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# Status and awareness of cervical, breast, and colon cancer screening in a Turkish city

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**Summary**

*Purpose of Investigation:* Mortality and morbidity rates of cervical, breast, and colorectal cancers (CRC) can be decreased via effective screening strategies. Developing countries are to be expected to establish and implement their own programs. *Materials and Methods:* To evaluate regional awareness and status of cervical, breast, and CRC screening, a questionnaire-based study was conducted in 500 volunteers from a Turkish community hospital. *Results:* Awareness rates were 57.4% for Pap smear, 61.2% for mammography, and 25.4% for CRC. Implementation rates were 19.2%, 23.9%, and 12%, respectively. Positive family history for gynecologic cancer and past cervical ablative procedure parameters were related to higher Pap smear rates. Educational level, breast self-exam, and positive Pap smear history parameters were related to higher mammography rates. Factors related to higher colorectal cancer screening rates were nulliparity and positive Pap smear history. *Conclusion:* Cancer screening rates for this Turkish city are still below the expected levels despite recently revitalized national screening program. For success, it is essential not only to educate rural populations but also to train negligent healthcare providers regularly.

*Key words:* Cervix cancer; Breast cancer; Colorectal cancer; Cancer screening; Pap smear.

## Introduction

Cervical cancer is the fourth most common cancer among women in the world. The majority of deaths from cervical cancer occur in developing countries [1]. According to Turkish Ministry of Health's "The Short Report on Cancer Prevention and Screening", 1,500 new cervical cancer cases were diagnosed in 2014 and half of these were in their early stages [2].

Oncogenic subtypes of human papillomavirus (HPV) cause cervical cancer. There are continuously updated screening guidelines offered by several scientific society and committees. Countries were recommended to establish and systematically implement their own screening programs based on their economic capacities and regional-ethnic properties [3]. Algorithms include Pap smear and HPV tests that are used for screening large populations. Visual inspection with acetic acid (VIA) is another screening method recommended by World Health Organization (WHO). American College of Physicians (ACP), American College of Obstetricians and Gynecologists (ACOG), and United States Preventive Services Task Force (USPSTF) have recommended Pap smear screening every three years beginning at age 21 and also suggested HPV test as co-test option.

Notoriously, breast cancer is the leading diagnosed cancer among women. It is the most frequent cause of cancer death in women in developing regions and the second in developed countries [1]. ACOG recommends breast cancer screening by mammography beginning at age 40 and repeated every year or two [4]. American Cancer Society (ACS) has recently changed its recommendations to commence annual screening at age 45, and every other year after age 55, with no limit to cease testing [5]. The WHO recommends mammography every one or two years for ages between 50 to 69 years [6].

Colorectal cancer (CRC) takes the second place among women malignancies in Turkey and in the world [1]. For CRC screening, guaiac-based fecal occult blood test (gFOBT), immunochemical-based fecal occult blood test (iFOBT, FIT), stool DNA test (sDNA), colonoscopy, sigmoidoscopy, double-contrast barium enema (DCBE), and computed tomographic colonography (CTC) can be used. According to ACS and the Multi-Society Task Force on Colorectal Cancer (ACS-MSTF) joint guidelines, intermediate risk group should begin having any of the above screening modalities at age 50 provided that clinicians are aware of their different preventive/early detection properties and repeat frequencies [7].

In Turkey, national screening for cervical, breast and CRC are being conducted at Family Health Care Centers, and Cancer Early Diagnosis -Screening –Training Centers

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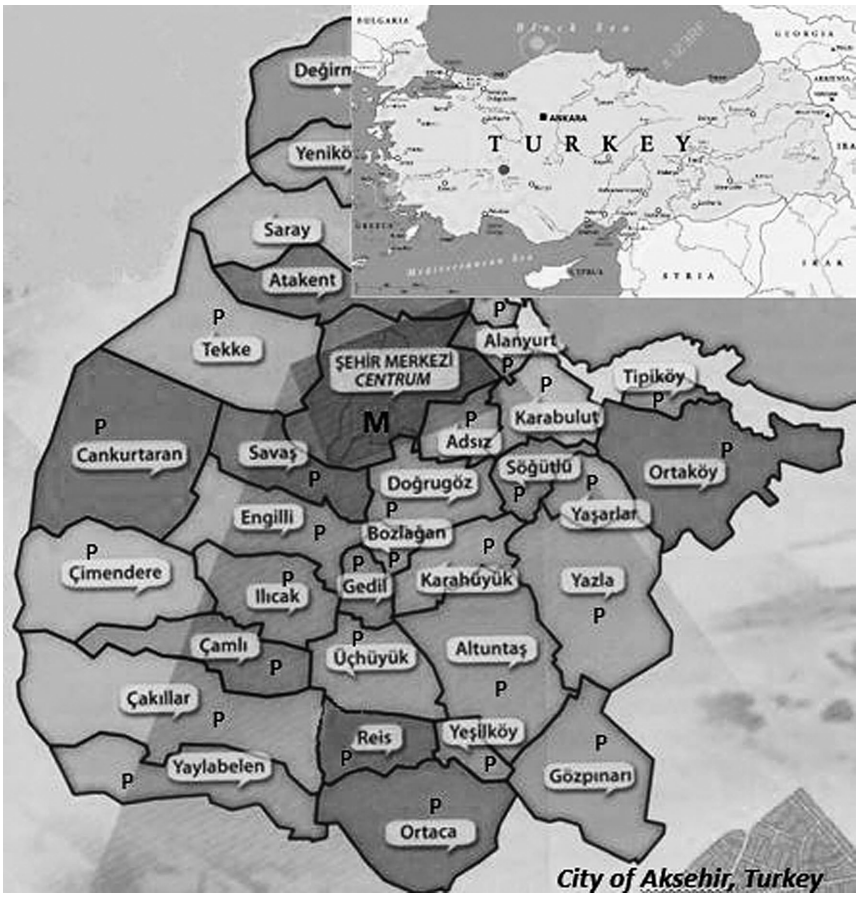


Figure 1. — City of Aksehir and its districts.

(KETEMs) under the regulation of Public Health Care Department [8]. In this study, the authors aimed to evaluate awareness and status of cervical, breast, and CRC screening tests in a rural city from central Turkey.

## Materials and Methods

The authors conducted a cross-sectional survey on participants during their regular physical examinations at an outpatient clinic. Data on awareness and status of cervical, breast, and colorectal cancer screening tests were collected via printed questionnaires specifically designed for this study after a detailed literature search. Answers were recorded by nurses and a medical doctor. Regional ethics committee approval was obtained prior to study.

This study was conducted between May 2013 and July 2013 at the Obstetrics and Gynecology Outpatient Clinic of a community hospital in the city of Aksehir, with a 48,974 women population. Five hundred women were included in this study with an age range between 18 and 75 years. Although younger participants are not expected to be screened for any cancer, awareness rates in a larger population was questioned. Screening test awareness and implementation rates were then re-grouped and analyzed based on their target age windows.

Age, pregnancy, parity, educational level, address information, marital and working statuses were questioned and recorded.

To evaluate participants' status and awareness of cervical cancer screening, following questions were asked in printed questionnaires: "have you ever had a Pap smear?", "have you heard of Pap smear test?", and when these questions could not be understood "have you heard of womb orifice sampling?" "have you heard womb orifice cancer screening?", participants were also questioned for a previous history of cervical ablative (cautery or cryo) procedure with "have you ever had an electrocautery or cryo treatment for a cervical lesion?". If they had one, then their Pap smear history right before and after the procedure was questioned. With questions regarding parity (do you have any children?), current pregnancy status (are you pregnant now?) and intrauterine device (IUD) placement history (have you ever had an IUD placement?), healthcare providers' adherence to cervical cancer screening program was intended to be investigated. In addition, participants were asked if they had ever heard of cervical cancer vaccine. When medical terminology could not be understood, local phrases were used instead, such as "freezing treatment" instead of "cryo".

To find out rates for undergoing mammography, question of "have you ever had a mammography?" was asked. If mammography term was not understood, "breast roentgen" phrase was used instead. Also participants were asked if they ever heard about breast cancer screening test or program. Histories of breast self-exam (BSE) and visits to doctor's office for breast exam were questioned too.

Participants were asked if they ever had FOBT or colonoscopy/sigmoidoscopy. If not, their awareness of FOBT and colonoscopy/sigmoidoscopy was questioned by using local phrases. In addition, family history of gynecologic or colon cancer was questioned for its possible effect on awareness and implementation rates.

According to last census, women population was recorded as

31,507 in the central district and 12,480 in peripheral districts. To evaluate the possible effect of distance from hospital on status/awareness rates, the authors categorized participants into two groups based on their living locations: central (M), and peripheral (P) (Figure 1).

Data obtained from questionnaires were analyzed with SPSS 15.0 software. Descriptive statistics were represented by means ± standard deviation, frequency, and percentage. The chi-square analyses were used for data comparison. *P* values under 0.05 were regarded as statistically significant.

## Results

Demographic features are summarized in Table 1. Mean age was 41.6 ± 13.9. In summary, 86% of the participants were married and 5.2% of them have been working in a job. Illiteracy rate was 11.6%. At the time of the study, 87.8% of the participants were parous and 10.4% were pregnant. More participants were coming from central district (M) [68.2% (n=341)] and less from peripheral districts (P) [31.8% (n=159)]. Demographics and other parameters were also evaluated with respect to Turkish Ministry of Health and US professional societies' recommended target age groups for related cancer types (Table 1).

Table 1. — *Patient characteristics by age.*

| Demographics | | General age group (18-75 years) (n=500) | | Age 21-65 years (n=445) | | Age 30-65 years (n=354) | | Age 40-69 years (n=268) | | Age 50-70 years (n=142) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | n | % | n | % | n | % | n | % | n | % |
| Marital status | Married | 430 | 86 | 394 | 88.5 | 315 | 89 | 236 | 88.1 | 117 | 82.4 |
| | Single | 32 | 6.4 | 20 | 4.5 | 8 | 2.2 | 0 | | 0 | |
| | Widowed | 38 | 7.6 | 31 | 7 | 31 | 8.8 | 32 | 11.9 | 25 | 17.6 |
| Educational level | Illiterate | 58 | 11.6 | 44 | 9.9 | 43 | 12.2 | 46 | 17.2 | 41 | 28.9 |
| | Primary School | 310 | 62 | 292 | 65.6 | 255 | 72 | 192 | 71.6 | 87 | 61.3 |
| | High School | 112 | 22.4 | 89 | 20 | 46 | 13 | 25 | 9.3 | 12 | 8.5 |
| | College Degree | 20 | 4 | 20 | 4.5 | 10 | 2.8 | 5 | 1.9 | 2 | 1.4 |
| Working status | Not working | 474 | 94.8 | 420 | 5.6 | 20 | 5.6 | 260 | 97 | 4 | 2.8 |
| | Working/Retired | 26 | 5.2 | 25 | 94.4 | 334 | 94.4 | 8 | 3 | 132 | 97.2 |
| Parity | Nulliparous | 61 | 12.2 | 44 | 9.9 | 17 | 4.8 | 12 | 4.5 | 6 | 4.2 |
| | Parous | 439 | 87.8 | 401 | 90.1 | 337 | 95.2 | 256 | 95.5 | 136 | 95.8 |
| Pregnancy status | Pregnant | 52 | 10.4 | 46 | 10.3 | 16 | 4.5 | 3 | 1.1 | 0 | 0 |
| | Not pregnant | 448 | 89.6 | 399 | 89.7 | 338 | 95.5 | 265 | 98.9 | 142 | 100 |
| History for having a relative with gynecologic/colorectal cancer | Yes | 188 | 37.6 | 170 | 38.2 | 138 | 39 | 107 | 39.9 | 48 | 33.8 |
| | No | 312 | 62.4 | 275 | 61.8 | 216 | 61 | 161 | 60.1 | 94 | 66.2 |

Table 2. — *Cervical cancer screening status and awareness related frequencies by age.*

| Cervical cancer screening | | General age group (18-75 years) (n=500) | | Age 21-65 years (n=445) | | Age 30-65 years (n=354) | |
|---|---|---|---|---|---|---|---|
| | | n | % | n | % | n | % |
| Have you ever had a Pap smear? | At least once | 84 | 16.8 | 80 | 18 | 68 | 19.2 |
| | None | 416 | 83.2 | 365 | 82 | 286 | 80.8 |
| Have you heard of a Pap smear? | Yes | 92 | 18.4 | 88 | 19.8 | 72 | 20.3 |
| | No | 408 | 81.6 | 357 | 80.2 | 282 | 79.7 |
| Have you heard of womb orifice sampling? | Yes | 157 | 31.5 | 146 | 32.8 | 121 | 34.2 |
| | No | 342 | 68.5 | 299 | 67.2 | 233 | 65.8 |
| Have you heard of womb orifice cancer screening? | Yes | 287 | 57.4 | 257 | 57.8 | 203 | 57.3 |
| | No | 213 | 42.6 | 188 | 42.2 | 151 | 42.7 |
| Have you ever had IUD placement? | Yes | 218 | 43.7 | 208 | 46.8 | 184 | 52 |
| | No | 281 | 56.3 | 237 | 53.2 | 170 | 48 |
| Have you ever had a cervical ablative procedure? | Yes | 70 | 14 | 68 | 15.3 | 68 | 19.2 |
| | No | 430 | 86 | 377 | 84.7 | 286 | 80.8 |
| If yes (prior question), have you had a Pap smear before or after the procedure? | Yes | 27 | 38.5 | 25 | 36.7 | 24 | 35.2 |
| | No | 43 | 61.5 | 43 | 63.3 | 44 | 64.8 |
| When did you have your last pelvic exam? | None | 132 | 26.4 | 103 | 23.1 | 73 | 20.6 |
| | Last year | 160 | 32 | 147 | 33 | 107 | 30.2 |
| | More than one year | 208 | 41.6 | 195 | 43.9 | 174 | 49.2 |
| Have you ever heard of a vaccine for cervical cancer? | Yes | 110 | 22 | 99 | 22.2 | 89 | 25.1 |
| | No | 390 | 78 | 346 | 77.8 | 265 | 74.9 |

Table 3. — *Parameters found to be related to undergoing cervical cancer screening.*

| Cervical cancer screening | "Have you ever had a Pap smear before?" (ages 30-65 years) Yes | No | *p* value |
|---|---|---|---|
| When did you have your last pelvic exam? | | | < 0.001 |
| Last year | 42 (64.6%) | 65 (39.1%) | |
| 1-5 years ago | 14 (21.5%) | 46 (21.3%) | |
| More than 5 years | 9 (13.9%) | 105 (48.6%) | |
| Have you ever heard of a cervical cancer screening test? | | | < 0.001 |
| Yes | 55 (80.9%) | 148 (51.7%) | |
| No | 13 (19.1%) | 138 (48.3%) | |
| Do you have a relative with gynecologic cancer? | | | < 0.001 |
| Yes | 38 (55.9%) | 100 (35%) | |
| No | 30 (44.1%) | 186 (65%) | |
| Have you ever had a cervical ablative procedure? | | | 0.015 |
| Yes | 19 (27.9)% | 42 (14.7%) | |
| No | 49 (72.1)% | 244 (85.3%) | |

Table 4. — *Breast cancer screening status and awareness related frequencies by age.*

| Breast Cancer Screening | | General age group (18-75 years) (n=500) n | % | Age 40-69 years (n=268) n | % |
|---|---|---|---|---|---|
| Have you ever had a mammography? | Yes | 86 | 17.2 | 64 | 23.9 |
| | No | 414 | 82.8 | 204 | 76.1 |
| Have you heard of mammography or breast roentgen? | Yes | 306 | 61.2 | 157 | 58.6 |
| | No | 231 | 38.8 | 111 | 41.4 |
| Do you perform breast self-exam regularly? | Yes | 269 | 53.8 | 140 | 52.2 |
| | No | 231 | 46.2 | 128 | 47.8 |
| Do you visit doctor's office regularly for breast exam? | Yes | 62 | 12.4 | 40 | 14.9 |
| | No | 438 | 87.6 | 228 | 85.1 |

Table 5. — *Parameters found to be related to undergoing breast cancer screening.*

| Breast cancer screening | "Have you ever had a mammography before?" (40-69 years) Yes | No | *p* value |
|---|---|---|---|
| Have you heard of mammography/breast roentgen or breast cancer screening? | | | < 0.001 |
| Yes | 60 (93.8%) | 97 (47.5%) | |
| No | 4 (6.3%) | 107 (52.5%) | |
| Do you visit your doctor regularly for breast exam? | | | < 0.001 |
| Yes | 37 (57.8%) | 3 (1.5%) | |
| No | 27 (42.2%) | 201 (98.5%) | |
| Do you regularly perform breast self-exam? | | | 0.006 |
| Yes | 43 (67.2%) | 97 (47.5%) | |
| No | 21 (32.8%) | 107 (52.5%) | |
| Which school did you graduate from? | | | < 0.001 |
| Illiterate | 9 (14%) | 37 (18.2%) | |
| Primary School | 44 (68.8%) | 148 (72.5%) | |
| High School | 6 (9.4%) | 19 (9.3%) | |
| College Degree | 5 (7.8%) | 0 | |
| Have you ever had a Pap smear before? | | | < 0.001 |
| Yes | 25 (39.1%) | 27 (13.2%) | |
| No | 39 (60.9%) | 177 (86.8%) | |

Table 6. — *CRC screening status and awareness related frequencies by age.*

| Colorectal cancer (CRC) screening | | General age group (18-75 years) (n=500) n | % | Age 40-69 years (n=268) n | % |
|---|---|---|---|---|---|
| Have you ever had a FOBT? | Yes | 40 | 8 | 17 | 12 |
| | No | 460 | 92 | 125 | 88 |
| Have you heard of a FOBT? | Yes | 127 | 25.4 | 33 | 23.2 |
| | No | 373 | 74.6 | 109 | 76.8 |
| Have you ever had a colonoscopy? | Yes | 31 | 6.2 | 18 | 12.7 |
| | No | 469 | 93.8 | 124 | 87.3 |
| Have you heard of colonoscopy? | Yes | 147 | 29.4 | 36 | 25.4 |
| | No | 353 | 70.6 | 106 | 74.6 |

In the general age group (18-75 years), "Pap smear" term was known in 18.4%, "womb orifice sampling" term in 31.5%, and "womb orifice cancer screening" term in 57.4%. The rate for cervical cancer vaccine awareness was 22.2% (Table 2). IUD history was positive in 52% in the Turkish target age group (30-65 years); 37.6% of the participants had a close or distant relative with a history of gynecologic or colorectal cancer.

Rate for having Pap smear at least once in a lifetime in the general age group was 16.8. This was 19.2% in the 30-65 age group. Of these, 4% needed a follow-up exam for an abnormal result. In the 30-65 age group, 79.4% had at least one pelvic examination in their lifetime, and of these only 39.3% had a positive Pap smear history. When Pap smear rates were compared between age groups (21-65 *vs.* 30-65 years), no statistically significant difference was found (18% and 19.2%, respectively). Educational level, marital status, being parous/nulliparous, pregnancy, and history of IUD placement parameters were not related to Pap smear implementation rates.

There was a noticeable but not statistically significant relationship between Pap smear rates and awareness for cervical cancer vaccine ($p = 0.082$) (Table 3). History for having pelvic examination was found to be significantly related to higher Pap smear rates ($p < 0.01$). Awareness for "cervical smear", "womb orifice sampling" or "womb orifice cancer screening test" phrases, and having a relative with a gynecologic cancer were significantly related to higher Pap smear rates ($p < 0.05$). However, positive family history for gynecologic or colon cancer parameter was not related to higher breast or CRC screening test rates. It was found that 19.2% of the participants had a positive history for having a cervical ablative procedure (electrocautery or cryo) in the past and this was significantly related to higher Pap smear rates ($p < 0.05$). Nonetheless only 35.2% of these had had a Pap smear prior or after the surgery.

The mammography rate was 23.9% in the target age group (Table 4). The percentage for having heard of breast

Table 7. — *Parameters found to be related to undergoing CRC screening.*

| Colorectal cancer screening *Colonoscopy* | "Have you ever had a colonoscopy before?" (ages 50-70) | | |
|---|---|---|---|
| | Yes | No | *p* value |
| Do you have children? | | | 0.027 |
| Yes | 15 (83.3) | 121 (97.6%) | |
| No | 3 (16.7%) | 3 (2.4%) | |
| Have you heard of CRC screening test? | | | < 0.001 |
| Yes | 13 (72.2%) | 23 (18.5%) | |
| No | 5 (22.8%) | 101 (81.5%) | |
| Have you ever had a Pap smear before? | | | 0.005 |
| Yes | 7 (38.9%) | 13 (10.5%) | |
| No | 11 (61.1%) | 111 (89.5) | |

| Colorectal cancer screening *FOBT* | "Have you ever had a FOBT test before?" (ages 50-70) | | |
|---|---|---|---|
| | Yes | No | *p* value |
| Have you heard of a FOBT before? | | | < 0.001 |
| Yes | 16 (94.1%) | 17 (13.6%) | |
| No | 1 (5.9%) | 108 (86.4%) | |
| Have you ever had a Pap smear? | | | 0.067 |
| Yes | 5 (29.4%) | 15 (12%) | |
| No | 12 (70.6%) | 110 (88%) | |

Table 8. — *Effects of living locations on screening awareness rates.*

| Location *vs.* screening awareness | Central district (M) | Peripheral districts (P) | *p* value |
|---|---|---|---|
| Have you ever heard of a Pap smear? | | | 0.005 |
| Yes | 74 (21.7%) | 18 (11.3%) | |
| No | 267 (78.3) | 141 (88.7%) | |
| Have you ever heard of breast cancer screening test? | | | 0.015 |
| Yes | 221 (64.8%) | 85 (53.5%) | |
| No | 120 (35.2%) | 74 (46.5%) | |
| Have you ever heard of colonoscopy as a screening test? | | | 0.002 |
| Yes | 115 (33.7%) | 32 (20.1%) | |
| No | 226 (66.3%) | 127 (79.9%) | |

cancer screening was 58.6%. In this age group 52.2% were preforming BSE regularly and only 14.9% had visited a doctor for a breast exam in their lifetime. Awareness for screening program, higher educational level, BSE, positive history for Pap smear, and visiting a doctor for breast exam factors were significantly related to higher mammography rates ($p < 0.05$) (Table 5).

With regards to CRC screening awareness, FOBT was known in 23.2% and colonoscopy in 25.4% of the target age group (Table 6). However implementation rates were 12% and 12.7%, respectively. Positive Pap smear history, nulliparity, and screening test awareness were significantly related to higher CRC screening rates ($p < 0.05$) (Table 7). None of the parameters were found to be significantly related to the awareness statuses.

Pap smear, mammography or CRC screening statuses were not related to participants' living distance from community hospital. Nonetheless, awareness rates were significantly higher for central district in the general age group (Table 8). Central district advantage continued only for Pap smear awareness in the cancer specific target age groups.

## Discussion

Cancer Early Diagnosis-Screening and Training Centers (KETEM) under Public Health Department have been conducting cervical, breast and CRC screenings in Turkey, and became more organized for the last several years. Based on different cultural backgrounds and financial realities, Turkish Ministry of Health determined that feasible target for cervical cancer screening age window as 30-65 years by Pap smear or HPV DNA test repeated every five years; for breast cancer screening mammography every two years between ages of 40-69, patient education after age 20 for BSE; for CRC screening iFOBT between ages 50-70 and colonoscopy at ages 51 and 61 regardless of iFOBT results [8].

In the present study, results for cervical, breast and CRC screening test awareness in the general age group were 57%, 61.2%, and 23%, respectively. Screening rates were 19.2% for cervical cancer, 23.9% for breast cancer, and 12% for CRC. Previous studies from Turkey have reported 10-90% awareness and 11-56% screening rates for cervical cancer; 39-92% awareness and 20-37.5% screening rates for breast cancer; 45-100% awareness and 12-21% screening rates for colorectal cancer [9-20]. The present findings are on the low margin of these ranges. Department of Health and Human Services of United States set the screening rate goals as 93% for cervical cancer, 81% for breast cancer, and 70.5% for CRC [21].

This study showed that recent pelvic exam, positive cervical ablative procedure history, Pap smear awareness, and knowing a relative with a history of gynecologic cancer parameters were significantly related to higher Pap smear rates. Due to unexpectedly low Pap smear percentages among pregnant or parous participants and among participants with history of IUD placement, the present authors inferred that healthcare providers have been missing valuable opportunities to offer and perform cervical cancer screening. Surprising enough, Pap smear rates among those with a positive history for cervical ablative procedure was only 35%. This unfortunate rate is probably the result of some gynecologists' maltreatment as they might have been performing cervical ablative procedures with "cervical erosion" indication based on inspection without acetic acid application. Recently this habit is fading away, especially in the regions where university hospitals' vicinities, although we still continue to witness it sporadically.

Many professional medical societies such as ACS, American Society for Colposcopy and Cervical Pathology (ASCCP), American Society for Clinical Pathology

(ASCP), USPSTF, ACOG, and Society of Gynecologic Oncology (SGO) recommend Pap smear for cervical cancer screening beginning at age 21 and accept to use HPV DNA as co-test [22]. WHO has emphasized that countries must determine their own criteria for minimum age to begin testing based on their sources and conditions. Also, it accepts HPV vaccination for girls' ages between 9 and 13 years as a primary preventive strategy [3]. ASCCP/SGO has recently declared that HPV testing could be used alone in the population over 25-years-old [23]. In this perspective, Turkish Ministry of Health's program differ from WHO by lack of clear support for HPV vaccination. Nonetheless it is similar to ASCCP/SGO 2015 interim guidelines for accepting the use of HPV test alone (quote "Pap smear or HPV testing") for screening test. If age to begin cervical cancer screening will be selected as 30 years, as in WHO recommendations, then it would be logical for the present guideline to emphasize HPV vaccine's benefits, if not to recommend it clearly. Even though cervical cancer is the 10$^{th}$ most common cancer among Turkish women according to Ministry of Health, higher prevalence in WHO data for developing countries should not be overlooked.

This study's finding of low awareness and screening rates for cervical cancer implies our need for clear and accessible implementation strategies for regions of low socio-economic status. Obviously, there is also a need for in-service training of gynecologists and family practitioners, as it can be inferred from the rates of cervical ablative procedures without Pap smear tests and from very low Pap smear rates among pregnant and parous women. It might be more practicable if we could establish protocols for sharing KETEMs' and Family Health Centers' screening responsibilities with university and community hospitals.

The low mammography rate (23.9%) in the target age group supports other studies' findings from Turkey. Relatively high BSE rate (52%) deceptively reflects participants' awareness and low mammography rates suggest that BSE is being misunderstood as an effective way for breast cancer screening. The significant positive relationship with Pap smear and mammography/CRC screening rates implies the awareness for these cancers are interconnected.

The rate of undergoing CRC screening in the target age group in considerably under the desired levels. Awareness for CRC screening tests (FOBT and colonoscopy) were the lowest among other studies from Turkey. This low rate can be related to very high illiteracy rate (28.9%) in this target age group.

In the studied population, living distance from the community hospital (only hospital in the town), did not make any difference in overall screening rates. However, awareness rates were significantly higher in central districts. This finding supports the present authors' suggestion that more reachable public education strategies would be needed to spread awareness in rural areas.

One of the limitations of this study was the dependence on participants' memories due to the nature of questionnaire based data. Also excluding males for CRC screening may blur the results since colorectal cancer is not a gender-specific disease. Another limitation was to conduct the study in a community hospital outpatient clinic as it might have led to biased result. However even so, the present screening rates were far lower than expected for a possible biased result.

## Conclusion

Approximately half the studied population was aware of cervical and breast cancer screening tests, while only one fifth underwent these tests. CRC screening awareness and implementation rates were even lower in the target age group and were far below then desired levels. In this city from Turkey, the fact that over 70% of the population were either primary school graduates or illiterates, indicates the urgent need for a better planned and targeted public education strategies. More importantly this study showed a significant inadequacy of the healthcare providers, who have the opportunity to offer and implement these vital cancer screening programs.

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