RESEARCH ARTICLE

Breast Cancer Knowledge and Screening Behaviour among Women with a Positive Family History: A Cross Sectional Study

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Abstract

Background: Breast cancer is the commonest type of cancer among women, and in Malaysia 50-60% of the new cases are being detected at late stages. Do age, education level, income, ethnicity, relationship with breast cancer patients and knowledge of breast cancer risk factors influence breast screening practices? This study revealed interesting but significant differences. Objectives: To assess the knowledge of breast cancer risk factors and early detection measures among women in a high risk group. Materials and Methods: A cross sectional survey of one hundred and thirty one women relatives of breast cancer patients was carried out. Participants were selected through purposive sampling, during hospital visits. A self-administered questionnaire was used for data collection. Results: The majority of the respondents (71%) had poor knowledge of the risk factors for breast cancer. Income, relationship with a patient and practise of breast cancer screening predicted performance of mammography, $R^2=0.467$, $F=12.568$, $p<0.0001$. Conclusions: The finding shows inadequate knowledge of breast cancer risk factors and poor cancer screening practise among women with family history of breast cancer. Poor knowledge and practise of breast screening are likely to lead to late stage presentation of breast cancer disease. Some important predictors of breast cancer screening behaviour among women with positive family history of breast cancer were identified. An understanding of the strengths and significance of the association between these factors and breast screening behaviour is vital for developing more targeted breast health promotion.

Keywords: Breast cancer prevention - breast self-examination – mammogram - family history of breast cancer

Introduction

Breast cancer is the most common cancer and the leading cause of cancer related deaths among women across the globe (Hisham and Yip, 2003; 2004; Agarwal et al., 2009; Secginli and Nahcivan, 2011; Al-Azmy et al., 2012). In 2002, breast cancer was responsible for 410,000 deaths among women in the world (Washbrook, 2006). All women above the age of 20 are at risk of developing breast cancer, irrespective of race, ethnicity, age or occupation (Banning, 2011). However, it is known that women with positive family history of breast cancer in first-degree relatives (mother, sister, or daughter) are twice at risk of developing breast cancer than women without positive family history of breast cancer, and the risk increases three to four folds if a woman has 2 or more first-degree relatives who have breast cancer (Norman and Brain, 2005; Allen et al., 2010). This fact is reiterated by American Cancer Society (2010) report that women with a family history of breast cancer in a mother or sister are believed to have higher risk of breast cancer. A small, but

important percentage of breast cancer cases are caused by the inheritance of a single copy of a mutated gene. About 5-10% of breast cancer cases are thought to be hereditary, resulting directly from gene defects (mutations) inherited from a parent (Ford et al., 1998; Allen et al., 2010).

Higher incidence rate of 94.9 per 100,000 has been reported in developed countries compared to 19.66 per 100,000 in developing countries (Hisham and Yip, 2003; Parsa and Kandiah, 2005; Baig et al., 2011). In Malaysia the National Cancer Registry reported that breast cancer constitute 31% of all female cancer, with 3,738 cases reported in 2003(Chye and Yahaya, 2004), by 2007 the total number had gone down to 3,242 but this represents 32.1% of all female cancer cases, which was slightly higher than previous record (Ariffin and Saleha, 2011). However, a high mortality rate of 40% was reported by Suthahar et al. (2009) in a two year follow-up sample of 80 breast cancer subjects recruited from Oncology Department of Hospital Universiti Kebangsaan Malaysia. This high rate of mortality underscores the seriousness of breast cancer in Malaysia, and the underlying problem of

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late presentation at clinics. The relatively lower incidence rate of breast cancer reported among Malaysian women, compared to Europe and United States, reflects the pattern reported in developing countries. The lower incidence rate has been attributed to diet and life style (Hisham and Yip, 2004), but it could also be due to under reporting, and low rate of breast self-examination (BSE) practise, which invariably explain the late stage presentation of breast cancer among Malaysian women (Hisham and Yip, 2004; Agarwal et al., 2009). Also, there are frequent breast cancer screening activities in developed countries (Suthahar et al., 2009), than in Malaysia and other developing countries. It is possible that inaccurate or poor breast cancer screening behaviour, leading to under reporting constitutes a major obstacle to breast cancer prevention and treatment in Malaysia.

Reports from Malaysia point to late presentation of breast cancer at clinics, leading to higher mortality rate (Hisham and Yip, 2004; Yip et al., 2006; Taib et al., 2007; Agarwal et al., 2009; Leong et al., 2009; Suthahar et al., 2009). Early detection of breast cancer and presentation at hospitals is crucial for effective treatment and cure, offers good chance for rapid recovery and reduced breast cancer mortality (Sadler et al., 2001; Green and Taplin, 2003; Secginli and Nahcivan, 2006). When detected at the early stage, breast cancer is curable, 93-88% with a 5-year survival rate for Stage 0 and I (American Cancer Society, 2012). Advances in the field of breast cancer genetics have led to an improved understanding of detection and prevention strategies. Amongst the strategies, breast screening which includes BSE, clinical breast examination (CBE), and mammogram, are believed to be effective for early detection of breast cancer (Norman and Brain, 2005; Secginli and Nahcivan, 2006), and plays an important role in reducing breast cancer related morbidity among women. Women who are at higher risk of the disease are often advised to consider early screening or having more frequent tests (American Cancer Society, 2010).

Previous studies have shown that breast screening practises are widespread among women around the world. However, the proportions that engage in this practise and the frequency across countries vary. A study of breast cancer screening behaviour among Turkish women shows that 17% of the women reported performing BSE on a regular basis (Secginli and Nahcivan, 2006). Another study among African American women with a strong family history of breast cancer showed that most women adhered to recommendations for mammography (75%), CBE (93%) and 41% performed excessive BSE (Halbert et al., 2006).

In Malaysia, few published studies have explored the knowledge of risk factors for breast cancer and breast screening among women, but none has looked at women with family history of breast cancer. Again breast cancer is commonly diagnosed at late stage among lower socioeconomic groups, and such women are unlikely to receive adequate treatment (Hisham and Yip, 2004; Yip et al., 2006; Taib et al., 2007). The average size of the tumours at the time of presentation in the hospital was 5.4 cm in diameter, and varied among racial and age groups (Hisham and Yip, 2003). The delay in presentation of

breast cancer was attributed to a strong belief in traditional medicine, the negative perception of the disease, poverty, poor education, fear and denial (Taib et al., 2007). According to Hisham and Yip (2004) from 1998-2001, 50-60% of new breast cancer cases were diagnosed in the late stages (Stages 3 and 4) in Malaysia. The Malaysian Health Ministry statistics also reported that 8,600 women were diagnosed with breast cancer in 2008 and 60% of the women reported too late for treatment (Registry, 2008).

The worrisome reports of late presentation at clinics and the increasing number of women at risk of developing breast cancer necessitates this study. Although breast cancer and cancer screening have been widely explored in most countries, such studies are relatively few in Malaysia and in most developing countries. This is the first study in Malaysia that tries to determine patients' knowledge of risk factors for breast cancer and practise of breast cancer screening among women with family history of breast cancer. In particular, this study hopes to provide insights on barriers to performing breast cancer screening among women with family history of breast cancer in first degree relatives.

The Health Belief Model (HBM) remains one of the most widely recognized conceptual frameworks for understanding health behaviour (Sadler et al., 2001; Ahmad et al., 2005; Norman and Brain, 2005). The HBM identifies four factors that influence the likelihood of preventive health behaviour: perceived susceptibility (perceived vulnerability to a disease or the risks of contracting it); seriousness (perceived severity of the consequences of contracting a disease); benefits (positive results of steps taken to avoid contracting the disease); and barriers (perceived negative aspects of undertaking health behaviours). The concepts of motivation and confidence were later added to this model. Motivation refers to beliefs and behaviours related to the state of general concern about health. In Rosenstock et al. (1988) added self-efficacy to the list of variables that predict health behaviour. Champion (1999) revised and developed the susceptibility, benefit, and barriers scale for mammography screening that was based on the HBM principles and theory. Champion's instrument presented a combined measure of the HBM concepts of susceptibility, seriousness, benefits, barriers, health motivation, and self-efficacy, as they relate to breast cancer screening. The original scales have been tested and found to be valid and reliable in measuring BSE practices and breast cancer beliefs. On the basis of the HBM, Champion developed and revised the Champion's Health Belief Model Scale (CHBMS) associated with breast cancer, mammography, and BSE (Secginli and Nahcivan, 2006). This study has adopted the Champion's model of health belief in the study of breast screening behaviour among women with family history of breast cancer in Malaysia.

Materials and Methods

Cross sectional survey design was used in this study of women with family history of breast cancer, who accompanied or were visiting their first degree relatives (mother, sister or daughter) at the Surgical Wards, Breast

Clinic and Oncology Clinic of University Malaya Medical Centre, Kuala Lumpur.

Instruments

Data was collected using a questionnaire, which was adapted and modified based on Champion Health Belief Model (Champion, 1993). The questionnaire comprised of three parts: *i*) the demographic; *ii*) knowledge of risk factors, and breast screening; *iii*) practise of breast screening, perceived barriers and benefits. Knowledge of breast cancer risk factors was assessed based on the nine risk factors identified in American Cancer Society classification. The respondents' knowledge of breast cancer risk factors was categorized into two: knowledge of 5-9 risk factors was considered as good knowledge, while knowledge of 4 or less risk factors was categorised as poor knowledge. Measures of perceived benefits and perceived barriers for BSE and mammogram practise were formulated based on Champion health belief model. The internal reliability with the Cronbach's Alpha was 0.846. The respondents were asked to state whether they had performed BSE and/or Mammogram (for respondents 40 years and above). The benefits of performing BSE and mammography were assessed by four items that asked about the perceived usefulness and value of these preventive measures. Respondents who never had mammography screening or performed BSE were asked to rate the items on the barriers to performing these actions.

Setting and sample

A sample size of 134 women was determined as adequate to estimate the population parameter, based on a 10% prevalence of positive family history with a 95% confidence interval for 4000 women diagnosed with breast cancer in Malaysia. To allow for a 5% attrition rate, 140 women were recruited for the study, through the Surgical Wards, Breast Clinic and Oncology Clinic. However, only 131 of the sample who consented completed and returned the questionnaires, giving a response rate of 93.5% of the estimated sample.

Inclusion and exclusion criteria

Women with positive family history of breast cancer, having a first-degree relative such as mother, sister, or daughter diagnosed with breast cancer were included in the study. Participants were 18 years and above, able to read and write in Malay or English. Women diagnosed with breast cancer, less than 18 years of age, not able to sufficiently communicate in Malay or English, or who indicated no family history of breast cancer in their first degree relatives were excluded.

Ethical considerations

The ethics approval was obtained from the University of Malaya Research Ethics Committee. Permission was also obtained from University of Malaya Medical Centre (UMMC) for posting the recruitment poster. Potential participants were screened for eligibility using the inclusion and exclusion criteria. The eligible participants received information and consent form, which they were required to read and sign prior to participation in the study. Participants were informed of their rights not to participate and the freedom to withdraw at any time from the study; their participation or none participation would not in any way affect the treatment they were receiving from the hospital. All the data were kept confidential and anonymous.

Data analysis

The data was analysed using SPSS version 20. The Spearman rho and Chi-square test were used to determine significant relationship between variables. Logistic regression and odds ratios were applied to explain predictors of performing BSE and Mammogram, and the odds of such health behaviours, based on selected participant characteristics.

Results

The primary purpose of this study was to determine the knowledge of breast cancer risk factors and the performance of breast cancer screening among women with family history of breast cancer. One hundred and thirty one women with positive family history of breast cancer in first degree relatives, who visited UMMC, participated in this study, representing 93.6% of a total of 140 women who consented to participate. This study assessed their knowledge on risk factors for breast cancer and practise of breast cancer screening.

Demographic data

The age range was 18-60 (M=37.28, SD=11.44). All of the participants had basic education, 10.7% had primary education, 22.9% had secondary education and most of them had college or university education. The average income per month for the participants was RM3,592.42 ($1,210.00 USD), SE=RM197.03, and 68.7% had income above RM2000, greater than the national average monthly income of RM1,168 (Malaysia Household Income Survey, 2009). The participants came from diverse ethnic groups of Malays (45.8%), Chinese (35.9%), Indians (15.3%) and other ethnic groups (3.1%). All the respondents had close blood relationship with a breast cancer patient, 71% had mother with breast cancer, 23.7% had a sister with breast cancer and 5.3% had a daughter.

Knowledge of risk factors for breast cancer

The respondents' knowledge of breast cancer risk factors was assessed using the nine risk factors category

Table 1. Knowledge of Risk Factors for Breast Cancer

Risk factors for breast cancer	Have knowledge n (%)	No knowledge n (%)
Family history of cancer	98 (74.8)	33 (25.2)
Age	77 (58.8)	54 (41.2)
Prior history of benign tumour/cyst in breast	75 (57.3)	56 (42.7)
Hormone therapy before/during menopause	47 (35.9)	84 (64.1)
If and how long a woman breastfed	45 (34.4)	86 (65.6)
Birth control methods	38 (29.0)	93 (71.0)
Childlessness	35 (26.7)	96 (73.3)
Age at menopause	33 (25.2)	98 (74.8)
Age at the first menstrual period	28 (21.4)	103 (78.6)

by American Cancer Society. The nine risk factors tested in this study are presented in Table 1. Knowledge of 5 to 9 risk factors was considered a good knowledge, while less than 5 risk factors was consider poor knowledge.

Majority of the respondents, 71% had poor knowledge of the risk factors for breast cancer, which means they were able to identify less than five risk factors. Most of the respondents considered family history of cancer (74.8%), age (58.8%), prior history of benign tumour/cyst in breast (57.3%) as risk factors, while 35.9% considered hormone therapy before/during menopause, and 34.4% considered if and how long a woman breastfed as risk factors. Less than 30% recognised age at first menstrual period, age at menopause, childlessness and birth control methods as risk factors.

Awareness and performance of breast cancer screening

Participants' awareness of BSE and mammogram techniques for breast cancer screening was assessed by simple questions requiring yes or no answer. Majority of the participants were aware of the BSE (92.4%) and Mammogram (87.8%) methods, and recognised the benefits of practising BSE and Mammogram. Among those that had performed mammogram (n=25, 19.1%), 10 were between 26 and 39 years, while 15 were between 40 and 60 years, which is the age range commonly recommended for mammogram. Within the age group 40 and 60, there was a significant gap between awareness and practise, as majority 32 (68.1%) had not performed mammogram. Also, 84 (64.1) of the participants had not performed BSE, despite their awareness and belief about the benefits of breast screening. A large proportion, 86.3% agreed BSE and Mammogram can help early detection of abnormal mass in breast, 82.4% agreed if detected early, it reduces the period of treatment, prevent anxiety of developing the disease 83.2%, and effective in detecting abnormality in breast 89.3%. This shows a high knowledge of the benefits of performing BSE and mammogram. All respondents who never performed mammogram or BSE answered the questions on the barriers to their performing breast screening.

The 32 (40 years and above) who never performed mammogram and 84 who never performed BSE identified some barriers to their not performing the screening. For mammogram, majority identified fear of positive result (56.3), lack of knowledge on how the test is done (53.1) as the major obstacles, while cost was the least identified barrier (25%). For BSE lack of knowledge and fear of positive result were the main factors.

The correlational analysis shows significant relationship between mammogram and ethnic background (p<0.01), relationship with breast cancer patient (p<0.05), and knowledge of breast cancer risk factors (p<0.05). BSE had significant relationship (p<0.01) with income level but not any of the other five variables in this analysis. To further validate this correlation, the Chi Square test was performed.

More of the respondents practise BSE (35.9), n=131, than Mammogram (31.9), n=47 of the women 40 years and above. Most of those who practised BSE (70.2) had college and university education, 83% had income level RM2000 and above, which was above the national average monthly income, and 71% had mother with breast cancer. However, only income (p<0.008) had significant association with BSE performance, confirming the correlation result. With regard to mammogram, 84% of those who had practised mammogram had income level RM2,000 and above, 88% with college and university education, and 48% had mother or sister (36%) with breast cancer. The Chi square test shows a significant relationship between performance of mammogram and income (p=0.05), ethnic group (p<0.0001), knowledge of breast cancer risk factors (p<0.05), and relationship with breast cancer patient (p<0.004). Education and age did not have a significant association with either BSE or mammogram performance. Although the Malay ethnic group constituted 45.8% of the respondents in our sample, only 8% of those who had done mammogram were Malays, compared to 48% Chinese.

Table 2. Barrier to Breast Screening Examination

Barrier	Mammogram (n=32)		BSE (n=84)	
	Yes (%)	No (%)	Yes (%)	No (%)
Do not know how the test is done				
	17 (53.1)	15 (46.9)	NA	NA
Do not know how to do BSE				
	NA	NA	34 (40.5)	50 (59.5)
Discomfort	16 (50)	16 (50)	NA	NA
No free time	12 (37.5)	20 (62.5)	24 (28.6)	61 (71.4)
Embarrassment	8 (25)	24 (75)	31 (36.9)	54 (63.1)
Fear of positive result	18 (56.3)	14 (43.8)	33 (39.3)	52 (60.7)
Cost	8 (25)	24 (75)	NA	NA

Table 4. Association between Demographic Characteristics and Performance of Breast Cancer Screening

Factors	performance of BSE			Mammogram		
	X^2	df	p value	X^2	df	p value
Age	3.459	3	0.326	0.377	1	0.539
Education	0.475	1	0.491	0.081	1	0.474
Income (RM)	6.948	1	0.008	3.443	1	0.064
Ethnic group	3.44	3	0.329	31.146	3	0.0001
Relationship with breast cancer patient						
	2.867	2	0.238	10.854	2	0.004
Knowledge	3.072	1	0.08	4.651	1	0.031

Table 3. Correlation Analysis of Demographic Characteristics and Breast Screening

	Had mammogram	Practiced BSE	Age	Education	Income	Ethnic	Relationship with breast cancer patient
Age	0.113	-0.026					
Education	0.021	-0.053	-0.053				
Income	0.087	-.230**	.265**	0.136			
Ethnic	562**	0.117	-0.063	-0.127	-0.143		
Relationship with breast cancer patient	.335*	0.039	.483**	-.172*	0.039	-0.023	
Knowledge	.315*	-0.153	.173*	0.126	.273**	0.058	-0.071

*Correlation is significant at the 0.05 level (2-tailed); **Correlation is significant at the 0.01 level (2-tailed); n=47 for mammogram, n=131 for BSE

Table 5. Explanatory Variables for Performance of Breast Screening

		BSE (n=131)				Mammogram (n=47)			
		OR	95% CI	Chi-Square	p	OR	95% CI	Chi-Square	p
Knowledge	Poor knowledge	1.235	0.957, 1.593	3.072	0.08	1.674	0.946, 2.964	4.651	0.031
	Good knowledge	0.622	0.367, 1.053			0.41	0.183, 0.920		
Ethnic	Malays	0.783	0.874, 1.776	1.613	0.204	4.922	1.322, 18.321	11.175	0.001
	Other groups	1.246	0.874, 1.776			0.397	0.236, 0.666		
Income	High income	0.732	0.590, .907	6.948	0.008	0.737	0.562, 0.965	3.443	0.064
	Low income (below RM2000)	2.308	1.164, 4.578			4.688	0.659, 33.345		
Relationship with breast cancer patient									
	Mother	0.927	0.744, 1.156			2.66	0.917, 7.691		
	Sister/daughter	1.212	0.676, 2.173	0.430	0.512	0.586	0.375, 0.916	4.584	0.032
Age	Younger age	0.957	0.736, 1.244	0.107	0.743	1.21	0.648, 2.244	0.377	0.539
	Older age	1.084	0.667, 1.763			0.82	0.443, 1.518		
Education	College or higher education	0.916	0.717, 1.170	0.475	0.491	0.891	0.563, 1.409	0.23	0.632
	Primary/Secondary Education	1.199	0.710, 2.026			1.219	0.532, 2.793		

*Age for Mammogram Younger age (40-49years), Older age (50-60); Age for BSE: Younger age (18-39 years), Older age (40 to 60 years)

While the Indians constituted 15.3% of our sample, 28% of those who had performed mammogram were Indians. This shows a substantial difference in the background of those that performed mammogram screening in this study.

The odd ratio for not performing BSE or mammogram was calculated based on six factors considered in the correlation analysis. For mammogram, the odd ratio was calculated for women who were 40 years or more, because this is the age at which mammogram is commonly recommended. The Chi-Square statistics was applied to test for the significance of difference in the risk of none performance of breast cancer screening, found between the groups. Overall, the result shows that only income was statistically significant (Chi-Square=6.948, df=1, p<0.01) for differentiating the groups in performing BSE. Women in the low income group were 2.3 times unlikely to perform BSE than their counter parts in higher income category. For the mammogram, knowledge of breast cancer risk factors, ethnic background, and relationship with the breast cancer patient were statistically significant for differentiating breast screening behaviour. The result shows that those who had poor knowledge of breast cancer risk factors were 67.4% (95%CI, 0.946, 2.964) unlikely to perform mammogram than those with good knowledge. Also, for ethnic background, the women from the Malay ethnic group were nearly 5 times unlikely to perform mammogram (OR=4.922, 95%CI: 1.322, 18.321). The difference was significant at p=0.001, Ch-Square=11.175. Women with mother diagnosed with breast cancer were unlikely to perform mammogram than those with daughter or sister (OR=2.66, 95%CI 0.917, 7.691, Chi-Square=4.584, p<0.05). The difference was significant at p=0.032.

Women in low income group (below RM2,000) were 4.7 times (95%CI: 0.659, 33.345) unlikely to have had a mammogram. Although the Chi-Square showed a moderately significant difference for income (p=0.064), the odd for none performance of mammogram was quite high for the women in lower income category.

Apart from age and education all the other four factors showed some level of significant difference for the performance of mammogram. Regression analysis was performed for mammogram based on ethnic background, relationship with breast cancer patient, and knowledge of breast cancer risk factors, which have p<0.05. The regression analysis shows that relationship with breast cancer patient, knowledge of breast cancer risk factors and ethnic background account for 46.7% mammogram screening behaviour, R²=0.467, adjusted R²=0.430, F=12.568, p<0.0001.

Discussion

This study describes knowledge of the risk factors for breast cancer and screening practices among women with positive family history. Good knowledge was determined as the ability to recognise more than 4 out of 9 risk factors. Washbrook (2006) emphasized the importance of knowledge of breast risk factors among women. However, in this study the level of knowledge of risk factors for breast cancer was very poor, as only 29% of the respondents demonstrated good knowledge of the risk factors, which reaffirms previous findings (Sadler et al., 2001; Consedine et al., 2004; McMenamin et al., 2005). This study shows that those with good knowledge of the risk factors performed more breast cancer screening than those with poor knowledge, which is in line Parsa et al. (2008) findings from a study of female teachers in Selangor, Malaysia.

Sadler et al. (2001) mentioned that within the framework of HBM, women's knowledge of breast cancer screening can be changed in order to help them make choices that can benefit their health. Knowledge of risk factors is important for prevention of breast cancer, but the knowledge alone may not be sufficient to prompt the right action. Nonetheless, knowledge of breast cancer could give rise to breast cancer beliefs and assessment of perceived individual susceptibility and risk, which would lead to behaviour change (Farmer et al., 2007).

A large number of the participants in this study were aware of BSE (92.4%) and mammogram (87.8%) and their benefits for breast cancer prevention. Yet, this study shows a discrepancy between awareness, knowledge of breast cancer risk factors and actual practise of breast screening. This suggests that health practise is not determined by only knowledge or awareness, but possibly a combination of other factors such as socioeconomic status, ethnic and cultural values, beliefs and practises. Knowledge combined with belief about the benefits of BSE and mammogram, it is expected, would lead to taking

preventive actions. Although the performance of breast cancer screening was low in this study and in previous studies (Secginli and Nahcivan, 2006; Al-Azmy et al., 2012), more women (35.9%) in this study practised BSE compared to 31.9% for mammogram. These values are within the range reported in previous studies as cited by Secginli and Nahcivan (2006), but higher for mammogram than 3.8% for women age 50 years and older in the general population (Rosmawati, 2010). The higher rate for mammogram in this study is probably because the sample constituted of women with positive family history whose awareness and knowledge of breast cancer risks and screening techniques may have been heightened by their family experience. Our result revealed that ethnic background, income, knowledge of breast cancer risk factors, and relationship with the breast cancer patient had significant association with breast screening behaviour, especially mammogram, which agrees with Rosmawati (2010) study in Malaysia. The mammogram is a more objective means of detecting breast cancer. Although our analysis shows that Malay women were 1.28 times more likely to practise BSE, they were about 5 times less likely to have had a mammogram. This discrepancy may explain the "larger tumors and a later stage presentation than other ethnic groups" (Hisham and Yip, 2004). This could indicate that the performance of BSE among many of the Malay women were probably in accurate, leading to missed opportunities. This should be an area of focus for oncologists and breast healthcare providers for this population.

The level of knowledge of risk factors and appropriate screening practises among the women in this study, were low due to several perceived barriers that ranged from economic to cultural beliefs and practises, which agrees with Amin et al. (2009). As Secginli and Nahcivan (2006) observed, women who perceived more benefits and fewer barriers for BSE and mammography were more likely to engage in breast cancer screening. In this study, a significant proportion of the women perceived barriers, ranging from knowledge of how it is done, to lack of time, discomfort, and embarrassment. Contrary to West et al. (2003) finding that many women with family history of breast cancer may not realize their risk is elevated compared to women in the general population, our data suggests that a large number of the women knew the risk factors, and the performance of mammogram was higher than the average in the general population as reported by the Ministry of Health Malaysia (Rosmawati, 2010). However, about half of the women did not know that early age at menstruation, late age at menopause, and childlessness were risk factors for breast cancer, and much higher for hormone therapy (64.1%). Such poor knowledge of the risk factors could reinforce myths and lead to low practise of regular screening, especially by older women whose risk are higher. It has been reported that women with a family history of breast cancer are 59% less likely to develop premenopausal breast cancer if they breastfed (Stuebe et al., 2009). This study found small percentage of the women (34.4%) knew that breast feeding was beneficial for reducing the risk of breast cancer. More of the respondents (74.8%) recognised that family history

of cancer was a risk factor; yet, their regular breast cancer screening behaviour was still poor.

Poor knowledge on breast cancer screening as reported in previous study (Chua et al., 2005), constitutes a barrier to screening practise. In Asia, the low breast screening rate among women has been associated with poor knowledge and perception of preventive health measures (Chua et al., 2005). This was confirmed by this study which shows that lack of knowledge on how to perform BSE (40.5%) and 54.7% for mammogram were responsible for non-practise of BSE and mammogram. The effect of cost was relatively low compared to other studies (Chua et al., 2005; Lee-Lin et al., 2007), which found financial cost as a major obstacle to accessing mammogram screening. The cost of mammogram was not a major barrier in this study, but may be a barrier among the rural poor in Malaysia. However, this study found that women in higher income category were more likely to have had a mammogram than lower income women.

Do age, education level, income, ethnicity, relationship with breast cancer patient, and knowledge of breast cancer risk factors influence breast screening practices? This study revealed a significant difference in knowledge and practise of breast screening among ethnic groups in Malaysia, and corroborates existing evidence on ethnic disparity in incidence of breast cancer in Malaysian. It is known that the incidence of breast cancer is higher in non-Hispanic white women than in African American women for most age groups (American Cancer Society, 2011). More recent figures suggest that mortality due to breast cancer is higher in Black women compared to Caucasian women (Banning, 2011). This study reveals a significant association between mammogram and ethnicity (p<0.01), relationship with breast cancer patient (p<0.05), knowledge of breast cancer risk factors (p<0.05), and between income and BSE (p<0.01). These are important information for health professionals working in women health or planning breast cancer intervention among women.

In conclusions, the impact of breast screening on mortality remains controversial (Smith et al., 2003; Allen et al., 2010). The literature points to both positive and negative outcomes of BSE. The argument in support and against breast screening is vast and well documented in literature. However, the lack of a consensus on standard recommendation for BSE continues to present a challenge to patients and care providers (Allen et al., 2010).

This study has important implications for health care providers. The poor knowledge of risk factors and practise of breast screening leads to late stage presentation of breast cancer disease. This puts a high burden on the already overburdened healthcare services. Inaccurate practise of BSE can lead to missed opportunities for early detection and treatment. This seems very probable among women from the Malay ethnic group. Since mammogram is a more objective procedure, emphasis should be on integrating these two procedures. Preventive health behaviour among women with positive family history of breast cancer is an important strategy that should be encouraged. Women, especially those with family history of cancer need to be better informed about breast cancer risk factors and

proper BSE procedures. An understanding of the role of factors such as age, ethnicity, and relationship with breast cancer patient as identified in this study is critical for planning health promotion and prevention of breast cancer. Nurses and other health care providers should provide women with positive family history of breast cancer with opportunities to discuss their thoughts and experiences with breast cancer. Intervention programs that address the barriers to breast screening practise would be helpful for women experiencing these challenges.

Future studies should try to explore the lived experiences of women with positive family history of breast cancer, using qualitative phenomenological approach. This will help to understand better how the family experience influence their practice of breast screening.

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