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# Investigation of the Relationship Between Breast Cancer Awareness and Health Literacy in Female Textile Workers

## Kadın Tekstil İşçilerinde Meme Kanseri Farkındalığı ve Sağlık Okuryazarlığı İlişkisinin Değerlendirilmesi

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## ABSTRACT
**Introduction:** The level of breast cancer awareness among female may vary depending on their level of health literacy.
**Aim:** It was aimed to investigate the relationship between breast cancer awareness and health literacy among female textile workers.
**Method:** This study was a cross-sectional study. The study population consisted of female employed as workers in a textile company. The sample included 360 female workers as participants. The Information Form, the Breast Cancer Awareness Scale, and the Health Literacy Scale are the data collection instruments used in the study. Independent samples t-test, ANOVA, and regression analyses were used to evaluate the data.
**Results:** The results were that 73.6% of the participants did not perform regular breast self-examination, and 55.3% had information on early diagnosis and treatment. Significant positive correlations were observed between women's breast cancer awareness and the functional (r = 0.135; p = 0.011), interactive (r = 0.145; p = 0.006), and critical (r = 0.156; p = 0.003) sub-scales of health literacy. According regression analysis to the established model, an increase in health literacy scores corresponded to increased breast cancer awareness, explaining 3.9% of the variation.
**Conclusion:** It was revealed that as the health literacy of working female increases, breast cancer awareness will increase. Therefore, the focus should be on supporting the health literacy of women in the risk group, reaching more women in collective institutions and breast cancer awareness activities.

**Keywords:** Awareness; breast cancer; female; health literacy; worker.

## ÖZ
**Giriş:** Kadınlarda meme kanseri farkındalığı sağlık okuryazarlığına bağlı olarak değişiklik gösterebilmektedir.
**Amaç:** Kadın tekstil işçilerinde meme kanseri farkındalığı ve sağlık okuryazarlığı ilişkisinin araştırılması amaçlanmıştır.
**Yöntem:** Çalışma kesitsel türdedir. Çalışmanın evreni, bir tekstil firmasında işçi olarak çalışan kadınlardan oluşmaktadır. Örnekleme dahil edilen kadın işçi sayısı 360'tır. Çalışmada kullanılan veri toplama araçları Bilgi Formu, Meme Kanseri Farkındalık Ölçeği, Sağlık Okuryazarlığı Ölçeği'dir. Verilerin değerlendirmesinde Bağımsız örneklem t testi, ANOVA ve regresyon analizleri kullanılmıştır.
**Bulgular:** Çalışmaya katılan kadın işçilerin %73.6'sı düzenli olarak kendi kendine meme muayenesi yapmamakta olup %55.3'ü erken teşhis ve tedaviye dair bilgi sahibidir. Kadınların meme kanseri farkındalığı ile sağlık okuryazarlığı fonksiyonel (r = 0.135; p = 0.011), interaktif (r = 0.145; p = 0.006), eleştirel (r = 0.156; p = 0.003) alt boyutları arasında pozitif yönlü anlamlı ilişki vardır. Regresyon analizi sonrası kurulan modele göre, sağlık okuryazarlığı puanındaki artış meme kanseri farkındalığını arttırmakta olup sağlık okuryazarlığı puanı meme kanseri farkındalığı puanını %3.9 düzeyinde açıklamaktadır.
**Sonuç:** Kadın işçilerde sağlık okuryazarlığı arttıkça meme kanseri farkındalığının da arttığı ortaya çıkmıştır. Bu nedenle risk grubundaki kadınların sağlık okuryazarlığı desteklenmeli, toplu çalışılan kurumlarda daha fazla kadına ulaşılmalı ve meme kanseri farkındalık çalışmalarına odaklanılmalıdır.

**Anahtar Kelimeler:** Farkındalık; işçi; kadın; meme kanseri; sağlık okuryazarlığı.

# Introduction

Among all cancers affecting women, breast cancer is the most common (Panahi et al., 2020). Female are one of the most vulnerable groups from a public health perspective and considered to be at greater risk of developing breast cancer (Erdek, Çavdar, İpek & Okur, 2024). Various factors such as low socioeconomic status, adverse working conditions, limited health literacy (HL), and limited access to healthcare services, in particular, contribute to the increased breast cancer mortality rates worldwide (Güzel & Bayraktar, 2019).

The most important strategy for reducing breast cancer prevalence, its complications, and mortality lies in early diagnosis protocols and increasing public awareness (Wei, Wu & Tung 2021). Increased breast cancer awareness (BCA) facilitates the adoption of risk-reducing behaviors and promotes preventive health practices. In addition, there is a positive correlation between overall HL and disease awareness (Ektir & Yılmaz, 2017). As an important social determinant of health, HL is defined as "accessible health education that meets minimum standards across all levels of society" (Gözlü, 2020). Providing planned health education, learning environments, and opportunities to improve HL in communities are preventive measures for BCA. In breast cancer, there are factors that can be modified (lifestyle choices, environmental and occupational exposures, obesity, etc.) and factors that could not (such as age, gender, family history, and ethnicity) (Okan, Kavici, Taşdemir, Temiz & Arslan, 2023). Raising awareness and increasing HL level are among the most significant modifiable factors for positive change. Numerous studies suggest a potential relationship between breast cancer prevention behaviors, awareness, and HL (Panahi et al., 2020; Almoajel, Alshamrani & Alyabsi, 2022; Yang et al., 2022). It should be researched to detect breast cancer at an early stage, to raise public awareness about breast cancer screening, and to what extent individual screenings are consistent. There is still no consensus on this topic in the literature (Liu et al., 2020).

In Turkey, garment and textile companies are the main employers of women, where they are predominantly employed as workers. Collective workplaces are important places for many health assessments and risk analyses. The working environment in such establishments, which employ a significant number of female workers, poses notable health risks to these women, making them particularly disadvantaged in this regard (Kolaç, Sezer Balcı, Şişman, Ataçer & Dinçer, 2018; Çevik & Özkul, 2022). In addition, women lacking HL may exhibit behaviors such as difficulty understanding health-related concepts and insufficient responsibility for their well-being (Panahi et al., 2020; Uçkaç, 2022). For this reason, new studies should be conducted to reveal this relationship.

# Aim

This study aimed to investigate the relationship between breast cancer awareness and health literacy among female textile workers.

## Research Questions

1. Is there a relationship between breast cancer awareness and health literacy among female textile workers?

2. If there is a relationship between breast cancer awareness and health literacy among female textile workers, to what extent does this correlation exist?

# Method

## Study Design

This cross-sectional study was conducted between February 15 and March 15, 2024.

## Study Setting

The study applied in the female workers in in a private textile company in the Eastern Black Sea.

## Study Population and Sample

The study population included female workers in a textile company. The G*Power 3.1 package program was used to calculate the sample size, which resulted in a sample size of 330 with a 95% confidence interval, 5% margin of error, and 95% power to represent the study population. Considering the data loss, the study was completed with 360 female workers with 10% backup. Research inclusion criteria were; (1) being a female 18 years of age or older, (2) being employed as a worker, and (3) having no communication barriers. Individuals who did not meet these criteria were excluded from the study.

## Data Collection Tools

*Information Form:* This form, designed by the researcher, consisted of items on sociodemographic characteristics and questions related to breast cancer (Ektir & Yılmaz, 2017; Liu et al., 2020; Yang et al., 2022; Karabulutlu, Bakır & Demir, 2023).

*Breast Cancer Awareness Scale:* This scale was developed by Baş (2022). The scale consists of 13 items covering symptoms (11 items), frequency of breast examination (1 item), and awareness of age-related risk (1 item). Covering symptoms are scored as "Yes = 1 point", "No = 0 points", "I Don't Know = 0 points". Symptoms include changes in shape and pain, with a total of 11 items. Frequency of breast examination is scored as "Rarely or Never", at least once every 6 months and at least once a week = 0 points, at least once a month = 1 point. Awareness of age-related risk is scored as a 30-year-old woman, a 50-year-old woman and women of any age = 0 points, 70-year-old women = 1 point. As the score increases, awareness also increases. The Cronbach's alpha was 0.89 (Baş, 2022). In study, the Cronbach's alpha was calculated as 0.89.

*Health Literacy Scale:* This scale was developed by Suka et al. (2013). The scale consists of 14 items and its Turkish reliability and validity study was conducted by Türkoğlu and Kılıç (2021). The scale has three sub-scales: Functional HL (5 items), Interactive HL (5 items), and Critical HL (4 items). The five-point Likert scale is scored from Strongly Disagree (1 point) to strongly agree (5 point). As the scale score increases, health literacy increases. The Cronbach's alpha was 0.85 (Suka et al., 2013; Türkoğlu & Kılıç, 2021). In study, the Cronbach's alpha was 0.84.

**Ethical Considerations**

Before conducting this research, the necessary permissions were obtained from the textile company. Approval was obtained from the Ethics Committee of Giresun University (Date: 07.02.2024 and No: 02/17), and participants were informed about the study and their informed consent was obtained. In addition, permission to use the scale was obtained from the authors.

**Data Collection**

Data collection was conducted face-to-face using the "Information Form", the "Breast Cancer Awareness Scale" and the "Health Literacy Scale". Given the shift schedules of the female workers, data collection was conducted in two sessions by the same researcher. The reason for data collection in two sessions was that women workers worked in two shifts. Participants completed the data collection instruments in an average of 25 minutes**.**

**Data Analysis**

The study data were analyzed using Statistical Package for the Social Sciences Version 22.0 (IBM Corp., Armonk, NY, USA) and G*Power 3.1 software packages.

**Table 1: Distribution of Demographic Characteristics among the Participants (n = 360)**

|  | n | % |
|---|---|---|
| **Age** | | |
| Under 25 years old | 54 | 15.0 |
| 26-30 years old | 53 | 14.7 |
| 31-35 years old | 65 | 18.1 |
| 36-40 years old | 81 | 22.5 |
| 41-45 years old | 68 | 18.9 |
| Over 45 years old | 39 | 10.8 |
| **Education status** | | |
| Primary school graduate | 129 | 35.8 |
| Secondary school graduate | 94 | 26.1 |
| High school graduate | 113 | 31.4 |
| University graduate | 24 | 6.7 |
| **Marital status** | | |
| Married | 282 | 78.3 |
| Single | 78 | 21.7 |
| **Smoking status** | | |
| Yes | 95 | 26.4 |
| No | 265 | 73.6 |
| **Chronic disease status** | | |
| Yes | 62 | 17.2 |
| No | 298 | 82.8 |
| **Medication use status** | | |
| Yes | 74 | 20.6 |
| No | 286 | 79.4 |

**Table 2: Distribution of Breast Cancer Knowledge among the Participants (n = 360)**

|  | n | % |
|---|---|---|
| **Presence of cancer in the family** | | |
| Yes | 144 | 40.0 |
| No | 216 | 60.0 |
| **Breast self-examination** | | |
| I do it regularly | 104 | 28.9 |
| I don't do it regularly | 256 | 71.1 |
| **Mammography status (over 40 years old)** | | |
| Yes | 41 | 38.3 |
| No | 66 | 61.7 |
| **Breast examination status** | | |
| Yes | 95 | 26.4 |
| No | 265 | 73.6 |
| **Problems with the breasts** | | |
| Yes | 54 | 15.0 |
| No | 306 | 85.0 |
| **Knowledge of early diagnosis and treatment** | | |
| Yes | 199 | 55.3 |
| No | 161 | 44.7 |
| **Source of information on breast cancer** | | |
| Physicians and nurses | 151 | 75.9 |
| Family and close circle | 16 | 8.0 |
| Social media | 20 | 10.1 |
| Conferences and seminars | 12 | 6.0 |

A significance level of $p < 0.05$ was considered for all statistical tests. Descriptive statistics, including mean, median, and percentage distribution, were used to characterize the data, while Pearson correlation and Linear regression analyses were performed to assess the level of impact of the parameters.

## Results

In the study, the mean age of the participants was 35.37 ± 8.24 (min: 18, max: 55) years. Among workers, 35.8% had completed primary school and 78.3% were married. Of the participants, 73.6% were non-smokers, 82.8% had no chronic diseases, and 79.4% were not currently taking any medications (Table 1).

Of the participants, 79.7% reported no family history of cancer, 73.6% did not engage in regular breast self-examination, 61.7% had not undergone mammography (over the age of 40), 85.0% had no history of breast-related problems, 55.3% had information on early diagnosis and treatment, and 75.9% obtained this information from physicians and nurses (Table 2).

In the study, BCA scale in those taking medication have a significantly higher mean score than those not taking medication (t = 2.025; p = 0.044). In addition, participants with a family history of cancer have a statistically higher mean score on the BCA scale than

**Table 3: Comparison of Scale Scores by Demographic Characteristics and Breast Cancer Knowledge (n = 360)**

| Variables | | Breast Cancer Awareness<br>Mean ± SD | Test Statistic | p | Health Literacy<br>Mean ± SD | Test Statistic | p |
|---|---|---|---|---|---|---|---|
| **Age** | Under 25 years old | 0.57 ± 0.57 | | | 46.13 ± 7.24 | | |
| | 26-30 years old | 0.49 ± 0.72 | | | 47.64 ± 7.30 | | |
| | 31-35 years old | 0.51 ± 0.59 | | | 44.17 ± 8.67 | | |
| | 36-40 years old | 0.54 ± 0.59 | 0.374‡ | 0.866 | 44.31 ± 9.40 | 1.721‡ | 0.129 |
| | 41-45 years old | 0.63 ± 0.73 | | | 43.59 ± 10.21 | | |
| | Over 45 years old | 0.56 ± 0.75 | | | 45.03 ± 8.34 | | |
| **Education status** | Secondary school graduate | 0.46 ± 0.60 | | | 43.01 ± 10.3 | | |
| | High school graduate | 0.58 ± 0.61 | 1.799‡ | 0.147 | 46.35 ± 7.12 | 3.659‡ | 0.013* |
| | University graduate | 0.79 ± 0.88 | | | 48.13 ± 6.71 | | |
| **Marital status** | Married | 0.54 ± 0.65 | 0.761† | 0.447 | 44.93 ± 8.79 | 0.245† | 0.806 |
| | Single | 0.60 ± 0.67 | | | 45.21 ± 8.84 | | |
| **Smoking status** | Yes | 0.64 ± 0.71 | 1.558† | 0.120 | 44.03 ± 9.78 | 1.239† | 0.216 |
| | No | 0.52 ± 0.63 | | | 45.33 ± 8.40 | | |
| **Chronic disease status** | Yes | 0.44 ± 0.59 | 1.558† | 0.120 | 42.29 ± 9.60 | 2.681† | 0.008* |
| | No | 0.58 ± 0.66 | | | 45.55 ± 8.52 | | |
| **Medication use status** | Yes | 0.69 ± 0.79 | 2.025† | 0.044* | 43.77 ± 9.57 | 1.34† | 0.181 |
| | No | 0.52 ± 0.61 | | | 45.30 ± 8.56 | | |
| **Presence of cancer in the family** | Yes | 0.69 ± 0.66 | 3.239† | 0.001* | 45.25 ± 9.08 | 0.460† | 0.646 |
| | No | 0.46 ± 0.63 | | | 44.81 ± 8.61 | | |
| **Breast self-examination** | I do it regularly | 0.77 ± 0.74 | 4.097† | 0.001* | 43.60 ± 9.55 | 1.924† | 0.055 |
| | I don't do it regularly | 0.46 ± 0.59 | | | 45.55 ± 8.41 | | |
| **Mammography status (Over 40 years old)** | Yes | 0.66 ± 0.73 | 0.563† | 0.574 | 44.49 ± 8.61 | 0.319† | 0.750 |
| | No | 0.58 ± 0.75 | | | 43.88 ± 10.16 | | |
| **Breast examination status** | Yes | 0.62 ± 0.69 | 1.189† | 0.235 | 44.86 ± 9.07 | 0.162† | 0.871 |
| | No | 0.53 ± 0.64 | | | 45.03 ± 8.70 | | |
| **Problems with breasts** | Yes | 0.57 ± 0.63 | 0.260† | 0.795 | 46.54 ± 8.49 | 1.406† | 0.161 |
| | No | 0.55 ± 0.66 | | | 44.72 ± 8.82 | | |
| **Knowledge of early diagnosis and treatment** | Yes | 0.66 ± 0.67 | 3.632† | 0.001* | 46.15 ± 7.89 | 2.816† | 0.005* |
| | No | 0.42 ± 0.61 | | | 43.55 ± 9.62 | | |

SD: Standard Deviation; * p < 0.05; ‡ One way ANOVA Test; † Independent Samples *t* Test.

**Table 4: Relationships Between Breast Cancer Awareness and Health Literacy and Sub-Scale Scores (n = 360)**

| Variables | Breast Cancer Awareness Scale | |
|---|---|---|
| | r | p |
| Functional Health Literacy | 0.135† | 0.011* |
| Interactive Health Literacy | 0.145† | 0.006* |
| Critical Health Literacy | 0.156† | 0.003* |
| **Health Literacy Scale** | 0.197 † | 0.001* |

†r: Pearson correlation coefficient; *p < 0.05.

those without such a history (t = 3.239; p = 0.001). In addition, participants who regularly perform breast self-examinations have a significantly higher mean BCA score than those who do not (t = 4.097; p < 0.001). Likewise, participants with knowledge about early diagnosis and treatment have a significantly higher mean score on the BCA scale than those without such knowledge (t = 3.632; p < 0.001). According to the mean HL scores, the mean HL scores of primary and secondary schools graduates participants were statistically lower than those of high school and university graduates (F = 3.659; p = 0.013). Participants with chronic diseases have a statistically lower HL mean score than those without such conditions (t = 2.681; p = 0.008). Conversely, participants with information about early diagnosis and treatment have a significantly higher mean score than those without such information (t = 2.816; p = 0.005) (Table 3). A statistically significant positive correlation is observed between BCA and HL across the functional, interactive, and critical sub-scales (p < 0.05) (Table 4).

When evaluating the impact of HL scores on BCA scores through linear regression analysis, the established models demonstrated statistical significance (F = 14.493; p < 0.001). The Durbin-Watson value was found to be 1.926. According to the model, a one-unit increase in HL score increases BCA score by 0.015 points. The model indicates that HL scores explain 3.9% of the variance in BCA scores (Table 5).

## Discussion

Female workers face increased disadvantages in their work life. This exposes them to increased health risks. Cancer is a major public health concern and breast cancer is affecting women worldwide (Baş, 2022; Çevik & Özkul, 2022). This study highlights the relationship between BCA and HL among female workers. The study indicated that participants who take medications have higher mean BCA scores than others. In the review of various studies, it was found that the relationship between BCA and taking medications has not been studied, but broader societal access to information about various diseases, taking medications for a present condition, and advances in diagnostic and treatment options may collectively contribute to increased awareness of breast cancer, which is a global health problem. Existing literature also supports this case (Akram, Iqbal, Daniyal & Khan 2017; Agbokey et al., 2019).

In the current study the average level of BCA among participants with a family history of cancer exceeds that of participants without a family history. This result was predictable because when an immediate family member was diagnosed with cancer, individuals become directly involved in the process and consequently increase their awareness. There are some discrepancies between the various studies conducted on this topic. A study among women in the Philippines found that individuals with a diagnosed relative or who underwent routine breast cancer screening did not develop adequate awareness (Wu & Lee, 2019). Yet, a study of college students found high BCA, and knowledge level in individuals who underwent screening (Islam et al., 2022). It can be stated that women with family members diagnosed with cancer come from different segments of society, resulting in different levels of perspectives on breast cancer.

In addition, the average level of BCA among women who regularly perform breast self-examinations exceeds that of women who do not perform such examinations. The literature review has included conflicting results that some studies indicated a lower percentage of women who regularly perform breast self-examination, which

**Table 5: The Effect of Health Literacy Scores on Breast Cancer Awareness Scores (n = 360)**

| Dependent variable | Argument | †ß | ‡t | *p | §F | Model (p*) | ‖R² |
|---|---|---|---|---|---|---|---|
| | Constant | –0.106 | 0.604 | 0.547 | | | |
| **Breast Cancer Awareness** | | | | | 14.493 | 0.001* | 0.039 |
| | Health Literacy | 0.015 | 3.807 | 0.001* | | | |

†ß: Unstandardized Regression Coefficient; ‡t Test in Independent Groups; §F: Simple Linear Regression Measurement Value; *p < 0.05; ‖R²: Linear Regression Analysis.

correlated with a lower level of awareness (Asadi, Shahsavari, Khosravizadeh & Nourmohammadi, 2018), while others suggested that participants who performed breast self-examination had a higher level of knowledge and awareness (Osei-Afriyie et al., 2021). Therefore, it could be stated that performing breast self-examination had the potential to increase awareness levels and consequently promote positive health behaviors regarding early detection.

The mean score of BCA among participants with information about early diagnosis and treatment exceeds that of those without such information. Research shows that women who perform breast self-examination and possess knowledge about early diagnosis and treatment tend to have higher levels of education and awareness (Sayed et al., 2016; Wu & Lee, 2019). This result was similar to the literature; there is a need to expand planned activities aimed at increasing women's understanding of early diagnosis and treatment.

The study indicated that women with primary and secondary education have lower mean HL scores than women with high school and university education. Health literacy is a multidimensional concept. It is mainly associated with socio-demographic characteristics and educational level (Gözlü, 2020). Studies in the relevant literature have shown that health literacy decreases with lower levels of education (Svendsen et al., 2020) and increases with higher levels of education (Singu, Acharya, Challagundla, & Byrareddy, 2020). This is also valid for our study. Health literacy leads to the emergence of several health-promoting conscious behaviors, including accessing, understanding, evaluating, and using health information in everyday life. Therefore, efforts should be made to support these female workers in their health promotion efforts.

In addition, participants with chronic conditions have lower average HL mean scores than those without such conditions. It is known that people with high health literacy manage chronic diseases better (Gözlü, 2020). This result of the study was supported by studies examining the relationship between different chronic conditions and HL (Svendsen et al., 2020; Fischer, Watson, Tolisano & Riley, 2021). In addition, the literature highlights the importance of HL not only in the management of chronic diseases but also in the management of infectious diseases (Akalu, Ayelign & Molla, 2020; McCaffery et al., 2020).

The mean HL score of the women who have knowledge about early diagnosis and treatment exceeds that of those who do not. A review of the literature reveals supportive studies, albeit with varying conclusions different from this finding. These studies associate insufficient health literacy with negative health behaviors, lack of knowledge, and poor health outcomes (Svendsen et al., 2020; Meherali, Punjani & Mevawala, 2020). Therefore, it is expected that individuals with positive health behaviors should have higher HL since they have knowledge about early diagnosis and treatment.

In addition, a positive correlation was found between BCA and HL, as well as its functional, interactive, and critical sub-scales. In addition, an increase in HL scores increases BCA scores, and according to the established model, health literacy scores explain 3.9% of the variance in breast cancer awareness scores. These findings are consistent with the research questions and are supported by existing literature (Almoajel, Alshamrani & Alyabsi, 2022; Wang et al., 2022). It can be inferred that improving health literacy skills would correspondingly improve awareness, thereby improving screening practices, breast cancer prevention efforts, and personal health responsibility.

### Study Limitations

The study relied on self-reports from female workers. Therefore, the findings can only be generalized to the sample and its counterparts.

## Conclusions

This study indicate that the majority of female workers had no family history of cancer, did not have any breast-related problems in their lifetime, and more than half had information about early diagnosis, and treatment, primarily obtained from physicians and nurses. In addition, individuals who took medications had a family history of cancer, performed regular breast self-examination, and had information about early diagnosis and treatment had higher levels of BCA. Conversely, those who were primary or secondary school graduates, and those who had chronic diseases had lower HL, while those with information about early diagnosis and treatment had higher health literacy. Moreover, a positive relationship was observed between BCA and HL sub-scales, and according to the established model, HL scores explained BCA scores.

According to the study, targeted educational initiatives are needed to improve breast cancer awareness in female workers, who are one of the vulnerable groups. Efforts should aim to address gaps related to regular breast self - examination and mammography while providing informative and motivational presentations in workplaces where women are collectively employed. This has the potential to improve health literacy. It is recommended that these educational sessions be provided by public and occupational health nurses and that interactive educational materials be developed, particularly in primary health care facilities.

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