RESEARCH ARTICLE

Awareness and Prevalence of Mammography Screening and its Predictors - A Cross Sectional Study in a Primary Care Clinic in Malaysia

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Abstract

Background: Worldwide, over half a million women died of breast cancer in 2011 alone. Mammography screening is associated with a reduction of 20 to 35% in breast cancer mortality. The aim of this study was to determine the awareness and practice of mammography screening and predictors of its uptake in Malaysian women attending a primary care clinic. Materials and Methods: A cross-sectional study was carried out among women aged 40 to 74 years attending a primary care clinic in Selangor, Malaysia. An assisted structured questionnaire included questions on socio-demography, source of information and level of knowledge. An adapted version of the revised Champion Health Belief Model Scale plus other associated factors for mammography screening up-take were also included as part of the questionnaire. Predictors for mammography screening uptake were only determined in those who were aware about mammography screening. Significant predictors were determined by logistic regression. Results: 447 women were recruited for this study; 99.1% of them (n: 411) were aware about breast cancer. Only 50.1% (n: 206) had knowledge about mammography screening. Prevalence of clinical breast-examination (CBE) was 23.3% (n: 104) and mammography screening up-take was 13.2% (n: 59). The predictors for the latter were those who have had clinical breast-examination (aOR=17.58, 95%CI: 7.68-39.82) and those aged between 50 to 59 years (aOR=3.94, 95%CI: 1.61-9.66) as well as those aged 60 years and above (aOR=6.91, 95%CI: 2.28-20.94). Good knowledge and positive beliefs about mammography screening were not associated with mammography screening uptake. Conclusions: Half of our Malaysian women were aware about mammography screening. However, the uptake of mammography was low. Previous CBE and older age were significant predictors of mammography screening uptake. Increasing CBE services may increase compliance with guidelines.

Keywords: Breast cancer awareness - mammography - screening - predictors - breast examination - Malaysia

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Introduction

Breast cancer is the most frequently diagnosed cancer in women worldwide (Globocan, 2008). Successful treatment of breast cancer depends on early diagnosis (Anderson et al., 2011). Mammography is a gold standard for breast cancer screening (Ministry of Health Malaysia Management of breast cancer, 2010; Canadian Task Force on Preventive Health Care, 2011). It plays a major role in the early detection of disease and reduces breast cancer mortality by 20 to 35% (Elmore, 2005; Services Task Force, 2011). Yet in many countries the uptake of mammography screening remains poor.

In Malaysia, breast cancer is the leading cause of cancer in women. Approximately, 1 in 19 women in this country develop breast cancer in their lifetime. Unfortunately, more than a third of these women presented late and it is the leading cause of cancer death in Malaysian women (Yip et al., 2006; Omar and Tamin 2007; Taib et al., 2007).

It has been reported that good knowledge about breast cancer and positive beliefs in screening is associated with mammography uptake (Champion, 1999; Yip et al., 2008; Anderson et al., 2011). In Malaysia, 99.2% women were aware of breast cancer as a leading disease among them. Nonetheless, less than half of them were aware that mammography is a good tool in breast cancer screening (Kanaga et al., 2011).

Therefore this study is aimed to answer the following research question: what is the level of awareness and prevalence of mammography screening done and the associated predictors of mammography uptake among women attending a primary care clinic?

Materials and Methods

A cross-sectional study was carried out among women who attended a primary care clinic in Selangor, Malaysia from October to November 2011. The inclusion criteria

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were women aged between 40 to 74 years who were aware about breast cancer. The exclusion criteria were current or previous history of any cancer and those unable to communicate in either Malay or English.

Women were considered to be aware about breast cancer if they had ever heard or read about breast cancer. Women were considered to be aware about mammography screening if they had ever heard or read that mammography is a screening tool for breast cancer.

Data were collected using an 82 item self-designed questionnaire which included questions on socio-demographic characteristics, awareness of breast cancer and mammography screening, source of awareness, practice of mammography screening and the associated predictors for mammography uptake. Health beliefs were measured using an adaptation of the revised Champion Health Belief Model Scale 1998 (CHBMS). Current individual risk of breast cancer was categorized using risk categories from the National Guideline of Early Breast Cancer Detection Programme, Malaysia (Champion, 1999; Ministry of Health Malaysia Management of breast cancer, 2010; Canadian Task Force on Preventive Health Care, 2011).

The questionnaire was developed in English, translated into Malay and back translated to English. Content validity was assessed by two family medicine specialists and one mammography radiologist. Face validity was assessed by 20 women of whom 10 were practising primary care physicians and 10 were clinic patients. A pilot study was conducted on 30 participants. The Cronbach's alpha coefficient was between 0.778 and 0.958.

The CHBMS has 20 Items with a 5-point Likert scale. This section is divided into three domains; 1) Susceptibility: 3 items, 2) Benefit Mammogram: 5 items and, 3) Barriers Mammogram: 12 items. An item was added to the domain on barriers to account for cost as a barrier to mammography. The scale was treated as an ordinal data with the following given response at each point; "Strongly disagree", "disagree", "neutral", "agree" and "strongly agree". Points were given for each category as follows; 1- Strongly disagree; 2 - Disagree; 3 - Neutral; 4 - Agree; 5 - Strongly agree. For each domain, the total score was a summation of the points obtained for all the items in the domain. This was re-categorized as strong belief, poor belief and neutral (neither strong nor poor) belief using a threshold which was calculated by multiplying 3 (points for answering neutral) with the number of items in each domain (Table 1).

Table 1. Health Belief Scale Scoring System

Domain 1: Perception of Susceptibility (3 items)	
Strong belief	if cumulative total score more than 9 (>9)
Neutral/ No belief	if cumulative total score equal to 9 (=9)
Poor belief	if cumulative total score less than 9 (<9)
Domain 2: Perception of Benefit Mammogram (5 items)	
Strong belief	if cumulative total score more than 15 (>15)
Neutral/ No belief	if cumulative total score equal to 15 (=15)
Poor belief	if cumulative total score less than 15 (< 15)
Domain 3: Perception of Barrier Mammogram (12 items)	
Strong belief	if cumulative total score more than 36 (>36)
Neutral/ No belief	if cumulative total score equal to 36 (=36)
Poor belief	if cumulative total score less than 36 (<36)

For the section on knowledge, only 7 questions out of 35 were used to assess the level of knowledge about mammography screening. A scoring system was developed by an academic breast surgeon. For each item 1 point was given if the answer is "know" and zero for "don't know". Level of knowledge was categorized into poor, intermediate and good as in Table 2.

Each individual's breast cancer risk was categorized according to guidelines of the Malaysian Ministry of Health (Table 3).

Data analyses

All data was analysed using the Statistical Package for Social Sciences (SPSS) v. 21.0. Descriptive frequencies were used to describe socio-demographic characteristics, awareness of breast cancer and awareness of mammography screening. Chi square test and logistic regression were used to determine the associated predictors of mammography screening uptake. Odds ratio (OR) was used to test for significant association. A p-value of less than 0.05 was considered significant. Fisher's exact test was used when appropriate.

Results

Out of the 1500 women who attended the clinic during the study period, a total of 447 were recruited into the study. However, only 411 respondents have ever heard about breast cancer and 206 (50.1%) of these subjects have ever heard about mammography screening.

The socio-demographic characteristic of respondents (n: 411)

The median age of respondents was 52 years (IQR: 13). Majority were married, did not have higher education, were uninsured and were from low socio-economic background. Ethnicity was mixed with 40% Malay, 30% Chinese, 20% Indian and 1.7% other ethnicities.

Table 2. Knowledge Level Scoring System

Total knowledge level	
	Total patient's knowledge score/ total maximum knowledge score x 100%
Classification for level of knowledge	
	Poor level of knowledge : 0-50%
	Intermediate level of knowledge: 51-70%
	Good/ High level of knowledge: 71-100%.

Table 3. Breast Cancer Risk Stratification According to Guidelines from Malaysia Ministry of Health

Criteria A: 3 items	Criteria B: 5 items
1. Family history of first degree relatives with breast cancer	1. Null parity or delivered first baby after aged of 30
2. Carrier of BRCA1 and BRCA2 genetic mutation	2. Menarche before age of 12 years
3. Atypia benign breast disease	3. Menopause after age of 55 years
	4. History of taking hormonal replacement therapy
	5. Obesity with BMI ≥27.5

Table 4. Univariate Analysis for Factors Associated with Mammography Screening Uptake (n:206)

Variable		Mammogram		OR	95% CI	P value
		Yes (n=59) N (%)	No (n=147) N (%)			
Age	40-49	17 (17.7)	79 (82.3)	1		0.003
	50-59	27 (35.1)	50 (64.9)	2.51	1.24-5.07	
	≥60	15 (45.5)	18 (54.5)	3.87	1.63-9.18	
Ethinicity	Malay	22 (22.2)	77 (77.8)	1		0.10[α]
	Chinese	24 (38.7)	38 (61.3)	2.21	1.10-4.44	
	Indian	12 (27.9)	31 (72.1)	1.36	0.60-3.07	
	Others	1 (50)	1 (50)	3.5	0.21-58.3	
Marital status	Married	45 (26.6)	124 (73.4)	1		0.187[α]
	Single	3 (30)	7 (70)	1.18	0.29-4.76	
	Widow	11 (45.8)	13 (54.2)	2.33	0.98-5.58	
	Divorcee	0 (0)	3 (100)	0	0	
Religion	Muslim	22 (22)	78 (78)	1		0.151[α]
	Buddhist	19 (36.5)	33 (63.5)	2.04	0.98-4.26	
	Hindu	12 (30)	28 (70)	1.52	0.67-3.47	
	Christian	4 (36.4)	7 (63.6)	2.03	0.54-7.56	
	Others	2 (66.7)	1 (33.3)	7.09	0.61-81.89	
Education level	Non formal	3 (30)	7 (70)	1		0.932[α]
	Primary	15 (31.9)	32 (68.1)	1.09	0.25-4.83	
	Secondary	34 (27.6)	89 (72.4)	0.89	0.22-3.65	
	Tertiary	7 (26.9)	19 (73.1)	0.86	0.17-4.29	
Insurance coverage	Uninsured	44 (30.1)	102 (69.9)	1		0.798[α]
	Insured	10 (24.4)	31 (75.6)	0.75	0.34-1.66	
	Government servant	5 (26.3)	14 (73.7)	0.83	0.28-2.44	
Household income (RM)	<1500	36 (30)	84 (70)	1		
	1500-3000	13 (27.1)	35 (72.9)	0.87	0.41-1.83	0.392[α]
	3001-5000	6 (20)	24 (80)	0.58	0.22-1.55	
	≥5000	4 (50)	4 (50)	2.33	0.55-9.85	
Level of MMG's knowledge	Poor	13 (25)	39 (75)	1		
	Intermediate	8 (20.5)	31 (79.5)	0.77	0.29-2.10	0.27
	Good	38 (33)	77 (67)	1.48	0.71-3.10	
Susceptibility	Poor belief	33 (29.2)	80 (70.8)	1		0.978
	Undetermined	6 (27.3)	16 (72.7)	0.91	0.33-2.53	
	Strong belief	20 (28.2)	51 (71.8)	0.95	0.49-1.83	
Benefits of MMG	Less belief	1 (50)	1 (50)	1		
	Undetermined	0 (0)	5 (100)	0	0	0.289[α]
	More belief	58 (29.1)	141 (70.9)	0.41	0.03-6.69	
Barriers for MMG	Less Belief	53 (29.8)	125 (70.2)	1		0.702[α]
	Undetermined	1 (16.7)	5 (83)	0.47	0.05-4.14	
	More belief	5 (22.7)	17 (77.3)	0.69	0.24-1.97	
Regular health visit	Yes	47 (31.8)	101 (68.2)	1		0.78
	No	12 (20.7)	46 (79.3)	0.56	0.27-1.16	
Perceived health status	Poor	12 (41.4)	17 (58.6)	1	0.24-1.28	0.175
	Good	39 (28.3)	99 (71.7)	0.55	0.13-1.07	
	Satisfied	8 (20.5)	31 (79.5)	0.37		
Done CBE	Yes	42 (63.6)	24 (36.4)	12.66	6.21-25.84	<0.001
	No	17 (12.1)	123 (87.9)	1		
Fhx of BC	No	52 (26.9)	141 (73.1)	1		
Current individual BC risk status	Intermediate risk	41 (26.5)	11 (73.5)	1	1.03-10.22	0.104
	High Risk Category A	7 (53.8)	6 (46.2)	3.24	0.5-2.49	
	High Risk Category B	11 (28.9)	27 (71.1)	1.13		

*OR: odd ratio; CI: confident interval; RM: Ringgit Malaysia; MMG: Mammography screening; Fhx: Family history; BC: breast cancer; CBE: Clinical breast examination; [#]Man Whitney U test; [α]Fisher exact test; significant $p<0.05$

Awareness and practice of mammography screening

Although 91.9% (n: 411) of women were aware about breast cancer, only half of them (n: 206; 50.1%) were aware about mammography screening. Approximately 23.3% women had done CBE. Out of those who had CBE done, 40% have undergone mammogram. Only 13.2% (n: 59 out of 447) of all the study participants had ever done mammography screening.

Associated factors for undergoing mammography screening

Table 4 shows the factors that were significantly associated with uptake of mammography screening. These were "Age 50-59" (OR: 2.51, 95% CI: 1.24-5.07), "Age ≥60" (OR: 3.87, 95% CI: 1.63-9.18), previous clinical breast-examination (OR=12.66, 95% CI: 6.21-25.84, p≤0.001) and first degree family history of breast cancer (OR=3.16, 95% CI: 1.02-9.85, p=0.044). There was no significant association found between level of knowledge and health beliefs with uptake of mammography screening.

Predictors for mammography screening uptake

Table 5 shows the results of the final model of multivariate analysis. Older age and previous CBE were significant positive predictors of mammography screening uptake. A respondent who had a previous CBE had the adjusted odds of undergoing mammography screening which was 17.5 times more than respondents who never

Table 5. Predictors for the Mammogram Screening Up-Take; A Final Model of Multivariate Analysis

Characteristic	Crude		Adjusted	
	OR	95% CI	OR	95% CI
Age group: 50-59	2.51	1.24-5.07	3.94	1.61-9.66
Age group: ≥60	3.87	1.63-9.18	6.91	2.28-20.94
Have had CBE	12.66	6.21-25.84	17.48	7.68-39.82

*OR: Odds ratio; CI: Confident interval; Significant p≤0.005; CBE: Clinical breast examination

had a CBE. When compared to women within 40 to 49 years of age, the adjusted odds of mammography screening was 4 times more in those aged between 50 to 59 years and 7 times more in those aged 60 years and above.

Discussion

Four key findings were deduced from this study: 1) Majority of respondents were aware about breast cancer. However, only half of the respondents (n=206) were aware about mammography screening; 2) Prevalence of mammography screening was very low at 13.2%; 3) Predictors for mammography screening were those with previous CBE and older age, and 4) good knowledge and positive beliefs on mammography screening had no effect on mammography screening uptake.

When discussing issues relating to breast cancer awareness, these findings are similar to a study done in Malaysia which also showed that, 82% of respondents were aware about breast cancer and nearly 50% were aware about mammography screening (Al-Dubai et al., 2011). In Nigeria, the awareness among women regarding mammography was even poorer at 5% (Obajimi et al., 2013) Although awareness of breast cancer is high in Malaysia, this did not correspond well with awareness of available screening measures. When awareness of mammography screening is low, it is not surprising that the prevalence of mammography screening uptake will be low at 13.2% as found in our study. This low uptake of mammography screening was consistent with the finding of 14.6% seen in a community based study on women in Malaysia (Dahlui et al., 2012).

We conducted this study in a primary care clinic because we postulated that mammography screening uptake would be higher in women attending a primary care clinic compared to the general population. A primary care clinic is meant to be a setting for health promotion and disease prevention. Yet, the prevalence of mammography screening uptake in this study population was similar to the prevalence of 13.6% found among teachers in Selangor and of 10.5% in the general population of a sub-urban area in Terengganu.(Parsa and Kandiah, 2010; Rosmawati, 2010) A study conducted in Saudi Arabia also showed a similar prevalence of 10% among women who attended primary care clinics and hospital (Ravichandran et al., 2011). However studies from developed countries reported higher mammography uptake, ranging from 50 to 85%. (Akinyemiju et al., 2012; Leong et al., 2007; Shetty, 2010; Wang et al., 2001) There is a possibility that primary care clinics do not play their role as a preventive care centre. Hence more effort should be made to opportunistically offer mammography screening to patients who are already attending a primary care clinic.

In our study we also found that older women and women who have had a previous CBE were more likely to undergo mammography screening. This is similar to a study done among female teachers in Malaysia that regular clinical breast examination was a significant predictor for having a mammography.(Parsa and Kandiah, 2010) In developed countries for example the US National Health Interview Surveys from 1980 to 2011 also found that older age and clinical breast examination were associated with increased mammography up-take. Although this US study (Hiatt et al., 2002) and a study in Iran (Samah and Ahmadian, 2012) found that higher income, higher education level and insurance coverage were associated with mammography screening uptake, these factors were not found to be associated with mammography uptake in our study. It is possible that our study was not able to determine the true relationship between income, education and insurance with mammography screening uptake because of the relative homogeneity of the factors in our study population.

In terms of knowledge of mammography screening, our finding was similar to a study among Korean American women. It was found that although education increased knowledge, it did not increase uptake of mammography screening. (Kim et al., 2010) However in a another study knowledge about mammography testing was significantly associated with the practice of mammography (Al-Naggar and Bobryshev, 2012).

Higher perceived susceptibility to breast cancer was found to be a significant predictor for doing mammography screening. (Parsa and Kandiah 2010). However in our study, this was not the case. Furthermore in a study conducted in a polyclinic in Singapore, 1 in 4 women did not have mammography screening because they believed that cancer would not happen to them.(Leong et al., 2007).

No similar studies have been done in a primary care clinic in Malaysia, a developing country in the midst of fast economic transition, to assess the awareness, prevalence and associated predictors of mammography screening. Most other studies were conducted in the community or in hospitals. The results our study offer an insight and opportunities for primary care services to offer more CBE so as to increase the uptake of mammography screening. However, a major limitation of our study is the low response rate of 27.4%.

In conclusion, despite high awareness of breast cancer, only half of women who attended a primary care clinic were aware about mammography screening. Only 1 in 7 women in this study had ever done mammography screening. Good knowledge and positive beliefs do not seem to have any impact on uptake. However, previous clinical breast-examination was a predictor. Hence every effort should be made to do CBE for patients who are already attending a primary care clinic.

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