

# Am I breast cancer smart? Assessing breast cancer knowledge among healthcare professionals

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## ABSTRACT

**Introduction:** Health professionals are a direct source of medical information to the public. Hence, it is crucial that their knowledge is accurate and aids in building awareness. Our aim was to ascertain the level of breast cancer knowledge and screening practices among nurses in a general hospital.

**Methods:** Between January and April 2004, all registered nurses in a general hospital were surveyed by a self-administered questionnaire for their knowledge of breast cancer and screening practices. One point was given for a correct knowledge answer and zero for wrong/“not sure” answer. The maximum knowledge score was 19.

**Results:** There were 716 (79.4 percent) respondents. The median score was 16 (range 2–19). The scores were high for general knowledge and natural disease progression, fair for knowledge of symptoms and treatment, but dropped when it came to knowledge of risk factors and screening. Nurses also held several common misconceptions held by the public. Those who had managed breast cancer patients had higher total scores (15.7). Only 63 percent did regular breast self-examination (BSE) and only 35 percent had gone for a screening mammogram. Chinese nurses who had managed breast cancer patients were more likely to do regular BSE.

**Conclusion:** Nurses working in a general hospital had good knowledge of breast cancer progression, average understanding of symptoms and treatment, but lacked knowledge in risk factors and screening.

They had low BSE and mammographic screening rates. Experience in managing breast cancer patients improved their knowledge and practices.

**Keywords:** breast cancer knowledge, breast screening, breast self-examination, health professionals, nursing knowledge

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## INTRODUCTION

Several studies have shown that barriers to diagnosis and treatment can be addressed by increasing women's awareness of breast cancer.<sup>(1,2)</sup> A positive correlation also exists between breast cancer awareness and screening practice.<sup>(3–5)</sup> Among women of Asian origin in particular, many myths surrounding breast cancer still exists. Many women are not aware of common presenting symptoms or breast cancer risk factors, and these translate to poor breast cancer screening practices.<sup>(6–9)</sup> Singapore has one of the highest breast cancer incidences in Asia (53.1/100,000 women-years).<sup>(10)</sup> The incidence has seen a 2.5 times increase since 1968 and continues to rise at a rate of 3%–4% per annum. The Singapore breast screening project in 1996 reported a response rate of only 41.7%.<sup>(11)</sup> Among the responders, 39.7% felt that there was very little hope of cure, even if the breast cancer was detected early.<sup>(12)</sup>

Healthcare workers are a direct source of medical information to the public and patients. Due to their frequent contact with patients and their relatives, nurses particularly are often looked upon to provide information and support regarding medical problems, including cancer. This extends not just to patients but also to their own circle of family and friends. It is essential then, that the information that they convey is accurate and assists in building further awareness. Because of this important role that nurses play in cancer education, the nursing workforce of a general hospital was chosen to be our target population for this study. The aim of this study was to ascertain the level of knowledge of breast cancer, personal attitudes and practices of breast cancer screening among nurses.

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**Table I. Demographics of respondents.**

Number of respondents	716
Female	686
Male	30
Age (years)	n (%)
< 20	14 (2)
20–29	359 (50)
30–39	175 (24)
40–49	104 (15)
50–59	49(7)
≥ 60	15 (2)
Race	
Chinese	322 (45)
Malay	120 (17)
Indian	93 (13)
Others	181 (25)
Education level	
Secondary school or lower	211 (30)
A-levels	163 (23)
University or college	326 (45)
Postgraduate	16 (2)
Nursing experience (years)	
< 1	71 (10)
1–3	119 (17)
4–6	169 (24)
7–10	98 (14)
> 10	259 (35)

## METHODS

Between January and April 2004, all the nurses who were registered with the Singapore Nursing Board (i.e. enrolled nurses, staff nurses, nursing managers and nurse clinicians) from a general hospital were surveyed. The required information was drawn from a self-administered questionnaire, conducted in the English language. The questionnaire was distributed in person to all the nurses of the hospital, an immediate response requested for and the questionnaires collected back. The nurses were instructed not to confer with each other. Student nurses and nursing educators were excluded from the study.

As there was no international standardised questionnaire on breast cancer knowledge available, the authors developed one with questions on what we considered to be common general knowledge and local myths about breast cancer. These included basic essential knowledge that would affect screening and treatment practices. A validity test was not performed. Basic demographical variables such as age, gender, race and educational level were included. In addition, we captured the respondents' length of nursing experience as well

as involvement in nursing breast cancer patients. We also included a question to determine from where the respondents acquired their breast cancer information.

The first part of the questionnaire contained questions that would reflect the respondents' knowledge of risk factors, the natural disease progression, symptomology, screening and treatment of breast cancer. We also included a question which looked at the respondents' reaction in discovering a breast lump. The second part of the questionnaire was targeted at the female respondents' own practices with regard to screening. Questions were directed to all women with regard to breast self-examination (BSE), and to women aged 40 years and above with regard to mammographic screening and the reasons for having or not having one. Based on the national breast cancer screening programme in Singapore, 40 years is the recommended age to commence mammographic screening.

These questions were then scored; a correct response being that based on current literature. One point was given for a correct response and zero for a wrong/"not sure" response. Questions reflecting the respondents' personal perception and practice were excluded from the scoring. The maximum attainable score was 19. The data was entered into a Statistical Package for the Social Sciences (SPSS) spreadsheet and analysis was performed using SPSS version 12.0 (SPSS Inc, Chicago, IL, USA). Frequency distributions were employed to describe the data. For categorical data, the chi-square test or Fisher's exact test was used. Logistic regression was performed to adjust for potential confounder. The Bonferroni correction was used where necessary. The ANOVA test was used in comparing mean knowledge scores between sub-groups. A p-value of < 0.05 was considered significant.

## RESULTS

In 2004, there were a total of 902 nurses in the general hospital. There were 716 (79.4%) nurses who responded, of which the majority (96%) was women. Most of the nurses were below 40 years of age (77%), Chinese (45%) and almost half (45%) had a university or college education. More than a third had been in nursing for more than ten years (Table I). There were 551 nurses (77%) who had experience in the nursing care of a breast cancer patient. Based on the Singapore Nursing Board Annual Report 2004,<sup>(13)</sup> the respondents were similar to the general population of nurses, in terms of racial distribution and age groups.

The majority (86%) knew that breast cancer is the leading women's cancer in Singapore. Most (93%) of them agreed that it can metastasise and 85% of them knew that breast cancer can be fatal. Most (94%) were aware that breast cancer is curable. Most (95%) could correctly name at least one symptom of breast cancer

**Table II. Mean score differences between age, race, educational level, years of nursing experience and previous experience in caring for breast cancer patients.**

	Mean score	p-value	F value
Age (years)			
< 29	15.3	0.053	0.958
30–39	15.9		
40–49	15.9		
≥ 50	15.5		
Race			
Chinese	16.0	< 0.001	2.117
Malay	15.1		
Indian	14.4		
Others	15.4		
Educational level			
Completed secondary school or lower	15.2	0.187	1.468
Completed A-levels	15.6		
Degree holders	15.6		
Nursing experience (years)			
< 1	15.4	0.083	1.084
1–3	14.9		
4–6	15.5		
7–10	15.7		
> 10	15.7		
Experience in caring for breast cancer patients			
Yes	15.7	< 0.001	2.843
No	14.6		

(81% named two correct symptoms and 14% correctly named one symptom). The two most frequent symptoms named were a palpable breast lump and nipple discharge. However, up to 20% of the respondents thought that cancerous lumps were painful. Where treatment for breast cancer was concerned, 20% thought that a mastectomy was the only available treatment. Most (93%) knew that a mastectomy does not result in complete loss of function for the ipsilateral arm. Majority (93%) was aware that apart from surgery, other modalities such as radiotherapy and chemotherapy might be necessary.

Knowledge on breast cancer risk factors was lacking. About a third (32%) was not aware that increasing age was a risk factor and another third (37%) did not realise that hormonal replacement therapy usage was associated with an increased risk. It was encouraging to note that 85% were aware of the risk that a positive family history poses. Unfortunately though, 9% still believed a common myth – i.e. that women with larger breasts have a higher risk of breast cancer. About a fifth (21%) believed that they were immune to breast cancer if they did not have any risk factors. With regard to BSE, 38% was ignorant of the frequency and 17% thought that a normal BSE meant further screening was not necessary. 5% believed that radiation from a mammogram was dangerous and could

increase one's risk of breast cancer, while 12% remained unsure. Majority (87%) was able to correctly name a place that conducted screening mammograms.

The mean total score for the knowledge questions was 15.5 (standard deviation = 2.64) while the median was 16. Statistically significant factors that affected the knowledge score were race and having cared for breast cancer patients. The mean score did not significantly differ between different age groups, the level of education or years of nursing experience (Table II). Majority of the respondents (74%) received breast cancer information via formal teaching both in school and in the workplace. Posters and brochures were the next frequently-used portals of information (42%). Other means included the television (24%), the internet (19%), family members and friends (8%) and their personal family physician (4%). It is encouraging that up to 94% answered that they would seek immediate medical attention upon the discovery of a breast abnormality, be it in themselves or close relatives. The remaining 6% opted to watch for progression of the symptom before seeking help.

Only 63% of the respondents did regular BSE. On univariate analysis, these were younger (< 40 years), Chinese, degree holders, with longer nursing experience (> 10 years) and had cared for breast cancer patients (Table III). However, on logistic regression analysis, race (Chinese; odds ratio [OR], 1.7; confidence interval [CI], 1.1–2.5) and prior experience of caring for breast cancer patients (OR, 1.9; CI, 1.3–2.8) were significant factors. For the women aged 40 years and older, only a dismal 35% had gone for a screening mammogram. Of those who had not, the commonest reasons cited were not having thought about it (36%) (Table IV). Of those who did go for a screening mammogram, 62% took their own initiative to do so. Another 18% thought they had breast cancer symptoms while 8% were motivated by having had a relative or friend diagnosed with breast cancer.

There were significantly more women in the 50–59 year age group who had gone for a screening mammogram. Although more Chinese, with secondary school or less education but with longer (> 10 years) nursing experience and had had cared for breast cancer patients, had had a mammogram, it was not statistically significant (Table V). Respondents with knowledge score greater than or equal to the median score of 16 were not found to have higher BSE or screening mammogram rates. Instead, those who had cared for breast cancer patients were found to have statistically significant higher knowledge score ( $p < 0.05$ ) and practised BSE ( $p < 0.05$ ) but did not have higher screening mammogram rates.

## DISCUSSION

The majority of our respondents were aware that breast cancer is the most common cancer among Singaporean

**Table III. Comparison of breast self-examination (BSE) practice by age, race, educational level, years of nursing and experience in caring for breast cancer patients.**

	Don't practise BSE n (%)	Practise BSE n (%)	p-value
Age (years)			
< 40	195 (83.0)	330 (73.7)	0.006
≥ 40	40 (17.0)	118 (26.3)	
Race			
Chinese	144 (61.5)	156 (35.0)	< 0.001
Malay	26 (11.2)	91 (20.4)	
Indian	23 (9.8)	66 (14.8)	
Others	41 (17.5)	133 (29.8)	
Educational level			
Completed secondary school or less	55 (23.7)	147 (32.9)	0.034
Completed A-levels	61 (26.3)	93 (20.8)	
Degree holders	116 (50.0)	207 (46.3)	
Nursing experience (years)			
< 1	31 (13.3)	33 (7.4)	0.006
1-3	44 (18.8)	73 (16.4)	
4-6	66 (28.2)	99 (22.3)	
7-10	27 (11.5)	66 (14.9)	
> 10	66 (28.2)	173 (39.0)	
Cared for breast cancer patients			
Yes	159 (69.1)	373 (83.3)	< 0.001
No	71 (30.9)	75 (16.7)	

**Table IV. Common reasons for not attending screening mammography.**

Common reasons for not attending screening mammography	%
I have never thought about it.	36
I have no breast problems so a mammography is not necessary.	24
I do not have the time.	18
My doctor has not recommended that I have one.	8
It is too expensive.	4
Other reasons.	10

women. They knew that although potentially fatal, a cure is possible. This is in contrast to the results obtained from the Singapore Breast Screening Project, where 39% of women felt that treatment was futile even when breast cancer was detected early.<sup>(11)</sup> However, their knowledge of risk factors, BSE and screening was lacking. This is in contrast to a similar study conducted on 431 public health nurses in Singapore, where the authors reported a high

level of knowledge on risk factors.<sup>(14)</sup> The difference in knowledge between nurses from a general hospital and those in the public health could be related to their nature of work and the disease pattern seen.

Many of the public health facilities (polyclinics) are screening centres for the national breast cancer screening programme. Hence, nurses from the public health are more familiar with risk assessment and screening issues, having to educate, encourage and counsel women attending the screening programme. In contrast, nurses working in a hospital would be involved in the care of breast cancer patients, making them more in tune with the disease process, presenting symptoms and treatment. Not surprisingly, the survey of public health nurses showed a high BSE (93%) and screening mammogram (96.1%) rates,<sup>(14)</sup> whereas those from our study was 63% and 35%, respectively. This is, however, similar to a survey of 240 Nigerian nurses from a general hospital.<sup>(15)</sup> They had a high level of knowledge of breast cancer symptoms and diagnosis, but only 8% had gone for a screening mammogram.

Clinical experience appeared to influence level of knowledge and practice. We found that the knowledge scores and BSE rates were higher in those who had managed breast cancer patients. This is not surprising, as actual involvement with the care of a patient would have a greater impact on the nurses' understanding of the disease. This might then also increase their health awareness and thus practise BSE. There were several worrying findings from our study. These included 21% who thought they were immune to breast cancer if they did not have any risk factors, 17% who thought that mammographic screening was not necessary if BSE was normal, and 17% who were not aware that the radiation from a mammogram had no ill effects. Together with the reasons listed in Table IV, these may be possible explanations for the low screening mammogram rates among our respondents. In addition, there were 20% who believed that breast cancer lumps were painful, and 20% who thought that mastectomy was the only treatment for breast cancer. These erroneous beliefs could result in a delay in seeking medical attention and having treatment. These may have further implications in that they may give invalid advice and information to friends, family and patients.

Most of the nurses obtained their information and knowledge from nursing school and workplace. This emphasised the importance of continuous medical education for nurses. It is imperative to keep them informed and updated with important health issues that they are not often exposed to in their course of work. This is not only important for their own health but also in their role as a public educator. Despite aggressive nationwide public education on breast cancer and the benefits of screening prior to the launch of the breast

**Table V. Comparison of screening mammogram in women 40 years and above by age, race, educational level, years in nursing and experience in caring for breast cancer patients.**

	Screening mammogram		
	Have not done n (%)	Have done n (%)	p-value
Age (years)			
40-49	69 (73.4)	24 (40.7)	0.000
50-59	20 (21.3)	25 (42.4)	
> 60	5 (5.3)	10 (16.9)	
Race			
Chinese	50 (53.8)	42 (71.2)	0.141
Malay	25 (26.9)	12 (20.3)	
Indian	16 (17.2)	4 (6.8)	
Others	2 (2.1)	1 (1.7)	
Educational level			
Completed secondary school or lower	69 (73.4)	35 (59.3)	0.176
Completed A-levels	16 (17.0)	14(23.7)	
Degree holders	9 (9.6)	10 (17.0)	
Nursing experience (years)			
1-3	1 (1.1)	0	0.55
4-6	2 (2.2)	0	
7-10	2 (2.2)	2 (3.4)	
> 10	88 (94.5)	56 (96.6)	
Cared for breast cancer patients			
Yes	78 (83.0)	51 (87.9)	0.408
No	16 (17.0)	7 (12.1)	

screening programme in Singapore in 2002,<sup>(16)</sup> 21.5% of women were still found to present with stage III or IV breast cancer.<sup>(17)</sup> The nursing profession forms a large and important group of the healthcare professionals. Their role in public education should not be viewed as a secondary responsibility. Therefore, if their knowledge is lacking or erroneous, it could perpetuate common misconceptions and result in delayed diagnosis and treatment.

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