	< 0.001
Preventing cervical cancer is a responsibility of both the GYN and GP	76.2	65.3	< 0.05
Obtains information about preventing cervical cancer from colleagues	23.8	36.6	< 0.001
Obtains information about preventing cervical cancer from mass media	23.8	41.8	< 0.001
Obtains information about preventing cervical cancer at lectures, association meetings, conferences	96.2	93.0	0.172
Obtains information about preventing cervical cancer from professional resources (literature) about reproductive health	65.0	35.7	< 0.001
No need to receive information about preventing cervical cancer	5.0	0	< 0.001
Has not taken an interest in preventing cervical cancer since university	0.6	0	0.248
Believes that he/she has comprehensive knowledge about preventing cervical cancer	29.4	2.8	< 0.001
Believes that he/she has sufficient knowledge about preventing cervical cancer	67.8	59.6	< 0.001
Believes that he/she has sufficient and comprehensive knowledge about preventing cervical cancer	96.9	62.4	< 0.001
Would like to broaden her/his knowledge about preventing cervical cancer	88.5	85.8	0.462
The best way to learn about screening program is through lectures	83.1	76.9	0.140
The best way to learn about screening program is through written, printed resources	54.1	55.7	0.763

Results of the regression analysis

When exploring each individual factor, we found that knowledge depended on the doctor's specialization. GYNs' knowledge was evaluated as good and sufficient 5.2 times more than that of GPs' (RR = 5.264; $p < 0.001$). Older doctors' knowledge is evaluated as poorer (RR = 0.954; $p < 0.001$). The screening program knowledge of doctors practicing in urban areas was poorer (RR = 0.460; $p < 0.001$). A multifactor regression analysis showed that only two of the above factors reliably influenced doctors' knowledge: doctors' specializations and their age. GYNs' knowledge was 5.4 times more often evaluated as good (RR = 5.362; $p < 0.001$). In the study group, irrespective of the specialization and place of work, knowledge was evaluated as poorer with an increase in age (RR = 0.950; $p < 0.001$). See Table 5.

Table 5 | **Results of logistic regression analysis.**

Variable	RR	RR 95 % CI		p-value
Single-variable regression analysis				
Specialization				
GP (reference)	1			
GYN	5.264	3.301	8.395	< 0.001
Age	0.954	0.931	0.976	< 0.001
Place of work				
Urban and rural areas (reference)	1			
Urban area only	0.460	0.302	0.700	< 0.001
Multi-variable regression analysis				
Specialization				
GP (reference)	1			
GYN	5.362	3.128	9.191	< 0.001
Age	0.950	0.925	0.975	< 0.001
Place of work				
Urban and rural areas (reference)	1			
Urban area only	0.938	0.565	1.559	0.805

Discussion

Doctors or trainees that carried out the CSP in Latvia were invited to take part in the study. Therefore, the effectiveness of the program significantly depended on the knowledge of these professionals and their perception of cervical cancer and its prevention. For this reason, the study design and implementation involved GYNs and GPs in the target group.

The response by the doctors involved in the study differed between the GYN and GP groups. The GYNs completed the questionnaires with a 74% response rate, which is fairly high. The GYNs received the questionnaires on a single occasion (i.e., at an annual conference of GYNs association) and returned them on the same day, after the conference. This is probably why the response rate among GYNs was considerably higher compared with that of GPs, who received their questionnaires by mail or in their per-

sonal mailbox at NHS premises. The number of completed and returned questionnaires shows that the GYNs that engaged in the study comprised one-third of all GYNs practicing in Latvia, and the results are representative for the entire population of Latvian GYNs. The conference where the survey was carried out was not a regional or specialized event, but general meeting of the Latvian Association of Gynecologists and Obstetricians; that is, it covered the entire population of GYNs.

The situation was different with the GP group. The response rate of GPs to the questionnaires sent was only 23%, which was low. The GPs were randomly selected based on the list of GPs at the NHS (questionnaires were sent to about 66% of GPs) corresponding to the regional distribution of practices. No differences in regional response rates (based on postmarks) were found. Although only 23% of invited GPs participated in the study, comprising only 15% of all GPs practicing in Latvia, these are practitioners that tried to engage in the CSP because they responded to the survey. After completing the questionnaire, GPs had the opportunity to examine various Latvian materials and regulations on the program and cervical cancer prevention that were not available to GYNs.

However, there were aspects that made both groups comparable, although the GYN group represented 32% and the GP group only 15% of all professionals in Latvia. Representativeness was achieved through randomized selection of the GP group, the presence at the conference of almost a half of all GYNs practicing in Latvia, and the questionnaires being sent and distributed proportionally. The average age of practitioners did not differ from the average age of all practitioners in the specializations or between the groups. This confirms that there was not a group selection factor. There was also no difference regarding the sex of respondents. More than 90% of GYNs and GPs in Latvia are women. This should have a favorable effect on implementing the CSP because preventing cervical cancer is an aspect of female reproductive health.

The results showed a difference between specialist groups with regard to place and length of practice. As a secondary-level professional, GYNs mostly practice in cities instead of rural areas. This confirms the need for GPs to take part in gynecological care in rural areas, especially primary gynecological care, including involvement in cervical cancer prevention measures such as vaccination against HPV and screening. GPs can improve the availability of primary gynecological care, especially for rural women, although historically primary and secondary gynecological healthcare has been controlled by GYNs. The historical tradition is also confirmed by the fact that almost 99% of GYNs provided advice on cervical cancer prevention issues. The GPs involved in the study showed relatively high activity; 44% of them offered advice. However, this is not sufficient, especially in the view of the specialization's weight. It must also be taken into account that only 30% of GPs that responded believed that GPs play an important role in preventing cervical cancer, and more than 75% believed that it was a matter for GYNs. The institution of GP is relatively new in Latvia. This also explains the difference of practice length between specializations. However, if GPs' attitude does not change, it will have an adverse effect on further implementation of the CSP.

At every stage of data analysis, GPs consistently knew less about various aspects of the Latvian CSP: the age of women involved, regularity and intervals of cytological examinations, conditions for screening with a private practitioner, conditions for taking samples for testing, and detailed procedure when early precancerous changes were found. The level of knowledge does not allow GPs to fully engage and offer advice about preventing cervical cancer, to be concerned about response rates and confidently encourage women to respond to the invitation from the NHS program, or to explain how and where women can have a cytological test.

Unfortunately, only 36% of respondents knew that GPs can check the online NHS information system's screening module for the response rates of women registered with their practice that were invited to the screening program. To what extent do GPs use and know the NHS electronic system? Perhaps there is still much to do to train and motivate doctors to take advantage of modern technologies. This particularly refers to the older generation, who are less comfortable with modern technology compared to younger doctors. Usually, these older doctors are also conservative in their professional activity. Our study indicated that older doctors knew less about the CSP. Only 34% of GPs correctly answered the question about the concept of organized screening. In addition, only 63% of GPs correctly answered regarding the positive effect of screening on reducing cervical cancer morbidity and mortality rates. It is noteworthy that 74% of GPs knew of vaccination against HPV as a primary prevention measure; however, only 34% of respondents were confident about the usefulness of vaccination. Such understanding of these issues raises serious concern about carrying out the national HPV vaccination program for 12-year-old girls in Latvia because many parents consider their GP's opinion on vaccination in general and vaccination against HPV. Also of concern is that 60% of GPs stated that their knowledge about preventing cervical cancer is sufficient and comprehensive; in fact, this does not correspond to the objective assessment of their knowledge. A positive sign is that 90% of GPs would like to learn more about preventing cervical cancer. Almost one-third of GPs believed that there should be a financial reward for GPs whose practices have a high response rate of women to the invitation letters. To encourage GPs to participate in the CSP, financial incentives were used in some European countries; for example, when screening was introduced in the 1990s. In the study, only about 50% of GPs believed that they should follow up the responses to the program invitation. In many countries, including the Netherlands, France, Canada, Australia, and the UK, carrying out the CSP is the responsibility of GPs.

Although our study showed that GPs know less about and are less competent than GYNs in preventing cervical cancer, this does not mean that Latvian GYNs' knowledge and competence in this field was outstanding. In particular, GYNs are the professionals responsible for preventing cervical cancer in Latvia now because they extensively advise patients, as the results of our study indicate. Moreover, as mentioned above, the GYN group is certainly representative of the entire Latvian GYNs community. Disappointingly, only about two-thirds of respondents provided a correct answer regarding the point of the screening program. Less than two-thirds of GYNs considered vaccination against HPV to be useful. A little more than two-thirds of practitioners believed that vaccination and screening could help in preventing cervical cancer. Consequently, the following question arose: what is the professional attitude towards and knowledge about preventing cervical cancer among one-third of GYNs in Latvia, especially if these doctors have active practices? GYNs' knowledge about the Latvian CSP regarding the age group of women involved, intervals and regularity of testing, receipt of NHS invitations, payment conditions for doctors that have contracts with the NHS, and conditions for taking samples for cytological testing (vaginal and cer-

vical inflammation, or during menstruation) might be evaluated as good because 70 to 85% of respondents answered correctly. However, this cannot be interpreted as very good. For example, only a little more than half of GYNs knew that a woman could have her examination with a doctor that had no contract with the NHS, and that the NHS paid the laboratory for cervical smear cytological examination if the material was taken by a doctor that had no contract with the NHS. Considering that at least half of Latvian GYNs practice privately, with no contracts with the NHS, and (as mentioned above) that primary gynecological healthcare in Latvia is traditionally and historically performed by GYNs, the result might show that not all cytological examinations collected through the NHS payment system are recorded due to ignorance and lack of understanding by private GYNs because they may not be performed or may even be prevented. At the same time, a little more than a half of GYNs believe that private practitioners should not become actively involved in carrying out the CSP, thus demonstrating an incomplete understanding of cervical cancer prevention principles in Latvia. Another relatively alarming fact is that only 65% of GYNs know that, if cervical intraepithelial neoplasia (CIN) I is diagnosed, the women should have another smear after 6 months. This means that one-third of GYNs would not act in line with the agreed guidelines.

Even more concerning is the fact that almost 97% of GYNs assess their own knowledge about preventing cervical cancer as sufficient and complete, which clearly does not correspond to the results of our study. Perhaps, as in the case with GPs, GYNs cannot objectively assess their own knowledge. As mentioned above, knowledge was assessed based on a point system with a maximum score of 12. In the GP group, the average score was 5, versus 7 in the GYN group. This indicates that GPs' knowledge is fairly poor and that of GYNs is sufficient. It is positive that almost 90% of professionals would like to lean more. In both groups, three-quarters would like to learn through lectures, and for half of the respondents printed materials are also an important source of information. The questions for doctors (regardless of their specialization) were generally educational and had a positive impact on the further course of the CSP.

Conclusions

Based on the results of the study, it can be concluded that:

- The influence that medical practitioners involved in cervical cancer screening might have on carrying out the screening was studied for the first time in Latvia;
- The study data obtained can be applied to the entire community of all Latvian GYNs and GPs;
- Latvian GYNs are the professionals that currently carry out the major burden of CSP in Latvia;
- Current involvement of Latvian GPs in CSP implementation is insufficient;
- GYNs' knowledge, awareness, and perception of cervical cancer prevention and screening in Latvia can be assessed as sufficient;
- GPs' knowledge, awareness, and perception of cervical cancer prevention and screening in Latvia is poor;
- Older professionals' knowledge is significantly poorer;
- Latvian doctors uncritically assess their own knowledge about preventing cervical cancer;
- Latvian doctors would like to learn more about preventing cervical cancer.

Conflict of interest

The authors have no conflicts of interests to declare. The authors alone are responsible for the content of this article. The study was designed and carried out through the ESF project Interdisciplinary Research Group for Early Cancer Detection and Cancer Prevention (2009/0220/1DP/1.1.1.2.0/09/APIA/VIAA/016) and the EUROCHIP-3 project for Latvia 2010–2012.

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