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Breast Cancer Knowledge and Preventive Behavior Among Filipino Women in a Rural Area: A Cross-Sectional Study

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Abstract

Background: The incidence and mortality rates of breast cancer are high among Filipino women. The lack of knowledge on preventive behavior and early detection related to breast cancer is considered a reason.

Objectives: This study aimed to determine the association between knowledge about breast cancer and selected sociodemographic characteristics, daily life factors, reproductive factors, and perceived breast cancer risk factors.

Patients and Methods: This study used a cross-sectional design. The study population consisted of 527 women. Interviews were conducted by the investigators. The contents of the questionnaire collected basic characteristics of the respondents, including their sociodemographic profiles, their knowledge of breast cancer risk factors, preventive behaviors, early detection, and their daily life and reproductive factors. Predictor variables were analyzed using a Chi-square test, Fisher's exact test, and a t-test. Multivariate logistic regression was applied for any significant differences ($P < 0.005$) among the predictor variables. One-way ANOVA and Tukey's HDS were used to evaluate the association between education level and reproductive factors.

Results: Less than half of the women (42.7%) had knowledge on breast cancer risk factors, and an equivalent number had knowledge on breast cancer symptoms. Women with higher educational levels were noted to give birth to their first child at a significantly older age and have a significantly lower number of childbirths. Multivariate logistic regression demonstrated that body mass index, education history, knowledge about symptoms, knowing how to conduct a breast self-examination, family history of cancer, and passive smoking could predict breast cancer knowledge.

Conclusions: Women who were aware of risk factors for breast cancer possessed a higher education level and had knowledge of the association of risk factors with preventive behaviors and early detection. However, a minority of women (42.7%) knew enough about breast cancer, preventive behaviors, and what actions to take for early detection.

Keywords: Breast Cancer, Prevention, Filipino

1. Background

Breast cancer is one of the most common diseases and has a high mortality rate worldwide (1). The incidence rate is the highest of all cancers that afflict women. The total number of affected patients makes breast cancer the fifth leading cancer (2).

The age-standardized incidence of breast cancer in all Southeast Asian countries is 34.8 per 100,000, and the age-standardized mortality is 14.1 per 100,000 (1). Singapore has the highest age-standardized incidence (65.7 per 100,000), followed by Brunei (48.6 per 100,000) and the Philippines (47 per 100,000) (3). With respect to age-standardized mortality rates, Malaysia ranks first (18.9 per 100,000), followed by the Philippines (17.8 per 100,000) and Indonesia (16.6 per 100,000) (3).

In a previous study on an Asian population in the United States of America (USA), Filipino women were found to have the highest breast cancer mortality rate (4). Furthermore, it was reported using a sample from Hawaii that when Filipino women were diagnosed with cancer, many were already in the advanced stage (5, 6). These statistics suggests that whether inside or outside of the Philippines, breast cancer incidence and mortality rates are higher among Filipino women than other Asian women worldwide.

A study on breast cancer in Manila did not explain why the incidence rate was high in the Philippines (7, 8); however, its authors pointed out that changes in diet, lack of exercise, a Westernized lifestyle, and changes in reproductive health practices could be closely related to this occurrence (9-11). Although several breast cancer control studies (7, 8) have been conducted in metropolitan Manila, few studies have highlighted the relationship between breast

cancer and the predisposing situation, preventive behaviors, early detection, and risk for the development of breast cancer, especially in rural areas of the country.

Previous studies (7, 11) have shown that the risk of breast cancer decreases for women, even those with a low level of education, if they have given birth to more than five children before the age of 30. However, this finding may be understated when considering reproductive health and economic status. In developing countries, like the Philippines, where most women cannot undergo annual mammography for early detection due to socioeconomic issues, the importance of early detection, breast self-examination (BSE), and preventive behavior should be addressed. Information dissemination and implementing action plans related to preventive behaviors and early detection are necessary for this population.

2. Objectives

This study aimed to determine the association between breast cancer knowledge and selected sociodemographic characteristics, daily life factors, reproductive factors, and perceived breast cancer risk factors.

3. Patients and Methods

This survey used a cross-sectional design and was carried out from 1 - 11 April 2014 in a municipality of the Tarlac province in the Philippines. The municipality is composed of 15 barangays, which are the smallest administrative division with its own health workers. For every six barangays in the municipality, there is a health center with a physician. In this study, six of the fifteen barangays were randomly selected.

The inclusion criteria were women over the age of 18 years old, the age of legal adulthood in the Philippines (12). Exclusion criteria were women who had been diagnosed with breast cancer and those who refused to participate in this survey. The target population was selected randomly from the basic resident registration by barangay health workers. Calculation for the estimated number of women in the targeted area aged above 18 years using a 99% confidence level and a 5% margin of error yielded 613 possible participants. However, due to some missing registration data and a lack of preparation time for random selection, 600 was the total sample size for this study.

The study utilized the interview method to collect questionnaire data. The participants were interviewed by six university nursing students at the local community hall or their place of residence. The questionnaires were developed based on several previous studies (7, 9, 13-18). The contents covered basic information about the respondents, including their socio-economic details and their knowledge about breast cancer risk factors and symptoms. The questionnaire ascertained the following: have history of breast disorders, have history of mammography or breast ultrasound, know breast self-examination, know breast self-examination intervals; daily life factors, including physical activity, consumption of alcohol, and tobacco, have knowledge on passive smoking, and presence of smokers in the family; and reproductive factors, namely, oral contraceptive use, age at menarche and menopause, parity, age at first childbirth, history of lactation, and period of lactation.

Questions related to knowledge of breast cancer risk factors and symptoms were based on the information from the American cancer society (ACS) (17) and information and guidelines from the national cancer center in Japan (NCC) (18), Japan breast cancer society (JBCS) (19), and World cancer research fund (WCRF) (20). Previous studies also developed questionnaires based on information from ACS. Our study selected nine items related to knowledge of risk factors. Estrogen is the most important exposure factor of breast cancer (21). Three items (family history of cancer as a genetic factor, obesity as a daily life factor, and childbirth and breastfeeding as reproductive factors) were selected based on the convincing evidence levels of these traits. To assess knowledge of breast cancer symptoms, respondents answered yes or no to the following possible symptoms: lump, skin depression, pain, no symptoms in early period, don't know; each correct answer was added to the score. For questions related to the respondents' knowledge of risk factors, a choice of do not know was added; if chosen, it was regarded as a wrong answer. One point was given for each correct answer, and zero points were awarded for wrong answers and do not know. Total scores of more than 1 point were categorized as have knowledge and 0 points were classified as no knowledge. Likewise, for questions related to knowledge of symptoms, a choice of don't know was included.

3.1. Ethical Considerations

Ethical approval for this study was obtained from the ethics board of the target city (date of approval: 19/February/2014) and university of the Ryukyus's research ethics committee (date of approval: 28/March/2014, approval number: 213). Before the survey was conducted, the participants were given clear explanations of the study's protocol, and informed consent was attained using printed instructions and agreement documents. Participants were

informed of their right not to participate and their freedom to withdraw from the study at any time. All data were kept confidential and anonymous.

3.2. Data Analysis

All analyses were performed using SPSS (version 23). The dependent variables were the respondents' knowledge about breast cancer risk factors. Predictor variables were analyzed using a Chi-square test, Fisher's exact test, and a t-test. Multivariate logistic regression (method of increasing variables) was applied for any significant differences ($P < 0.005$) among the predictor variables. One-way ANOVA and Tukey's HDS were used to evaluate the association between educational level and reproductive factors.

4. Results

A total of 527 women participated in the study. The mean age was 39.6 years, and the mean body mass index was 21.2. The majority of subjects (84%) were Roman catholics. A higher proportion of the respondents (46.1%) only completed elementary education compared to an almost equal proportion (44.0%) who had a high school education. The average reported income per week was 1,493 Philippine pesos (PHP). Half of the respondents had no health insurance. Most of the women (72.7%) were married (Table 1).

Table 2 illustrates the distribution of the respondents according to behavioral and non-behavioral risk factors related to breast cancer. Only a very small proportion (6.7%) admitted to being smokers or former smokers (3.0%). Similarly, there was a small proportion who drink alcohol. Only 8.5% claimed to have had a family history of cancer. Half of the respondents (42.7%) had knowledge about breast cancer risk factors, as well as breast cancer symptoms; 38.9% knew BSE, and 34.9% knew the BSE intervals.

Questions related to breast cancer risk factors included family history of cancer as a genetic factor (23.9%), obesity as a daily life factor (28.3%), childbirth and breastfeeding as reproductive factors (10.2%), "no risk factor" (3.6%), and don't know (53.7%). Questions related to breast cancer symptoms were lump (31.1%), skin depression (4.2%), pain (57.7%), no symptom (3.2%), and don't know (57.7%).

Table 2 further shows that half of the respondents (43.3%) used oral contraceptives. The mean age at menarche was 13.6 years, while nearly a quarter (24.3%) had their first menstruation before the age of 13. The mean age at menopause was 47.9 years. The mean age at first childbirth was 22.7 years with the mean number of childbirths at 3.02. Most of the women (85.7%) experienced lactation with a mean lactation period of 16 months.

Table 3 demonstrates the association between knowledge about breast cancer and the respondents' sociodemographic profiles, daily life factors, reproductive factors, and breast cancer risk factors and symptoms. The results revealed that a higher proportion of the respondents who attained a higher level of education ($P < 0.001$) had knowledge about breast cancer; the difference was statistically significant. Respondents with a family history of cancer ($P < 0.001$), knew passive smoking ($P < 0.001$), and had knowledge on passive smoking ($P = 0.005$) were aware of the breast cancer risk factors. A higher proportion of the respondents who knew BSE ($P < 0.001$) had knowledge about breast cancer. Those who had a history of breast disorders ($P < 0.001$) had knowledge about breast cancer. Regarding their sources for accessing health information, more respondents identified the internet ($P < 0.001$) and their physicians ($P = 0.004$) as their sources of information than their family and friends ($P = 0.003$).

Table 4 shows the association between educational level and reproductive factors analyzed using one-way ANOVA and Tukey's HDS. For women with a higher level of education, their age at first childbirth was significantly higher and their number of children was significantly lower. Most of the women experienced lactation for longer than 12 months, regardless of their educational level.

Table 5 illustrates the multivariate logistic regression analysis on the association between breast cancer knowledge and significant differences among the predictor variables. Significant differences resulted in the following predictor variables: among the related factors on preventive behavior, family history of cancer ($P = 0.012$) and knew passive smoking ($P = 0.003$); among the related factors for early detection, knew BSE ($P = 0.001$) and had knowledge of breast cancer symptoms ($P < 0.001$); and among the sociodemographic factors, BMI ($P = 0.032$) and educational level ($P = 0.006$).

5. Discussion

5.1. Association Between Sociodemographic Factors and Reproductive Factors

Multivariate logistic regression analysis revealed significant differences between BMI and educational level and knowledge of breast cancer risk factors.

According to the national statistical coordination board's (NSCB) fact sheet (22), 54.2% of women attain an educational level of high school undergraduate or lower, and 45.8% of women have completed high school or higher. Compared to the national average, these percentages were lower for those with an educational background of high school undergraduate or lower and higher for those who completed high school or higher.

Table 1. Frequency and Percentage Distribution of Respondents According to Their Sociodemographic Profile (N = 527)[a]

Sociodemographic Profile	Frequency
Age	39.59 ± 13.93
Body mass index (BMI)	21.21 ± 3.67
Residence area	
Urban	287 (54.5)
Rural	240 (45.5)
Religion	
Roman Catholic	441 (83.7)
Others	86 (16.3)
Educational level	
Elementary graduate	243 (46.1)
High school graduate	232 (44.0)
College graduate	52 (9.9)
Health insurance	
No insurance	267 (50.7)
Public	196 (37.2)
Private	64 (12.1)
Marital status	
Married	383 (72.7)
Single	62 (11.8)
Separated Cohabitation	48 (9.1)
Widow	34 (6.5)
Average income per week, PHP[b]	1493 ± 1432.3

[a] Values are expressed as No. (%) or mean ± SD.
[b] Philippine peso.

In 2007, the breast health global initiative indicated the importance of developing guidelines for encouraging breast cancer early detection among low- and middle-income women, as well as providing basic education and increasing awareness of breast cancer (23). However, the Philippine cancer society (11) reported that women who went to college had almost twice the risk than those with minimal education. Even the current study demonstrated that women with a higher educational level had some risk factors, such as a Westernized lifestyle (e.g. more frequent meat intake, higher BMI) and less experience of childbirth (7).

The results revealed no significant differences between any of the reproductive factors and knowledge of breast cancer risk factors. However, we should emphasize two characteristics, namely, the period of lactation and oral contraceptive use. In this study, the average period of lactation was 15.97 months, and most of the women breast-fed for more than 12 months. Most of the women believed and followed what they were taught by their mothers, relatives, and barangay health workers, e.g., that they should breastfeed up to 24 months. According to some guidelines (19, 20), lactation lasting more than six months reduces the risk of breast cancer, and the evidence grade is convincing. A previous study conducted in the Philippines only asked participants whether they lactated (7) and did not include data on the duration of lactation. A longer lactation period is one of the most important preventive behaviors that can reduce the risk of breast cancer (24). However, we discovered that most barangay health workers and women did not know this fact.

The use of oral contraceptives is another critical aspect to consider. Previous studies have shown that there are some risks associated with the use of oral contraceptives (24, 25). A gender factsheet published by the Philippines' national statistics office (26) reported that among married

Table 4. Association Between Educational Level, BMI, and Reproductive Factors

Predictor Variables	One-Way ANOVA			Tukey's HDS			
	dF	P Value	F	Educational Level		Mean Difference	P Value
BMI, mean ± SD	2	0.089	2.43				
				Elementary school	High school	-0.37	0.553
				20.92 ± 3.47	College	-1.277	0.079
				High school	Elementary	0.37	0.553
				21.29 ± 3.87	College	-0.907	0.277
				College	Elementary	1.277	0.079
				22.19 ± 3.61	High school	0.907	0.277
Age at first childbirth, mean ± SD	2	< 0.001	11.757				
				Elementary school	High school	-1.079	0.022
				21.98 ± 4.06	College	-3.213	< 0.001
				High school	Elementary	1.079	0.022
				23.06 ± 4.18	College	-2.134	0.007
				College	Elementary	3.213	< 0.001
				25.19 ± 4.22	High school	2.134	0.007
Parity, mean ± SD	2	< 0.001	19.48				
				Elementary school	High school	0.931	< 0.001
				3.52 ± 1.88	College	1.176	< 0.001
				High school	Elementary	-0.931	< 0.001
				2.59 ± 1.52	College	0.245	0.665
				College	Elementary	-1.176	< 0.001
				2.35 ± 1.34	High school	-0.245	0.665
Lactation period, mean ± SD	2	0.756	0.28	**Elementary school**	High school	-0.616	0.792
				15.73 ± 8.33	College	0.288	0.983
				High school	Elementary	0.616	0.792
				16.35 ± 8.74	College	0.905	0.848
				College	Elementary	-0.288	0.983
				15.44 ± 10.83	College	-0.905	0.848

Table 5. Association of Predictor Variables and Knowledge of Risk Factors

Dependent Variable	Predictor Variables	Odds Ratio	95%CI	P Value
Knowledge of breast cancer risk factors (Yes: 1, No: 0)	Body mass index (whenever increased by BMI of 1)	1.072	1.006 - 1.143	0.032
	Educational level (whenever increased)	1.703	1.167 - 2.485	0.006
	Knowledge of breast cancer symptoms (Yes: 1, No: 0)	3.641	2.273 - 5.833	< 0.001
	Know breast self-examination (Yes: 1, No: 0)	2.305	1.427 - 3.722	0.001
	Family history of cancer (Yes: 1, No: 0)	3.085	1.278 - 7.448	0.012
	Know passive smoking (Yes: 1, No: 0)	2.111	1.290 - 3.440	0.003

Filipino women in 2011, 19.8% used oral contraceptives for birth control, compared with 43.3% in our study. Although

this higher percentage of oral contraceptive use might have been due to our inclusion of both single and married women, this data should not be neglected. Whereas the Philippine cancer society (11) has shown the absence of a relationship between oral contraceptive use and breast cancer risk, previous studies reported some risks (24, 25), which remain under discussion. Even the barangay health workers and nursing students who took part in this study did not know of any such relationship. This is presumably why many women still use oral contraceptives routinely. Hence, all women should be informed of this relationship through policy initiatives and by medical professionals, such as the barangay health workers.

We analyzed the association between educational level and reproductive factors. Educational level had a significant association with the age at first childbirth and parity. However, regardless of educational level, the average age at first childbirth was below 30 years and the lactation period was longer than 12 months. Because the reproductive and daily life factors of the rural women who participated in this study could differ from those of women living in urban areas, like Manila, it is difficult to determine that a higher educational level is one of the risk factors for breast cancer. Further investigation is needed.

In addition, we determined the reasons why some women did not experience lactation. No milk production from breast was the reason 56% of the women did not lactate, followed by the presence of an inverted nipple (20%). However, difficulties with lactation can also be related to the use of oral contraceptives during the period of lactation (27). We should point out that these situations can be avoided if women and health professionals have correct knowledge and use appropriate practices.

5.2. Association Between Sources of Breast Cancer Knowledge

There were no significant differences between knowledge of breast cancer risk factors and any of the indicated sources of health information. However, respondents who identified the internet as a source of information gained more knowledge about breast cancer compared with those who identified their family and friends as a source.

The Philippines is one of the most active social networking service (SNS) countries (28), and SNSs keep Filipinos abroad in touch with family, friends, and acquaintances (29). Hence, this study also emphasizes the great potential of SNS as a valuable tool for educating people in the Philippines.

Some previous studies have indicated that Filipino women share health information with others (30) and that they are willing to advise other women through health awareness events (31). Furthermore, scholars have demonstrated the influence of mothers' decisions on their daughters' decision-making regarding heath (32). It is therefore very possible that health-related information disseminated from mothers to daughters is a common and very important practice.

However, the acquisition of information using the internet can be an economic problem and incorrect information may be shared. In fact, the current study indicated that women had a false understanding of the risks of oral contraceptive use. The possibility of incorrect information being shared is a real concern. Hence, it can be said that everyone needs access to appropriate sources and opportunities to obtain correct information.

5.3. Association Between Early Detection and Preventive Behaviors

Women who had knowledge of breast cancer symptoms, knowledge of BSE, a family history of cancer, and knowledge of passive smoking showed significant differences regarding their knowledge of breast cancer risk factors. Women who possessed knowledge about risk factors were aware of prevention and early detection, owing to their family history of cancer. Educational level was associated with these variables as a background. Women with a higher education level may recognize the risks of breast cancer due to family history and health-consciousness; therefore, there is a critical need to obtain knowledge on preventive behaviors and early detection.

In this study, participants were not asked about the techniques for BSE. Therefore, it was not clear if women who responded that they knew BSE actually knew the correct technique.

5.4. Association Between Daily Life Factors

There were no significant differences noted between knowledge of breast cancer risk factors and different daily life factors. With respect to histories of drinking and smoking, the results were similar to those of a previous study conducted in Manila in which few women reported to drink or smoke (7). Among the daily life factors, we discovered some customs that could be preventive behaviors; i.e. no smoking, no drinking, and getting a proper amount of physical activity. Women should be aware of the possible risk factors so they can avoid such practices.

Educating women to modify their behavior in order to prevent and detect breast cancer early is vital. The Philippines has a young median population age (23.2 years) with an overall population of more than 100,000,000 (33). In 2050, the Gross Domestic Product (GDP) is estimated to be the 16th largest in the world (34). This means that the Filipino lifestyle will be highly influenced by Western developed countries; hence, the incidence of cancer will likely

increase. To keep Filipino citizens healthy, sources and opportunities to obtain knowledge on breast cancer, especially for young people, are very important.

Current studies have suggested that intervention from elementary school age is effective for cancer prevention (35-37). This is also applicable for breast cancer prevention. According to the NSCB (22) and our findings, most Filipino women have at least completed elementary school. Therefore, breast cancer information dissemination at elementary schools would be ideal. We propose that school-based information dissemination becomes a fundamental educational method, which has been proven effective in ensuring sustainable behavioral change and contributing to disease prevention in developing countries (38, 39). The next aspect to consider is at which grade level intervention should begin.

Due to the scarcity of resources for health information, some health behaviors are assumed to have been passed on as tradition, like the manner of lactation. Although we propose school-based information dissemination, the practice of mothers teaching knowledge and practical skills to their children also plays a vital role in health education. Therefore, we believe that both traditional education and school-based education are the most important methods of health education.

The present study suggests that women with knowledge of risk factors for breast cancer possessed a higher level of education and had knowledge about preventive behaviors and early detection. On the other hand, the findings also suggest that few women had sufficient knowledge about breast cancer, preventive behaviors, and what actions to take for early detection. Therefore, this study indicates that school-based education at the elementary level is necessary so that everyone can obtain the correct knowledge about breast cancer preventive behavior and early detection.

The strength of this study lies in the breadth of the survey, covering not only whether women have knowledge about breast cancer but also the association between this knowledge and reproductive factors, such as lactation period and oral contraceptive use. This data will be very important for further research.

The limitations of this study include limited verification of the knowledge instruments. This study was conducted in only one municipality. Therefore, generalization of the results is difficult. Further research should be conducted in a greater number of municipalities.

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Footnotes

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Table 2. Frequency and Percentage Distribution of Respondents According to Breast Cancer-Related Risk Factors (N = 527)[a]

Respondents	Frequency
Comorbid illness	
Yes	159 (30.6)
No	361 (69.4)
Oral contraceptive use	
Yes	228 (43.3)
No	299 (56.7)
Age at menarche, mean ± SD	13.57 ± 1.56
< 13	128 (24.3)
13 +	399 (75.7)
Age at menopause, mean ± SD	47.89 ± 4.47
Menopausal status	
Pre	432 (82.0)
Post	95 (18.0)
Parity Mean ± SD	3.02 ± 1.7
Age at first childbirth, mean ± SD	22.73 ± 4.22
History of lactation	
Yes	394 (85.7)
No	66 (14.3)
Period of lactation (months), mean ± SD	15.97 ± 8.7
Family history of cancer	
Yes	45 (8.5)
No	482 (91.5)
History of breast disorder	
Yes	57 (10.8)
No	470 (89.2)
Knowledge of breast cancer risk factors	
No knowledge	302 (57.3)
Have knowledge	225 (42.7)
Knowledge of breast cancer symptoms	
No knowledge	302 (57.3)
Have knowledge	225 (42.7)
History of mammography or breast ultrasound	
Yes	59 (11.2)
No	468 (88.8)
Know breast self-examination	
Yes	205 (38.9)
No	322 (61.1)
Know breast self-examination intervals	
Yes	184 (34.9)

No	343 (65.1)
History of smoking	
Never	475 (90.3)
Current	35 (6.7)
Former	16 (3.0)
Presence of smokers in family	
Yes	246 (52.3)
No	224 (47.7)
Know passive smoking	
Yes	189 (35.9)
No	337 (64.1)
Knowledge on passive smoking	
Yes	259 (49.3)
No	266 (50.7)
Alcohol drinker	
Yes	97 (18.4)
No	430 (81.6)
Physically active	
Yes	417 (79.1)
No	110 (20.9)

[a]Values are expressed as No. (%) unless otherwise indicated.

Table 3. Association Between Respondents' Sociodemographic Profiles and Knowledge of Breast Cancer-Related Risk Factors[a]

Predictor Variables	Have Knowledge (N = 225)	No Knowledge (N = 302)	T Value, χ^2 (df) Value	P Value
Age	39.56 ± 14.01	39.61 ± 13.9	0.04	0.968[b]
Body mass index	21.66 ± 3.942	20.87 ± 3.435	-3.909	< 0.001[b]
Average income per week (PHP)	1793.36 ± 1901.49	1266.34 ± 871.03	-2.318	0.021[b]
Residence area			2.242 (1)	0.134[d]
Urban	131 (58.2)	156 (51.7)		
Rural	94 (41.8)	146 (48.3)		
Marital status			0.375 (3)	0.945[c]
Married	163 (72.4)	220 (72.8)		
Single	28 (12.4)	34 (11.3)		
Separated/Cohabitation	19 (8.4)	29 (9.6)		
Widow	15 (6.7)	19 (6.3)		
Health insurance			3.613 (1)	0.064[d]
Yes	122 (54.2)	138 (45.8)		
No	103 (45.8)	163 (54.2)		
Comorbid illness			1.250 (1)	0.29[d]
Yes	74 (33.2)	85 (28.6)		
No	149 (66.8)	212 (71.4)		
Educational level			35.959 (2)	<0.001[c]
Elementary graduate	77 (34.2)	166 (55)		
High school graduate	109 (48.4)	123 (40.7)		
College graduate	39 (17.3)	13 (4.3)		
English-literate			29.281 (1)	< 0.001[d]
Yes	77 (34.2)	43 (14.2)		
No	148 (65.8)	259 (85.8)		
Internet as source of health information			13.988 (1)	< 0.001[d]
Yes	70 (31.1)	52 (17.2)		
No	155 (68.9)	250 (82.8)		
Newspaper as source of health information			0.055 (1)	0.832[d]
Yes	48 (21.3)	67 (22.2)		
No	177 (78.7)	235 (77.8)		
Television as source of health information			2.288 (1)	0.15[d]
Yes	60 (26.7)	99 (32.8)		
No	165 (73.3)	203 (67.2)		
Family and friends as source of health information			8.515(1)	0.003[d]
Yes	42 (18.7)	90 (29.8)		
No	183 (81.3)	212 (70.2)		
Books as source of health information			2.841(1)	0.092[d]
Yes	26 (11.6)	22 (7.3)		
No	199 (88.4)	280 (92.7)		

Physician as source of health information			7.322(1)	0.004[d]
Yes	21 (9.3)	11 (3.6)		
No	204 (90.7)	291 (96.4)		
Age at first childbirth, y	22.60 ± 4.08	22.82 ± 4.33	0.503	0.615[b]
Age at menarche, y	13.60 ± 1.55	13.55 ± 1.58	-0.378	0.706[b]
Age at menopause, y	48.20 ± 4.35	47.62 ± 4.62	-0.629	0.531[b]
Parity, mean ± SD	2.97 ± 1.71	3.05 ± 1.80	0.503	0.615[b]
Oral contraceptive use			0.174 (1)	0.677[d]
Yes	95 (42.2)	133 (44.0)		
No	130 (57.8)	169 (56.0)		
History of lactation			1.146 (1)	0.346[d]
Yes	171 (43.4)	223 (56.6)		
No	24 (36.4)	42 (63.6)		
Period of lactation (months)	16.96 ± 9.14	15.22 ± 8.36	-1.915	0.056[b]
Knowledge of breast cancer symptoms			66.894 (1)	< 0.001[c]
No knowledge	83 (36.9)	219 (72.5)		
Have knowledge	142 (63.1)	83 (27.5)		
History of breast disorder			12.895 (1)	< 0.001[d]
Yes	37 (16.4)	20 (6.6)		
No	188 (83.6)	282 (93.4)		
History of mammography or breast ultrasound			14.878 (1)	< 0.001[d]
Yes	39 (17.3)	20 (6.6)		
No	186 (82.7)	282 (93.4)		
Know breast self-examination			56.135 (1)	< 0.001[d]
Yes	129 (57.3)	76 (25.2)		
No	96 (42.7)	226 (74.8)		
Know breast self-examination intervals			15.692 (1)	< 0.001[d]
Yes	100 (44.4)	84 (27.8)		
No	125 (55.6)	218 (72.2)		
Family history of cancer			21.716 (1)	< 0.001[d]
Yes	34 (15.1)	11 (3.6)		
No	191 (84.9)	291 (96.4)		
Smoking			0.290 (2)	0.865[c]
Never	204 (91.1)	271 (89.7)		
Current	14 (6.3)	21 (7.0)		
Former	6 (2.7)	10 (3.3)		
Presence of smokers in family			4.016 (1)	0.056[d]
Yes	117 (57.6)	129 (48.3)		
No	86 (42.4)	138 (51.7)		
Know passive smoking			17.119 (1)	<0.001[d]
Yes	103 (46.0)	86 (28.5)		
No	121 (54.0)	216 (71.5)		
Knowledge on passive smoking			7.971 (1)	0.005[d]

Yes	126 (56.5)	133 (44.0)		
No	97 (43.5)	169 (56.0)		
Alcohol drinker			3.807 (1)	0.051[d]
Yes	50 (22.2)	47 (15.6)		
No	175 (77.8)	255 (84.4)		
Physical active			3.773 (1)	0.065[d]
Yes	187 (83.1)	230 (76.2)		
No	38 (16.9)	72 (23.8)		

[a] Values are expressed as No. (%) or Mean ± SD.
[b] Student's t-test.
[d] Fisher's exact test.
[c] χ^2 test.