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## RESEARCH COMMUNICATION

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# Satisfaction in the National Cancer Screening Program for Breast Cancer with and without Clinical Breast Examination

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### Abstract

The purpose of this study was to evaluate whether screening by clinical breast examination (CBE) in addition to mammography affected participant satisfaction in the National Cancer Screening Program (NCSP). Data were derived from the Quality Evaluation of National Cancer Screening satisfaction survey. This population-based nationwide telephone survey included participants who had been screened by the NCSP for breast cancer between June and August 2010 (n=2,370), and collected information on satisfaction with screening and screening service use. Five multiple regression models were used to determine satisfaction according to screening method, and according to each of five satisfaction measures (pre-screening information transfer, staff interpersonal skills, physical surroundings, reporting of results and general satisfaction). A total of 1,858 (78.4%) participants were screened by mammography alone and 512 (21.6%) by both mammography and CBE. Satisfaction was significantly higher in subjects screened by both mammography and CBE compared with those screened by mammography alone.

**Key words:** Breast cancer - mammography - mass screening - satisfaction - professional-patient relations

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### Introduction

In recent years, quality assurance for breast cancer screening by mammography has received increased emphasis in the international community. Participant satisfaction has been considered an important outcome measure of the quality of screening by mammography. Assessing the specific elements of quality for screening by mammography is important in order to foster more efficient use of resources, greater understanding of how to achieve the maximum benefits within organized screening programs, and to improve outcomes for women undergoing screening by mammography in community settings (Klabunde et al., 2001).

In the Republic of Korea, the National Cancer Screening Program (NCSP), which has been in place since 1999, provides breast cancer screening for women aged 40 years and over. The participation rates for breast cancer screening programs have increased (from 18.2% in 2004, to 40.0% in 2009) (Lim et al., 2010), but remain suboptimal (Evaluation Indicators Working Group., 2007). Studies have indicated that previous experiences of pain, discomfort, or distress during mammography

can undermine a woman's decision to undergo repeated mammography (Cockburn et al., 1993; Lerman et al., 1990). In addition, as women often hear about mammography services through friends and neighbors, a negative mammography experience may also affect the decision of her family and friends to undergo mammography, or to attend a selected mammography center.

Mammography is the method used for breast cancer screening in the Republic of Korea. However, in the Korean NCSP screening by clinical breast examination (CBE) is recommended in addition to mammography (Yoo, 2008) although the NCSP pays for mammography only. Several organizations that provide clinical guidelines and practice policies for the early detection of breast cancer vary in their recommendations with regard to CBE; some continue to recommend it (Smith et al., 2006), while others make no recommendation whatsoever (Calonge et al., 2009). Scientific studies do not provide a great amount of evidence to support screening by CBE, but it is well known that mammography misses 10% to 20% of breast cancer in asymptomatic women. For example, in a trial that compared the sensitivity of both

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CBE and mammography, mammography outperformed CBE. However, the sensitivity when the two methods were combined was greater than that of mammography alone, as CBE detected some cancers that had been missed by mammography (Day, 2008).

In this study, we investigated participant satisfaction in the NCSP for breast cancer. We then further evaluated the percentage of breast cancer screening participants who were also screened by CBE, and compared the satisfaction among those who were screened by both CBE and mammography with those screened by mammography alone.

## Materials and Methods

### Data source

Quality Evaluation of National Cancer Screening (QENCS) programs were established in 2008 in order to improve the quality of the NCSP. QENCS programs evaluate all aspects of cancer screening such as structure, process, and outcome. QENCS programs also evaluate participant satisfaction and screening accuracy as outcome indicators.

Based on a previously validated questionnaire (Yoon et al., 2009), in October 2010 a professional research center conducted a population-based, nationwide telephone survey of participants screened by the NCSP for breast cancer between June and August 2010. A sample of 12,480 participants was randomly selected and stratified according to age and breast cancer screening mammography unit (among those participating in the NCSP for breast cancer). We evaluated participant satisfaction in these mammography units, which included mobile vans and static sites such as the breast cancer screening unit, which screened over 90 participants over the 3-month period in 2010. In total, 2,915 calls succeeded and 2,370 participants (81.3%) agreed to answer the survey. This study was approved by the Institutional Review Board Committee.

Data collected from participants during the survey included age (40-49, 50-59, ≥60 years), education level (elementary school or none, middle school, high school, college or above), insurance type (Medical Aid Program, National Health Insurance), screening location (mobile van, static site) and previous health check-up (no, yes).

### Additional screening by CBE

Additional screening by CBE was assessed with the following question: “In addition to mammography at breast cancer screening, did you get clinical breast examination (palpation or check-up by physician)?”

### Satisfaction measures

The questionnaire included five determinants of participant satisfaction with the screening experience: pre-screening information transfer (between staff and participant), staff interpersonal skills, physical surroundings, reporting of results and general satisfaction.

Table 1 lists the nine questions used to evaluate these five measures of participant satisfaction in the final questionnaire. The responses were ranked on a scale of 1–4, where 4 was the highest level of satisfaction possible (Table 1).

### Statistical analysis

Chi-square tests were performed to determine if screening methods (mammography alone or both mammography and CBE) differed by participant characteristics. T-tests were performed to determine whether the mean score of each satisfaction measure differed according to screening methods. Next, multiple linear regression analyses were conducted to determine if screening methods were associated with each of the five satisfaction measures. Each model was controlled for age, education level, insurance type, screening location and previous health check-up. All analyses were performed using SAS version 9.2 software.

## Results

Of the 2,370 respondents, 1,858 (78.4%) were screened by mammography only and 512 (21.6%) by both mammography and CBE. The distributions of age, education level, insurance type, screening location and previous health check-up did not differ by screening methods (Table 2).

The mean scores of general satisfaction were 8.03±1.72. Of all five satisfaction measures, the mean score for

**Table 1. Satisfaction Measures and Scoring for Breast Cancer Screening**

Item	P	F	G	E
Pre-screening information transfer				
Q1. Did the staff inform you that you should not have screening if there was any possibility of pregnancy?	1	2	3	4
Q2. Did the staff inform you of the screening processing and the methods?	1	2	3	4
Q3. Did the staff fully explain the pain or discomfort that could result from the screening?	1	2	3	4
Staff interpersonal skills				
Q4. Did you feel free to ask any questions to the staff during screening?	1	2	3	4
Q5. Did the medical staff treat you with respect and use good manners?	1	2	3	4
Q6. Did the staff ensure your privacy?	1	2	3	4
Physical surroundings				
Q7. Did you feel that the examination room was clean?	1	2	3	4
Reporting of results				
Q8. Did you feel that the screening result was explained well and understandable?	1	2	3	4
General satisfaction				
Q9. Were you satisfied with the screening services?	SD	SA		
	1	.....		10

P, Poor; F, Fair; G, Good; E, Excellent; SD, Strongly Disagree; SA, Strongly Agree

**Table 2. General Participant Characteristics**

	Total (n=2,370)	Without CBE (n=1,858)	With CBE (n=512)	P-value
Age (years)				0.201
40-49	955(40.3)	755(79.1)	200(20.9)	
50-59	931(39.3)	738(79.3)	193(20.7)	
≥60	484(20.4)	365(75.4)	119(24.6)	
Education level				0.074
Elementary school or none	559(25.7)	421(75.3)	138(24.7)	
Middle school	447(20.6)	352(78.6)	95(21.3)	
High school	868(39.9)	702(80.9)	166(19.1)	
College or above	300(13.8)	242(80.7)	58(19.3)	
Insurance type				0.314
Medical Aid Program	202(8.5)	164(81.2)	38(18.8)	
National Health Insurance	2,168(91.5)	1,694(78.1)	474(21.9)	
Screening location				0.612
Mobile van	364(15.4)	289(79.4)	75(20.6)	
Static site	2,369(84.6)	1,568(78.2)	437(21.8)	
Previous health check-up				0.329
No	2,098(88.5)	1,651(78.7)	447(21.3)	
Yes	272(11.5)	207(76.1)	65(23.9)	

CBE, Clinical Breast Examination; Data are expressed as number (%).

**Table 3. Satisfaction Scores according to Screening by CBE**

Satisfaction measure	Total	Without CBE	With CBE	P-value
Pre-screening information transfer	2.83(0.89)	2.72(0.89)	3.22(0.79)	<0.001
Staff interpersonal skills	3.44(0.58)	3.39(0.6)	3.59(0.49)	<0.001
Physical surroundings	3.35(0.65)	3.32(0.66)	3.45(0.6)	<0.001
Reporting of results	3.27(0.67)	3.24(0.67)	3.37(0.65)	<0.001
General satisfaction	8.03(1.72)	7.92(1.76)	8.43(1.51)	<0.001

CBE: Clinical Breast Examination.; Data are expressed as mean (standard deviation).

**Table 4. Multiple Regression Results according to Screening by Clinical Breast Examination for Each Satisfaction Measure\***

Satisfaction measure	$\beta$ coefficient	SE	P-value
Pre-screening information transfer	0.470	0.066	<0.001
Staff interpersonal skills	0.193	0.037	<0.001
Physical surroundings	0.128	0.034	<0.001
Reporting of results	0.151	0.036	<0.001
General satisfaction	0.489	0.089	<0.001

\*Each regression model adjusted for age, education level, insurance type, screening location and previous health check-up

pre-screening information transfer was the lowest. The satisfaction for screening by both mammography and

CBE was higher than that for mammography alone for all satisfaction measures (Table 3).

Multiple linear regressions revealed significant associations between screening methods and all five satisfaction measures. After adjusting for the potential confounders of age, education level, insurance type, screening location and previous health check-up, satisfaction scores were more likely to be higher for all satisfaction measures if the participant was screened by both mammography and CBE. Screening by mammography and CBE was associated with higher satisfaction scores for pre-screening information transfer ( $p<0.001$ ), staff interpersonal skills ( $p<0.001$ ), physical surroundings ( $p<0.001$ ), reporting of results ( $p<0.001$ ) and general satisfaction ( $p<0.001$ ; Table 4).

## Discussion

The evaluation of participant satisfaction is an integral part of monitoring the quality of breast cancer screening services. Monitoring general and specific determinants of satisfaction allows identifying and resolving problems, which in turn improves the service. This is especially important in national programs, where a consistently high quality must be maintained despite differences in mammography units and in the populations served by the program (Almog et al., 2008). Satisfaction is also a crucial factor in targeting asymptomatic individuals, as they have no obvious reason to seek the services of the screening program (Decker et al., 1999). The current study was part of a quality assurance evaluation, carried out in the mammography units participating in the NCSP for breast cancer.

In general, mean satisfaction scores were high ( $>3$ ) for all satisfaction measures except pre-screening information transfer. Among 2,370 participants, 1,858 (78.4%) were screened by mammography only and 512 (21.6%) were screened by both mammography and CBE. There was a trend toward higher mean satisfaction scores in the group screened by both methods.

In the present study, the lowest satisfaction score was revealed for pre-screening information transfer, especially among participants that were not screened by CBE. This discovery suggests that breast cancer screening is often performed without sufficient prior explanation, despite previous reports indicating that participants do want information and explanation before being screened (Doyle and Stanton, 2002; Engelman et al., 2004). Indeed, prior to screening, the various steps in the preparation and process of mammography should be explained. It would also be helpful to explain about possible discomfort. Shrestha et al. (Shrestha and Poulos, 2001) showed that even verbal information about mammography had a significant effect on reducing reported levels of discomfort by reducing the expectations of discomfort of the women. This effect was more pronounced in first-time participants.

It is not clear why breast cancer screening participants

were screened by CBE, but government recommendations and increased accuracy of breast cancer screening may be attributed our study. In Korea, a national guideline for breast cancer screening recommend CBE in addition to mammography for women aged 40 and over (Yoo, 2008). Moreover, the United States (Centers for Disease Control and Prevention) and Japan (Moore and Sobue, 2009) conduct nationwide breast cancer screening using both mammography and CBE. On the other hand, Canada (Public Health Agency of Canada), the United Kingdom (NHS Cancer Screening Programmes, 2008), New Zealand (National Screening Unit) and Australia (Australian Government Department of Health and Aging) perform nationwide breast cancer screening using mammography only. The efficacy of CBE to detect breast cancer is controversial. The American Cancer Society recommends CBE about every 3 years for women in their 20s and 30s, and every year for women aged 40 and over (Smith et al., 2006). On the other hand, the USPSTF concluded that current evidence is insufficient to assess the additional benefits and/or harms of screening by CBE in addition to mammography in women aged 40 years and over (Calonge et al., 2009).

A possible explanation for our findings is the accuracy of breast cancer screening in the Korean population. High accuracy can increase the reliability of screening tests, and in turn, participant satisfaction. However, the accuracy of mammography to detect breast cancer declines with increasing breast density (Kolb et al., 2002). Compared with Caucasian women, Asian women have higher breast densities relative to their smaller breast size, which lowers the accuracy of mammography to detect breast cancer in this population (Maskarinec et al., 2001). In a previous study, CBE in addition to mammography significantly decreased false-negative rates (Day, 2008). The higher accuracy conferred by both screening methods could have increased the reliability of screening tests, thereby increasing satisfaction in our study.

Long consultation time also generally increases participant satisfaction (Esch et al., 2008), and additional screening by CBE meant that the consultation time for screening was longer than for those who were not screened by CBE. Through CBE, participants could communicate more fully with physicians. This could have affected satisfaction measures such as pre-screening information transfer, staff interpersonal skills and reporting of results. Also, the satisfaction score of physical surroundings was high in subjects who were screened by both mammography and CBE compared with those who had mammography only. Usually, the location of mammography and CBE were separate. Indeed, CBE can be performed easily in a doctor's office with simple facilities such as a bed and partition, whereas appropriate facilities are needed for mammography that may not be available in a doctor's office. As participants who were also screened by CBE often visited more than one location, there was a higher probability of one of these

settings being to their liking. This may have influenced the satisfaction score of physical surroundings, and could explain why they were higher in subjects screened by both methods.

Mammography is a safe, simple, non-invasive and quick procedure. It involves a fairly tight compression of the breast to obtain a good image which can cause shame, pain, anxiety, embarrassment and discomfort. Expectation of discomfort, anxiety, and any discomfort actually experienced during mammography negatively influence a woman's satisfaction with screening by mammography and their likelihood to undergo regular screening, a cycle that could lead to delays in the detection of breast cancer (Lambertz et al., 2008). Many different techniques have been employed to help women better tolerate the discomfort associated with mammography, as well as several methods to reduce this discomfort, such as lidocaine gel (Lambertz et al., 2008), relaxation techniques (listening to a relaxation or music audiotape before and during mammography) (Domar et al., 2005), breast cushions (Dibble et al., 2005), and courteous and knowledgeable technicians (Dullum et al., 2000). In this study, satisfaction was significantly higher in subjects who underwent both mammography and CBE compared with those who had mammography only. Implementing CBE as a regular screening method in addition to mammography might be helpful to improve the satisfaction and quality of breast cancer screening in Korea. However, standardizing CBE and training to that standard, evaluation of accuracy of CBE and cost-effectiveness in Korean women should be considered prior to considering the implementation of CBE as a regular method in breast cancer screening.

This study has several limitations. The performance rate of CBE was ascertained by self-report and did not identify the actual performance of CBE as recorded on patient records or any other verifiable source, so the performance rate may be under- or over-reported. Nevertheless, self-reported screening behavior is reported to be fairly accurate (Baier et al., 2000; Etzi et al., 1994) and many publications rely upon this. As the study was conducted among healthy participants of the NCSP for breast cancer, the results may not be applicable to other patient populations. Our study participants might have different values, procedure expectations and pain tolerance, which may have potentially influenced their satisfaction with screening procedures. Also, our study was conducted in a clinic setting. This might influence the generalizability of our findings to other settings such as hospitals.

Participant satisfaction was significantly higher among women who were screened by both mammography and CBE compared with those who were screened by mammography alone. To the best of our knowledge, this is the first attempt to measure satisfaction with breast cancer screening methods (mammography with or without CBE), using a reliable and valid survey method in the NCSP. An assessment of satisfaction



within the NCSP is useful as the degree of satisfaction with a screening program correlates with adherence patterns. With regard to CBE, the introduction of regular screening using this method or an education program of communication/attitude skills for screening staff may helpful in improving participant satisfaction and promoting recruitment and adherence to breast cancer screening in Korea.

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