ORIGINAL ARTICLE

WILEY European Journal of Cancer Care

Distribution of cervical and breast cancer risk factors in women and their screening behaviours

Senay Karadag Arli[1] (iD) | Ayse Berivan Bakan[1] (iD) | Gulpinar Aslan[2] (iD)

[1]Department of Nursing, Agri Ibrahim Cecen University School of Health, Agri, Turkey

[2]First and Immediate Aid Program, Agri Ibrahim Cecen University Health Services Vocational School, Agri, Turkey

Correspondence
Senay Karadag Arli, Department of Nursing, Agri Ibrahim Cecen University School of Health, Agri, Turkey.
Email: senay1981@yahoo.com

Abstract

Breast cancer and cervical cancer are important causes of cancer-related mortality in women all over the world. The present study was conducted in order to investigate the distribution of cervical and breast cancer risk factors in women and their knowledge and behaviours about cancer screening methods. The study is cross-sectional in nature. It was conducted with the participation of 1,886 women in Turkey. Data were collected through a questionnaire. The knowledge and behaviours of women aged 40 and over about breast cancer or cervical cancer screening methods were investigated according to the education level; results showed that the rates of those who knew and did breast self-examination were significantly lower in illiterate women. Besides, the rates of women who did breast self-examination were significantly lower in those who were aged 40 and over, and the rates of those who had clinical breast examination and Pap smear test were significantly lower in women aged 39 and below ($p < 0.01$). This study identified the most notable breast and cervical cancer risk factors as low education levels, high number of deliveries, short breastfeeding period, obesity and low socio-economic level. For this reason, public health policies should be developed to minimise these risk factors.

KEYWORDS
breast cancer, cervical cancer, risk factors, screening tests

1 | INTRODUCTION

Increasing prevalence of cancer every day is an important public health problem both in Turkey and in the world. If the cancer increase rate continues this way by the year 2030, every year 27 million new cancer diagnosis will be made, every year 17 million people will lose their lives due to cancer, and the number of people living with cancer will reach up to 75 million (Güner & Taşkıran, 2007; Kolutek & Avci, 2015; Soylar & Genç, 2016). International Agency for Research on Cancer (GLOBOCAN) data show that 14.1 cancer cases have developed worldwide, and there have been 8.2 million cancer-related deaths (Carter, 2014). World cancer report and Ministry of Health data indicate that cancer-related deaths in Turkey are ranked second among all causes of death (Bağçivan et al, 2015; Coleman, 2014; Stewart & Wild, 2014; Turkish Statistical Institute, 2016).

Breast cancer is the most prevalent cancer type in women in our country and in the world, and it is followed by cervical cancer. In comparison with other cancer types, breast cancer and cervical cancer are the most common and deadly cancer types in women (Boyle & Levin, 2008; Özmen, 2008).

Breast cancer in women is still an international problem that affects all countries. Risk factors for breast cancer aetiology include advanced age, breast cancer history in the family, genetic susceptibility, identification of precancerous findings in breast biopsy, menarche before the age of 12 (<12), menopause at advanced age (>55), first delivery after the age of 35 or being nulliparous, hormone replacement treatment, use of oral contraceptives for more than 5 years, obesity, sedentary life style and use of alcohol (Göl & Erkin, 2016; İz & Tümer, 2016; Thompson, Lopez, & Stopeck, 2005).

Cervical cancers are the fourth most common cancers in the world. High-risk serotypes of human papillomavirus (HPV) are effective in its pathogenesis. Invasive cancer development process could prolong up to 20 years from the precursor lesion caused by sexually transmitted HPV. There are a number of risk factors for cervical cancers which include coitarche at a young age (<16), multiple sexual partners, smoking, race, high parity and low socio-economic level. Society-based early diagnosis, screening activities and HPV vaccination are recommended for this preventable cancer type (Farmer et al, 2010; Jemal et al, 2011).

Like today, cancer will continue to be one of the most important health problems and reasons of mortality in the future. In this regard, the present study was designed with the notion that informing women and involving them in screenings could dramatically decrease the cervical cancer incidence and breast cancer mortality. That breast and cervical cancers are among treatable illnesses makes it important and necessary to evaluate the knowledge and behaviours about cancer screening methods. Diagnosis should be aimed in the early phases when the treatment is effective and much easier. Hence, this study aims to investigate the distribution of cervical and breast cancer risk factors and women's knowledge and behaviours about cancer screening methods.

2 | METHODOLOGY

This study is cross-sectional in nature. It was conducted in Family Health Centers (FHCs) in a city located in the eastern part of Turkey between October and December 2016. Target population was 6,975 women who applied to FHCs between these dates. No sampling was performed; the study was conducted with 1,886 women who were aged 18 and over, who were not pregnant, who could communicate sufficiently and who accepted to participate in the study. Only volunteer participants were involved in the study.

2.1 | Data collection methods

Data were collected by the researcher through face-to-face interviews conducted with those who applied to FHCs, met the research criteria and accepted to participate in the study. Each interview took about 10–15 min.

2.2 | Survey

Data were collected through a questionnaire. The questionnaire, which was developed by the researchers in line with the related literature, is composed of 47 questions that aim to collect data about women's socio-demographic features and knowledge and behaviours about breast and cervical cancers. The participants were asked questions that involved breast self-examination, Pap smear test, clinical breast examination, diet, smoking and age at first labour. The findings are presented in detail in the tables in the findings section (Göl & Erkin, 2016; İz & Tümer, 2016; Kanbur & Çapık, 2011; Kolutek & Avci, 2015; Kurt, Canbulat, & Savaşer, 2013; Soylar & Genç, 2016).

2.3 | Data analysis

Data were analysed in SPSS package programming using descriptive statistics and chi-square analyses. Statistical significance was taken $p < 0.05$.

2.4 | Ethical considerations

Prior to the study, Ethical Committee Approval was obtained with 13/05/2016-E.8791 document number 002 declared on 12.05.2016; written permission was obtained from the Public Health Agency; and the participants' written consent and verbal consent were obtained after they were informed about the purpose of the study.

2.5 | Findings

An analysis of the participants in terms of their socio-demographic features showed that their average age was 29.01 ± 11.79. Of all the participants, 36.9% received university education/graduated from university, 52.5% were married, 70.6% had social security, 46.6% were students/worked in daily jobs, and 49% had income equal to expenses (Table 1).

An analysis of breast cancer risk factors in women aged 40 and over showed that 17.2% did not eat vegetables, 1.4% drank alcohol, 33% breastfed for <1 year, 16.9% went through menopause at the age of 55 or later, and 8.4% used hormone for more than 5 years after the menopausal period. Besides, 70.8% were overweight, 27% had early menarche history, 1.4% had first delivery after the age of 35, 8.2% had two or less deliveries, 3.8% used contraception pills for more than 5 years, 12.5% had a benign breast disease, and 22.1% had someone with breast cancer in their family (sister, mother or aunt; Table 2).

An analysis of cervical cancer risk factors showed that 53.1% of the participants had their first pregnancy at the age of 20 or younger, 20.2% had untreated vaginal infection, 10.6% were immunosuppressed, 61.6% had their first delivery at the age of 20 or younger, 89.6% had three or more deliveries, 19.1% smoked, and 17.8% had coitarche before the age of 16 (Table 2).

An analysis of the knowledge and behaviours of women aged 40 and over about breast cancer screening methods according to education level showed that the rates of those who knew and did breast self-examination were significantly lower in illiterate women. As for the occupation variable, the rates of those who knew and did breast self-examination and who had clinical examination were significantly lower in housewives ($p < 0.05$, $p < 0.01$; Table3).

An analysis of the knowledge and behaviours of women aged 40 and over about cervical cancer screening methods showed that the rates of those who knew Pap smear test were significantly lower in women who were illiterate, who had no social security

TABLE 1 Socio-demographic features of the women (N = 1,886)

Variables	N (%)
Education level	
Illiterate	325 (17.3)
Literate/primary school	304 (16.1)
Secondary school	128 (6.8)
High school	432 (22.9)
University	694 (36.9)
Marital status	
Married	988 (52.5)
Single	849 (45.1)
Widow/divorced	46 (2.4)
Social security	
Yes	1,330 (70.6)
No	553 (29.4)
Occupation	
Civil servant	169 (9.0)
Housewife	837 (44.5)
Other	877 (46.6)
Monthly income	
Income less than expenses	783 (41.6)
Income equal to expenses	923 (49.0)
Income more than expenses	177 (9.4)
Early diagnosis in cancer is	
Important	1,792 (95.2)
Not important	91 (4.8)
Having received education about BSE (breast self-examination)	
Yes	785 (41.7)
No	1,098 (58.3)
Source of the education	
Nurse	208 (26.5)
Doctor	231 (29.4)
Media	136 (17.3)
Relatives-neighbours	32 (4.1)
Other	178 (22.7)
Age	$\overline{X} \pm SD$
	29.01 ± 11.79 (min. 18 – max. 86)

and who had income less than expenses. As for the occupation variable, the rates of those who knew about Pap smear test and had it done were significantly lower in housewives (p < 0.01; Table 4).

An analysis of women's knowledge and behaviours about screening methods according to age groups indicated that the rates of women who did breast self-examination (BSE) were lower in those who were aged 40 and over, and the rates of those who had clinical breast examination (CBE) and Pap smear test were significantly lower in women aged 39 and below (p < 0.01; see Table 5).

3 | DISCUSSION

Breast cancer and cervical cancer are the most common cancer types that cause death in women and that can be prevented with early diagnosis and screening. In Turkey, breast cancer is the cancer type that is most commonly seen and at the same time that causes most deaths. Mammography is the recommended screening method in our country. It is recommended that screening should be started at the age of 40 in women and continued in every 2 years until the age of 69. In December 2012, a decision was made in country indicating that cervical cancer screening should primarily be performed with HPV-DNA tests. According to the revised national cancer screening standards, all women aged between 30 and 65 should undergo screening with HPV test once a year; cases with positive findings should be re-evaluated with Pap smear in Turkey (Kaya et al, 2017; Saatçı, 2014). On the other hand, international major organizations recommend cytology screening (Pap test) every 3 years for women aged 21–65; women aged 30–65 have the option of adding the HPV test (cotest) every 5 years (Watson, Benard, King, Crawford, & Saraiya, 2017). Cancer screening is crucial for early diagnosis, and the lack of screening is associated with late phase diagnosis or low survival rates (Lees, Erickson, & Huh, 2016; Pace & Keating, 2014; Roman et al, 2014). As recommended by the current protective health guidelines, there are various methods that enable screening these cancers in early period: mammography for breast cancer and Pap smear for cervical cancer (Nelson et al, 2009; Whitlock et al, 2011). According to our research results, an analysis of women's knowledge and behaviours about screening methods according to age groups showed that the rates of women who did breast self-examination were significantly lower in those who were aged 40 and over, and the rates of those who had clinical breast examination and Pap smear test done were significantly lower in women aged 39 and below.

Considering the characteristics of people living in the eastern part of Turkey where the present study was conducted and considering the prevalence of breast cancer risk factors in women aged 40 and over, notable findings were 33% breastfed for <1 year and 70.8% were obese. These risk factors are among controllable risk factors. Therefore, women need to be informed about the importance of breastfeeding and weight control. Besides, the literature indicates obesity as a risk factor for breast cancer (Subbaramaiah et al, 2012). It is also reported in a meta-analysis study results that longer breastfeeding time is a protective factor against breast and ovarian carcinoma (Chowdhury et al, 2015). On the other hand, a study showed that associations of density with breast cancer risk did not differ by the levels of BMI, age at menarche, parity, age at first child's birth, age at menopause, alcohol consumption, a family history of breast cancer, a history of benign breast disease and physical activity. Moreover, women with dense breasts, who currently use menopausal hormone therapy, are at a particularly high risk of breast cancer (Yaghjyan, Colditz, Rosner, & Tamimi, 2015). According to a research result, mammographic

TABLE 2 Distribution of breast and cervical cancer risk factors in women aged 40 and over (N = 367)

Breast cancer risk factors	N (%)	Cervical cancer risk factors	N (%)
Not eating vegetables	63 (17.2)	First pregnancy at the age of 20 and below	195 (53.1)
Using Alcohol	5 (1.4)	Presence of untreated vaginal infection	74 (20.2)
Breastfeeding for <1 year	121 (33.0)	Being immunosuppressed	39 (10.6)
Menopause at the age of 55 and over	62 (16.9)	First delivery at the age of 20 or younger	226 (61.6)
Using hormone for more than 5 years after menopause	31 (8.4)	Three or more deliveries	329 (89.6)
Obese/pre-obese	260 (70.8)	Smoking	70 (19.1)
Early Menarche	99 (27.0)	Coitarche before the age of 16	65 (17.8)
First delivery age over 35	5 (1.4)		
Having less than two deliveries	30 (8.2)		
Using contraceptive pills for more than 5 years	14 (3.8)		
Having a benign breast disease	46 (12.5)		
Family history	81 (22.1)		

density partially mediates some of the association between hormone replacement therapy and breast cancer risk. Also, the association between hormone replacement therapy and breast cancer seems to be stronger in women with dense breasts (Azam et al, 2018).

In addition, given the features of people in this region in terms of cervical cancer risk factors, important risk factors to be noted include 53.1% had their first pregnancy at the age of 20 or younger; 61.6% had their first delivery at the age of 20 and younger; 89.6% had three or more deliveries; and 20.2% had untreated vaginal infection. These risk factors are controllable risk factors which reveal very important information about women's health in this region. Given the studies on this issue, an important risk factor for cervical cancer includes adolescent sexuality and high number of deliveries (Chung, Franceschi, & Lambert, 2010; Louie et al, 2009; Plummer, Peto, & Franceschi, 2012). Therefore, policies that aim to prevent cervical cancer should involve trainings to be provided to adolescents about sexual health, delivery and women's health. The related literature indicates that trainings specifically on cancer are beneficial for the improvement of women's health (Kim & Han, 2016). An analysis of the knowledge and behaviours of women aged 40 and over about breast cancer screening methods according to education level showed that the rates of those who knew and did breast self-examination were significantly lower in illiterate women at our research. Conversely, another results of a study showed that revealed that occupation, marital status, number of children, sexual activity, health insurance scheme, history of oral contraceptive pill use, perceived barriers, perceived benefits and knowledge about cervical cancer prevention were significantly associated with cervical cancer screening adherence (Visanuyothin, Chompikul, & Mongkolchati, 2015).

An analysis of the knowledge and behaviours of women aged 40 and over about cervical cancer screening methods showed that the rates of those who knew about Pap smear test were significantly lower in women who were illiterate, who did not have social security and who had income less than expenses (p < 0.01). A study conducted in Turkey reported that the rates of having mammography within the past 2 years increased with the increase in the education level; women who had education level of university and above had mammography done more than the women who had lower education levels (Demir Yıldırım & Özaydın, 2014). Other studies reported different results about the relationship between education level and having mammography done. Some studies indicated similar results (Maral, Budakoğlu, Özdemir, & Bumin, 2009; Yılmazel, 2016) while some others found no significant relationships between women's education level and having mammography done (Dişcigil, Şensoy, Tekin, & Soylemez, 2007; Seçginli & Nahçıvan, 2006). On the other hand, a study result showed that the knowledge of cervical cancer and the uptake of Pap smear screening are abysmally low among the women (Okunowo et al, 2018). Moreover, Lu et al. (2012) in their systematic review about interventions to increase breast and cervical cancer screening uptake in Asian women reported that the combination of workplace-based group education programmes with mobile screening services and attending screening is effective in promotion breast and cervical cancer screening uptake.

4 | CONCLUSION

According to our research results, the most important risk factors for breast cancer include low education level, being housewife, short breastfeeding duration and obesity. Also, the most important risk factors for cervical cancer include low education level, low socio-economic level and high fertility rates. Therefore, comprehensive public health programmes should be organised in order to improve women's health. Besides, it is important that the education programmes should be provided by the health personnel in

Breast cancer screening methods

TABLE 3 Distribution of knowledge and behaviours of women aged 40 and over about breast cancer screening methods according to personal features (N = 367)

Variables	Knowing BSE N (%)	x^2	Doing BSE (every month) N (%)	x^2	Having CBE done N (%)	x^2	Having mammography N (%)	x^2
Education level								
Illiterate	55 (27.5)	16.372 $p = 0.003$	56 (28.0)	18.867 $p = 0.001$	66 (33.0)	1.836 $p = 0.766$	57 (28.5)	1.547 $p = 0.818$
Literate/primary school	41 (36.0)		44 (38.6)		41 (36.0)		37 (32.5)	
Secondary school	10 (43.5)		12 (52.2)		10 (43.5)		8 (34.8)	
High school	12 (63.2)		13 (68.4)		8 (42.1)		6 (31.6)	
University	7 (63.6)		6 (54.5)		3 (27.3)		2 (18.2)	
Social security								
Yes	91 (36.1)	1.507 $p = 0.220$	94 (37.3)	0.905 $p = 0.342$	90 (35.7)	0.248 $p = 0.618$	81 (32.1)	1.804 $p = 0.179$
No	34 (29.6)		37 (32.2)		38 (33.0)		29 (25.2)	
Occupation								
Civil servant	11 (84.6)	18.968 $p = 0.000$	11 (84.6)	15.650 $p = 0.000$	7 (53.8)	8.747 $p = 0.013$	5 (38.5)	2.231 $p = 0.328$
Housewife	102 (30.9)		109 (33.0)		107 (32.4)		95 (28.8)	
Other	12 (50.0)		11 (45.8)		14 (58.3)		10 (41.7)	
Monthly income								
Income less than expenses	48 (29.1)	3.951 $p = 0.139$	53 (32.1)	2.207 $p = 0.332$	55 (33.3)	1.129 $p = 0.569$	47 (28.5)	1.459 $p = 0.482$
Income equal to expenses	62 (36.9)		63 (37.5)		63 (37.5)		55 (32.7)	
Income more than expenses	15 (44.1)		15 (44.1)		10 (29.4)		8 (23.5)	

Note. BSE: breast self-examination; CBE: clinical breast examination.

TABLE 4 Distribution of knowledge and behaviours of women aged 40 and over about Cervical Cancer Screening Methods according to personal features (N = 367)

Cervical cancer screening methods

Variables	Knowing Pap smear test N (%)	x^2	Having Pap smear test done N (%)	x^2
Education level				
Illiterate	22 (11.0)	22.835	29 (14.5)	9.224
Literate/primary school	34 (29.8)	p = 0.000	28 (24.6)	p = 0.056
Secondary school	6 (26.1)		4 (17.4)	
High school	7 (36.8)		7 (36.8)	
University	4 (36.4)		3 (27.3)	
Social security				
Yes	61 (24.2)	9.399	54 (21.4)	2.235
No	12 (10.4)	p = 0.002	17 (14.8)	p = 0.135
Occupation				
Civil servant	7 (53.8)	13.238	7 (53.8)	19.461
Housewife	58 (17.6)	p = 0.001	54 (16.4)	p = 0.000
Other	8 (33.3)		10 (41.7)	
Monthly income				
Income less than expenses	21 (12.7)	9.780 p = 0.008	28 (17.0)	4.293 p = 0.117
Income equal to expenses	44 (26.2)		32 (19.0)	
Income more than expenses	8 (23.5)		11 (32.4)	

TABLE 5 Comparison of women's behaviours about breast and cervical cancer screening methods according to age groups

Age group	Those doing BSE N (%)	x^2	Those who had CBE done N (%)	x^2	Those who had Pap smear test done (N = 1,034)[a] N (%)	x^2
40 and over	131 (35.7)	8.868	128 (34.9)	130.825	71 (19.3)	27.601
39 and below	671 (44.3)	p = 0.003	164 (10.8)	p = 0.000	54 (8.1)	p = 0.000

Notes. BSE: breast self-examination; CBE: clinical breast examination.
[a]It included women who were not single.

a wway women can understand. State policies could be beneficial for monitoring women's health.

ETHICAL APPROVAL

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

CONFLICT OF INTEREST

The authors declare that they have no competing interests.

AUTHOR CONTRIBUTIONS

SKA and ABB contributed to study conception/design. ABB and GA performed data collection/analysis. SKA drafted the manuscript. SKA and ABB performed critical revision for intellectual content. SKA contributed to study supervision.

ORCID

Senay Karadag Arli 🔟 http://orcid.org/0000-0002-8231-3857

Ayse Berivan Bakan 🔟 http://orcid.org/0000-0002-0052-9890

Gulpinar Aslan 🔟 http://orcid.org/0000-0002-1231-4272

REFERENCES

Azam, S., Lange, T., Huynh, S., Aro, A. R., von Euler-Chelpin, M., Vejborg, I., … Andersen, Z. J. (2018). Hormone replacement therapy, mammographic density, and breast cancer risk: A cohort study. *Cancer Causes & Control*, *29*(6), 495–505. https://doi.org/10.1007/s10552-018-1033-0.

Bağçivan, G., Uysal, N., Karaaslan, A., Kapucu, S., Talas, M. S., & Terakye, G. (2015). Review of oncology nursing research that conducted by nurses in Turkey and published between 2009–2013: A systematic review. *Turkish Journal of Oncology*, *30*(1), 5–15.

Boyle, P., & Levin, B. (Eds.) (2008). *World cancer report 2008*. Lyon, France: World Health Organization. International Agency for Research on Cancer.

Carter, D. (2014). New global survey shows an increasing cancer burden. *The American Journal of Nursing*, *114*(3), 17. https://doi.org/10.1097/01.NAJ.0000444482.41467.3a.

Chowdhury, R., Sinha, B., Sankar, M. J., Taneja, S., Bhandari, N., Rollins, N., … Martines, J. (2015). Breastfeeding and maternal health outcomes: A systematic review and meta-analysis. *Acta Paediatrica*, *104*(S467), 96–113. https://doi.org/10.1111/apa.13102.

Chung, S. H., Franceschi, S., & Lambert, P. F. (2010). Estrogen and ERα: Culprits in cervical cancer? *Trends in Endocrinology & Metabolism*, *21*(8), 504–511. https://doi.org/10.1016/j.tem.2010.03.005.

Coleman, M. P. (2014). Cancer survival: Global surveillance will stimulate health policy and improve equity. *The Lancet*, *383*(9916), 564–573. https://doi.org/10.1016/S0140-6736(13)62225-4.

Demir Yıldırım A., & Özaydın, A. N. (2014). Sources of breast cancer knowledge of women living in Moda/İstanbul and their attendance to breast cancer screening. *The Journal of Breast Health*, *10*, 47–56. https://doi.org/10.5152/tjbh.2014.1762.

Dişcigil, G., Şensoy, N., Tekin, N., & Soylemez, A. (2007). Attitude and practice on breast health in west Anatolian women sample. *The Breast Journal*, *13*, 218–219. https://doi.org/10.1111/j.1524-4741.2007.00411.x.

Farmer, P., Frenk, J., Knaul, F. M., Shulman, L. N., Alleyne, G., Armstrong, L., … Gospodarowicz, M. (2010). Expansion of cancer care and control in countries of low and middle income: A call to action. *The Lancet*, *376*(9747), 1186–1193. https://doi.org/10.1016/S0140-6736(10)61152-X.

Göl, I., & Erkin, Ö. (2016). Knowledge and practices of nurses on cervical cancer, HPV and HPV vaccine in Cankiri state hospital, Turkey. *The Journal of the Pakistan Medical Association*, *66*(12), 1621–1626.

Güner, H., & Taşkıran, Ç. (2007). Epidemiology of cervical cancer and the role of human papilloma virus. *Turkish Journal of Obstetrics and Gynecology*, *4*(1), 11–19.

İz, F. B., & Tümer, A. (2016). Assessment of breast cancer risk and belief in breast cancer screening among the primary healthcare nurses. *Journal of Cancer Education*, *31*(3), 575–581.

Jemal, A., Bray, F., Center, M. M., Ferlay, J., Ward, E., & Forman, D. (2011). Global cancer statistics. *CA: A Cancer Journal for Clinicians*, *61*(2), 69–90. https://doi.org/10.3322/caac.20107.

Kanbur, A., & Çapık, C. (2011). Cervical cancer prevention, early diagnosis-screening methods and midwives / nurses role. *Hacettepe University Faculty of Health Sciences Nursing Journal*, *18*(1), 61–72.

Kaya, C., Üstü, Y., Özyörük, E., Aydemir, Ö., Şimşek, Ç., & Şahin, A. D. (2017). Knowledge, attitudes and behaviors of health workers about cancer screenings. *Ankara Medical Journal*, *17*(1), 73–83.

Kim, K., & Han, H. R. (2016). Potential links between health literacy and cervical cancer screening behaviors: A systematic review. *Psycho-Oncology*, *25*(2), 122–130. https://doi.org/10.1002/pon.3883.

Kolutek, R., & Avci, I. A. (2015). The effect of training and monitoring at home on the knowledge level and practices of married women regarding breast and cervical cancer. *Journal of Breast Health*, *11*(4), 155–162. https://doi.org/10.5152/tjbh.2015.2647.

Kurt, A., Canbulat, N., & Savaşer, S. (2013). Cervical cancer and risk factors of featured with adolescent sexuality. *Medical Journal of Bakırköy*, *9*(2), 59–63.

Lees, B. F., Erickson, B. K., & Huh, W. K. (2016). Cervical cancer screening: Evidence behind the guidelines. *American Journal of Obstetrics and Gynecology*, *214*(4), 438–443.https://doi.org/10.1016/j.ajog.2015.10.147.

Louie, K. S., de Sanjose, S., Diaz, M., Castellsague, X., Herrero, R., Meijer, C. J., … Bosch, F. X. (2009). Early age at first sexual intercourse and early pregnancy are risk factors for cervical cancer in developing countries. *British Journal of Cancer*, *100*, 1191–1197. https://doi.org/10.1038/sj.bjc.6604974.

Lu, M., Moritz, S., Lorenzetti, D., Sykes, L., Straus, S., & Quan, H. (2012). A systematic review of interventions to increase breast and cervical cancer screening uptake among Asian women. *BMC Public Health*, *12*(1), 413.

Maral, I., Budakoğlu, İ., Özdemir, A., & Bumin, A. (2009). Behaviors toward methods of breast cancer early detection in women over 40 years in a rural region of Ankara, Turkey. *Journal of Cancer Education*, *24*, 127–128. https://doi.org/10.1080/08858190902854673.

Nelson, H. D., Tyne, K., Naik, A., Bougatsos, C., Chan, B. K., & Humphrey, L. (2009). Screening for breast cancer: An update for the US Preventive Services Task Force. *Annals of Internal Medicine*, *151*(10), 727–737. https://doi.org/10.7326/0003-4819-151-10-200911170-00009.

Okunowo, A. A., Daramola, E. S., Soibi-Harry, A. P., Ezenwankwo, F. C., Kuku, J. O., Okunade, K. S., & Anorlu, R. I. (2018). Women's knowledge of cervical cancer and uptake of Pap smear testing and the factors influencing it in a Nigerian tertiary hospital. *Journal of Cancer Research and Practice*, *5*, 1–7. https://doi.org/10.1016/j.jcrpr.2018.02.001.

Özmen, V. (2008). Breast cancer in the world and Turkey. *The Journal of Breast Health*, *4*, 2–6.https://doi.org/10.1016/j.jcrpr.2018.02.001.

Pace, L. E., & Keating, N. L. (2014). A systematic assessment of benefits and risks to guide breast cancer screening decisions. *JAMA*, *311*(13), 1327–1335. https://doi.org/10.1001/jama.2014.1398.

Plummer, M., Peto, J., & Franceschi, S. (2012). Time since first sexual intercourse and the risk of cervical cancer. *International Journal of Cancer*, *130*(11), 2638–2644. https://doi.org/10.1002/ijc.26250.

Roman, L., Meghea, C., Ford, S., Penner, L., Hamade, H., Estes, T., & Williams, K. P. (2014). Individual, provider, and system risk factors for breast and cervical cancer screening among underserved Black, Latina, and Arab women. *Journal of Women's Health*, *23*(1), 57–64. https://doi.org/10.1089/jwh.2013.4397.

Saatçı, E. (2014). Cancer Epidemiology: Worldwide and Turkey. *Turkiye Klinikleri Journal of Family Medicine Special Topics*, *5*(2), 1–8.

Seçginli, S., & Nahçivan, N. O. (2006). Factors associated with breast cancer screening behaviors in a sample of Turkish women: A questionnaire survey. *International Journal of Nursing Studies*, *43*, 161–171.

Soylar, P., & Genç, M. F. (2016). The Treatment Approach and Social Support Needs for Patients with Breast Cancer. *Journal of Breast Health*, *12*(2), 56–62. https://doi.org/10.5152/tjbh.2016.2753.

Stewart, B. W., & Wild, C. P. (2014). *World cancer report 2014*. Lyon, France: International Agency for Research on Cancer, World Health Organization.

Subbaramaiah, K., Morris, P. G., Zhou, X. K., Morrow, M., Du, B., Giri, D., … Dannenberg, A. J. (2012). Increased levels of COX-2 and prostaglandin E 2 contribute to elevated aromatase expression in inflamed breast tissue of obese women. *CancerDiscovery*, *2*(4), 356–365.

Thompson, P. A., Lopez, A. M., & Stopeck, A. (2005). Breast cancer prevention. In D. S. Alberts, & L. M. Hess (Eds.), *Fundamentals of cancer prevention* (pp. 255–276). Berlin, Germany: Springer.

Turkish Statistical Institute (TUIK) (2016). *Death reward statistics, 2015*. Retrieved from https://www.tuik.gov.tr/PreHaberBultenleri.do?id=21526#. accessed on: August 13, 2018.

Visanuyothin, S., Chompikul, J., & Mongkolchati, A. (2015). Determinants of cervical cancer screening adherence in urban areas of Nakhon Ratchasima Province, Thailand. *Journal of Infection and Public Health, 8*(6), 543–552. https://doi.org/10.1016/j.jiph.2015.04.018.

Watson, M., Benard, V., King, J., Crawford, A., & Saraiya, M. (2017). National assessment of HPV and Pap tests: Changes in cervical cancer screening, National Health Interview Survey. *Preventive Medicine, 100*, 243–247. https://doi.org/10.1016/j.ypmed.2017.05.004.

Whitlock, E. P., Vesco, K. K., Eder, M., Lin, J. S., Senger, C. A., & Burda, B. U. (2011). Liquid-based cytology and human papillomavirus testing to screen for cervical cancer: A systematic review for the US Preventive Services Task Force. *Annals of Internal Medicine, 155*(10), 687–697. https://doi.org/10.7326/0003-4819-155-10-201111150-00376.

Yaghjyan, L., Colditz, G. A., Rosner, B., & Tamimi, R. M. (2015). Mammographic breast density and breast cancer risk: Interactions of percent density, absolute dense, and non-dense areas with breast cancer risk factors. *BreastCancer Research and Treatment, 150*(1), 181–189. https://doi.org/10.1007/s10549-015-3286-6.

Yılmazel, G. (2016). Health literacy, mammogram awareness and screening among tertiary hospital women patients. *Journal of Cancer Education, 33*, 89–94. https://doi.org/10.1007/s13187-016-1053-y.