

RESEARCH ARTICLE

Understanding Breast Cancer Screening Practices in Taiwan: a Country with Universal Health Care

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Abstract

While the incidence of breast cancer (BC) has been relatively low in Asian countries, it has been rising rapidly in Taiwan. Within the last decade, it has replaced cervical cancer as the most diagnosed cancer site for women. Nevertheless, there is a paucity of studies reporting the attitudes and practices of breast cancer screening among Chinese women. The aim of this study is to assess Taiwanese women's knowledge of and attitudes toward BC screening and to identify potential factors that may influence screening behavior. The study population consisted of a sample of 434 Taiwanese women aged 40 and older. Despite access to universal health care for Taiwanese women and the fact that a majority of the women had heard of the breast cancer screening (mammogram, clinical breast exams, etc.), the actual utilization of these screening modalities was relatively low. In the current study, the majority of women had never had mammograms or ultrasound in the past 5 years. The number one most reported barriers were "no time," "forgetfulness," "too cumbersome," and "laziness," followed by the perception of no need to get screened. In addition, the results revealed several areas of misconceptions or incorrect information perceived by study participants. Based on the results from the regression analysis, significant predictors of obtaining repeated screening modalities included age, coverage for screening, barriers, self-efficacy, intention, family/friends diagnosed with breast cancer. The findings from the current study provide the potential to build evidence-based programs to effectively plan and implement policies in order to raise awareness in breast cancer and promote BC screening in order to optimize health outcomes for women affected by this disease.

Keywords: Breast self-exam - clinical breast-exam - mammography - Taiwan

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Introduction

Breast cancer has become a health concern among women worldwide. While the incidence of breast cancer (BC) has been lower in Asian countries, it has been rising rapidly in Taiwan. Within the last decade, breast cancer has replaced cervical cancer as the most diagnosed cancer site for women (Chen et al., 2002). According to the latest Taiwanese cancer registry report, 8,136 women were diagnosed with breast cancer, and 1,706 died of this disease. Despite the relatively lower incidence rate of 56 per 100,000, the number of newly diagnosed breast cancer cases increased 5-7% every year (NIH: Health Promotion Bureau in Taiwan, 2008). The incidence of breast cancer in Taiwan increased by 15% from 2003-2008, and 8,136 women were newly diagnosed with breast cancer in 2008 (Chang et al., 2012). According to the 2011 Public Health Annual Report in Taiwan, breast cancer was the fourth leading cause of death from cancer among women (Department of Health, 2011).

The analysis from age distribution shows a unique

pattern for this population; about 16% of breast cancer incidence is at a relatively younger age (less than 40 years), a much higher percentage compared to the U.S.; therefore, more ominous prognostic signs are exhibited. In addition, the median age at diagnosis of breast cancer in Taiwan (45-49 years) is lower than that of Western countries (70-74 years) (Shen et al., 2005). That only 36% of BC patients were diagnosed at the early stages (0&I) and 40% of BC were diagnosed at stage II are alarming signs. Mortality from BC can be reduced by early detection through regular mammography screening and advances in treatment. Currently in Taiwan, with the universal health plan, Taiwanese women age 45-69 can get free mammograms; nevertheless, earlier data indicated that fewer than 3% of women had ever undergone a mammogram (Lin, 2008), and a recent report from the Department of Health in 2011 showed that 26.4% of women age 45-69 ever received a mammogram (Department of Health, 2011).

These vital statistics confirm the need for breast cancer interventions to promote screening practices in Taiwan. In a previous study on a high-risk group of women in Taiwan

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with a family history of breast cancer among first-degree relatives using mammogram, ultrasound, and physical examination, annual screening resulted in a 30% mortality reduction (Lai et al., 1999). A Taiwanese study reported that through regular breast self-examination (BSE), smaller tumors can be detected; therefore, contributes to a greater choice of treatments and an increased survival rate (Lu, 2001).

With an increasing incidence of breast cancer in Taiwanese women, there is a critical need to investigate what can be done to promote and increase screening rates in this population. Currently, a paucity of data exists on Taiwanese women's perceptions and attitudes toward breast cancer (BC) screening and the factors influencing their decisions to engage in BC screening. The aim of this study is to assess Taiwanese women's knowledge of and attitudes toward BC screening and to identify potential factors that may influence screening behaviors.

Materials and Methods

Setting and Procedure

In this cross-sectional study, the data were collected from Chang-hua city, an important central city (population of 230,000) as the political, economic, scientific and technological, cultural and financial center in Taiwan. The study participants were recruited at the gatherings of community centers, parks, and temples, and the final sample consisted of 434 Taiwan women aged 40 years and older. This study protocol was reviewed and approved by the Institutional Review Board for conducting this research. The study aim was explained to eligible women who were assured that their participation would be voluntary and confidential. After consents were obtained, the participants completed the survey, which took approximately 20-30 minutes.

Measurement

The study measurement survey included two parts: A. Chinese Mammogram Screening Beliefs Questionnaire (CMSBQ) and three subscales were used in current study: 1) perceived self-efficacy (2 items), 2) perceived benefits subscale (6 items), and 3) perceived barriers subscale (15 items), 4) perceived risk (2 items), and 5) knowledge related to breast cancer risks subscale (7 items). Possible responses to the items (self-efficacy, benefits, barriers, and risk) ranged from 1 (strongly agree) to 4 (strongly disagree) and each subscale was scored by calculating the means of all subscale items. Responses for the knowledge subscale included yes, no, and don't know; if a participant correctly answered the question, she got a 1; if not, she got a 0. The findings of benefits and barriers subscales among Asian women demonstrated excellent supportive psychometric properties with promising Cronbach's alphas above 0.70, and the results from the confirmatory factor analysis supported construct validity with good model fit indices (Wu and Yu, 2003; Wu and Brady, 2007). The survey instrument also included demographic information (e.g., age, marital status, education, and income level; health insurance coverage). B. The open-ended questions asked participants to identify the three

most frequent barriers that they encountered and that prevented them from getting breast cancer screening, and the facilitators that would make them more likely to get screened. The participants were instructed to leave the space blank if they did not believe they had a significant barrier to using mammography.

Data analyses

Data analyses were performed using the SPSS statistical software package (Version 18.0). Descriptive statistics, including percentages, means, and standard deviation (SDs), were calculated. Next, regression analysis was performed to examine the associations of demographic, knowledge, beliefs, and behavioral factors with the number of screenings that women received in the past 5 years including clinical breast exam(s), mammogram(s), and ultrasound(s).

Qualitative analytic techniques were employed for the analysis of the open-ended questions. The primary researcher and two research associates reviewed and coded participants' responses separately to uncover emerging themes and the categories of the responses. The coding of the responses was then discussed and verified by two senior investigators with expertise in cancer control and qualitative research. Once consensus on coding was reached by the research team, the set of themes/categories was finalized. To complete each content area, quotes from the responses were highlighted to illustrate the category. Discrepancies between the two researchers were resolved through iterative discussions until consensus was reached. Both the content and frequency of the responses were then analyzed.

Results

Demographic Characteristics

The mean age of 434 participants was 47.6 (SD=6.9) years (ranging from 40-80 years). Ninety-one percent of the respondents were currently married. While the educational levels varied widely, 43% of the women reported their highest education was high school, 9% reported with college or higher education, and 2% had no formal education. Of those who reported their monthly income, 45% reported a monthly income between \$679 to \$1,698 (in U.S. dollars), while almost 17% of participants reported having monthly incomes of less than \$679. In the study sample, more than 40% of the women reported their occupations as housekeeping or housewives, while the percentage of blue- versus white-collar distribution was comparable. Twenty-six percent of women reported knowing someone with breast cancer and 7% of the participants had a family member who had been diagnosed of breast cancer. More than 90% of the respondents had insurance; however, only 11% of the women thought the universal health insurance covered mammography screening, and 26% of the women reported don't know if it's included.

Breast Cancer Screening: Past Practices and Intention

Despite the fact that 95% of the participants had heard of breast self-exams, only 39% of the women knew the

appropriate time interval to conduct monthly breast self-exams. Even with the universal health insurance, still 40% of the women had never had their breast exams by doctors or other clinicians. In terms of mammograms and ultrasound, more than 50% of women reported never having any of the procedures in the past 5 years. During the same period, about one-third of the women had one mammogram or ultrasound; nevertheless, in terms of compliance (having more than 2 mammograms/ultrasounds), fewer than 10% of the women reported meeting the criteria (Table 2). In terms of the intention of getting any of the above breast cancer screenings, more women reported planning to have breast self-exams (n=191, 44%), while the intent to get clinical breast exams was the lowest (n=60, 14%) among the four screening modalities.

Table 1. Demographic Characteristics of Study Participants (N=434)

Characteristic	Frequency	%
Age (in years)		
40-49	315	73
50-59	88	20
60+	31	7
Marital Status		
Married	393	91
Widowed/divorced/separated	30	7
Not married, living with a partner	3	1
Never married	7	1
Income (monthly)		
<20000TWD (equals to U.S. \$679)	73	17
20000-50000 TWD (U.S. \$679-\$1698)	195	46
50001-70000 TWD (U.S. \$1698-\$2378)	85	20
70001-100000 TWD (U.S. \$2378-\$3397)	57	13
100001-150000 TWD (U.S. \$3397-\$5095)	8	2
150001-200000 TWD (U.S. 5095-\$6793)	6	1
>200001 (>U.S. \$6793)	4	1
Occupation Type		
Housekeeping/housewife	188	43
Blue collar	109	25
White collar	122	28
Other	10	2
Unemployed	5	1
Level of education		
None	10	2
Elementary school	46	11
Middle school	80	18
High school	187	43
Vocational school	73	17
Bachelor's degree	36	8
Master's degree or higher	2	1
Diagnosis of breast cancer		
Yes	1	0.2
No	432	99.8
Family history of breast cancer		
Yes	30	7
No	403	93
Health insurance		
Yes	391	90
No	42	10
I don't know	1	<1
Health insurance covering mammograms		
Yes	54	12
No	261	61
I don't know	114	27

Table 2. Knowledge and Practice of Breast Cancer Screening (N=434)

Characteristic	Frequency	%
Breast self-exams (BSE)		
Heard of breast self-exam		
Yes	413	95
Practice of breast self-exam		
Never	68	16
2-6 times a year	86	20
7-11 times a year	24	5
Once every month	171	39
Once a week	20	5
Other	65	15
Clinical breast exams (CBE)		
Obtaining most recent CBE		
Never	173	40
Don't remember	30	7
A year or less	75	17
1-2 years ago	48	11
2-5 years ago	60	14
More than 5 years ago	47	11
Mammograms		
Obtaining mammogram (s) in past two years		
Yes	88	20
Obtaining mammogram (s) in the past five years		
More than two mammograms	38	9
One mammogram	146	34
No mammogram	250	57
Ultrasounds		
Obtaining ultrasound(s) in past two years		
Yes	71	16
Obtaining ultrasound(s) in the past five years		
More than two ultrasounds	36	8
One ultrasound	135	31
No ultrasound	263	61

Table 3. Intention for future breast cancer screening (N=434)

Characteristic	Frequency	%
Plan to do BSE	191	44
Plan to do CBE	60	14
Plan to do mammogram	131	30
Plan to do ultrasound	148	34

Table 4. Self-reported Obstacles to Perform Breast Cancer Screening (N=434)

Characteristic	Frequency
Excuses (no time, forgot, cumbersome, & lazy)	332
No need for screening	96
Modesty	93
Discomfort	57
Logistics	50
Lack of info/knowledge	44
Fear of finding cancer	44

Knowledge and Beliefs about Breast Cancer

The mean score on the breast cancer knowledge scale was 2.92 (SD=1.68, range from 0-7). The majority of women (62%) knew that hitting, bumping, or fondling the breasts does not increase a woman's chance of getting breast cancer; however, the percentage for correctly answering the other seven items was lower than 50%. These items included doing something morally bad (41%), air pollution (27%), and having large breasts (45%) were

not associated with increased risk, while obesity (40%) and ovarian cancer (41%) were associated with increased risk. Only 34% of the women respondents believed that mammograms can help doctors or other health professionals find breast cancer before it can be felt.

The mean score for the perceived barrier scale was 2.30 (SD=0.43, range=2.40) with the three subscales, lowest mean score on the "lack of access" subscale (mean score=2.07, SD=0.47), followed by the "inconvenience" subscale (mean score=2.26, SD=0.52), and the highest score for the discomfort subscale (mean score=2.52, SD=0.55). The mean score for the perceived benefit scale was 3.15 (SD=0.39, range=2.6)

In regard to the participants' risk perceptions on developing breast cancer, 64% of the women believed that they had no or a low risk of developing breast cancer. Compared to other women of the same age, more than 50% of the women perceived their risk much as less or less than the average. The mean score for perceived risk was 2.38 (SD=0.85, range=4.0).

Barriers toward BC Screening (based on participants' own words)

The respondents were also asked to name up to three of the most important reasons that prevented women from having regular breast cancer screening. In this sample, 434 participants provided 1,025 responses related to their perceptions of barriers toward BC screening. Table 4 lists the top seven themes that emerged from the participants' responses to the question of barriers to breast cancer screening. If a woman gave multiple responses that corresponded to the same theme, they only were counted once.

Table 4 shows the obstacles reported by the participants that prohibited them from performing breast cancer screening. Surprisingly, the number one most reported by more than 70% of participants (n=332) related to "no time," "forgetfulness," "too cumbersome," and "laziness," followed by the perception of no need to get screened either because they are "feeling OK/no symptoms," "too young," "too old," "no family history," or "having small breasts" (n=96). Another 21% of participants indicated their concerns related to modesty (n=93) and discomfort with breasts being touched (n=57). In addition, reasons related to transportation, finding hospitals and other logistic obstacles as well as "lack of general knowledge toward breast cancer screening" and "fear of finding cancer" were as followed as the main reasons for not getting breast cancer screening done. Interestingly enough, the barriers reported in the literature as common barriers such as costs (n=20), trust with providers (n=12) and radiation (n=4) did not emerge as top-reported obstacles.

Factors Predicting BCS Behavior and Intention

About one third of participants (34%) reported having a mammogram in the past 5 years while the majority of women (57%) reported never having a mammogram during the same time period. Only a very small percent of women (9%) reported having more than one mammogram done in the same time interval.

Unlike other studies using the outcome variable of "ever having a mammogram," this study focused on the compliance with regular breast cancer screening and used the number of screenings women received in the past five years as the outcome. Multiple regression was performed to examine the effects of sociodemographics (e.g., age, education, income, insurance status, number of family or friends being diagnosed with breast cancer), perceived risk, benefits, barriers subscales, self-efficacy, and knowledge of breast cancer and screening on regular breast cancer (BC) screening. The practice of ultrasounds was slightly lower. The model explained 28% of variance of BC screening behavior. Findings showed that women who are older ($\beta=0.15$, $p<.01$), had insurance coverage for the BC screening ($\beta=0.10$, $p<.05$), had friends and/or family member(s) diagnosed with breast cancer ($\beta=0.18$, $p<.001$), perceived lower barrier related inconvenience ($\beta=-0.24$, $p<.001$), reported higher self-efficacy ($\beta=0.15$, $p<.05$), and had higher intentions ($\beta=0.29$, $p<.001$) reported more screening tests done in the past 5 years. The remaining cognition variables, risk perceptions, benefits and knowledge, and other sociodemographic variables (income and education) were not significant predictors for regular BC screening.

Discussion

To our knowledge, this is the first study to investigate the wide range of correlates (i.e., socio-demographics, knowledge and beliefs toward BC) and their relationships with breast cancer screening among Taiwanese women. Breast cancer is the most common cancer site for women in Taiwan, and the incidence is increasing rapidly where only 30% of breast cancer patients were diagnosed in stage I in Taiwan. In order to improve breast cancer outcome and survival, early detection remains the cornerstone of breast cancer control (WHO, 2012). Despite access to universal health care for Taiwanese women and that a majority of the women have heard of the breast cancer screening (mammogram, clinical breast exams, etc.), the actual utilization of these screening modalities was relatively low. In the current study, the majority of women (age 40 and older) had never had mammograms (57%) or ultrasound (61%) in the past 5 years. A slightly higher percentage of women reported having clinical breast exams (54%) in the same period. Participants reported lower rates of having mammograms and clinical breast exams compared with other Asian studies in Singapore (Chong et al., 2002), Hong Kong (Kwong et al., 2008), and Turkey (Ozmen et al., 2011), but higher than the study in Malaysia (Parsa et al., 2010).

The findings from current study also showed that they had higher perceived barrier scores and comparable perceived benefits scores compared to other three studies among Asian and Chinese American women (Yu and Wu, 2005; Lee-Lin et al., 2007; Wu and Ronis, 2009). In addition, this group of women had low knowledge scores about breast cancer screening and risk. More than half of the participants did not know about obesity and ovarian cancer as risk factors for developing breast cancers while a majority of women still believe doing something morally

wrong can increase the risk. It is also alarming to see that only a limited number of women (less than 1/3) believe that mammograms can help doctors to detect breast cancer early. The open-ended questions provide helpful insights in exploring the views of Taiwanese women about why they do not get breast cancer screening done. Aside from the more common barriers reported in Western literature (for example, no time and logistics), women reported in their own words that they do not feel the need to get the screening done because they have no family history, feel OK (or no other symptoms), and are too young and/or too old. In addition, based on the responses, the women also reported a general lack of knowledge and awareness of the importance of early detection. These findings underscore a comprehensive education campaign to appropriately address the misconceptions and promote breast health awareness. Given the respect that Taiwanese women have for their physicians, it is crucial during every possible encounter (for example, OB/GYN, or primary care visits) that the clinicians help to disseminate breast health information and encourage their female clients to take advantage of breast cancer screening (available to all women without additional cost as the benefit of universal health care). Findings presented in this study can assist health professionals to effectively plan and implement evidence-based programs to promote participation in breast cancer screening.

Based on the results from the regression analysis, significant predictors of obtaining repeated screening modalities in this sample of women include barriers and self-efficacy. Our findings were similar to previous studies on breast cancer screening among Chinese American (Yu and Wu, 2005), Asian American (Wu and Ronis, 2009) and Singaporean women (Straughan and Seow, 2000). In addition, in our study, women who had family members and/or friends diagnosed with breast cancer were more significantly more likely to have more than one screening modality done in the past five years. This variable has not been consistently reported in previous literature as an influencing factor except in one study on Chinese Americans (Lee-Lin et al., 2007). Unlike other previous studies in the literature, education and health insurance have not emerged in current study as significant factors that predict repeat breast cancer screenings. It is not surprising findings as women in this country are covered by the national health care plan (i.e., universal health insurance) whereas individuals pay a reasonable premium (i.e., less than \$30 U.S. dollars annually). In current study, 90% of participants reported having the coverage; nevertheless, results from current study suggest that there still is a critical need to effectively plan and implement policies and programs to effectively raising awareness in breast cancer and the role of BC screening in order to increase early detection rates in Taiwan. While the health authority in Taiwan has been promoting the concept of “three points examined together” that includes examinations for cervix and breasts for decades in an effort for preventing female cancer, the policy has been shown to be less effective in operation since a workable scheme has not been fully established (Chang et al., 2012). The findings study provide the potential to build evidence-based public health

campaigns that take into account the issues discussed in this paper including the concept of preventive measures (i.e., importance of early detection and risk factors for breast cancer) and strategies to overcome cultural barriers (e.g., modesty and embarrassment), fear (related to cancer, radiation, and treatment), and address misconceptions.

The study findings need to be interpreted with respect to several study limitations. Due to the nature of non-randomized convenience sample, the selection and response bias cannot be ignored. The results cannot be generalized beyond the sample with similar demographic characteristics. Next, the study utilized self-reported screening use, which may be subject to telescoping recall error and social desirability bias; the actual use of screening tests among this group of women may be even lower than what has been reported in the current study. Future studies that incorporate the review of medical records can assist researchers to verify participants' self-reports about screening use.

In conclusion, changes in breast cancer incidence and distribution of breast cancer patterns among Taiwanese women present opportunities for developing and implementing effective public health programs that promote BC screening for women in Taiwan. This study reported the practice of breast cancer screening and how sociodemographics, knowledge and beliefs associated with breast cancer screening among Taiwanese women. This study is the first to use open-ended questions to provide in-depth perspectives from participants' own words on why they did not obtain BC screening. The information presented in this study provides understanding of correlates and perceptions of breast cancer screening among this population; therefore, emphasize the importance of effectively designing, planning, and implementing comprehensive interventions to improve health outcomes with respect to breast cancer through early detection, diagnosis, and treatment.

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