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Knowledge about cervical cancer, Pap test, and barriers to women's participation in screening in Belgrade, Serbia

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Summary

Introduction: Cervical cancer (CC) is a serious public health concern in Serbia, due to opportunistic screening still being in force, which led to twice higher than the average incidence rate of cervical cancer in Europe. Despite the fact that early detection and treatment services of CC are available at no additional cost, majority of women use inadequate screening services in Serbia. *Objective:* This study aimed to examine the link between the knowledge about CC and Papanicolaou (Pap) test and perception of barriers to women's participation in CC screening. *Materials and Methods:* The study included 300 women aged 21 to 69, with a place of residence in the city of Belgrade (Serbia), who were attending for their medical examination to the University Clinic of Gynecology and Obstetrics - "Narodni front", from June through December 2014. A survey instrument to collect data was an adapted questionnaire for the assessment of knowledge about and barriers to CC and Pap test. Patients were divided into three groups: a study group consisted of women attending irregularly (over three years), women who never participated in screening, and a control group that included women regularly participating in screening. *Results:* Women regularly participating in screening (52.7%) had adequate knowledge about CC and Pap test, while women who irregularly (79.4%) or never participated (71.9%) did not have any adequate knowledge. There was a significant statistical difference between the CC and Pap test awareness in a group of respondents who regularly participated in comparison to respondents who irregularly or never participated in screening ($x^2 = 27.772$, $p = 0.000$). Regarding knowledge about human papillomavirus (HPV), 80% of women did not know that Pap test cannot be used for detection of HPV, as well as that abnormal Pap test result may be due to HPV (61.7%). Majority of women (93.7%) had poor knowledge about Pap test role in CC early detection and considered Pap test to be used to diagnose CC. The authors found a significant statistical correlation between participation of women in screening and barriers. Women who were irregular or never participated, had barriers such as: lack of time (F = 9.51; $p = 0,000$), difficult access to Healthcare facilities (F = 11.29; $p = 0.000$), lack of knowledge about the Pap test procedure (F = 21.27, $p = 0.000$), discomfort (F = 9.36; $p = 0.000$), and anxiety of Pap test results (F = 3.35; $p = 0.036$). Women who regularly participated did not have prejudice when choosing a gynecologist, unlike the other two groups that preferred a female gynecologist (F = 3.61; $p = 0.028$). *Conclusion:* This study showed that the level of knowledge about CC and Pap test in women is an important factor associated with regular participation in screening. It is necessary to take educational measures in order to raise awareness of women regarding risk factors, as well as to overcome fear and shame, with the ultimate aim to reduce frequency and mortality rate caused by CC in Serbia.

Key words: Cervical cancer; Knowledge; Barriers; Papanicolaou smear screening.

Introduction

Cervical cancer (CC) is the third most common in the world and with over three million new cases diagnosed every year amounts to 13.1% of all cancers in women. The majority of new cases of CC (around 80%) are detected in less developed regions in the world and in later stages of disease when prognosis is poor. Serbia is ranked fifth for the incidence rate of CC (27.1 in 100,000 women) after Romania, Macedonia, Bulgaria, and Lithuania, which have twice higher than the average incidence rates in Europe (10.6 in 100,000 women) [1].

Human papillomavirus (HPV) infection, is sexually transmitted, and is the major etiological factor and represents a required, though not sufficient condition for the occurrence of CC [2, 3]. Due to its slow progression, cellular identification and effective treatments, CC can be prevented. Today, there are numerous early detection methods, and one of them is a conventional Papanicolaou (Pap) test [4]. Pap test is mostly used in organised CC screening programs due to its effectiveness in reducing mortality and morbidity of this disease [5].

Advantages of Pap test in CC are shown in countries such as Finland and Sweden that have screening programs at a national level. As a result, these countries have the lowest frequency and prevalence of CC and related morbidity and mortality in the world [6, 7]. Most countries in development are still facing challenges of screening implementation [8] and over 75% CC cases per year occur in developing countries due to less comprehensive CC prevention programs [9]. It is estimated that regular screening can prevent over 90% of CC cases [10].

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proved in May 2008, the implementation of the National CC prevention program, which was partly implemented in practice due to limited funds and organizational resources. In addition to partial initiation of organized screening activities (in the northern region of Serbia –Vojvodina and partly in the capital city of Serbia, Belgrade), generally speaking, the opportunistic CC screening is still being applied. Despite the fact that cervical cancer early detection and treatment services are available in Serbia and are provided with no additional cost, majority of women in Serbia use inadequate screening services [11].

Understanding factors related to CC screening is very important in order to increase the total rate of participation in screening. Many studies have shown that knowledge, attitudes, and beliefs about Pap test are the strongest predictors of initial and repeated screening [12-14]. Therefore, identification of methods to overcome these concerns is a prerequisite for improvement of screening programs coverage. This study examined the correlation between CC and Pap test, as well as barriers in comparison to women's participation in screening.

Materials and Methods

The survey was conducted as a prospective cross-sectional study. The study included 300 women aged 21 to 69, with a place of residence in the city of Belgrade (Serbia) and attending for their medical examination to the University Clinic of Gynecology and Obstetrics "Narodni front" June through December 2014. The study was approved by the Ethics Committee of the University Clinic of Gynecology and Obstetrics "Narodni front" in Belgrade.

The study included women selected at random from the population who lived in the territory of Belgrade: women who regularly, irregularly, and never participated in screening. Women who regularly participated in screening filled in the questionnaire with the assistance of an interviewer in the waiting room outside the doctor's office, where screening services at the University Clinic of Gynecology and Obstetrics "Narodni front" in Belgrade were conducted. While women who irregularly or never participated in screening, were selected at random from at least four streets in every Belgrade municipality. The survey was conducted from door to door of homes randomly selected.

Criteria for inclusion in the study were women who lived in the territory of the city of Belgrade, aged 21 to 69, and who accepted to take part in the survey. Criteria for exclusion from the study were women who did not have a place of residence in the territory of the city of Belgrade, under 21 and over 69 years, who were pregnant or had cervical cancer diagnosed, had hysterectomy, or did not consent to participate in the survey.

A survey instrument to collect data was an adapted questionnaire adjusted to women from these regions created on the basis of similar studies [15-17]. The questionnaire included 48 questions divided into four major parts referring to: 1) socio-demographic characteristics, 2) cervical cancer screening history, 3) women's knowledge about cervical cancer and screening, and 4) barriers to screening.

Socio-demographic characteristics included age (21-30, 31-50, > 50), marital status (married, single, divorced, widow), education (primary school, high school, university), employment status (employed, unemployed, pensioner), and income: low (< 20,000 RSD), middle (20, 000 – 40,000 RSD), high (> 40,000 RSD).

Table 1. — *Socio-demographic characteristics of the respondents.*

Demographic factors	Number of respondents (n=300)	Percentage (%)
Age (years)		
21-30	101	33.7
31-50	110	36.7
>50	89	29.7
Marital status		
Married	161	53.7
Single	94	31.3
Divorced	22	7.3
Widow	23	7.7
Level of education		
Primary school	32	10.7
High school	146	48.7
Higher and university education	122	40.7
Employment status		
Employed	142	47.3
Unemployed	114	38,0
Pensioner	44	14.7
Residence type		
Urban	193	64.3
Rural	107	35.7
Economic status		
> 40,000	112	17
20,000 - 40,000	137	45.7
< 20,000	51	37.3
Last Pap test		
Regularly (< three years)	112	37,3
Irregulary (> three years)	131	43,7
Never	57	19
Result of Pap test		
Normal	168	56
Abnormal	30	10
Do not know	45	15
I have no result	57	19

Cervical cancer screening history included screening intervals (regular screening, irregular screening, never participated in screening), Pap test result (normal and abnormal results).

Respondents' knowledge about cervical cancer and screening were divided into six parts: 1) knowledge about the anatomy and physiology of cervix (three questions), 2) knowledge about detection methods and prevention of cervical cancer (four questions), 3) knowledge about the causes of cervical cancer (five questions), 4) knowledge about the risks of cervical cancer (seven questions), 5) knowledge about the symptoms of cervical cancer (three questions), and 6) knowledge about Pap test (ten questions). The total knowledge of respondents was determined on the basis of the total score of the correct answers ranking from 0 to 32 points. Respondents with over 19 points (60% of the correct answers) were placed in a group with adequate knowledge, while those with below 19 points were placed in a group with inadequate knowledge.

The respondents' barriers were measured using five-point Likert scale (ten subscales, total scale score in the range from 0 to

Table 2. — *Frequency and percentage of respondents' knowledge about cervical cancer.*

Questions	Answered correctly		Answered incorrectly	
	N. of respondents	Percentage (%)	N. of respondents	Percentage (%)
Knowledge about anatomy and physiology of cervix				
1. The parts of female reproductive organs are: uterus, ovaries, vagina and Fallopian tubes	265	88.3	35	11.7
2. Cervix is the upper part of uterus*	155	51.7	145	48.3
3. Function of cervix is to prevent bleeding in pregnancy*	77	25.7	223	74.3
Knowledge about detection and prevention of cervical cancer				
4. Occurrence of cervical cancer can be prevented using colposcopy and Pap test	252	84	48	16
5. Regular usage of condoms 100% protects from getting cervical cancer*	191	63.7	109	36.3
6. Cervical cancer can be detected by using X-rays*	90	30	210	70
7. You may get cervical cancer if you are not sexually active	163	54.3	137	45.7
Knowledge about causes				
8. Human papilomavirus (HPV) can cause cervical cancer	93	31	207	69
9. Stress may cause cervical cancer*	77	25.7	223	74.3
10. Genetic predisposition is the cause of cervical cancer	201	67	99	33
11. Poor genital hygiene can not cause cervical cancer*	114	38	186	62
12. Sexually transmitted diseases cannot cause cervical cancer*	158	52.7	142	47.3
Knowledge about risks				
13. A large number of sexual partners is a risk of cervical cancer	186	62	114	38
14. Smoking is not a risk of cervical cancer*	178	59.3	122	40.7
15. Early initiation of sex is not a risk of cervical cancer*	125	41.7	175	58.3
16. Weak immune system is a risk of getting cervical cancer	162	54	138	46
17. Usage of oral contraceptive for over five years may cause cervical cancer	65	21.7	235	78.3
18. A large number of births and abortions can not cause cervical cancer*	121	40.3	179	59.7
19. Only women can get HPV infection*	73	24.3	227	75.7
Knowledge about symptoms				
20. Cervical cancer cannot be caused if there are no symptoms or signs*	207	69	93	31
21. Pain is a typical symptom of cervical cancer*	189	63	111	37
22. Irregular bleeding or postcoital bleeding can indicate cervical cancer	163	54.3	137	45.7

*In negative questions 2, 3, 5, 6, 9, 11, 12, 14, 15, 18, 19, 20, and 21 "incorrect" is the correct answer and it is marked as "answered correctly".

50). With the subscales the respondents were able make a choice of level of agreement according to their beliefs for each claim, from full agreement (5 points) to full disagreement (1 point). The scale was used in reverse direction for scoring of negative claims. The total major scales score was calculated on the basis of the summary subscales score. Respondents who had over 75% of maximum total major scale score were considered to have a positive (high) attitude, and those with below 75% had negative (low) attitude.

Test results were summarized using descriptive method, expressed as mean value for continuous variables, and in percentage for categorical variables. Chi-square test was used between categorical variables. Student's *t*-test was used to determine the significance of difference in mean values of continuous variables between two populations, and analysis of variance (ANOVA) was used for more than two populations. Statistical analysis was done using SPPS program, version 17.0. If the value *p was* less than 0.05 ($p < 0.05$), it was considered as statistically significant.

Results

Socio-demographic characteristics of 300 tested women are shown in Table 1. Average age was 39.32 (SD = 14.23) years, ranging from 21-68. Descriptive statistical analysis showed that the sample mainly consisted of group of respondents between 31-50 (36.7%), and then respectively followed by groups of respondents between 21-30 (33.7%) and over 50 (29.7%). Married women (53.6%) were included in the major group of respondents, then followed by groups of single women (31.3%), widows (7.7%), and divorced (7.3%). Only 10.7% of the respondents had primary education, 48.7% secondary education, and 40.7% had higher or university education. In the sample, 47.3% of the respondents were employed, 38% were unemployed and 14.7% were pensioners. Many respondents (64.3%) lived in urban environment (in a city), while remaining 35.7% lived in rural environment (suburbs and country side). Good financial status (> 40,000 RSD per member of the family) were 17% of the respondents, average financial status (20,000 - 40,000 RSD per member of the family) were 45.7% of the respondents, and poor economic status (< 20,000 RSD per member of the family) were 37.3% of the respondents.

All answers of the respondents about CC knowledge are summarized in Table 2. Most respondents (88.3%) had a high level of knowledge about the parts of female repro-

Table 3. — *Frequency and percentage of respondents' knowledge about Pap test.*

Questions	Answered correctly		Answered incorrectly	
	No of respondents	Percentage (%)	No of respondents	Percentage (%)
Knowledge about PAP test				
1. Women witha long-term steady partner should not have Pap test done*	254	84.7	46	15.3
2. Women in menopause should not have Pap test done*	247	82.3	53	17.7
3. Abnormal Pap test always indicate cervical cancer*	110	36.7	190	63.3
4. Abnormal Pap test can be the consequence of presence human papillomavirus (HPV) infection	115	38.3	185	61.7
5. Pap test can be used to indicate presence of human papillomavirus (HPV) infection*	60	20	240	80
6. Women should have their first Pap test done after the age of 30*	226	75.3	74	24.7
7. Women should have Pap test done once in five years*	204	68	96	32
8. Pregnant women should not have Pap test done*	173	57.7	127	42.3
9. Pap test can detect presence of sexually transmitted infections*	84	28	216	72
10. Pap test is used to diagnose cervical cancer*	19	6.3	281	93.7

*In negative questions 1, 2, 3, 5, 6, 7, 8, 9, and 10 incorrect is the correct answer and it is marked in table as answered correctly.

Table 4. — *The impact of knowledge of respondents about cervical cancer and Pap test to participate in screening.*

Variable	Participation in screening						Statistics	
	Regular		Irregular		Never			
	n	%	n	%	n	%	x^2	p
Knowledge about cervical cancer and Pap test								
Adequate	59	52.7	27	20.6	16	28.1	28.772	0.000
Inadequate	53	47.3	104	79.4	41	71,9		
Total	112	100	131	100	57	100		

*60% of the total score of the knowledge about cervical cancer and Pap test.
**Inadequate knowledge < 60% of the total score of the knowledge about cervical cancer and Pap test.

ductive organs, while 74.3% did not know the function of cervix in pregnancy. Most respondents knew that CC could be prevented by colposcopy and Pap test (84%), while 63.7% had wrong answers and that regular usage of condoms 100% protected from developing CC. High frequency of incorrect answers that CC can be detected using X-rays was found in 70% of the respondents. The respondents most identified genetic predisposition (67%), sexually transmitted diseases (52.7%) as causes of CC, while poor hygiene for 62% of the respondents was not included in causes of CC. Women did not consider that risks of CC could be oral contraceptives used for over five years (78.3%), that HPV infection besides women might also include men (75.7%), a large number of births and abortions (59.7%), and early initiation of sex (58.3%).

Among respondents there were certain gaps in knowledge about symptoms of CC and 45.7% of the respondents had no knowledge that irregular bleeding or postcoital bleeding might indicate CC (Table 2).

The study results showed that 37.3% of the respondents regularly participated in screening of cervical cancer, while 43.7% of the respondents participated irregularly and 19% never participated in screening. Most respondents (56%) participating in CC screening had normal results (PA II), while 10% had abnormal results.

Majority of women had a high knowledge about the recommendable application of Pap test because they knew that Pap test should be done every three years (68%), before the age of 30 (75.3%), though they had a steady partner for a long time (84.7%), were in menopause (82.3%) or pregnant (68%).

When it comes to knowledge concerning HPV, even 80% of women did not know that Pap test could not detect the presence of HPV, as well as that abnormal Pap test results might be due to HPV (61.7%). Majority of women (93.7%) had poor knowledge about the role of Pap test in early detection of CC and believed that Pap test was used to diagnose cervical cancer (Table 3).

When comparing women who regularly, irregularly or never participated in screening (Table 4), the present authors found that 52.7% had adequate level of knowledge about Pap test, while respondents who irregularly (79.4%) or never (71.9%) participated in screening of CC had inadequate knowledge. There was a statistically significant difference between the level of knowledge about CC and Pap test in the group of respondents who regularly participated in screening compared to those who irregularly or never participated ($x^2 = 28.772$, $p = 0.000$).

Table 5 reports what respondents saw as a barrier for using screening programs in comparison to screening status. Women who irregularly or never participated, had as a barrier: lack of time ($F = 9.51$; $p = 0.000$), difficult access

Table 5. — *Respondents' attitudes in comparison to participation in screening.*

Attitudes about barriers preventing participation in screening of cervical cancer	Participation in screening						Statistics	
	Regular n=112		Irregular n=131		Never n=57			
	M	SD	M	SD	M	SD	F	*p*
I was busy and had other priorities when it came to visiting a gynecologist	2.22	1.26	2.98	1.46	2.74	1.33	9.51	0.000
Waiting for a long period of time puts me off to have Pap test done	2.57	1.37	2.88	1.39	2.81	1.34	2.64	0.073
Waiting for my name to be announced in a waiting room for an examination puts me off to have Pap test done	2.46	1.22	3.27	1.41	2.95	1.32	11.29	0.000
Doing Pap test is a problem for me, due to opening hours of a healthcare facility when I am not available to go for an examination	2.49	1.27	2.76	1.37	2.70	1.29	1.33	0.264
No one has ever explained to me before or after examination how Pap smear is done	2.68	1.32	2.87	1.26	2.93	1.37	0.94	0.388
I have no idea at what age and how frequent I should have Pap test done	2.12	1.05	2.92	1.31	3.28	1.32	21.27	0.000
I am worried, because the procedure of having Pap test done is painful	1.89	0.83	2.11	0.88	2.12	0.87	2.38	0.094
I am embarrassed of gynecological examination	2.13	1.20	2.40	1.19	3.01	1.43	9.36	0.000
I am anxious that Pap test will indicate cervical cancer	2.52	1.31	2.86	1.34	3.04	1.40	3.35	0.036
I prefer a female gynecologist for doing Pap test	2.99	1.44	3.17	1.40	3.60	1.22	3.61	0.028

to healthcare system (F = 11.29; p = 0.000), and lack of knowledge about the procedures of Pap test (F = 21.27, p = 0.000), compared to those who regularly participated. Women who never participated in screening, that had a Pap smear done experienced discomfort as a potential strong barrier, including exposing of genital organs (F = 9.36; p = 0.000) and anxiety of Pap test results. Women who regularly participated did not show prejudice when choosing a gynecologist, unlike those who irregularly or never participated who mainly preferred a female gynecologist (F = 3.61; p = 0.028).

Discussion

The present study confirmed much statistically important determinants of preventive measures for CC in women who live in Belgrade. Regular Pap tests and gynecological examinations are of vital importance in CC early detection. The study showed that only 37% of women who participated in the survey, regularly participated in screening. Similar screening rate between 23% and 46% was found in other studies conducted in developing countries [18-20].

Knowledge has an important impact on screening status of women, and it is the main conclusion of this study. The fact that in the present study over two-thirds of respondents who irregularly participated or never participated have no adequate knowledge about CC, is the main reason for a low screening participation rate. It indicates that knowledge about this issue plays an important role in prevention. The present authors believe that education and raising awareness will enable effective early diagnosis and treatment. According to results of this study, majority of women knew that occurrence of CC can be prevented by colposcopy and Pap test (84%). However, 93.7% of respondents thought that Pap test is used for CC diagnosis. A survey in Chile, conducted in women aged 25-54 showed that only 28% knew that Pap test was conducted for detection of neolesions, while majority of women knew that it had something to do with their genitals, and 14% knew nothing about it; the fact that they have never had Pap test done, 34% of them attributed it to negligence, while 27% said that Pap test should not be done every three years [21].

As CC causes, women most identified a genetic predisposition (67%), and sexually transmitted diseases (52.7%), while 69% had no knowledge that HPV could be the cause of CC. Sixty-two percent of respondents thought that poor hygiene causes infections and cannot lead to causing cancer. Relatively similar percentage of participants in similar studies conducted in other countries showed HPV as a cause of the occurrence of CC(50%) [22]. In the present study, most respondents did not think that using oral contraceptives for over five years could cause CC (78.3%), that in addition to women, men also can have HPV infection (75.7%); other cause included a large number of births and abortions (59.7%) and early initiation of sex (58.3%). Women had a partial image about risk factors. This does not represent a good image for effective control of this disease, which was found in a study in the Netherlands where women who considered they had no risks, did not have a reason to participate in screening program [23].

Nearly half of the respondents had no knowledge about CC, which a study conducted in India confirmed, where the most common reasons for avoiding Pap test was absence of symptoms of any kind (58.4%) [13]. Also, a study conducted in 230 female respondents in Murtala Muhamed Special Hospital Kano, Nigeria, showed that over 60% of

respondents were not able to identify all important signs and symptoms of CC [24]. It indicates that women need education in order to improve their healthcare and use healthcare system services, regardless if the symptoms and signs are evident or not.

The present study showed that women had poor knowledge about indications and benefits of CC screening. Many women believed that only women who experience symptoms should have Pap test done. Lack of knowledge about Pap test was found among the present respondents. Many respondents had no clear understanding of abnormal smear result and necessity for CC early detection, as well as the purpose of Pap test which made them think that Pap test was not necessary because the respondents experienced no symptoms.

The greatest barrier to effective CC is insufficient knowledge about Pap test. Participation in CC screening will not be increased if education is not improved and barrier eliminated. This conclusion was derived from other different surveys [25, 26]. When it came to women's attitude towards screening in this study, shame and fear were considered great barriers for women to have Pap test done.The respondents who never participated in screening for taking Pap smear, saw discomfort as a potential strong barrier, due to exposure of genitals. Shame was present not only among women in Serbia, but can freely state that it is quite universal. Likewise, a study in Canada also found that fear, discomfort, and shame were main barriers to CC screening [27]. According to survey in other studies, shame is also one of the main barriers [28, 29]. In order to help women deal with pain and discomfort during the procedure of taking Pap smear, educational actions must focus on teaching how to relax women and use smaller speculums. Also, it is important that doctors are aware of these issues and encourage women to give feedback on their pain and discomfort before and after Pap smear. Though many of the respondents who irregularly or never participated in screening, positively identified a hospital where they can get help, yet gave up on examination due to long waiting which represented a strong barrier to screening. Similar results were found in other studies [30, 31]. In general, majority of women said they did not have Pap test done, because they were afraid of positive result on cancer. Survey results also show that fear of negative Pap test results among respondents who never participated in screening also had an influence on making negative perceptions towards health institutions. Other authors achieved similar results about female fear of positive results [32-34]. The present survey results indicated that it is important to provide information on the procedure of taking Pap smear, especially in a group of women who never participated in screening in order to eliminate barriers. Women, no regardless if they irregularly or never participated, said that they would prefer a female gynecologist to have their Pap test done. The respondents also confirmed that only female doctors can be gentle and better at taking Pap smear because they are capable of showing understanding for the same sex. On the basis of that, we can ask ourselves if shame, discomfort and embarrassment are in women's nature or cultural milleu.

Conclusion

Key determinants in women's participation in screening are knowledge, beliefs, and barriers to CC and prevention strategy. The present survey results showed that the level of knowledge about CC and Pap test among women who irregularly participated in screening and those who never participated in screening is very poor. Authors have found a statistically significant correlation between barriers concerning Pap test and participation in screening. This study also provided relevant information on women's knowledge and barriers; therefore more attention should be paid when developing modern screening programs and development of primary prevention which should be directed to eliminating barriers, that will enable an opportunity to increase participation in screening of women in Serbia.

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