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# The effects of women's insight levels on breast cancer prevention behaviors: a cross-sectional study

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## ABSTRACT

The aim of this study is to determine the effect of women's insight levels on their breast cancer prevention behaviors in primary health care services. A systematic sampling method was used to select a sample of 393 women in a province in Turkey. Socio-demographic Characteristics Form, Insight Scale and Scale for Determining Factors Affecting Women's Breast Cancer Prevention Behaviour were used as data collection tools. Data were collected face-to-face and then analyzed statistically using Student's t-test, one-way analysis of variance, Tukey HSD, Spearman correlation test and multiple regression analysis. The results showed that those who felt "healthy" had significantly higher mean breast cancer prevention behavior ( $p < .05$ ). It was determined that there was a weak positive correlation between the level of insight and breast cancer prevention behaviors, and the increase in the level of insight had a significant positive effect of  $0.37 \pm 0.051$  points on breast cancer prevention behaviors. It was found that there was a significant negative effect on prevention behaviors with  $1.66 \pm 0.796$  points in those with a high education level and  $1.58 \pm 0.505$  points in those with suspected disease. In conclusion, in this study, it was determined that insight level, education level, and awareness of early diagnosis affected the prevention behaviors of breast cancer.

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## KEYWORDS

Breast cancer; cognitive insight; early diagnosis; health behaviors; nursing

## Introduction

The 2020 Cancer Disease Report of the World Health Organization reveals that breast cancer is the most common type of cancer among women worldwide. Approximately 1.7 million women are diagnosed with breast cancer each year, while one in eight women have a lifetime risk of developing breast cancer (WHO 2020). Heredity is responsible for 8–10 percent of all harmful mutational breast cancers (Hu et al. 2021), indicating that breast cancer is not only a risk for those with hereditary characteristics, but all women. Globally, there are 626,679 deaths annually due to breast cancer, with an adjusted rate of 13 deaths per 100,000 women (Freudenheim 2020). It is estimated by 2040, with population growth and aging, that there will be over 3 million new diagnoses and 1 million deaths per year (Criscitiello and Corti 2022).

In a systematic review of risk factors for breast cancer in women, it was reported that obesity, inactivity, oral contraceptive use, menopausal status, smoking, alcohol consumption, and many lifestyle factors may be implicated in the etiology of breast cancer (Fakhri et al. 2022). This suggests that lifestyle choices may increase the risk of breast cancer (Ghosn et al. 2020; Park et al. 2021). In the prevention of breast cancer in health institutions, health education to promote behaviour change is considered within the scope of primary prevention. Encouraging behavior changes to improve health is one of the essential tasks of health teams (Ozturk et al. 2016).

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Another health service to prevent breast cancer is early detection initiatives. Early detection attempts applied by primary health care institutions are considered as secondary prevention (Ozturk et al. 2016). These initiatives include various screening interventions intended to reduce breast cancer-related morbidity and mortality. One such initiative is Breast Self-Examination (BSE), which was originally proposed as an intuitive, inexpensive, noninvasive, and universal way to reasonably identify early-stage breast neoplasms (Pippin and Boyd 2023). However, when BSE was evaluated in a study conducted in Shanghai, it was concluded that the practice did not provide any benefit in terms of survival, and could result in unnecessary biopsies (Mac Bride, Pruthi, and Bevers 2012). Today, it is suggested that the practice may be appropriate for certain populations in low-resource countries, though its recommendation is still debated (Pippin and Boyd 2023). Mammography is currently accepted as the most effective standardized method for early detection of breast cancer (Kim, Kim, and Moon 2020; Mirzaei-Alavijeh, Ghorbani, and Jalilian 2018). In addition, it is recommended that women with a high risk of breast cancer should have magnetic resonance imaging (MRI) scanning in addition to mammography after the age of 30 (Mahmud and Aljunid 2018), and breast ultrasonography, which is often used in clinical breast examinations, in addition to mammography (Kim, Kim, and Moon 2020). Studies have identified various barriers women may face in terms of participating in early detection screening test, such as social, economic, and geographical inequalities (Ginsburg et al. 2020; Smith et al. 2018; Tin Tin et al. 2018).

It was hypothesized in this study that another reason for women not engaging in preventative health behaviors for breast cancer might be their level of insight. Commonly, the term insight is defined as the “the capacity to understand someone or something accurately and deeply.” The concept of lack of insight was being considered as a neuropsychological deficit or a psychological defense (Cooke et al. 2005). However, more recently the notion of insight has been recognized as a multifaceted concept with social and cultural aspects (Lysaker et al. 2018). Upon examining the literature, no study evaluating breast cancer and the concept of insight together was found in the field. Therefore, it was proposed to investigate the effect of women’s insight levels on breast cancer prevention behaviors, with the thought that one of the barriers to women’s health behaviors may be insight. As a result of the literature review, the lack of similar studies to this one implies that the subject is unique and the research may contribute to the literature.

## Research questions

- Do socio-demographic characteristics of women influence their breast cancer prevention behaviors?
- Is there an association between the level of insight and women’s breast cancer prevention behaviors?
- What is the effect of the level of insight women have on their breast cancer prevention behaviors?

## Materials and methods

### *Sample and design*

This research was a cross-sectional, analytical and relationship-seeking study conducted between February and August 2022. The sample size for this study comprised adult women aged 18 and above who were enlisted at a family health center in Karatay District, Konya Province. Subsequently, these women were contacted and the appointments for their visit to the institution were scheduled. The minimum sample size of 166 was determined by Gpower analysis with the assumption of  $1-\beta = 0.95$  power,  $\alpha = 0.05$  significance level, and  $f = 0.51$  effect size. The sample group was selected by systematic sampling from list of records, and they were contacted by telephone; the final sample size was 393. The dependent variables in the study were the behavior levels of the women in order to prevent breast cancer and insight levels, while the independent variables were the women’s socio-

demographic characteristics. The scale developed by Akdogan and Turkum (2018) was used for analysis.

### **Exclusion and inclusion criteria**

Women over the age of 18 were included in the study. In order to avoid communication problems during the study, all adult women who could read and write, who did not have physical or mental disabilities and who spoke our language were included. After the data were collected, the questionnaires of the individuals who were outside of the age range and those who filled out the scale questions incompletely were excluded from the evaluation.

### **Data collection tools**

The researchers used the Sociodemographic Characteristics Form, the Insight Scale (for which validity and reliability studies were conducted), and the Scale for Determining the Factors Affecting Breast Cancer Prevention Behaviors in Women as data collection tools in the study.

*Sociodemographic characteristics Form:* This form, created by scanning the literature by the researchers, has a total of 14 questions, two of which are open-ended. It inquires about age, gender, education level, income status, and some health-related characteristics of the individuals in the research sample.

*The Scale of Factors Affecting Breast Cancer Prevention Behaviours of Women (FABCPB):* It is a scale developed by Maryam Khazae-Pool et al. in Iran in 2016 to determine the factors affecting breast cancer prevention behaviors in women (Khazae-Pool et al. 2016). The scale has seven sub-dimensions including attitude, motivation, self-efficacy, support systems, information-seeking, self-care, and stress management. It is a 5-point Likert-type scale containing 33 items (“1” never, “2” rarely, “3” sometimes, “4” often, “5” always). The validity and reliability study was conducted by Turan and Yigit (2021). Reverse scoring is applied to items 1, 2, 3, 18, 19, 21, 22, and 23. Factor 1 (support systems) consists of 4 items (items 10, 11, 12, and 13), factor 2 (self-efficacy) includes 4 items (item 7, 8, 9, and 30), factor 3 (self-care) consists of 6 items (items 24, 25, 26, 27, 28, and 29), factor 4 (stress management) includes 3 items (items 31, 32, and 33), factor 5 (motivation) consists of 4 items (4, 5, 6, and 14), factor 6 (information-seeking) consists of 4 items (15, 16, 17, and 20), and factor 7 (attitude) consists of 8 items (1, 2, 3, 18, 19, 21, 22, and 23). The lowest score of the scale is 33, and the highest score is 165, with higher scores indicating positive behaviors (Turan and Yigit 2021). The authors reported that the Cronbach’s alpha coefficient of the scale ranged between 0.76 and its sub-dimensions varied between 0.70 and 0.77. In the present study, the Cronbach’s alpha coefficient of the scale was calculated to be 0.85, indicating a high level of reliability.

*The Insight Scale:* It is a 20-item Likert-type scale developed by Akdogan and Turkum (2018) to determine the level of insight, with a five-point scale where 1 indicates “never” and 5 indicates “always.” Items 4, 9, 13 and 17 of the scale are reverse scored and it is accepted a higher indicates a higher level of insight. Exploratory Factor Analysis (EFA) analyses show that the scale has three sub-dimensions: the “holistic view,” “self-acceptance” and “self-understanding,” which together explain 45.24 percent of the total variance. While the authors stated that the Cronbach alpha value of the scale was 0.84 (Akdogan and Turkum 2018), it was determined in this study that the scale had a high reliability with a Cronbach alpha coefficient of 0.80.

### **Data collection method**

The data for the study were collected face-to-face between February and June 2022. A measurement tool was created by combining the socio-demographic characteristics form, which served as the data collection tool, and the scales and consent letter. The survey questions were self-report based, with

women answering the questions by reading the questions aloud. Completing the questions in each form took approximately 10 to 15 minutes.

### **Statistical analysis of the data**

The data obtained for statistical analysis was considered statistically significant at  $p < .05$  using the IBM SPSS Statistics 24.0 package program. Descriptive statistics such as the mean, standard deviation, number and percentile were given for categorical and continuous variables in the present study. The homogeneity of variances, which is one of the prerequisites of the parametric tests, was evaluated using the Levene's test and the assumption of normality was evaluated using the Shapiro-Wilk test. Student's t Test was used when the differences between the two groups were met and the parametric test prerequisites were satisfied. One-way Analysis of Variance and Post Hoc Tukey HSD test from multiple comparison tests were used for comparison of three or more groups, while Kruskal-Wallis test and the Bonferroni-Dunn test from multiple comparison tests were used. The Spearman correlation test was used for inter-scale correlation statistics and multiple regression analysis was performed to determine the effect level.

### **Ethical statement**

This study was performed in line with the principles of the Declaration of Helsinki. The approval of the Ethical Committee for Clinical Research, excluding Pharmaceutical and Medical Devices Research, of the Faculty of Medicine within XXX (Decision date: 20.01.2022; Decision number: 2022/014) was obtained. Permission to use the scales was obtained from the authors who conducted the validity and reliability studies for the Insight Scale and the FABCPB Scale. An "Informed Consent Form" was prepared for the participants, explaining the purpose of the research, that the results would be used for science, and that the participants were free to participate. Signed consent was obtained from the participants, agreeing to their participation in the study.

### **Results**

The findings presented in the study were from 393 female participants over the age of 18 who volunteered to participate in the research.

The mean age of the women participating in the study was  $37.24 \pm 10.01$  (min:18, max: 66). 68.2 percent of them were over 30 years old. When the FABCPB total score was compared according to age groups, it was determined that there was no significant difference among them ( $p > .05$ ). When the demographic characteristics of the participants were evaluated, it was seen that the majority of the individuals had health insurance by 90.1 percent, were married by 71.8 percent, had university education level by 76.6 percent, and whose income was equal to their expenditures by 51.2 percent. When the participants were asked about their health level, 59.5 percent of them stated that they felt generally healthy whereas 9.9 percent of them stated that they thought they had an undiagnosed disease (Table 1).

The sub-dimensions of the scales used in the study and their associations with each other were presented with the results of the correlation analysis. There was a weak positive correlation between the Holistic View Self sub-dimension, one of the sub-dimensions of the Insight Scale, and the Support Systems, Self-Care, Stress Management, Information Search sub-dimensions, and FABCPB total score. However, a weak negative correlation was observed between Holistic View Self and the Attitude sub-dimension. There was a weak positive correlation between the Acceptance Self sub-dimension and the Support Systems, Self-Care, Stress Management sub-dimensions and FABCPB total score. There was a very weak negative correlation between the Acceptance Self sub-dimension and the Self-Efficacy and Motivation sub-dimensions. The Self-Understanding sub-dimension had a very weak positive correlation with the Support Systems, Self-Care, Stress Management sub-dimensions, a weak positive

**Table 1.** Comparison of participants' demographic variables and total score of breast cancer prevention behaviors.

Variables		Frequency		FABCPB			
		n	%	Min-Max	Mean ± SD	F	p
Age	18–30 year	125	31.8	69–133	106.52 ± 10.21	0.225	.153
	>30 year	268	68.2	76–133	108.10 ± 10.07		
Social security	Yes	354	90.1	76–133	107.61 ± 10.03	0.114	.736
	No	39	9.9	69–130	107.53 ± 11.10		
Marital status	Married	282	71.8	69–133	107.94 ± 10.48	2.183	.140
	Single	111	28.2	84–128	106.73 ± 9.16		
Level of education	Primary education	28	7.1	91–133	111.17 ± 12.71	1.883	.154
	High school	64	16.3	69–130	107.34 ± 11.45		
	≥ University	301	76.6	76–133	107.32 ± 9.52		
Income rate	Income less than expenses	21	5.3	90–127	105.19 ± 10.41	0.784	.457
	Income equals expense	201	51.2	69–133	107.47 ± 10.41		
	Income more than expenses	171	43.5	81–133	108.05 ± 9.77		
Self-health assessment	Healthy	234	59.5	69–133	108.19 ± 10.57	<b>2.861</b>	<b>.037*</b>
	Rarely sick	112	28.6	85–133	108.06 ± 9.16		
	Constantly sick	8	2.0	91–122	103.50 ± 9.87		
	Suspected of being sick	39	9.9	84–126	103.58 ± 9.34		
Chronic disease	Yes	98	24.9	88–133	109.50 ± 9.73	0.299	.585
	No	295	75.1	69–133	106.97 ± 10.19		
Relative with breast cancer	Yes	79	20.1	85–128	108.22 ± 9.19	0.763	.383
	No	314	79.9	69–133	107.44 ± 10.36		
Degree of kinship	First degree	23	29.1	92–124	110.60 ± 7.89	1.442	.243
	Second degree	32	40.5	85–126	106.37 ± 9.60		
	Third degree	24	30.4	92–128	108.41 ± 9.60		

\* $p < .05$ ; \*\* $p < .01$ : Student's t-test. One-way ANOVA Test of variance. summary statistics are given as F(p) values. FABCPB: The Scale of Factors Affecting Breast Cancer Prevention Behaviours of Women.

correlation with the Information Search and FABCPB total score, and a very weak negative correlation with the Attitude sub-dimension. There was a weak positive correlation between the total score of the Insight Scale and the sub-dimensions of Support Systems, Self-Care, Stress Management, Information Search, and the total score of the FABCPB. However, a weak negative correlation was observed between the total score of the Insight Scale and the Attitude sub-dimension (Table 2).

The review of Table 3 revealed a significant score of  $81.46 \pm 5.97$  points was obtained from the FABCPB Scale without the effect of the variables in the model ( $t = 13.626$   $p = .000$ ). The score of Holistic Approach had a positive,  $0.38 \pm 0.144$  point, statistically significant effect on

**Table 2.** Correlation between the insight scale and the scale for identifying factors Affecting women's breast cancer prevention behaviors ( $n = 393$ ).

	Holistic View Self	Acceptance Self	Self-Understanding	Insight Scale Score
Support Systems	0.311**	0.229**	0.243**	0.348**
	0.000	0.000	0.000	0.000
Self-Efficacy	0.035	-0.104*	0.069	-0.012
	0.488	0.039	0.174	0.810
Self-Care	0.316**	0.270**	0.237**	0.367**
	0.000	0.000	0.000	0.000
Stress Management	0.290**	0.220**	0.244**	0.341**
	0.000	0.000	0.000	0.000
Motivation	-0.056	-0.243**	0.009	-0.130**
	0.268	0.000	0.855	0.010
Information Search	0.340**	0.186**	0.274**	0.361**
	0.000	0.000	0.000	0.000
Attitude	-0.281**	-0.092	-0.231**	-0.261**
	0.000	0.068	0.000	0.000
FABCPB	0.305**	0.204**	0.277**	0.349**
	0.000	0.000	0.000	0.000

\* $p < .05$ ; \*\* $p < .01$ : Spearman Correlation Coefficient (r); Summary statistics are given as r (p) values. FABCPB: The Scale of Factors Affecting Breast Cancer Prevention Behaviours of Women.

**Table 3.** The effect of insight scale. Sub-dimensions and demographic characteristics on breast cancer prevention behaviors.

		Unstandardized B ± SH	Standardized			CI
			Beta	t	p	
Breast Cancer Prevention Behaviors	Constant	81.46 ± 5.97	-	13.626	<b>.000**</b>	69.710; 93.220
	Age (mean)	0.10 ± 0.051	0.102	2.023	<b>.044*</b>	0.003; 0.203
	Social Security	-0.52 ± 1.640	-0.015	-0.317	.751	-3.744; 2.703
	Holistic View Self	0.38 ± 0.144	0.174	2.640	<b>.009**</b>	0.097; 0.663
	Self Acceptance	0.27 ± 0.124	0.111	2.222	<b>.027*</b>	0.032; 0.519
	Self-Understanding	0.44 ± 0.177	0.166	2.534	<b>.012*</b>	0.100; 0.795
	Level of Education	-1.44 ± 0.867	-0.085	-1.668	.096	-3.153; -0.258
	Self-Health Assessment	-1.27 ± 0.524	-0.117	-2.423	<b>.016*</b>	-2.301; -0.240
Durbin-Watson = 1.946	R = 0.395 <sup>a</sup>	R <sup>2</sup> = 0.156	Adj R <sup>2</sup> = 0.141	F = 10.167	<b>p = .000<sup>b</sup> **</b>	

\* $p < .05$ ; \*\* $p < .01$  <sup>a</sup>Regression Analysis (F); <sup>b</sup>Coefficient Analysis (t); Summary statistics are given as Regression Coefficient (Standard Error) value.CI: Confidence Interval.

breast cancer prevention behaviors ( $t = 2.640$   $p = .009$ ). Self Acceptance score had a statistically significant positive effect on breast cancer prevention behavior with a score of  $0.27 \pm 0.124$  point ( $t = 2.222$   $p = .027$ ). Self-Understanding score had a statistically significant positive effect on breast cancer prevention behavior with a score of  $0.44 \pm 0.177$  point ( $t = 2.534$   $p = .012$ ). The breast cancer prevention behaviors score of those with a higher education level was  $1.44 \pm 0.867$  points less than those with a lower level of education ( $t = -1.668$   $p = .096$ ). The breast cancer prevention behaviors score of those with a lower Self-Health Assessment level was  $1.27 \pm 0.524$  points less than those with a higher level of Self-Health Assessment ( $t = -2.423$   $p = .016$ ). The effect of these variables on the FABCPB Scale was found to be statistically significant ( $F = 10.167$   $p = .000^b$ ).

## Discussion

At the end of the study, among the demographic characteristics of the women, self-assessment of health, for prevention of breast cancer were found to be significantly higher. It was predicted that differences seen in demographic variables were mainly related to health awareness. However, as another result of the study, it was observed that the mean FABCPB of those with higher education level was lower. It was determined that women's level of insight was positively correlated with their level of behaviors for the prevention of breast cancer, and the level of insight statistically affected the mean levels of FABCPB. Self-efficacy and motivation, which are sub-dimensions of the FABCPB Scale, were also found to have a weak negative relationship with the level of insight. The results suggest that women experience a lack of motivation and a sense of inadequacy for healthy behaviors. Nearly 65 percent of breast masses were diagnosed by the woman herself while diagnosing the breast cancer (Estebarsari et al. 2023). This highlighted the importance of women's self-efficacy and motivation to prevent the risk of this disease (Bashirian et al. 2019). It was also known that self-efficacy has a positive effect on health-promoting behaviors (Akdogan and Turkum 2018). This situation suggested that women with a high level of education had high self-efficacy, therefore they could practice healthy lifestyle behaviors (diet, exercise, etc.), but they faced many social obstacles for early diagnosis of the disease and did not participate in these programs because of the concern of what if there were a problem. Even if the insight was higher in these individuals with a higher education level, it was considered that the work intensity experienced may reduce their self-efficacy and motivation to implement health behaviors. This may explain why insight decreases as education level increases. In a recent study conducted by Akarsu and Alsac on 219 female students, it was detected that the majority of the participants had regular healthcare controls and did not perform regular BSE even though they knew how to apply BSE (Akarsu and Alsac 2019). This study by Akarsu and Aksac shows that female students with higher education are aware of the mortality-reducing effect of BSE. Nevertheless, it is thought that the fact that the students did not apply BSE may be related to insight.

According to another finding of the study, it was seen that as the insight level of the participants increased, their breast cancer prevention behaviors also increased. It was considered that the level of knowledge about diseases may affect the level of insight. In this case, Sadoh et al. (2021), concluded in a study involving female students that peer education could be beneficial for the development of breast self-examination (BSE) knowledge was also in line with the research findings. According to the results of the study in which the knowledge level of 417 female participants in Brazil about breast cancer risk factors was investigated, it was stated that increased knowledge level could be helpful in order to avoid risk factors and motivate prevention behavior (Freitas and Weller 2019). The findings support the conclusion that health education given to the public and counseling received from health professionals could have positive effects on breast cancer prevention behaviors. However, women's fear of being diagnosed with the disease prevents them from participating in screenings for early diagnosis. This situation suggests that there may be a relationship between the feeling of fear and insight. At this point, it could be expected that the participants who felt sick would show breast cancer prevention behaviors due to their past health history, suspicion or fear of having cancer, but it has been determined that this situation shows the opposite results. In a study conducted on the subject, it was stated that the mean scores of the breast cancer fear scale of the women who had mammography were higher than those who did not have mammography (Ersin et al. 2015), and in another study conducted on 178 female nurses, it was stated that participants who had BSE, BE and mammography had higher level of fear for breast cancer (Ersin and Dedeoglu 2020); such findings were not similar to the research result. On the other hand, there were studies which indicated that there was no significant difference between the BSE, BE and mammography behaviors of women and their breast cancer fear levels (Polat and Ersin 2017), as well as a study that found that the mammography rate of women with fear of breast cancer decreased were available (Norouznia and Gordes Aydogdu 2019). The differences between the studies suggest that it may not be insufficient to explain women's reluctance to participate in screening only with the fear variable. In this context, it is thought that women's refusal to have these tests done out of fear of "what if I get cancer" should be evaluated not only with a sense of fear, but also with concepts such as knowledge level, self-efficacy, holistic perspective, motivation and insight.

The results obtained from the study cannot be generalized to the whole world. They can only be generalized to the country where the research was conducted and to populations in countries with similar socio-cultural and socio-economic characteristics. Another limitation of this study is that individuals reduced their visits to healthcare institutions during the pandemic process, and the individuals seeking medical care were generally those with a higher level of education. Moreover, not all women registered with the institution could be included in the study, which may have understanding of the items in the questionnaire forms and hindered effective communication. The use of a probability sampling method in the study helps reduce selection bias. However, there is still a risk of selection bias since double blinding was not possible due to the study's methodology.

At the end of the study, it was determined that individuals with higher education levels, who receive regular breast examinations and believe they may have an undiagnosed disease, exhibit lower breast cancer prevention behaviors. Additionally, as women's level of insight increased, their breast cancer prevention behaviors also increased. A weak positive correlation was found between the support systems, Self-Care, Stress Management, Information Search and FABCPB total score and the level of insight. On the other hand, a weak negative correlation between self-efficacy, motivation, and insight. Although the level of insight was found to affect the mean levels of breast cancer prevention behaviors, the correlation between them was weak. Based on these findings, it is recommended to include cancer scans as part of occupational safety and health examinations for female employees who are overwhelmed by work pressure. It is also suggested to implement health behavior trainings that involve the entire family, rather than just individuals, and expand programs on stress management. Furthermore,



conducting intervention studies to increase the level of insight and reassessing breast cancer prevention behaviors may contribute to future research in this field.

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Critical Revision of the Article: Berna BAYIR, Esra UNAL, Aysenur DEMİR KUCUKKOSELER

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