RESEARCH COMMUNICATION

Mammography Screening Uptake among Hospital Personnel in Kuala Lumpur Tertiary Hospital

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Abstract

Background: Breast cancer is the most common cancer among women in Malaysia. Of the total cancer cases registered in the National Cancer Registry for 2006, 3,525 were female breast cancer cases. The overall age standardized rate was 39.3 per 100,000 population in 2006. An estimated 30%-40% were diagnosed in the late stages and this had resulted in poor survival rates. The purpose of the study was to determine the factors and barriers related to mammography screening uptake among hospital personnel. Methods: This mixed method explanatory study was carried out on a universal sampling of 707 female personnel aged 40 and above, from June 2007 until November 2007. The study was conducted at University Malaya Medical Centre, a tertiary hospital in Kuala Lumpur. Pre-tested self-administered questionnaires were mailed to eligible personnel. Results: The prevalence of mammography screening uptake was 80.3% (95%CI: 76.8%,83.5%) among 534 respondents. Personnel who had physician recommendation had significantly higher odds of mammography screening uptake compared to those who did not have recommendation, adjusted odds ratio of 21.25 (95%CI:12.71,36.56). Reported barriers can be grouped into several themes; negative perception of the procedure like embarrassment due to the presence of male technicians/radiographers; low confidence with radiologist/radiographers in detecting abnormality; lack of coping skills in dealing with expected results and pain during procedure. Conclusions: The findings of this study highlighted that 20% of personnel did not undertake mammography screening although there is no cost incurred and the procedure is fully accessible to them. Opportunistic recommendation by physician and concerns on the procedure should be addressed.

Keywords: Mammography screening - uptake - hospital personnel - Malaysia

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Introduction

In 2006, breast cancer was the most common cancer among women in Peninsular Malaysia. A total of 3525 female breast cancer cases were reported. The overall age standardized rate was 39.3 per 100,000 population. The age pattern in 2006 showed a peak age-specific incidence rate at the 50-59 age group (National Cancer Registry,2006).

From 1993 to 2003, breast cancer cases diagnosed in University Malaya Medical Centre (UMMC) had increased six fold. An estimated 30%-40% of cases were diagnosed in late stages. Some of the reasons that had shown to cause delay in seeking treatment at the hospital were: use of traditional medicine, negative perception of disease, poverty, poor education, fear and denial (Hisham and Yip,2004).

In Malaysia, according to the Clinical Practice Guideline, mammography screening, may be considered in high risk woman if she has one of the followings: a previous history of breast and/or ovarian cancer, family history of breast cancer among first degree relatives before the age of 50 or more than two of maternal and paternal relatives with breast cancer, a previous history of atypia on breast biopsy and on hormone replacement therapy. In these situations, mammography screening should be done annually in women aged 40-49 years, and annually or biennially in those 50-75 years old (Academy of Medicine, 2002).

Although population based mammographic screening is not made available to the general population, mammography can be done in 16 private clinics and hospitals registered with the National Population and Family Development Board (2007). The cost is highly subsidized by the Ministry of Women, Family and Community Development where it provides a RM50 (USD 14.78) subsidy for every mammography session done which usually costs RM100-RM130 (USD 29.56 to USD 38.43) per session.

The 3rd National Health Morbidity Survey (NHMS) documented the prevalence of mammography utilization has increased to 7.6% in the general population from

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3.7% in 1996 (Ministry of Health,1996;Institute of Public Health, 2006). It is postulated that prevalence of mammography screening among health and medical personnel would be higher than the general population. Three studies documented prevalence of mammography screening among health and medical personnel. The prevalence rate among Turkish hospital workers were 31.3% (Canbulat and Uzun, 2008). A prevalence of 84% of Asian Indian physicians had undergone mammography versus another study that documented higher prevalence of 98% (Frank et al.,1998; Misra and Vadaparampil, 2004).

University Malaya Medical Centre (UMMC) is a tertiary government teaching hospital located at the border of the capital city, Kuala Lumpur and Petaling Jaya. Wellness clinic was established to provide routine medical examination to all its personnel beginning March 2005. A wellness program that consisted of free mammography screening once in two years was recommended by attending physician at the wellness clinic, to all female personnel aged 40 and above regardless of any risk factors. Hence, cost and availability factors have been addressed. Health and medical personnel are the main sources in getting information regarding health (Institute of Public Health, 2006). Health workers are expected to act as role models and educate the public (Akhigbe and Omuemu, 2009). Hence, it is important to study hospital personnel' health-related behaviour as they play an important role in encouraging women in the general population to attend screening.

We tried to explain the barriers to the mammography screening uptake using the Health Belief Model (HBM) which is a psychological model that explains and predicts health-related behaviors. It is commonly used to model prediction of health preventive behavior. A woman is more likely to utilize mammography if she perceived that she has a greater susceptibility in developing breast cancer, perceived greater seriousness of breast cancer, and has greater health motivation, perceived greater benefits but fewer barriers from mammography.

Objectives of this study were to establish prevalence of mammography screening uptake and to determine whether socio-demographic, medical factors, physician recommendation at the wellness clinic and HBM domains were significantly associated with mammography uptake among hospital personnel and to gather barriers for not undertaking mammography. Hence, it is believed that the findings could lead to a better understanding of factors influencing poor uptake of mammography and thus will aid in improvement of the wellness program.

Materials and Methods

This is a mixed method explanatory study design. The focus group discussion was conducted before the quantitative study. The reason why it was carried out was to gather additional information on barriers experienced by personnel not undertaking mammography screening. The focus group was carried out on the same day among two groups of personnel (who self-reportedly did not undertake mammography). The first group consisted of 11 health attendants and four assistant nurses while the second group consisted of five nurses and four clerks. There was interaction between the group members.

The sampling frame consisted of 746 female personnel aged 40 and above that were identified from the UMMC registry. However, those who were diagnosed with breast cancers, had undergone breast surgery and personnel in the focus group were excluded. Sample size calculation was performed by Power Sample Size Software and was based on the estimated rate of mammography screening. It was estimated that a minimum sample size of 624 women was required to produce a significance level of 0.05 and a power of study of 80%. As there were only 707 women who fulfilled the inclusion criteria, universal sampling was performed. Ethical approval was received from the Institutional Review Board on the 22nd October 2006.

Self-administered questionnaires were mailed to the sample during the six months duration (June 2007-November 2007). Respondents who did not return the questionnaires or failed to complete them in the first two weeks were politely requested to do so through phone calls and recollection was pursued. The self-reported questionnaires was adapted from a Turkish study which included sociodemographic characteristics such as age, ethnicity, marital status, highest education level, occupation, history of breastfeeding (ever breastfed), family history of breast cancer, presence of medical illness and physician recommendation at wellness clinic (Canbulat and Uzun, 2008).

In addition, HBM domains were adapted from Champion Revised Health Belief Model Scales (Secginli and Nachivan, 2004).Questions on five HBM domains consisted of 26-items: perceived susceptibility (5 items), perceived seriousness (7 items), health motivation (5 items), perceived benefits (5 items) and perceived barriers (4 items). Each items for the domains were formatted into sentences with a five point Likert scale, replies ranging from very disagree (1 point) to very agree (5 points).

Original questionnaires in English were translated to Bahasa Malaysia (national language). Translated questionnaires were pretested on 25 non-UMMC personnel of similar characteristics. It was administered twice; the latter after two weeks interval. Bland Altman pre and post tests were performed and the questionnaires were found to be reliable.

The data were entered and analysed using Statistical Package for Social Sciences (SPSS) version 15. Descriptive statistics were used to describe the personnel' sociodemographic, and medical factors related to mammography utilization. Chi square test, to detect any significant differences between respondents and non-respondents, were conducted and significant variables (p-value < 0.25) were further analysed using Binomial logistic regression. Confidence interval that did not include 1.0 and significance level was set at $p < 0.05$ for variables in the final model. Likelihood ratio test was performed to reduce covariates and the final model was tested for first order interaction using the 'chunk' test. The score distribution of the HBM domains was not normally distributed. The mean scores from the five Likert scales were divided into three tertiles to represent the three categories of low, medium and high.

Table 1. Association Between Sociodemographic Factors and Mammography Screening

Characteristics	Mammography Utilization Yes (%), N=429	No(%), N=105	Crude OR (95%CI)
Age Group			
40-44	130(30.3)	34(32.4)	1.00
45-49	160(37.3)	38(36.2)	1.11 (0.66,1.86)
50-54	106(24.7)	25(23.8)	1.12 (0.63,1.98)
>55	33(7.7)	8(7.6)	1.09(0.46,2.57)
Ethnicity			
Malays	365(85.1)	84(80.0)	1.00
Chinese	31(7.2)	7(6.7)	1.02 (0.43,2.39)
Indians,others	33(7.7)	14(13.3)	0.54(0.28,1.06)
Occupation			
Administrators	33(7.7)	8(7.6)	1.00
Clinical Professionals	28(6.5)	9(8.6)	0.59 (0.21,1.61)
Nurses	318(74.1)	76(72.4)	1.35(0.61,2.95)
Others	50(11.7)	12(11.4)	0.81(0.32,2.06)
Highest education level			
Secondary or lower	232(54.0)	46(43.8)	1.00
Graduate	183(42.7)	49(46.7)	1.06 (0.68,1.67)
Postgraduate	14(3.3)	10(9.5)	0.48(0.20, 1.18)
Marital status			
Single	30(7.0)	9(8.6)	1.00
Married	374(87.2)	88(83.8)	1.27(0.58,2.78)
Divorced/widow	25(5.8)	8(7.6)	0.94(0.31,2.79)

Results

The mean age of respondents was 47.6±4.7. The Malays (82.7%) formed the major ethnic group followed by Indians (9.8%) and Chinese (7.5%). Nurses (72.0%) formed the major category of occupation among the respondents. The least numbers of study population were from the clinical professional category (7.8%) that consisted of physicians, pharmacists, dieticians, lab technicians and physiotherapists. There were no significant differences between respondents and non-respondents regarding their age groups, ethnicities and occupations.

According to occupational category, nurses have higher odds, crude odds ratio of 1.35 (95%CI: 0.61,2.95) of mammography uptake compared to administrators. However, none of the sociodemographic factors (age, ethnicity, highest education level, marital status and occupation) were significantly associated with mammography screening uptake at UMMC (Table 1).

Presence of medical illness, breastfeeding history and family history of breast cancer were also found to be not significantly associated with mammography screening uptake. However, personnel who had physician recommendation at the wellness clinic had significant higher odds, crude odds ratio of 22.42 (95% CI:13.14,38.23) of mammography screening uptake versus personnel who did not have such recommendation (Table 2).

Personnel within the highest tertile of health motivation had higher odds of mammography uptake, crude odds ratio of 1.75 (95% CI:1.03,3.01) versus personnel in the lowest tertile. In relation to perceived barriers to mammography, personnel within the highest tertile had lower odds of mammography uptake, crude odds ratio of 0.53 (95% CI:0.23,1.20) versus those within the lowest tertile, but the association was not statistically significant.

Table 2. Association Between Medical Factors and Mammography Screening

Characteristics	Mammography Utilization Yes (%), N=429	No(%), N=105	Crude OR (95%CI)
Family history breast cancer			
Yes	55(77.5)	16(22.5)	1.00
No	357(81.1)	83(18.9)	1.25(0.68,2.29)
Uncertain	17(73.9)	6(26.1)	0.82(0.28,2.44)
Ever breastfed			
Yes	363(81.0)	85(19.0)	1.00
No	66(76.0)	20(23.3)	0.77(0.44,1.34)
Presence medical illness			
Yes	161(78.5)	44(21.5)	1.00
No	254(82.5)	54(17.5)	1.28(0.82,2.00)
Uncertain	14(66.7)	7(33.3)	0.55(0.21,1.44)
Physician recommendation			
No	53(40.2)	79(59.8)	1.00
Yes	377(94.0)	25(6.0)	22.4(13.1,38.2)

After adjustments for ethnicity, education, medical illness, seriousness of breast cancer, barriers to mammography, only physician recommendation was found to be significant in mammography screening uptake. Personnel who had physician recommendation at the wellness clinic had significantly higher odds, adjusted odds ratio of 21.25(95%CI: 12.71,36.56) of mammography uptake versus personnel who did not have such recommendations. No interaction was found between health motivation and physician recommendation. Hosmer- Lemeshow goodness-fit test, $p > 0.05$ showed that the model best fit the data.

From the focus group, reported barriers can be grouped into negative perceptions towards the procedure itself. Some of the perceptions are embarrassment due to the presence of male technicians/radiographers, low confidence with radiologist/radiographers in detecting abnormality and low coping skills in dealing with abnormal results. Anticipated pain during procedure and the procedural's side-effects were also reported.

Discussion

The response rate was 75.5% which is acceptable, as postal questionnaires usually have a lower response rate compared to face to face interviews. Among the respondents (N=534), the prevalence of mammography was 80.3% (95%CI: 76.8%, 83.5%). The published prevalence rate of mammography uptake in Malaysia was reported to be 7.6% in 2006 (Institute of Public Health,2006). However, this is not comparable to this study as the population based NHMS sampled a very large number of women and included women of lower ages. In addition, mammography was not a freely accessible service. High rate of mammography uptake by hospital personnel compared with the community highlighted that the differences between the hospital personnel and community may be the factors leading to low rate of breast cancer screening among the community.

We compared our results to recent studies conducted among health and medical personnel. Prevalence of

mammography screening among hospital workers in this study was higher than reported among hospital workers in Turkey and Nigeria (Canbulat and Uzun, 2008, Akhigbe and Omuemu, 2009). The higher prevalence in this study may be due to a larger sample size compared to previous studies. The difference between UMMC health personnel and abroad studies may be due to the existence of the wellness program in UMMC. However, it was lower than reported among Asian Indian physicians in America (Misra and Vadaparampil, 2004).The smaller proportion of physicians compared to the study in America may be the contributing factor.

The reason for the significant association between physician recommendations in this study could be due to the attitude of a large proportion of personnel following orders from physician at the wellness clinic. Furthermore, personnel may rely heavily upon the clinical judgment of physicians in referral for mammography screening (Rutten and Iannotti, 2003). On the other hand, physician recommendation may provide social support as such support is significantly associated with cancer screening practices among nurses (Silva et al.,2009). Women who had interaction with their family doctors were more likely to participate in cancer screening within the recommended time frames (Poole et al., 2010).

Likewise, other studies indicated that women with physician recommendation was significantly associated with having mammogram compared to women without physician recommendation (Beaulieu et al., 1996; Allen et al., 2002; Juon et al.,2004). However, in a Singaporean study, women who had mammogram were less likely to be told by physicians to go for free screening (Straughan and Seow, 2000).The negative relationship between the physician's advice and free screening was likely due to Singaporean participants already on a regular screening routine and hence did not need a free mammography screening.

Perceived susceptibility was significant with mammography uptake among hospital workers in Turkey and female teachers in Malaysia (Canbulat and Uzun, 2008; Parsa and Kandiah, 2010). However, in our study, HBM domains were found not to be significant similar to studies in South Florida (mailed questionnaire) and Turkey (Fuller et al.,1992; Gumus et al., 2010).

Fear of radiation to breasts may be due to lack of information on the side effects of mammography screening. Similarly, fear of radiation was significant among women who never had mammography (Allen et al.,2002). Likewise, expression of fear of mammography was significant (for example; fear of result and fear of x-rays) among women aged 50 and 69 years old (Beaulieu et al., 1996).

Negative perceptions were due to feeling of embarrassment towards the presence of male technicians/ radiographers. Cultural and religious issues that are confined to certain ethnicity may explain for the embarrassment. Generally Asian women were more private in their perception of their body and less receptive to revealing their private parts even to the health personnel. In regards to feeling of embarrassment towards male technicians/radiographers, radiology personnel may match the gender of patient to health care provider to alleviate embarrassment for the patients (Straughan and Seow, 2000). The implication of a poor first impression and negative experiences from first mammography screening can lead to further non-attendance.

Having lower confidence with radiologist/ radiographers in detecting breast abnormality was reported as a barrier in our study. In a Swedish population, non-attendance was common among women in the general population who have poor trust in health care (Lagerlund et al., 2000).

Some individuals, when faced with a certain amount of worry or anxiety, tend to cope by cognitively and behaviorally avoiding anything related to the topic (Lagerlund et al., 2000). Fear and anxiety as barriers were also reported in an Italian study (Donato et al., 1991). Chinese women in Hong Kong reported key barriers were concerns about the discomfort of mammography and being too busy to schedule a mammography (Abdullah and Leung, 2001).

Pain is one of the common barriers reported (Sapir and Patlas, 2003). However, in Orton and Fitzpatrick study (1991), they found no significant difference in relation to pain among women who went for mammography (24.5%) versus women who did not go for mammography (33.9%). The implication of pain is that it may interfere with compliance to future screening.

The focus group reported many barriers but the barrier measured by the scale HBM did not show any significant association in the final model. This indicated that the HBM domains measured by scale were not sensitive enough or valid in measuring the domains.

Due to the lower number of respondents compared to sample size required, the power of study was compromised. This may explain the reason for the non significant findings between sociodemographic factors, health belief model domains and mammography screening. There is lack of literature on mammography screening among health and medical personnel. The study population is hospital based, thus selection bias was unavoidable but this study can be used to infer to the general population of health care workers in Malaysia. Information bias and misclassification biases are some of the limitations. Self-reporting questionnaires may give inaccurate information due to recall bias or over-reporting. Validity of self-reporting through radiology records was not conducted. Although the prevalence rate of 80% is satisfactory for the wellness program to be successful, measures can still be taken to further increase the uptake among hospital employees. The hospital administration may reduce some of the modifiable barriers reported from the focus group.

Health education should emphasize on the important role of early detection. It should include information on concerns of the procedure for example, very small radiation risk of developing breast cancer due to mammography and pain during procedure. Pre-mammography counseling should be given to increase the level of confidence in managing the disease as to reduce fear and anxiety. Furthermore, personnel should be convinced to have better trust for technicians/radiographers in performing their

expertise. Opportunistic screening at clinics other than wellness clinic may increase screening uptake rates among the personnel. Further research such as a qualitative study on the barriers may provide more in-depth understanding of these barriers.

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