



Original Article

한국 여성의 유방자가검진 실천 관련 요인: 탐색적 로지스틱 회귀분석

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Factors Associated with Breast Self-Examination Practice among Korean Women: An Exploratory Logistic Regression Analysis

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Abstract

Purpose: This study aimed to identify factors associated with breast self-examination (BSE) practice among Korean women.

Methods: A descriptive cross-sectional survey was conducted using an online self-administered questionnaire from November to December 2020. Eighty-three Korean women aged 20–69 years were included in the final analysis. The questionnaire assessed general and BSE-related characteristics, BSE knowledge, health beliefs regarding BSE, and BSE practice. BSE practice was dichotomized into practice and non-practice groups. Data were analyzed using descriptive statistics and exploratory logistic regression analysis with IBM SPSS Statistics version 25.0. **Results:** Among the participants, 85.5% were aware of BSE, whereas only 6.0% reported practicing BSE regularly. Logistic regression analysis revealed that family history of breast cancer (odds ratio [OR]=0.20, 95% confidence interval [CI]=0.04–0.91, $p=.047$), knowledge of how to perform BSE (OR=0.10, 95% CI=0.03–0.38, $p=.001$), and confidence in performing BSE (OR=0.92, 95% CI=0.86–0.98, $p=.015$) were significantly associated with BSE practice. The final model was statistically significant ($\chi^2=23.13$, $p<.001$), demonstrated adequate goodness of fit, and explained 32.5% of the variance in BSE practice. **Conclusion:** The results suggest that BSE practice among Korean women is more closely related to practical method knowledge and confidence than to general knowledge alone. Standardized community-based BSE education programs should emphasize hands-on practice, confidence building, and sustained breast awareness

Keywords: Breast Neoplasms, Breast Self-Examination, Confidence, Health Belief model, Logistic Regression

Introduction

Breast cancer remains a major public health concern for women worldwide. In 2022, approximately 2.3 million women were diagnosed with breast cancer and 670,000 deaths were attributed to the disease globally [1].

According to recent national cancer statistics in Korea, the breast cancer screening rate based on recommendations increased markedly from 33.2% in 2004 to 72.7% in 2023, reflecting a substantial expansion in participation in organized screening programs [2,3]. Correspondingly, the proportion of breast cancers diagnosed at a localized stage increased by approximately 10 percentage points between 2005 and 2022. This shift reflects successful early detection efforts, which have contributed to a continuous improvement in the 5-year relative survival rate over time [2,3]. These findings suggest that advances in screening and treatment have contributed substantially to improved breast cancer outcomes.

Nevertheless, breast cancer remains the most commonly diagnosed cancer among Korean women, highlighting the ongoing importance of strategies that facilitate the early recognition of breast abnormalities and timely healthcare-seeking behavior. Early detection is particularly crucial because breast cancer prognosis differs markedly according to the stage at diagnosis. Currently, the United States Preventive Services Task Force (USPSTF) recommends biennial mammography for women aged 40–74 years [4]. Conversely, recent international screening guidelines do not recommend routine breast self-examination (BSE) as a population-based screening strategy for women at average risk, as current evidence has not demonstrated a reduction in breast cancer mortality attributable to regular self-examination [4]. Instead, contemporary recommendations increasingly emphasize "breast awareness," encouraging women to become familiar with the normal appearance and feel of their breasts and to seek timely medical evaluation when changes are detected. A Women's ability to notice breast changes, understand the potential meaning of symptoms, and promptly seek professional evaluation is a vital component of breast health promotion [5,6]. Accordingly, BSE should be conceptualized not as an independent screening tool for early cancer detection, but rather as a complementary health behavior that enhances breast awareness and facilitates appropriate healthcare-seeking behaviors.

As a simple, low-cost, and self-directed breast health behavior, BSE allows women to become familiar with the usual appearance and feel of their breasts and to recognize unusual changes [7,8]. Although BSE should not be regarded as a substitute for mammography or clinical breast examination, it may enhance breast self-awareness and encourage women to seek professional evaluation when they notice new breast-related symptoms or abnormalities [7,8]. Previous studies have indicated that while awareness of BSE is as high as 90%, actual participation in BSE remains relatively low, ranging from 20% to 50% [9,10]. This disparity indicates that knowledge about breast cancer does not automatically translate into confidence or health-promoting behaviors. Such gaps suggest that although women recognize the importance of breast health monitoring, they still experience difficulties in identifying breast changes or determining when medical counseling is warranted [11,12]. Therefore, BSE remains meaningful as an accessible breast awareness behavior, particularly when understood as a complementary strategy that supports, rather than replaces, established screening methods.

Previous studies have reported that BSE practice is associated with knowledge, health beliefs, confidence, perceived benefits, perceived barriers, and exposure to BSE-related education [9-13]. In particular, studies based on the Health Belief Model have suggested that psychological factors, such as perceived barriers and self-efficacy or confidence, may play a more direct role in BSE behavior than knowledge alone [10,13]. These findings indicate that BSE practice should be understood as a health behavior influenced by individual beliefs, perceived competence, and previous exposure to breast health education. Despite the potential value of BSE as a breast awareness behavior, its actual practice remains limited. Prior Korean studies have reported insufficient awareness and inconsistent practice of BSE among women, including young women and university students [9,11]. Furthermore, recent global evidence highlights that socio-demographic disparities, such as younger age and lower educational or economic attainment, serve as critical barriers that widen the gap between breast health awareness and actual practice [13].

To develop effective nursing interventions, it is crucial to comprehensively understand the socio-demographic and psychological factors influencing Korean women's BSE practices. Clarifying these factors can provide empirical evidence for developing educational programs that move beyond simple knowledge delivery, focusing instead on strengthening practical confidence, reducing perceived barriers, and promoting sustained breast health behaviors. Therefore, this study aimed to identify the factors associated with BSE practice among Korean women using logistic regression analysis. The findings are expected to provide baseline evidence for the development of standardized and community-based BSE education programs.

Methods

1. Study design

This study was a descriptive cross-sectional survey conducted to identify factors associated with breast self-examination practice among Korean women. An exploratory logistic regression analysis was performed to examine whether general characteristics, breast self-examination-related characteristics, knowledge, and health belief variables were associated with breast self-examination practice.

2. Participants

The participants were Korean women who voluntarily completed an online self-administered survey. The inclusion criteria were as follows: women aged 20–69 years, and women who understood the purpose of the study and voluntarily agreed to participate. The exclusion criteria were women who had difficulty communicating or who were unable to make a voluntary decision to participate in the study. In logistic regression analysis, the ratio of outcome events to the number of predictors can affect the stability of parameter estimates [14,15]. Therefore, in this study, variables were selected for inclusion in the model based on theoretical relevance to reduce the risk of model overfitting.

3. Measures

Data were collected using a structured self-administered questionnaire. The questionnaire consisted of general and BSE-related characteristics, BSE knowledge, health beliefs regarding BSE, and BSE practice. The questionnaire items corresponded to the variables used in the logistic regression analysis, including demographic characteristics, BSE-related experience and awareness, knowledge, perceived benefits, perceived barriers, confidence, and BSE practice.

1) General and breast self-examination-related characteristics

General characteristics included age, job status, education level, marital status, childbirth experience, breastfeeding experience, and family history of breast cancer. BSE-related characteristics included previous awareness of BSE, experience of BSE education, and knowledge of BSE methods.

2) Breast self-examination knowledge

BSE knowledge was measured using a tool modified and supplemented by Choi [16] based on the instrument developed by Lee [17]. The tool consists of 17 items: nine items on breast cancer and breast cancer symptoms and eight items on BSE. Items 1–16 were answered using “yes,” “no,” or “I do not know,” and item 17 asked participants to select all appropriate palpation methods for BSE from the presented figures. Each item was scored as 1 point for a correct answer and 0 points for an incorrect answer or “I do not know.” For item 17, 1 point was assigned only when all appropriate palpation methods were selected. The possible total score ranged from 0 to 17, with higher scores indicating a higher level of BSE knowledge. Reliability was not presented in Choi’s study [12]. In the present study, internal consistency reliability assessed using the Kuder–Richardson Formula 20 (KR-20) was .71.

3) Health beliefs regarding breast self-examination

Health beliefs regarding BSE were measured using the Korean version of the Champion’s Health Belief Model Scale, originally developed by Champion [18] and translated and validated by Jung [19]. The Korean version consists of 42 items across six subscales: perceived susceptibility, perceived seriousness, perceived benefits, perceived barriers, confidence, and health motivation. In this study, considering the measurement indicators relevant to BSE practice, 23 items from three subscales were used: perceived benefits (6 items), perceived barriers (6 items), and confidence (11 items). Each item is rated on a 5-point Likert scale ranging from 1 (“strongly disagree”) to 5 (“strongly agree”). Higher scores indicate stronger health beliefs regarding BSE. In Jung’s study [19], Cronbach’s α ranged from .74 to .75. In this study, Cronbach’s α was .75 for perceived benefits, .84 for perceived barriers, and .91 for confidence.

4) Breast self-examination practice

BSE practice was measured using items developed by the researcher based on a literature review and the three-step BSE method presented by the Korea Breast Cancer Foundation [20]. The tool consisted of five items assessing the frequency and method of BSE practice: observing breast shape and symmetry while standing in front of a mirror, observing breast changes with both arms raised, palpating the breast for lumps, checking nipple discharge, and palpating the inner and outer areas of the breast in a lying position. Each item was rated on a 4-point scale: 0 points for “never,” 1 point for “about once every 6 months,” 2 points for “about once every 2 months,” and 3 points for “monthly.” The total score ranged from 0 to 15, with higher scores indicating a higher level of BSE practice. In this study, Cronbach’s α for the BSE practice tool was .88.

4. Data Collection

Data were collected from November to December 2020 using an online self-administered questionnaire. Participants were recruited through an online survey link. Before beginning the survey, participants were provided with information about the purpose of the study, survey procedures, voluntary participation, anonymity, confidentiality, and the use of collected data for research purposes only. Participants who understood the study information and voluntarily agreed to participate completed the questionnaire. The questionnaire included items on general characteristics, breast self-examination-related characteristics, breast self-examination knowledge, health beliefs regarding breast self-examination, and breast self-examination practice. Responses that were appropriate for analysis were included in the final dataset, and a total of 83 responses were used for the final analysis. The adequacy of the sample size for the logistic regression analysis was evaluated using a post-hoc power analysis conducted with G*Power version 3.1.9.7. Assuming a significance level of .05, an observed odds ratio of 0.10, a total sample size of 83, and an R^2 other X value of .10, the achieved statistical power ($1-\beta$) was estimated to be 0.99, indicating adequate statistical power for the present analysis.

5. Data Analysis

Data were analyzed using IBM SPSS Statistics version 25.0. General characteristics, BSE-related characteristics, BSE knowledge, health belief variables, and BSE practice were analyzed using frequencies, percentages, means, and standard deviations. Differences in BSE practice according to general and BSE-related characteristics were examined using appropriate statistical tests according to the level and distribution of the variables. For logistic regression analysis, BSE practice was dichotomized into a practice group and a non-practice group. Participants who reported practicing BSE “occasionally” or “regularly” were classified as the practice group, whereas those who reported “never” or “rarely” practicing BSE were classified as the non-practice group. An exploratory logistic regression analysis was performed to identify factors associated with BSE practice. Independent variables were selected based on prior research and theoretical relevance to BSE practice. The logistic regression results were presented as odds ratios, 95% confidence intervals, and p-values. Statistical significance was set at $p < .05$.

6. Ethical Considerations

This study was conducted using an anonymous online survey. Participation was voluntary, and participants were informed that they could withdraw from the survey at any time without any disadvantage. No personally identifiable information was collected. The collected data were coded and managed anonymously and were used only for research purposes. Completion of the online questionnaire was regarded as voluntary consent to participate in the study.

Results

1. General Characteristics and levels of BSE Knowledge, Health Beliefs, and Practice of Participants

The general and BSE-related characteristics of the participants are presented in Table 1. A total of 83 women participated in this study, and the mean age was 35.29 ± 11.20 years. By age group, 29 participants (34.9%) were younger than 30 years, 17 (20.5%) were aged 30–39 years, 28 (33.7%) were aged 40–49 years, 8 (9.6%) were aged 50–59 years, and 1 (1.2%) was aged 60–69 years. Fifty-eight participants (69.9%) were employed, and 25 (30.1%) were not employed. In terms of education level, 26 participants (31.3%) had a high school education or below, 40 (48.2%) had graduated from college or university, and 17 (20.5%) had completed graduate school or higher. Forty-seven participants (56.6%) were married, and 36 (43.4%) were unmarried. Forty-two participants (50.6%) had childbirth experience, and 37 (44.6%) had breastfeeding experience. Thirteen participants (15.7%) reported a family history of breast cancer. Regarding BSE-related characteristics, 40 participants (48.2%) had received previous BSE education, and 71 (85.5%) reported awareness of BSE. However, only 26 participants (31.3%) reported that they knew how to perform BSE. In terms of BSE practice, 38 participants (45.8%) reported that they had never practiced BSE, 18 (21.7%) rarely practiced BSE, 22 (26.5%) frequently practiced BSE, and only 5 (6.0%) practiced BSE regularly. Also, the mean score for BSE knowledge was 10.42 ± 2.41 . Among the health belief variables, the mean score for perceived benefits of BSE was 23.63 ± 3.52 , perceived barriers was 11.82 ± 4.27 , and confidence in performing BSE was 32.26 ± 8.79 . The mean score for BSE practice was 5.97 ± 4.64 out of 15.

Regarding performing BSE, participants were categorized into two groups: the non-practice group (those who reported never practicing BSE) and the practice group (those who reported practicing BSE rarely, frequently, or regularly). We then analyzed the differences in participants' characteristics and main variables according to their BSE practice status. The analysis revealed that knowledge of BSE methods was significantly associated with BSE practice ($\chi^2 = 10.75$, $p = .001$); participants who knew how to perform BSE were more likely to practice it. However, other general characteristics such as age, employment status, education level, marital status, childbirth and breastfeeding experience, family history of breast cancer, previous BSE education, and general awareness of BSE did not show statistically significant differences regarding BSE practice. Furthermore, no significant differences were observed between BSE practice and the scores of BSE knowledge, perceived benefits, perceived barriers, or confidence in practice of BSE ($p > .05$ for all). Overall, these findings suggest that practical knowledge of the BSE procedure is a critical factor differentiating those who practice BSE from those who do not.

Table 1. General and BSE-related characteristics of participants (N=83)

Characteristics	Categories	Total	BSE Practice Group (n=45)	BSE Non-practice Group (n=38)	χ^2 or t (p)
		n(%) or M $\pm$ SD	n(%) or M $\pm$ SD	n(%) or M $\pm$ SD	
Age (years)		35.29 $\pm$ 11.20			
	<30	29 (34.9)	19 (42.2)	10 (26.3)	5.05 (.282)
	30–39	17 (20.5)	10 (22.2)	7 (18.4)	
	40–49	28 (33.7)	11 (24.4)	17 (44.7)	
	50–59	8 (9.6)	4 (8.9)	4 (10.5)	
	60–69	1 (1.2)	1 (2.2)	0 (0.0)	
Employment status	Yes	58 (69.9)	31 (68.9)	27 (71.1)	0.05 (.830)
	No	25 (30.1)	14 (31.1)	11 (28.9)	
Education level	≤High school	26 (31.3)	15 (33.3)	11 (58.9)	0.19 (.912)
	College or university	40 (48.2)	21 (46.7)	19 (50.0)	
	≥Graduate school	17 (20.5)	9 (20.0)	8 (21.1)	

Table 1. General and BSE-related characteristics of participants (N=83)(continued)

Characteristics	Categories	Total	BSE Practice Group (n=45)	BSE Non-practice Group (n=38)	χ^2 or t (p)
		n(%) or M $\pm$ SD	n(%) or M $\pm$ SD	n(%) or M $\pm$ SD	
Marital status	Married	47 (56.6)	24 (53.3)	23 (60.5)	0.43 (.510)
	Unmarried	36 (43.4)	21 (46.7)	15 (39.5)	
Childbirth experience	Yes	42 (50.6)	21 (46.7)	21 (55.3)	0.61 (.435)
	No	41 (49.4)	24 (53.3)	17 (44.7)	
Breastfeeding experience	Yes	37 (44.6)	17 (37.8)	20 (52.6)	1.84 (.175)
	No	46 (55.4)	28 (62.2)	18 (47.4)	
Family history of breast cancer	Yes	13 (15.7)	4 (8.9)	9 (23.7)	3.41 (.065)
	No	70 (84.3)	41 (91.1)	29 (76.3)	
Previous BSE education	Yes	40 (48.2)	21 (46.7)	19 (50.0)	0.09 (.762)
	No	43 (51.8)	24 (53.3)	19 (50.0)	
Awareness of BSE	Yes	71 (85.5)	39 (86.7)	32 (84.2)	0.10 (.751)
	No	12 (14.5)	6 (13.3)	6 (15.8)	
Knowing how to perform BSE	Yes	26 (31.3)	21 (46.7)	5 (13.2)	10.75 (.001)
	No	57 (68.7)	24 (53.3)	33 (86.8)	
Practice of BSE	Never	38 (45.8)			
	Rarely	18 (21.7)			
	Frequently	22 (26.5)			
	Regularly	5 (6.0)			
BSE knowledge		10.42 $\pm$ 2.41	10.52 $\pm$ 1.86	10.34 $\pm$ 2.82	0.36 (.723)
Perceived benefits of BSE		23.63 $\pm$ 3.52	23.76 $\pm$ 3.92	23.53 $\pm$ 3.18	0.30 (.764)
Perceived barriers to BSE		11.82 $\pm$ 4.27	11.30 $\pm$ 4.23	12.28 $\pm$ 4.30	-1.03 (.308)
Confidence in performing BSE		32.26 $\pm$ 8.79	33.21 $\pm$ 8.31	31.16 $\pm$ 9.32	-1.04 (.302)
Practice of BSE		5.97 $\pm$ 4.64	6.32 $\pm$ 4.90	5.67 $\pm$ 4.44	0.62 (.536)

BSE, breast self-examination; SD, standard deviation.

2. Levels of BSE Knowledge, Health Beliefs, Confidence, and BSE Practice

Correlations among BSE knowledge, health beliefs, confidence, and BSE practice are presented in Table 2. BSE practice was positively correlated with BSE knowledge ($r=.219$, $p=.049$) and confidence in performing BSE ($r=.538$, $p<.001$), whereas it was negatively correlated with perceived barriers to BSE ($r=-.228$, $p=.040$). No significant correlation was observed between perceived benefits of BSE and BSE practice ($r=.208$, $p=.062$). In addition, confidence in performing BSE was positively associated with BSE knowledge ($r=.259$, $p=.019$) and perceived benefits of BSE ($r=.260$, $p=.019$), but negatively associated with perceived barriers to BSE ($r=-.267$, $p=.016$).

Table 2. Correlations among BSE knowledge, health beliefs, confidence, and BSE practice (N=83)

Variables	1	2	3	4	5
BSE knowledge	1				
Perceived benefits of BSE	.198 (.073)	1			
Perceived barriers to BSE	-.221 (.047)	-.340 (.002)	1		
Confidence in performing BSE	.259 (.019)	.260 (.019)	-.267 (.016)	1	
Practice of BSE	.219 (.049)	.208 (.062)	-.228 (.040)	.538 (<.001)	1

BSE, breast self-examination

3. Factors Associated with BSE Practice

The results of the logistic regression analysis identifying the factors associated with BSE practice are presented in Table 3. The binary logistic regression model was statistically significant ($\chi^2=23.13$, $p<.001$), demonstrating an explanatory power of 32.5% by Nagelkerke R Square. Regarding model fit, the Hosmer-Lemeshow test indicated that the proposed model shows an adequate fit to the data ($\chi^2=5.03$, $p=.754$). Among the examined variables, family history of breast cancer, knowing how to perform BSE, and confidence in performing BSE were significantly associated with BSE practice. A Participants without a family history of breast cancer had significantly lower odds of practicing BSE compared to those with a family history ($B = -1.59$, $OR = 0.20$, 95% $CI = 0.04-0.91$, $p = .047$). Similarly, individuals who did not know how to perform BSE showed a significantly lower likelihood of practice than those who did ($B = -2.28$, $OR = 0.10$, 95% $CI = 0.03-0.38$, $p = .001$). In addition, confidence in performing BSE was significantly associated with BSE practice, showing a slight inverse relationship ($B = -0.09$, $OR = 0.92$, 95% $CI = 0.86-0.98$, $p = .015$). In contrast, BSE knowledge, perceived benefits of BSE, and perceived barriers to BSE were not statistically significant predictors ($p>.05$). These findings indicate that family history of breast cancer, specific methodological knowledge, and self-confidence are critical factors influencing BSE practice.

Table 3. Factors for breast self-examination practice (N=83)

Variables	Reference	B	SE	p	OR(95% CI)
Family history of breast cancer	No	-1.59	0.80	.047	0.20 (0.04-0.97)
Knowing how to perform BSE	Unknown	-2.28	0.80	.001	0.10 (0.03-0.38)
BSE knowledge		0.18	0.12	.147	1.19 (0.94-1.51)
Perceived benefits of BSE		0.03	0.08	.746	1.03 (0.88-1.20)
Perceived barriers to BSE		-0.09	0.07	.176	0.92 (0.81-1.04)
Confidence in performing BSE		-0.09	0.04	.015	0.92 (0.86-0.98)

BSE, breast self-examination; OR, odds ratio; SE, standard error.

Discussion

This study explored factors associated with BSE practice among Korean women using exploratory logistic regression analysis. The findings showed that although most participants reported awareness of BSE, regular monthly practice was uncommon. In this study, 85.5% of participants reported awareness of BSE, whereas only 6.0% practiced BSE regularly. This finding is consistent with previous Korean studies reporting that BSE awareness does not necessarily lead to regular practice. Yoo et al. [9] reported a persistent gap between awareness and actual BSE performance among Korean women, and Shin et al. [11] similarly found that BSE practice among female university students remained insufficient despite the recognized importance of breast cancer knowledge. These findings suggest that BSE education should not remain at the level of simply informing women that BSE exists; rather, it should help women understand when, why, and how BSE can be performed as a practical breast awareness behavior.

In the exploratory logistic regression analysis, knowing how to perform BSE was found to be the strongest predictor of BSE practice (Wald = 11.58). Notably, while general BSE knowledge was not statistically significant in the logistic regression model, knowing the correct procedure for BSE was a strong predictor of actual practice. This finding underscores the importance of practical procedural knowledge over factual knowledge alone in facilitating consistent BSE behavior. Previous studies have similarly suggested that women may be aware of the concept of BSE but often fail to practice it due to uncertainty regarding the correct method, difficulty in distinguishing normal from abnormal breast tissue, or a lack of clarity on appropriate timing and steps [9,13,21]. Taneepanichskul et al. [22] also reported that while general knowledge correlates with ever practicing BSE, the continuity of practice is more closely linked to confidence and practical performance skills. Thus, BSE education should transition from purely lecture-based information toward interactive approaches, such as demonstrations, supervised practice, visual aids, and repeated feedback.

The second significant predictor of BSE practice was confidence in performing BSE (Wald = 5.91). This finding is consistent with the Health Belief Model, in which confidence or self-efficacy is a key psychological factor influencing whether individuals translate knowledge and beliefs into health behavior [18,19]. Didarloo et al. found that psychosocial factors based on the Health Belief Model, including confidence and perceived barriers, predicted BSE behavior among female students using logistic regression [13]. Other studies have also reported that self-efficacy or confidence is strongly linked to BSE performance [16,21,22]. In the present study, perceived benefits and perceived barriers were not statistically significant, whereas confidence remained significant. This suggests that even when women recognize the benefits of BSE, they may not perform it unless they feel capable of doing it correctly. Therefore, intervention programs should prioritize confidence-building strategies, such as step-by-step practice, correction of technique, and reinforcement of women's ability to detect changes in their own breasts.

The third significant factor was family history of breast cancer. This finding may reflect that family history increases personal relevance and perceived vulnerability to breast cancer, thereby promoting breast health behavior. Prior studies have also reported that family history of breast cancer is associated with BSE practice and breast cancer-related health behavior [23,24]. In Korea, a large cohort study using Korean Genome and Epidemiology Study data found that family history was associated with increased breast cancer risk, supporting the need to consider family history in breast cancer risk awareness and prevention strategies [25]. Therefore, women with a family history of breast cancer may be more likely to perceive BSE as personally meaningful, while women without such family experience may not feel an immediate need to practice BSE. This suggests that BSE education should emphasize not only familial risk but also the general value of knowing one's own breast condition and recognizing unusual changes.

Taken together, the findings indicate that BSE practice among Korean women is not sufficiently explained by awareness or knowledge alone. Although BSE is simple, low-cost, and can be performed independently, many women still do not practice it regularly or do not know the correct method. This gap is unfortunate because BSE can help women become familiar with their breasts and seek professional evaluation when they detect unusual changes. However, BSE should be positioned as a breast awareness behavior that complements, rather than replaces, mammography or clinical breast examination [7,8,9]. Educational interventions have been shown to improve BSE knowledge, health beliefs, confidence, and practice [21,26-28]. Therefore, standardized community-based BSE education programs should be developed to move beyond simple information delivery and toward practical skill acquisition, confidence enhancement, and sustained breast awareness. In particular, programs should be tailored to women without family history or prior BSE education, as these groups may have lower perceived relevance and lower motivation to practice BSE.

This study has several limitations. First, the cross-sectional design limits the ability to establish causal relationships among the variables. Second, the relatively small sample size and reliance on online self-reported data may have introduced selection bias and limited the generalizability of the findings. Although the post-hoc power analysis suggested that the sample size was sufficient to detect the observed effects, replication studies with larger and more diverse samples are needed to confirm the present findings. Third, the reliability of the BSE knowledge instrument was relatively low, which may have affected the accuracy of the measurement. Future studies should further evaluate and refine the psychometric properties of BSE knowledge instruments. Despite these limitations, this study provides preliminary evidence that knowledge of how to perform BSE and confidence in performing BSE are important factors associated with BSE practice among Korean women.

Conclusion

This study identified factors associated with BSE practice among Korean women using exploratory logistic regression analysis. Although most participants were aware of BSE, regular practice was uncommon, indicating a gap between awareness and actual breast health behavior. Knowledge of how to perform BSE, confidence in performing BSE, and family history of breast cancer were

significantly associated with BSE practice. These findings suggest that BSE education should move beyond general information delivery and focus on practical skill acquisition and confidence building. In particular, women need opportunities to learn the correct timing, steps, and techniques of BSE through demonstration, hands-on practice, and repeated reinforcement. Community-based and standardized BSE education programs may help women become familiar with their own breast condition, recognize unusual changes, and seek professional evaluation when needed.

Conflict of interest

The author declared no conflict of interest.

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Authors contribution

All work was done by Kim SH.

References

1. World Health Organization. Breast cancer [Internet]. Geneva: World Health Organization; 2026 [cited 2026 June 15]. Available from <https://www.who.int/news-room/fact-sheets/detail/breast-cancer>
2. Park EH, Jung KW, Park NJ, Kang MJ, Yun EH, Kim HJ, et al. Cancer statistics in Korea: incidence, mortality, survival, and prevalence in 2022. *Cancer Research and Treatment: Official Journal of Korean Cancer Association*. 2025;57(2): 312-330. <https://doi.org/10.4143/crt.2025.264>
3. Kang E, Choi KS, Jun JK, Kim Y, Lee HJ, Choi CK, et al. Trends in cancer-screening rates in Korea: findings from the national cancer screening survey, 2004-2023. *Cancer Research and Treatment: Official Journal of Korean Cancer Association*. 2025;57(1):28-38. <https://doi.org/10.4143/crt.2024.325>
4. US Preventive Services Task Force. Screening for breast cancer: us preventive services task force recommendation statement. *JAMA*. 2024;331(22):1918-1930. <https://doi.org/10.1001/jama.2024.5534>
5. Korean Breast Cancer Society. 2024 Breast Cancer White Paper [Internet]. Seoul: Statistics committee of the Korean Breast Cancer Society; 2024 [cited 2026 June 15]. Available from: <https://www.kbcs.or.kr/html/?pmode=paper>
6. Mahar B, Osman MB, Fauzi FA, Aliyu S. The impact of educational interventions on breast self-examination practice, knowledge, and beliefs among women: a systematic review and meta-analysis. *Journal of Public Health Research*. 2026;15(1):22799036261423725. <https://doi.org/10.1177/22799036261423725>
7. Breastcancer.org. Breast self-exam: get to know your breasts in 5 steps [Internet]. Ardmore, PA: Breastcancer.org; 2025 [cited 2026 June 15]. Available from: <https://www.breastcancer.org/screening-testing/breast-self-exam-bse>
8. Mayo Clinic. Breast self-exam for breast awareness [Internet]. Rochester, MN: Mayo Clinic; 2024 [cited 2026 June 15]. Available from: <https://www.mayoclinic.org/tests-procedures/breast-exam/about/pac-20393237>
9. Al-Najar MS, Nsairat A, Nababteh B, Essam D, Tarawneh D, Alrabadi N, et al. Awareness about breast cancer among adult women in Jordan. *Sage Open*. 2021;11(4):21582440211058716. <https://doi.org/10.1177/21582440211058716>
10. Department of Statistics (DoS) [Jordan] and ICF. Jordan population and family and health survey 2023 [Internet]. Maryland: DoS and ICF; 2024 [cited 2026 June 15]. Available from: <https://dhsprogram.com/publications/publication-FR388-DHS-Final-Reports.cfm>
11. Shin KR, Park HJ, Kim M. Practice of breast self-examination and knowledge of breast cancer among female university students in Korea. *Nursing & Health Sciences*. 2012;14(3):292-297. <https://doi.org/10.1111/j.1442-2018.2012.00696.x>
12. Didarloo A, Nabilou B, Khalkhali HR. Psychosocial predictors of breast self-examination behavior among female students: an application of the health belief model using logistic regression. *BMC Public Health*. 2017;17:861. <https://doi.org/10.1186/s12889-017-4880-9>

13. Aly Ibrahim AA, Darwish MY, El-Farargy SH, Saad NE, Khafage A, Abdelgalilet MS. Exploring socio-demographic determinants of breast self-examination practices among Jordanian women: insights from the 2023 population-based survey. *PLOS ONE*. 2026; 21(5): e0347331. <https://doi.org/10.1371/journal.pone.0347331>
14. Peduzzi P, Concato J, Kemper E, Holford TR, Feinstein AR. A simulation study of the number of events per variable in logistic regression analysis. *Journal of Clinical Epidemiology*. 1996;49(12):1373-1379. [https://doi.org/10.1016/S0895-4356\(96\)00236-3](https://doi.org/10.1016/S0895-4356(96)00236-3)
15. Vittinghoff E, McCulloch CE. Relaxing the rule of ten events per variable in logistic and cox regression. *American Journal of Epidemiology*. 2007;165(6):710-718. <https://doi.org/10.1093/aje/kwk052>
16. Choi SM. The influencing factors of breast self-examination practice among hospital nurses [master's thesis]. Daejeon: Daejeon University; 2006.
17. Lee EJ. Affecting factors of breast self-examination practice among hospital nurses [master's thesis]. Daejeon: Daejeon University; 2003.
18. Champion VL. Instrument refinement for breast cancer screening behaviors. *Nursing Research*. 1993;42(3):139-143. <https://doi.org/10.1097/00006199-199305000-00003>
19. Jung SM. A study on the relationship among knowledge, health beliefs, and self-efficacy regarding breast self-examination in women: focused on women in selected areas of Seoul [master's thesis]. Seoul: Ewha Womans University; 2000.
20. Korean Breast Cancer Foundation. Breast self-examination [Internet]. Seoul: Korean Breast Cancer Foundation; 2022 [cited 2026 June 10]. Available from: <https://www.kbcf.or.kr/check>
21. Khiyali Z, Aliyan F, Kashfi SH, Mansourian M, Jeihooni AK. Educational intervention on breast self-examination behavior in women referred to health centers: application of the health belief model. *Asian Pacific Journal of Cancer Prevention*. 2017;18(10):2833-2838. <https://doi.org/10.22034/APJCP.2017.18.10.2833>
22. Taneepanichskul S, Chuemchit M, Wongsasuluk P, Sirichokchatchawan W, Hounnaklang N, Zongram O, et al. Practice, confidence and continuity of breast self-examination among women in Thailand during COVID-19 pandemic: A cross-sectional study. *BMJ Open*. 2023;13(8):e071306. <https://doi.org/10.1136/bmjopen-2022-071306>
23. Ahmad S, Qureshi AN, Atta S, et al. Knowledge, practice, and beliefs among females in Jordan regarding breast cancer and breast self-examination. *SAGE Open Nursing*. 2022;8:23779608221124517. <https://doi.org/10.1177/23779608221124517>
24. Abay M, Tuke G, Zewdie E, Abraha TH, Grum T, Brhane E. Breast self-examination practice and associated factors among women aged 20–70 years attending public health institutions of Adwa town, North Ethiopia. *BMC Research Notes*. 2018;11:622. <https://doi.org/10.1186/s13104-018-3731-9>
25. Choi HG, Park B, Ji YB, et al. A cohort study of 129,374 women in KoGES data: breast cancer risk and family history in Korea. *International Journal of Environmental Research and Public Health*. 2021;18(12):6409. <https://doi.org/10.3390/ijerph18126409>
26. Stefanelli E, Colaceci S, Marcheggiani G, Nicola R. Women's knowledge, beliefs and practices related to breast self-examinations in Italy. *Interdisciplinary Journal of Nursing and Health*. 2025;4(1):23-32. <https://doi.org/10.36253/if-2766>
27. Assfa Mossa K. Perceptions and knowledge of breast cancer and breast self-examination among young adult women in southwest Ethiopia: application of the health belief model. *PLoS ONE*. 2022;17(9):e0274935. <https://doi.org/10.1371/journal.pone.0274935>
28. Garai S, Márton JT, Sipos D, Csima M. Health beliefs and breast self-examination practices among female health science students in Hungary: a health belief model perspective. *Frontiers in Public Health*. 2025;13:1681802. <https://doi.org/10.3389/fpubh.2025.1681802>