**Research Article**

# THE RELATIONSHIP OF HEALTH LITERACY WITH PERCEPTION OF HEALTH AND CANCER SCREENING ATTITUDES IN CLIMACTERIC WOMEN

**Elif KETEN EDİS[1], Sümeyye BAL[2]**

## Abstract

**Aim**: The climacteric period represents a period when women's health risks increase, including cancer. This study aimed to investigate the relationship between health literacy, health perception, and cancer screening attitudes of women in the climacteric period.

**Method**: The sample of this cross-sectional study consisted of 322 women aged between 45 and 65 years. Data were collected using the Short-Form Health Literacy Instrument, Attitude Scale for Cancer Screening, and Health Perception Scale. Independent Samples t-test, One-way ANOVA, Pearson correlation analysis, and Linear regression analysis were used to analyze data.

**Findings**: The average age of the women was 49.14±5.33 years. The rate of women who had a cancer screening in the last five years was 30.4%. Of the women who had cancer screening, 46.2% had a pap smear, 46.9% had a mammography, and 6.9% had a colonoscopy. The health literacy average score was 29.35±9.75, the attitude for cancer screening average score was 92.94±15.80, and the health perception average score was 44.07±7.62. A low level of positive correlation was found between health literacy and attitudes toward cancer screening and health perception ($p<0.05$).

**Results**: Our findings showed that attitudes towards cancer screening were positively impacted as health literacy increased. Interventions aimed at increasing health literacy can contribute to increased cancer screening rates.

**Keywords:** Attitude to health; Early detection of cancer; Health literacy; Women's health

[1] Corresponding Author: Asst. Prof. Dr., University of Amasya, Department of Nursing Faculty of Health Sciences, Amasya, Türkiye elif.edis@amasya.edu.tr ORCİD: 0000-0002-5587-6726

[2] Lecturer Dr., University of Ondokuz Mayıs, Department of Midwifery Faculty of Health Sciences, Samsun, Türkiye sumeyyebal@gmail.com ORCİD: 0000-0002-7568-0974

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# *Klimakterik Dönemdeki Kadınların Sağlık Okuryazarlığı ile Sağlık Algısı ve Kanser Tarama Tutumları Arasındaki İlişki*

## Öz

**Amaç**: Klimakterik dönem kanserler de dahil olmak üzere kadınların sağlık risklerinin arttığı bir dönemdir. Bu çalışmanın amacı klimakterik dönemdeki kadınların sağlık okuryazarlığı ile sağlık algıları ve kanser taramalarına yönelik tutumları arasındaki ilişkiyi incelemektir.

**Yöntem**: Bu kesitsel çalışmanın örneklemini 45-65 yaş aralığındaki 322 kadın oluşturmuştur. Veriler Sağlık Okuryazarlığı Ölçeği-Kısa Form, Kanser Taramalarına Yönelik Tutum Ölçeği ve Sağlık Algısı Ölçeği kullanılarak toplanmıştır. Verilerin analizinde bağımsız örneklem t-testi, tek yönlü varyans analizi, Pearson korelasyon analizi ve doğrusal regresyon analizini kullanılmıştır.

**Bulgular**: Kadınların yaş ortalaması 49.14±5.33'tür. Son beş yılda kanser taraması yaptıran kadınların oranı %30,4'tür. Kanser taraması yaptıran kadınların %46,2'si pap smear, %46,9'u mamografi ve %6,9'u kolonoskopi yaptırmıştır. Kadınların sağlık okuryazarlığı puan ortalaması 29,35±9,75, kanser taramalarına yönelik tutum puan ortalaması 92,94±15,80 ve sağlık algısı puan ortalaması 44,07±7,62'dir. Sağlık okuryazarlığı ile kanser taramalarına yönelik tutum ve sağlık algısı arasında düşük düzeyde pozitif bir korelasyon saptanmıştır ($p<0,05$).

**Sonuç**: Bulgularımız sağlık okuryazarlığı arttıkça kanser taramalarına yönelik tutumun olumlu yönde etkilendiğini göstermiştir. Sağlık okuryazarlığını artırmayı amaçlayan müdahaleler kanser tarama oranlarının artmasına katkıda bulunabilir.

**Anahtar Kelimeler**: Sağlık tutumu; Kanser erken tespiti; Sağlık okuryazarlığı; Kadın sağlığı

## 1. INTRODUCTION

The climacteric period is the transitional period between a woman's life's reproductive and non-reproductive phases. During this period, estrogen levels reduce, and hormonal imbalances occur, which lead to pathologies causing morbidity and mortality (Misra et al., 2018). The climacteric period covers a great portion of women's lives, and the incidence of certain diseases, including cancer, increases with age. Cancer-related deaths still disproportionately affect women in low- and middle-income countries. Common cancers among women are breast cancer (47.8%), colorectal cancer (16.2%), lung cancer (14.6%), and cervical cancer (13.3%) (GLOBOCAN, 2020). World Health Organization reported that in 2020, 604,000 women were diagnosed with cervical cancer and 2.3 million with breast cancer; 342,000 died from cervical cancer, and 685,000 died from breast cancer (WHO, 2022).

Screening for early cancer diagnosis is associated with better health outcomes, such as lower incidence of disease and lower mortality (Yang et al., 2022). However, many factors influence individuals' participation in screening programs. These factors include sociocultural or gender-related factors, financial constraints, geographic and transportation barriers, and unavailability of services (WHO, 2017). One of the most important barriers to preventative health behaviors, including cancer screening, is low health literacy (Almutairi et al., 2018; Baharum et al., 2020; Yılmazel, 2018). Health literacy not only affects individuals' access to health information but also influences the adoption of appropriate health behaviors based on that information (Nutbeam, 1998). Individuals with a sufficient level of health literacy attach more importance to preventative health services and tend to display more positive health behaviors (Doğan & Çetinkaya, 2019). Inadequate health literacy is considered a significant barrier to accessing health services and leads to individuals' inability to comprehend their own well-being and how to improve it (Berkman et al., 2011; Michou et al., 2020). Some researchers highlighted health literacy that health literacy is associated with reproductive health information, behaviors, and outcomes including cancer screening (Baharum et al., 2020; Kilfoyle et al., 2016).

Most of the cancer-related deaths occur in low- and middle-income countries, including Türkiye (WHO, 2017). Despite the implementation of national screening programs for cervical, breast, and colorectal cancers in Türkiye, screening rates of individuals are still low (Ministry of Health, 2024). Therefore, it is important to have information about the factors that drive individuals' screening behaviors to reduce cancer-related death rates, keep women healthy, and ensure that they lead a productive life. As a critical factor affecting cancer diagnosis and treatment, health literacy is becoming increasingly more important (Sørensen, 2020). However, although many studies have investigated health literacy, the impact of health literacy on the health behaviors of women in the climacteric period was less studied. Additionally, while studies on health literacy, health perception, and cancer screening behaviors have been conducted

in Türkiye, these concepts have not been examined together, particularly in the context of the climacteric period. Indeed, the climacteric period represents a period when women's health risks increase, and they should undergo regular health checks. Therefore, in this period when women's health is at greater risk, including the risk of cancer, it is important to understand the factors that influence their participation in screenings to encourage higher compliance. Additionally, uncovering evidence concerning the impact of health literacy on women's health behaviors is an essential step in integrating health literacy into preventative health services and developing comprehensive measures and strategies. Therefore, our study focused on these factors that influence women's health during the climacteric period. The findings may contribute to developing strategies to improve women's health in developing countries, including Türkiye.

### 1.1. Purpose of the Study

The present study has a threefold research purpose: (i) To understand health literacy, health perception, and attitudes toward cancer screenings in women during the climacteric period, (ii) To examine the association between health literacy, health perception, and attitudes toward cancer screenings in women in this period, and, (iii) To identify the factors influencing health literacy, health perception, and attitudes toward cancer screenings in women during the climacteric period.

## 2. METHODS

### 2.1. Study Design

We designed a cross-sectional study. We carried out this study in the gynecology outpatient clinics of a hospital in northern Türkiye between January and May 2022.

### 2.2. Population

The target population was women between the ages of 45 and 65. According to Türkiye Address-Based Population Registration System Results (2021), the female population for the province where the research was conducted was 19.577. We calculated the sample size as 377 with 95% confidence and 50% prevalence (OpenEpi). The inclusion criteria were being at least literate, being able to communicate effectively in Turkish, and not having any cognitive or perceptual disabilities. The exclusion criteria were being outside the specified age limits, having any communication problems (language, vision, hearing, etc.), and being diagnosed with a psychiatric disease. We used convenience sampling, a non-probability sampling method, to select participants. We invited 400 women to participate in the study; however, some declined or did not fully complete the questionnaires. We completed the research with 322 women. We found the power of the study to be 99% in the post-hoc power analysis based on the correlation coefficient of health literacy and attitudes toward cancer screenings.

## 2.3. Measures

The participants completed the Introductory Information Form, Short-Form Health Literacy Instrument, Attitude Scale for Cancer Screening, and Health Perception Scale. It took approximately 15-25 minutes to fill out the questionnaire forms.

***2.3.1. Introductory Information Form*:** This form comprised 11 questions regarding sociodemographic questions such as age, education level, marital status, employment status, income level, and health behaviors such as self-health assessment status, smoking, having a chronic illness, and having regular health checkups.

***2.3.2. Short-Form Health Literacy Instrument (HLS-SF12)*:** The scale was originally developed by Duong et al. (2019) and the validity and reliability of its Turkish version were confirmed by Yılmaz and Eskici (2021). The instrument is a single dimension, consists of 12 items, and is a 4-point Likert type. Participants' health literacy levels are evaluated using a formula (Index = (Average-1) x 50/3), where the average is obtained by dividing the total scale score by the number of items. The index value obtained by this formula ranges from 0 to 50. Higher index values reflect higher health literacy. The internal consistency of the scale was reported as 0.856 (Yılmaz & Eskici, 2021).

***2.3.3. Attitude Scale for Cancer Screening*:** This instrument was developed by Öztürk et al. (2020) and evaluated on a 5-point Likert-type scale. The scale consists of 24 items that measure a single dimension. The scale is available for use in males and females aged 30-70 years. Thirteen items (9, 12, and 14-24) are negative expressions and are reverse coded. The total scores on the scale range from 24 to 120, with higher scores reflecting more positive cancer screening attitudes. The internal consistency of the scale was reported as 0.95 (Öztürk et al., 2020).

***2.3.4. Health Perception Scale (HPS)*:** The scale was originally developed by Diamond et al. (2007). The validity and reliability of the Turkish version were assessed by Kadıoğlu and Yıldız (2012). The responses are rated on a 5-point Likert-type scale. The scale consisted of 15 items covering four dimensions (center of control, self-awareness, certainty, and importance of health). Six items of the scale are positive and the remaining 9 items are negative expressions. The negative expressions are reverse coded. The total scores on the scale range from 15 and 75. The internal consistency of the total scale was reported as 0.70, whereas it varied between 0.53-0.73 for the subscales (Kadioglu & Yildiz, 2012).

## 2.4. Data Analysis

We used IBM SPSS v.23 to analyze the data. We presented the descriptive data as frequency, percentage, mean, and standard deviation. We evaluated the skewness and kurtosis coefficients (±2) to determine the normality of the data distribution (George & Mallery, 2010). We assessed the homogeneity of

variances through the Levene test. We accepted that data with skewness and kurtosis values of ±2 were normally distributed and employed parametric tests to analyze data. We used an independent samples t-test for pairwise comparisons and Cohen's d to assess effect size (with thresholds of 0.2 for small, 0.5 for medium, and 0.8 for large effects). For multiple comparisons, we employed One-way ANOVA with post-hoc Bonferroni correction and calculated eta-squared ($\eta 2$) to determine effect size (with thresholds of 0.01 for small, 0.06 for medium, and 0.14 for large effects). We applied a significance level of $p<0.05$ to statistical tests. Furthermore, we employed linear regression analysis to determine whether health literacy could predict attitudes toward cancer screening and health perception. The data met all assumptions required for the regression analysis. Additionally, we found the Cronbach's alpha values as follows: 0.89 for HLS-SF12, 0.90 for the Attitude Scale for Cancer Screening, and 0.66 for the HPS. The subscale reliabilities for the HPS were 0.70 for Control of Health, 0.73 for Self-Awareness, 0.73 for Certainty, and 0.75 for Importance of Health.

### 2.5. Ethical Principles of Research

Ethical permission for the research was obtained from the Social and Human Sciences Research Ethics Committee of Ondokuz Mayıs University (Decision no: 2021-906, Dated: 26.11.2021). In addition, written permission was obtained from the hospital where the research was conducted. The study was conducted in accordance with the Declaration of Helsinki. Written informed consent from the participants were obtained for the study.

## 3. RESULTS

The average age of the women was 49.14±5.33 years. Among the women, 12.7% were smokers, 32.9% had a chronic disease, and 35.1% had a family history of cancer. Only 23.0% of the participants had regular health check-ups. The percentage of those who had cancer screenings in the last five years was 30.4%. Among those who had cancer screening, 46.2% had a pap smear, 46.9% had mammography, and 6.9% had a colonoscopy. Table 1 includes some descriptive characteristics of the women.

The mean index of the HLS-SF12 was 29.35±9.75 (0-50). The mean score for the Attitude Scale for Cancer Screening was 92.94±15.80 (49-120). For the HPS, the overall mean score was 44.07±7.62 (20-65). The subscales of HPS had the following mean scores; HPS-Control of center was 14.07±4.2 (5-25), HPS-Self-awareness was 8.95±3.15 (3-15), HPS-Certainty was 11.99±3.48 (4-20), and HPS-Importance of health was 9.07±3.17 (3-15).

We found that health literacy decreased as women's age increased. Additionally, the HLS-SF12 scores significantly differ with education level, employment status, income level, smoking, and having regular health checkups. Accordingly, health literacy was higher in high school and university graduates, those

employed, those with middle and high incomes, smokers, and those with regular health checkups ($p<0.05$) (Table 1).

The results showed the mean scores of women on the Attitude Scale for Cancer Screening scores significantly differ with education level, smoking, having regular health checkups, having a family history of cancer, and having had a cancer screening in the last five years. Accordingly, the attitude score for cancer screening was higher among high school and university graduates than among those who were literate. Additionally, the attitude score for cancer screening was higher in smokers, those who have regular health checkups, those with a family history of cancer, and those who have had a cancer screening in the last five years ($p<0.05$) (Table 1).

Furthermore, women's HPS scores significantly differ with self-health evaluation status and smoking. The perception of health was higher in those who evaluated their self-health status as very good and smokers ($p<0.05$) (Table 1).

There was no difference between the other variables and the scale score averages ($p>0.05$) (Table 1).

**Table 1. Distribution of HLS-SF12, Attitude Scale for Cancer Screening, and Health Perception Scale Scores According to Variables**

| | | HLS-SF12 | | Attitude Scale for Cancer Screening | | Health Perception Scale | |
|---|---|---|---|---|---|---|---|
| **Variables** | **n (%)** | **Mean±SD** | **Test statistic/p** | **Mean±SD** | **Test statistic/p** | **Mean±SD** | **Test statistic/p** |
| **Education level** | | | | | | | |
| Literate | 30 (9.3) | 23.29±9.77[a] | F= 10,729 p=**0.000*** η2=0.092 | 85.73±17.52[a] | F=4.976 p=**0.002**** η2=0.045 | 44.13±4.99 | F=0,915 p=0.434 η2=0.009 |
| Primary school | 175 (54.4) | 28.16±9.59[ac] | | 91.62±16.24[ab] | | 43.91±7.48 | |
| High school | 51 (15.8) | 33.99±9.19[b] | | 97.25±13.58[b] | | 45.59±8.20 | |
| University or college | 66 (20.5) | 31.67±8.51[bc] | | 96.38±13.88[b] | | 43.32±8.48 | |
| **Marital status** | | | | | | | |
| Married | 284 (88.2) | 29.53±9.69 | t=0.909 p=0.364 d=0.157 | 92.87±15.55 | t=-0.200 p=0.841 d=-0.035 | 43.81±7.72 | t=1.686 p=0.093 d=-0.292 |
| Single | 38 (11.8) | 28.00±10.16 | | 93.42±17.79 | | 46.03±6.58 | |
| **Employment status** | | | | | | | |
| Employed | 112 (34.8) | 31.66±8.94 | t=3.150 p=**0.002**** d=0.368 | 94.97±16.04 | t=1.693 p=0.091 d=0.198 | 45.06±8.44 | t=1.704 p=0.089 d=0.199 |
| Unemployed | 210 (65.2) | 28.12±9.96 | | 91.85±15.61 | | 43.55±7.11 | |
| **Income level** | | | | | | | |
| Low | 111 (34.5) | 27.18±9.72[a] | F=4.754 p=**0.002**η2=0.029 | 92.37±17.57 | F=0.659 p=0.518 η2=0.004 | 43.84±7.68 | F=0.433 p=0.649 η2=0.003 |
| Middle | 179 (55.6) | 30.22±9.46[b] | | 91.75±14.57 | | 44.39±7.57 | |
| High | 32 (9.9) | 31.99±10.31[b] | | 95.94±16.15 | | 43.16±7.75 | |
| **Self-health assessment status** | | | | | | | |
| Very good | 11 (3.4) | 31.06±13.85 | F=0.391 p=0.759 η2=0.004 | 90.36±22.87 | F=2.107 p=0.099 η2=0.019 | 51.18±6.62[a] | F=5.772 p=**0.001**** η2=0.052 |
| Good | 124 (38.5) | 29.78±9.67 | | 94.73±15.01 | | 45.19±7.34[ab] | |
| Middle | 175 (54.4) | 28.86±9.70 | | 91.33±15.60 | | 42.90±7.64[b] | |
| Bad | 12 (3.7) | 30.44±7.24 | | 100.25±17.28 | | 43.08±6.42[ab] | |
| **Smoking** | | | | | | | |
| Yes | 41 (12.7) | 32.15±7.52 | t=1.978 p=**0.049**** d=0.331 | 97.80±14.79 | t=2.123 p=**0.035**** d=0.346 | 46.51±6.89 | t=2.205 p=**0.028**** d=0.368 |
| No | 281 (87.3) | 28.94±9.98 | | 92.23±15.85 | | 43.72±7.67 | |
| **Having a chronic illness** | | | | | | | |
| Yes | 106 (32.9) | 28.99±9.39 | t=0.453 p=0.651 d=-0.054 | 94.38±16.38 | t=1.146 p=0.253 d=0.136 | 44.97±9.26 | t=1.482 p=0.139 d=0.162 |
| No | 216 (67.1) | 29.52±9.93 | | 92.23±15.50 | | 43.63±7.77 | |
| **Having regular health checkups** | | | | | | | |
| Yes | 74 (23.0) | 31.85±9.44 | t=2.538 p=**0.012**** d=0.337 | 97.26±15.42 | t=2.705 p=**0.007**** d=0.358 | 45.16±8.23 | t=1.401 p=0.162 d=0.186 |
| No | 248 (77.0) | 28.60±9.73 | | 91.65±15.72 | | 43.75±7.42 | |
| **Having a family history of cancer** | | | | | | | |
| Yes | 113 (35.1) | 28.87±9.50 | t=0.703 p=0.483 d=-0.021 | 95.96±16.71 | t=2.549 p=**0.011**** d=0.297 | 43.41±7.73 | t=-1.156 p=0.248 d=-0.135 |
| No | 209 (64.9) | 29.07±9.89 | | 91.30±15.08 | | 44.44±7.56 | |
| **Having had cancer screenings in the last five years** | | | | | | | |
| Yes | 98 (30.4) | 30.41±8.62 | t=1.299 p=0.195 d=0.157 | 98.58±14.03 | t=4.356 p=**0.000*** d=0.527 | 44.41±8.06 | t=0.519 p=0.604 d=0.0629 |
| No | 224 (69.6) | 28.88±10.18 | | 90.47±15.93 | | 43.93±7.44 | |

HLS-SF12: Short-Form Health Literacy Instrument, SD: Standard deviation, t: Independent Samples t-test, F: One-way ANOVA, d: Cohen's d, η2: Eta squared, [a-b:] Letters indicating statistically significant differences between groups according to the Bonferroni test. There is no statistically significant difference between groups with the same letter, *p<0.001, **p<0.05

We observed a low positive correlation between HLS-SF12 and the Attitude Scale for Cancer Screening scores (r=0.314, p<0.001). Additionally, we also found a weak positive correlation between HLS-SF12 and HPS scores (r=0.110, p=0.049) (Table 2).

**Table 2. Bivariate correlations between Health Literacy Instrument, Attitude Scale for Cancer Screening, and Health Perception Scale**

| Scales | | Short-Form Health Literacy Instrument | Attitude Scale for Cancer Screening |
|---|---|---|---|
| Short-Form Health Literacy Instrument | r | 1 | 0.314 |
| | p | | **0.000** |
| Attitude Scale for Cancer Screening | r | 0.314 | 1 |
| | p | **0.000** | |
| Health Perception Scale (HPS) total score | r | 0.110 | 0.035 |
| | p | **0.049** | 0.528 |
| HPS-Control of Center | r | 0.097 | -0.114 |
| | p | 0.081 | **0.041** |
| HPS-Self-awareness | r | -0.002 | 0.103 |
| | p | 0.968 | 0.064 |
| HPS-Certainty | r | 0.122 | 0.016 |
| | p | **0.028** | 0.777 |
| HPS-Importance of Health | r | 0.003 | 0.124 |
| | p | 0.964 | **0.026** |

r: Pearson correlation

Table 3 includes the regression analysis results. According to the results of the analysis, health literacy explains 10% of the total variance for attitude towards cancer screenings and 1% for health perception. The results of the regression analysis revealed that individuals with higher HLS-SF12 scores were more likely to have higher scores on the Attitude Scale for Cancer Screening (β=0.314, p<0.001) and HPS (β=0.110, p=0.049) (Table 3).

**Table 3. Linear regression of Health Literacy Instrument, Attitude Scale for Cancer Screening, and Health Perception Scale**

| Dependent variables | Independent variables | B | SE | Beta | t | p |
|---|---|---|---|---|---|---|
| Attitude Scale for Cancer Screening | Constant | 77.997 | 2.660 | | 29.318 | 0.000 |
| | HLS-SF12 | 0.509 | 0.086 | 0.314 | 5.917 | **0.000** |
| | | R=0.314, $R^2$=0.099, F=35.010, p=0.000 | | | | |
| Health Perception Scale | Constant | 41.559 | 1.343 | | 30.937 | 0.000 |
| | HLS-SF12 | 0.086 | 0.043 | 0.110 | 1.973 | **0.049** |
| | | R=0.110, $R^2$=0.012, F=3.891, p=0.049 | | | | |

HLS-SF12: Short-Form Health Literacy Instrument, B: Regression coefficient, SE: Standard error, R: Multiple correlation coefficient, $R^2$: Coefficient of determination.

## 4. DISCUSSION

We examined health literacy, health perception, and cancer screening attitudes in women in the climacteric period. One of our important findings revealed that increased health literacy was associated with more positive attitudes toward cancer screening.

Most of the women in the current study were not undergoing regular health checkups, and cancer screening rates were low. Despite the high incidence of cancer-related deaths among women in Türkiye, screening rates remain insufficient. According to statistics from the Ministry of Health of the Republic of Türkiye, 65.6% of women have never undergone a mammogram, and 64.4% have never had a Pap smear (Ministry of Health, 2024). World Health Organization reports that 1 in 12 women die from cancer, and the global cancer burden continues to rise (WHO, 2024). However, studies conducted in various countries, including the United Arab Emirates (Abbas & Baig, 2023), Ethiopia (Belay et al., 2020), Vietnamese (Duong et al., 2020), Japan (Ishii et al., 2021) and United States (Sharma et al., 2022) indicate that screening participation rates are below the desired level. In Türkiye, cancer screening services are offered free of charge through Cancer Early Diagnosis, Screening, and Education Centers. Nevertheless, the low participation rate among women in these screening programs remains a significant concern. Another noteworthy finding of this study is that women have positive attitudes toward cancer screenings despite their low participation rates. While having a positive attitude toward screening is encouraging, the fact that this does not result in actual screening behavior is an important issue that should be addressed. We believe that the reasons for women's inadequate screening behavior may be related to some factors such as lack of information, inconvenient locations, limited accessibility, and screening activities being scheduled at certain times.

Cancer screening behaviors can be influenced by many factors. We found that women with higher education levels, those who received regular health checkups, had a family history of cancer, were smokers and had undergone cancer screening in the past five years tended to have more positive attitudes toward cancer screening. Many researchers have reported that older age, higher education levels, better socioeconomic status, a family or friend with a history of cancer, and receiving advice from health professionals increase the likelihood of undergoing cancer screening (Belay et al., 2020; Duong et al., 2020; Ishii et al., 2021; Liu et al., 2017). The low education level of the majority of participants in our study may explain the reduced cancer screening rates among women. This outcome is also associated with low health literacy.

In our study, the participants' mean health literacy level can be considered moderate. Although health literacy varies across countries, it is generally reported to be low (Huang et al., 2020; Sørensen et al.,

2015). Many studies conducted in Taiwan (Huang et al., 2020), Iran (Khorasani et al., 2020), Japan (Goto et al., 2018), and Brazil (França et al., 2020) have shown that women generally lack sufficient health literacy. In contrast, a study in Serbia found that 55.9% of women had adequate health literacy (Jovic-Vranes & Bjegovic-Mikanovic, 2012). Similarly, health literacy levels in Türkiye are also reported to below (İkiışık et al., 2020; Örsal et al., 2019). A study found that 45.9% of women in Türkiye had inadequate health literacy, 30.6% had limited health literacy, 16.0% had adequate health literacy, and 7.4% had excellent health literacy (Ayaz-Alkaya & Ozturk, 2021). Conversely, some studies have reported higher health literacy levels compared to our findings (Akça et al., 2020; Ugurlu & Uctu, 2023). Most of our participants were primary school graduates, which may explain the lower health literacy levels. Health literacy is an important issue influencing women's health outcomes. This is why efforts should focus on improving health literacy to help women maintain their well-being and lead productive lives. In our study, age, education, employment status, income level, and having regular health checkups were identified as factors influencing health literacy. These findings are consistent with previous studies (Ayaz-Alkaya & Ozturk, 2021; Huang et al., 2020; Jovic-Vranes & Bjegovic-Mikanovic, 2012). Consequently, the reasons for low health literacy among women should be determined, and efforts should be made to improve their health literacy. Additionally, factors such as age, education level, employment status, and income level should be considered when planning interventions to enhance health literacy among women.

Health awareness tends to increase with higher health literacy (Örsal et al., 2019). In our study, while the women’s cancer screening attitudes were favorable, their actual screening rates were low. We found a positive correlation between health literacy and attitudes toward cancer screening. Furthermore, individuals with higher health literacy scores tended to score higher on the attitude scale toward cancer screening. In general, individuals with good health literacy are more likely to actively use health services. Some researchers have demonstrated that health literacy influences the likelihood of undergoing cancer screenings, such as pap smears, mammograms, and colonoscopies (Almutairi et al., 2018; Baharum et al., 2020; Yılmazel, 2018). A meta-analysis found that health literacy is a predictor of both mammography attendance and Pap test uptake (Baccolini et al., 2022). On the contrary, a study conducted in Japan found no relationship between health literacy and compliance with recommendations for cancer screening and health-related behaviors (Goto et al., 2018). These different results may be attributed to variations in health system structures and levels of health literacy. We concluded that enhancing individuals' health literacy leads to more positive attitudes toward cancer screening. Improving health literacy may, therefore, contribute to increased cancer screening rates and help reduce the burden of cancer. Based on these findings, improving individuals’ health literacy should be a key

component of strategies to increase cancer screening. Additionally, training programs for cancer screening and community health campaigns should be designed to align with the health literacy levels of women.

We found that the women's perception of their health was at a moderate level. However, some researchers have reported higher health perceptions (Şen & Öztürk, 2020; Uysal & Toprak, 2022). A study conducted in Türkiye reported lower levels of health perception than those observed in our findings (Ugurlu & Uctu, 2023). Health perception influences both preventive health behaviors and actions aimed at improving health (Durmaz et al., 2020). Our findings indicated that health perception improves with increasing health literacy. Many researchers have stated a positive relationship between health literacy and health perception (Akça et al., 2020; Durmaz et al., 2020; Yiğitalp et al., 2021). Consequently, it can be argued that people with adequate health literacy are more likely to engage in behaviors that protect and improve their health. Nevertheless, further research is needed to fully understand the relationship between health literacy and health perception.

The association between health literacy and health perception, along with the common factors influencing both, significantly impacts individuals' decisions and behaviors related to their health and illness (Durmaz et al., 2020; Şen & Öztürk, 2020). Researchers have identified a positive correlation between health perception and attitudes toward cancer screening (Şen & Öztürk, 2020; Uysal & Toprak, 2022). However, in our study, we observed a negative correlation between cancer screening attitudes and the 'Control of Center' dimension of health perception, and a positive correlation between cancer screening attitudes and the 'Importance of Health' dimension. Our findings suggest that women who place greater importance on their health also tend to have a higher health perception. Similarly, health perception has been positively associated with a higher likelihood of participating in cancer screening (Soylar & Ozer, 2024).

Some researchers have found that age, education level, chronic disease, and receiving health education influence health perception (Şen & Öztürk, 2020; Uysal & Toprak, 2022). Consistent with these findings, we observed that women who rated their health as very good had higher health perception scores. Surprisingly, smoking women had higher scores in both health literacy and health perception. Consistently, Yiğitalp et al. (2021) reported that individuals who consume tobacco and alcohol also had higher health literacy scores. Geboers et al. (2016) found no relationship between low health literacy and smoking. Contrary to these findings, some researchers have reported a negative correlation between higher health literacy and smoking, (Fawns-Ritchie et al., 2018; Hoover et al., 2015) and no correlation between smoking and health perception (Kolaç et al., 2018). Only a limited number of studies have explored the relationships among health literacy, health perception, and tobacco smoking. To explain

the unexpected findings of our study and to elucidate the causal relationships between tobacco smoking, health literacy, and health perception, more comprehensive research is needed.

### 4.1. Study Limitations

This research has some limitations. First, the cross-sectional research design of this study does not allow us to determine causal relationships between the variables. Second, we collected the data from a single center, and participants were recruited using a non-probability sampling method. Third, our sample size was relatively small and consisted solely of women in their climacteric period. Fourth, the data were based on self-reported questionnaires, which may affect the accuracy of the information. Future research should explore the relationships between health literacy, health perception, and cancer screening attitudes with a larger and more diverse population.

## 5. CONCLUSION

Despite the presence of certain cancer risks among women, our study found that they did not consistently engage in regular cancer screening. Health literacy was related to characteristics such as education level, employment status, income level, smoking, and regular health checkups. Women who rated their health as very good and smoking had higher health perceptions. Furthermore, education level, smoking, regular health checkups, family history of cancer, and having undergone cancer screening in the past five years were associated with attitudes toward cancer screening. Individuals with higher health literacy scores were more likely to have more favorable attitudes toward cancer screening. In conclusion, interventions aimed at increasing health literacy could promote positive attitudes and encourage greater participation in screening programs.

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