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Identification of Women's Attitudes towards Early Diagnosis of Cervical Cancer

Kadınların Servikal Kanserin Erken Tanısına İlişkin Tutumlarının Belirlenmesi

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ABSTRACT

Purpose: Identification of women's attitudes towards early diagnosis of cervical cancer is important in terms of overcoming the barriers to the solution to a global health problem. In this regard, the purpose of this study is to identify women's attitudes towards early diagnosis of cervical cancer. **Methods**: This descriptive and cross-sectional study utilized a stratified, proportional sampling method. The participants were 1248 women aged between 20 and 64 who applied to the Maternity and Children Hospital polyclinics due to any reason. Data were collected through the socio-demographic form which was originally developed by the researchers in line with the literature and the Attitude Scale toward Early Detection of Cervical Cancer. **Results**: Of all the participants, 66.6% were found to have a regular gynecological examination. Almost half of the women who did not undergo regular examination reported to have done so because they felt embarrassed. Attitudes of women towards early diagnosis of cervical cancer were found to be at moderate level. Age, education level, financial situation, and being married were identified as the factors that affected attitudes towards early diagnosis ($p<0.05$). Perceived susceptibility, seriousness, and benefits of women who had regular gynecological examination were found to be significantly higher than those who did not. **Conclusions**: In line with the findings, although there is a reliable and accessible test that enables early diagnosis of cervical cancer, medium level of attitudes among women is an important barrier in preventing and decreasing deaths caused by cervical cancer.

Key words: Cervical cancer, pap smear, early diagnosis, attitudes.

ÖZET

Amaç: Kadınların serviks kanserinin erken tanısına ilişkin tutumlarının belirlenmesi küresel bir sağlık probleminin çözümündeki engelleri aşmak bakımından önemlidir. Bu bağlamda araştırmanın amacı, kadınların servikal kanserin erken tanısına ilişkin tutumlarını belirlemektir. **Yöntem:** Tanımlayıcı ve kesitsel nitelikteki bu araştırmada tabakalı, oranlı olasılığa dayalı örnekleme yöntemi kullanılmıştır. Araştırmanın örneklemini Kadın Doğum ve Çocuk Hastalıkları Hastanesi'nde çalışmanın yapıldığı tarihlerde herhangi bir nedenle ilgili polikliniğe başvuran, 20-64 yaş arasındaki 1248 kadın oluşturmuştur. Veriler, araştırmacılar tarafından literatür doğrultusunda özgün olarak hazırlanan sosyo-demografik anket formu ve Servikal Kanserin Erken Tanısına İlişkin Tutum Ölçeği ile toplanmıştır. **Bulgular:** Çalışmaya katılan kadınların %66.6'sı düzenli jinekolojik muayeneye gitmektedir. Düzenli muayeneye gitmeyen kadınların yaklaşık yarısı utandıkları için kaçındıklarını ifade etmiştir. Serviks kanserinde erken tanıya ilişkin tutumlarının orta düzeyde olduğu görülmektedir. Yaş, eğitim, ekonomik durum ve evli olmak erken tanıya ilişkin tutumlarını etkileyen faktörler olarak belirlenmiştir ($p<0.05$). Düzenli jinekolojik muayeneye gidenlerin erken tanıya ilişkin duyarlılık, ciddiyet, yarar algıları gitmeyenlere göre anlamlı düzeyde daha yüksektir. **Sonuçlar:** Bulgular doğrultusunda serviks kanserinin erken tanılanmasını sağlayan güvenilir ve ulaşılabilir bir test olmasına rağmen kadınların orta düzeyde bir tutum sergilemeleri serviks kanserine bağlı ölümlerin önlenmesinde ve azaltılmasında önemli bir engeldir.

Anahtar kelimeler: Servikal kanser, pap smear, erken tarama, tutum.

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INTRODUCTION

Cancer incidence and mortality demonstrate rapid growth in the world, and after coronary heart diseases, it is the second most important cause of death worldwide.[1] Breast, colorectal, lung, cervical, and gastric cancers are among the most common cancer types in women. After breast cancer, gynecological cancers, which are among these common cancer types, compose an important part of morbidity and mortality in women.[2]

With 569,847 cases and 311.365 expected deaths in the world in 2018, cervical cancer is the fourth most prevalent cancer in the world. Cervical cancer, in lower human development index environments, is the second after breast cancer in terms of incidence and mortality. Majority of the global load results from underdeveloped regions. It is the most commonly diagnosed cancer in 28 countries and the leading cause of cancer in 42 countries; the majority of these countries are Sub-Saharan Africa and South-eastern Asia. The highest regional incidence and mortality rates are seen in Africa, and it demonstrates an increase over the years.[1-3] According to the Ministry of Health cancer record data, cervical cancer is ranked ninth among all the cancer types in Turkey (2.2%). The proportion of gynecological cancers to all cancers in women is 21.5%; cervical cancer is ranked third (4.5 of 100.000) after ovarian and corpus cancers.[4] This cancer, whose primary factor is Human Papilloma Virus (HPV), has a low prevalence between all cancer types of women in our country, but analyses conducted by the International Agency for Research on Cancer indicates that it is responsible for 5 to 10 % of HPV-related female cancers.[5] Early diagnosis approach in cervical cancer is quite successful, and it has an important place in the treatment. Papanicolau test (pap test/pap smear) is a reliable test that enables early diagnosis of cervical cancer. It has a vital role in preventing and decreasing cancer-related deaths by enabling the diagnosis of cervical cancers in localized or pre-metastasis phases.[6] Enabling early diagnosis of cervical cancer and access to effective treatment could increase survival rates dramatically.[2] While some women in Turkey do not know the necessity of Pap smear test, some others do not have the test done despite knowing about it. Reasons for not having Pap smear test include pain, embarrassment, lack of health insurance, lack of time, a fatalist approach to cancer, a lack of complaints, and discomfort.[7] In cancer prevention and early diagnosis, risk assessment of individuals, regular health education and comprehensive counseling are important duties of doctors, midwives, and nurses, who are public health service providers. Determining the attitudes towards these approaches where individual differences can be effective should be the primary goal. In this context, it is important to know the attitudes and factors affecting women's attitudes towards early diagnosis of cervical cancer to determine the reasons for the increase in cervical cancer mortality.

METHODS

Study Design

This descriptive and cross-sectional study was conducted in a Maternity and Children Hospital located in Adana/Turkey between the 1st of May and 31st of October, 2017. Target population of the study was all women aged between 20 and 64 years who applied to the hospital polyclinics for any reason. Data were collected using a stratified, proportional probability sampling method, which is one of the clustered sampling methods. The sample size was identified using Adana Directorate of Public Health Family Practice Units Current Population numbers of 2016. According to this data, the population of women aged 20 to 64 was 647.218 in Adana. After the sample was identified according to the total number of women, sample proportions were identified according to the number of women in each age group. For the sample of the study, women in the 20 to 64 age group were divided to “20-29”, “30-39”, “40-49”, and “50 and ↑” age groups, and the sample size was identified as 1294 according to 2/1000 stratified, proportional sampling method.[8] The sample was composed of 1248 women while 46 data collection forms were not included due to lack of data. The number of women in the groups were 458, 334, 235, and 221 respectively. The study involved women who applied to the polyclinics of the related hospital for any reason between the aforementioned dates, who volunteered to participate in the study, speak Turkish, and aged 20-64 years. The primary exclusion criterion is to have received any diagnosis of cancer before.

Data Collection

Data were collected on May 1st- October 31st, 2017 with women who met the inclusion criteria after they were informed about the study. Data collection was performed through face to face interviews according to the participants’ self-reports. Filling in the data collection forms took about 20 minutes.

Data Collection Tools

Data were collected through the socio-demographic form developed by the researchers originally in line with the related literature and the “Attitude Scale toward Early Detection of Cervical Cancer (ASEDCC)”.

- *The Socio-demographic Form*

The questionnaire was composed of totally 35 questions: 10 questions about the demographic

features, 6 questions about going to gynecological examinations, and 19 questions about knowledge about cervical cancer and receiving Pap smear test.

- *Attitude Scale toward Early Detection of Cervical Cancer (ASEDCC)*

The scale was developed to identify women's attitudes towards cervical cancer, is composed of 30 items and 4 sub-scales called "perceived susceptibility", "perceived seriousness,", "perceived barriers", and "perceived benefits". Scores to be obtained from the scale range between 30 and 150. Higher scores indicate the individual's positive attitudes towards early diagnosis in cervical cancer. cronbach's alpha coefficient of the scale was 0.89.[9] This study found the cronbach's alpha internal consistency coefficient as 0.92.

Statistical Analysis

Data were analyzed in the SPSS 20.0 (Statistical Package for the Social Sciences) program using descriptive and parametric statistical analysis methods. Descriptive statistical analyses include means, standard deviations, minimum, maximum, frequency, and percentage values. Comparison of the quantitative data was performed with Independent Samples t-test for data that demonstrated normal distribution; a comparison of three or more groups that demonstrated normal distribution was performed using One-way ANOVA. Critical significance level was taken $p<0.05$.

Ethical Consideration

Informed consent, study permission, and approval were obtained from University Medical Faculty Non-invasive Clinical Research Ethics Committee (Approval number: 2014/30-22). The informed consent part of the study provided the participants with the volunteer and anonymous nature of the study that would allow withdrawal at any time they wanted in accordance with the Declaration of Helsinki. The participants were not paid any money, but they were told that they could be informed about the study results if they wanted.

RESULTS

Average age of the participants was 35.89±12.12 (20-64) years. Of all the participants, 79.2% were married, 43.8% graduated from primary school, 82.6% did not work, 91.6% had social security, and 72.6% had medium income level. Average age for first marriage was 16.42±8.89, and the average number of children was 2.07±1.88. 66.6% of the women participating in the study stated that they had regular gynecological examinations. While the common reason for having a gynecological examination was having an illness (74%), the proportion of those who stated to have a general gynecological examination was 26%. While those who did not have a gynecological examination reportedly did so because they did not have any illnesses (81.8%), the other reasons included feeling embarrassed to have an examination (41.2%) and considering it unimportant (16.3%).

Table 1. The participants' results in relation to cervical cancer and pap smear test

Variables	n	%
Having knowledge about cervical cancer		
Yes	638	51.1
No	610	48.9
Sources of knowledge about cervical cancer* (n:638)		
Health Personnel	377	59.1
Television	299	24.0
Internet	198	15.9
Books/Brochures	161	12.9
Presence of someone with cervical cancer diagnosis in family		
Yes	82	6.6
No	1166	93.4
Having knowledge about Pap smear test		
Yes	539	43.2
No	709	56.8
Receiving Pap smear test		
Yes	408	32.7
No	840	67.3
Reasons for receiving Pap smear test * (n: 408)		
Doctor's recommendation	219	53.7
General Check-up	114	9.1
Doctor's recommendation during a visit for a gynecological reason	248	19.9
Reasons for not receiving pap smear test * (n: 840)		
Lack of complaints due to an illness	644	76.7
Lack of knowledge about the test	414	49.3
Feeling embarrassed to have an examination	235	28
Fear of having a positive result	156	18.6
Considering it unimportant	88	10.5
Lack of time to have the test	103	12.3
Lack of health insurance	68	8.1

**** More than one answer was given***

Table 1 demonstrates the results of cervical cancer and Pap smear test. Half of the women stated that they had information about cervical cancer, and health professionals were found to be the most frequently preferred source of information about this issue. An analysis of family history showed that 6.6% of the women had cervical cancer history in their own family. Approximately half of the participants (51.1%) had information about Pap smear test, yet the proportion of having the test was lower. Majority of the participants who received the test reported to have done so based on their doctors' recommendations (53.7%). The other half stated that they received the test after a gynecological illness complaint or during general check-ups. Reasons for not having Pap smear test were not having any complaints primarily, which was followed by lack of knowledge about the test, feeling embarrassed to have a gynecological examination, fear of receiving a positive result, considering it unimportant, lack of time, and lack of social security

Total mean score obtained from the ASEDCC was found 91.55±19.93. Perceived susceptibility sub-scale mean score was 27.59±5.99, perceived seriousness sub-scale mean score was 25.12±8.00, perceived barriers sub-scale mean score was 20.87±5.60, and perceived benefits sub-scale mean score was 17.95±4.36. An analysis of the mean scores based on the top score to be obtained from the scale showed that the participants' attitudes towards early diagnosis of cervical cancer were at medium level (Table 2).

Table 2. Attitude scale toward early detection of cervical cancer mean scores

Sub-dimensions	Min. score	Max. score	Means±SD
Perceived susceptibility	11	42	27.59±5.99
Perceived seriousness	8	40	25.12±8.00
Perceived barriers	7	34	20.87±5.60
Perceived benefits	6	29	17.95±4.36
Total	49	136	91.55±19.93

Table 3. Comparison of the attitude scale toward early detection of cervical cancer and socio-demographic features

Socio-demographic features	n(%)	Perceived Susceptibility Mean± SD	Perceived Seriousness Mean± SD	Perceived Barriers Mean± SD	Perceived Benefits Mean± SD	ASEDCC total Mean± SD
Age						
20-29	458(36.7)	26.41±5.85	23.67±7.82	20.12±5.57	17.09±4.30	87.29±19.18
30-39	334(26.8)	27.95±6.14	25.92±8.02	20.73±5.77	18.18±4.50	92.78±20.89
40-49	235(18.8)	28.56±6.03	25.72±8.06	21.97±5.69	18.81±4.48	95.07±20.29
50 and ↑	221(17.7)	28.43±5.60	26.28±7.90	21.48±5.05	18.47±3.83	94.76±18.03
		F= 10.049	*F= 8.249*	*F= 6.781*	*F= 10.527*	*F= 12.039*
		p= 0.000	*p= 0.000*	*p= 0.000*	*p= 0.000*	*p= 0.000*
Marital Status						
Married	988(79.2)	28.08±5.94	25.92±8.01	21.25±5.50	18.36±4.30	93.64±19.85
Single	260(20.8)	25.69±5.78	22.08±7.24	19.42±5.73	16.40±4.23	83.58±18.18
		t= 5.803	*t=7.022*	*t=4.736*	*t=6.567*	*t=7.394*
		p= 0.000	*p= 0.000*	*p= 0.000*	*p= 0.000*	*p= 0.000*
Education Level						
Literate	170(13.7)	29.39±5.18	28.24±7.98	21.57±4.69	19.19±3.66	98.54±16.61
Primary education	547 (43.8)	28.81±5.78	26.96±7.98	22.10±5.26	19.05±4.17	96.92±19.46
High school	321 (25.7)	26.27±6.06	22.36±7.46	20.39±5.68	16.96±4.45	85.98±19.31
University and post graduate	209(16.7)	24.91±5.66	22.02±6.41	17.82±5.80	15.58±3.90	80.33±17.24
		F= 34.361	*F= 45.489*	*F= 33.504*	*F= 47.021*	*F= 57.482*
		p= 0.000	*p= 0.000*	*p= 0.000*	*p= 0.000*	*p= 0.000*
Financial Level						
Good	167(13.4)	25.46±5.85	22.46±7.64	19.20±5.72	16.35±4.40	83.47±18.88
Middle	906 (72.6)	27.78±6.04	25.29±8.03	21.13±5.54	18.12±4.38	92.34±20.05
Low	175(14.0)	28.61±5.35	26.78±7.62	21.14±5.53	18.61±3.86	95.13±18.32
		F= 13.797	*F= 13.467*	*F= 8.644*	*F= 14.257*	*F= 17.737*
		p= 0.000	*p= 0.000*	*p= 0.000*	*p= 0.000*	*p= 0.000*
Having Social Security						
Yes	1043(91.6)	27.59±6.032	25.12±7.95	20.83±5.61	17.92±4.39	91.47±19.99
No	1058(8.4)	27.54±5.544	25.16±8.58	21.33±5.48	18.29±4.00	92.32±19.30
		t=0.077	*t= -0.055*	*t= -0.884*	*t= -0.821*	*t= -0.418*
		p=0.939	*p= 0.957*	*p= 0.377*	*p= 0.412*	*p= 0.676*

t: Independent Samples t-test F: One-way ANOVA

Table 3 and Table 4 demonstrate the comparison of ASEDCC sub-scales and scale total scores in terms of various variables. Age groups and sub-scales and general scores were statistically significant. Post-hoc analysis results showed that this difference originated from the comparison of

the 20-29 age group with the other age groups ($p<0.05$). Comparison of the education level and scale mean scores showed that ASEDCC sub-scales and general scores decreased as the education level increased ($p<0.01$). Post-hoc analysis results showed that this difference resulted from the comparison between the high school and with below high school groups ($p<0.01$). Financial level was another variable that had significant relationships with the scale. Individuals who had reportedly good financial level were found to have higher ASEDCC sub-scales and scale total scores ($p<0.05$). Married participants were found to have higher ASEDCC sub-scale and scale total scores (Table 3).

Susceptibility, seriousness, benefits sub-scales, and scale total score of the participants who had regular gynecological examination were found to be significantly higher in comparison to those who did not. However, barriers sub-scale did not demonstrate significant differences between those who had a regular gynecological examination and who did not ($p>0.05$). Reasons for having gynecological examinations included knowledge about cervical cancer, the presence of cervical cancer history in the family, and having knowledge about Pap smear test. In addition, significant relationships were found between having Pap smear gynecological test sub-scales and general total scores (Table 4).

Table 4. Comparison of the attitude scale toward early detection of cervical cancer with variables

Variables	n(%)	Perceived Susceptibility Mean± SD	Perceived Seriousness Mean± SD	Perceived Barriers Mean± SD	Perceived Benefits Mean± SD	ASEDCC Total Mean± SD
Regular gynecological examination						
Yes	831(65.5)	28.20±6.16	26.08±7.88	21.03±5.87	18.33±4.45	93.67±20.63
No	417(34.5)	26.37±5.43	23.21±7.92	20.55±5.00	17.19±4.08	87.32±17.72
		t= 5.143	*t= 6.047*	*t= 1.427*	*t= 4.401*	*t= 5.364*
		p= 0.000	*p= 0.000*	*p= 0.154*	*p= 0.000*	*p= 0.000*
Reasons for having a gynecological examination (n=831)						
Having a complaint due to an illness	615(74.0)	28.24±6.05	26.09±7.86	21.14±5.68	18.31±4.34	93.83±20.05
General check-up	216(26.0)	28.06±6.47	26.06±7.95	20.71±6.39	18.39±4.75	93.22±22.26
		t= 0.367	*t= 0.052*	*t= 0.925*	*t= -0.213*	*t= 0.369*
		p= 0.714	*p= 0.959*	*p= 0.355*	*p= 0.831*	*p= 0.712*
Having knowledge about cervical cancer						
Yes	638(51.1)	27.92±6.38	25.39±7.80	20.57±5.87	17.92±4.54	91.80±20.81
No	610(48.9)	27.24±5.53	24.84±8.21	21.19±5.28	17.98±4.17	91.28±18.97
		t= 2.009	*t= 1.222*	*t= -1.950*	*t=-0.244*	*t=0.462*
		p= 0.045	*p= 0.222*	*p= 0.051*	*p=0.807*	*p= 0.644*
Presence of someone with cervical cancer diagnosis in family						
Yes	82(6.5)	28.24±7.43	25.55±8.79	21.09±5.83	18.18±4.86	93.06±22.84
No	1166(93.5)	27.54±5.87	25.09±7.95	20.86±5.58	17.93±4.32	91.44±19.71
		t=1.029	*t= 0.500*	*t=0.358*	*t= 0.498*	*t= 0.712*
		p=0.304	*p= 0.617*	*p=0.720*	*p= 0.619*	*p= 0.533*
Having knowledge about pap smear test						
Yes	539(43.1)	27.95±6.35	25.34±7.58	20.69±6.17	17.96±4.65	91.94±20.92
No	709(56.9)	27.31±5.68	24.95±8.31	21.01±5.13	17.95±4.13	91.25±19.15
		t=1.874	*t= 0.847*	*t= -1.004*	*t= 0.031*	*t= 0.601*
		p=0.061	*p= 0.397*	*p= 0.315*	*p= 0. 976*	*p= 0.548*
Having received pap smear test						
Yes	408(32.6)	27.98±6.51	25.20±7.77	20.72±6.12	18.01±4.60	91.91±21.22
No	840(67.4)	27.39±5.71	25.08±8.12	20.95±5.33	17.92±4.24	91.37±19.28
		t= 1.623	*t= 0.246*	*t= -0.682*	*t= 0.345*	*t= 0.449*
		p= 0.105	*p= 0.806*	*p= 0.495*	*p= 0.730*	*p= 0.654*

t: Independent Samples t-test

DISCUSSION

World Health Organization recommends a comprehensive approach involving life-long multidisciplinary interventions for the prevention and control of cervical cancer. It is reported that the improvement of cervical cancer check-ups requires community education, social mobilization, vaccination, screening, treatment, and palliative care. Cervical cancer screening aims to find out pre-cancerous changes that could cause cancer if they are not treated.[10] In this regard, Pap smear has an important place in early diagnosis and treatment of cervical cancer.

A study that evaluated data from 57 countries reported that cervical cancer screening frequency was 19% on the average in developing countries and 63% in developed countries. On the

other hand, it was also reported that this frequency increased up to 80% highest in Austria and Luxemburg-where effective comprehensive screening, having pelvic examination or Pap test frequency at least once within the last 3 years was low- and decreased less than 1% in Bangladesh, Ethiopia, and Myanmar. It was found that there was a huge difference between having pelvic examination proportions and having effective comprehensive screenings with additional laboratory tests beside pelvic examination proportions; this difference was found to be wider in developing countries. While in Georgia 67% of the women had a pelvic examination, 11% had an effective comprehensive screening. In a similar vein, while 70% of women in China were found to have a pelvic examination, the proportion of those who had effective comprehensive screening was 23%. In 16 countries out of 57, half of the women were found to have had no pelvic examination at all.[11] The related literature reports the proportions of receiving Pap smear test as 69% in Spain[12], 76 % in Vietnam[13], 20% in Korea[14]), 99% in the United States of America[15], and 83% in Serbia[16]. Studies conducted in different groups and regions in our country reported these proportions between 12% and 51.4%. [9,17-22] In their study conducted in the same region with the present study but in rural parts, Demirhindi et al. found the proportion of women who never had pap smear test as 90.6%.[23] While the proportion of having regular gynecological examination was 66.6% in the present study, the proportion of those who had effective comprehensive screening was 32.7%. These proportions were found to be similar to other national and international results in the literature.

The primary reason for not having examinations in the present study was found to have no complaints due to an illness (76.6%). Ashtarian et al.[24] found that lack of knowledge was the primary cause of the barriers (44.3%), which was followed by other reasons such as lack of health insurance/unemployment, fearing the results of the test, fearing pain, lack of recommendations by the health professionals, and lack of trust in health institutions. Other similar studies also indicate lack of knowledge as an important factor.[25-28] In line with the other studies in literature, the proportion of lack of knowledge about the test among the reasons for not having Pap smear test was found 49.3%.

Bal[19] reported that 92% of the participants thought they had no risk of having cervical cancer, and 77.5% did not have any complaints that would require using pap smear test. The most important barrier for receiving the test included feeling embarrassed (48.4%) and preferring a female doctor (64.4%). The other reasons included feeling embarrassed to have an examination, fear of receiving a positive result, considering it unimportant, lack of time to have the test, and lack of health insurance. National and international studies reported the most important barriers as feeling embarrassed to have an examination, fear of having a positive result, discomfort, and lack of guidance by the health professionals.[22, 24, 29-32] Even the studies conducted with health professionals in Turkey indicated similar results, which is thought-provoking. In their study conducted with female doctors, Işık et al. [20] reported that ignoring to have an examination was ranked first in the list, which was followed by such reasons as not considering themselves in the risk group, feeling embarrassed, or fearing to receive a positive result. In their study conducted with female health workers, Ozcam et al.[21] found the proportion of those who never had an examination as 56.5% and reported that health professionals' attitudes towards their self-care were insufficient. Similar results obtained from the present study showed that those who received Pap smear test did so with the doctor's recommendation during general health check-ups or when they saw a doctor due to a gynecological reason. While lack of knowledge is seen as the most important barrier and health professionals are seen as the most important source of knowledge, the health professionals' insufficiency about this issue is notable.

CONCLUSIONS

In line with the results of the present study, low attitude levels of women especially in the 20-29 age group regarding early diagnosis is an important barrier for the prevention of cervical cancer caused by HPV. Conducting educational programs that would increase women's knowledge levels regarding cervical cancer and the importance of Pap smear test is believed to be beneficial. Individuals' access to public health services varies according to socio-demographic characteristics, and these are predictors of attitudes. In this context, the study findings once again underlined the primary role of health professionals in women's attitudes towards early screening. Especially physicians, midwives and nurses who are primary health care providers, should encourage women to early diagnosis and regular gynecological examinations. Qualitative studies would contribute to the identification of women's attitudes towards early diagnosis of cervical cancer and the development of solutions.

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KAYNAKLAR

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