

# Breast cancer knowledge and screening practices: a survey of 1,000 Asian women

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## ABSTRACT

**Introduction:** The incidence of breast cancer in Asia is rapidly rising. Knowledge and perception often influence attendance at screening programmes. However, there has not been any survey to assess the level of knowledge of breast cancer in an Asian population. Singapore has a multiracial population and is the only Asian country with a national screening programme. We conducted a survey on 1,000 women to assess their level of knowledge and screening practices.

**Methods:** A self-administered questionnaire was used, where one point was given for a correct answer and zero for an incorrect / "not sure" response. The maximum knowledge score was 19. The women were also surveyed for their screening practices. Points were not assigned to questions on practice.

**Results:** The response rate was 100 percent. The mean score was 11.4 and the median was 12 (range 0–19). The scores were high for general knowledge and disease progression, but poor for risk factors, screening, symptoms and treatment. Several myths and misconceptions were prevalent. Only 53 percent did regular breast self-examination (BSE), while 57 percent of women aged 40 years and above had gone for a screening mammogram. Increasing age, Malay race, lower educational level, lower socioeconomic class and not knowing anyone with breast cancer were significant independent predictors of poor knowledge. Higher educational level and knowledge scores were significant independent predictors of BSE practice and screening mammogram attendance.

**Conclusion:** Knowledge affects practice. Public education is required to correct misconceptions and focus on women with poor knowledge. This

would help to improve screening attendance rates.

**Keywords:** breast cancer knowledge, breast self examination, public education, screening mammogram

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## INTRODUCTION

Breast cancer is a global health issue and a leading cause of death among women internationally.<sup>(1-3)</sup> Its incidence in Asia is rapidly rising with Singapore having one of the highest incidences.<sup>(4)</sup> It is well-established that early detection and early treatment lead to improved survival.<sup>(5-7)</sup> Several studies have shown that the knowledge and perception of women directly influence their attendance and acceptance of screening and treatment.<sup>(8-11)</sup> However, these findings were based mainly on Western or migrant Asian women. There has not been any survey to assess the level of knowledge of breast cancer in an Asian population. Singapore is a multiracial society and the only Asian country with a nationwide breast cancer screening programme.<sup>(12)</sup> Therefore, we conducted a survey to evaluate the level of knowledge of breast cancer and screening practices of women here.

## METHODS

Based on a survey we conducted on the knowledge and practices of nursing staff in a general hospital,<sup>(13)</sup> we conducted a similar survey on female visitors at the same hospital. Approval was obtained from the hospital's Institute Review Board. Between January and June 2007, female visitors at the hospital were invited by the research coordinator to participate in this survey. The survey was carried out on those who consented. These were women who were not attending the surgical clinics or wards. This was to reduce the probability of selection bias from women attending the hospital for a breast condition. A self-administered questionnaire in English, Mandarin and Malay was given to the women. An immediate response was requested and the questionnaires were collected

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**Table I. Respondents' demographics with mean and median knowledge scores.**

Demographics	No. (%)	Mean (SD) knowledge score	Median (range) knowledge score
Age group (years)	(n = 1,000)		
< 30	187 (19)	11.7 (4.2)	12 (0–19)
30–39	152 (15)	12.8 (4.2)	14 (0–19)
40–49	296 (30)	11.6 (4.5)	12 (0–19)
50–59	231 (23)	11.4 (4.5)	12 (0–19)
≥ 60	134 (13)	9.4 (4.5)	9 (0–18)
Race	(n = 1,000)		
Chinese	700 (70)	11.9 (4.4)	12 (0–19)
Malay	182 (18)	9.5 (4.2)	10 (0–19)
Indian	80 (8)	10.7 (4.6)	11.5 (0–18)
Others	38 (4)	13.3 (4.1)	14.5 (1–18)
Educational level	(n = 999)		
No formal education	58 (6)	7.2 (4.2)	7 (0–16)
Primary school	130 (13)	7.5 (3.5)	7 (0–16)
Secondary school	428 (43)	10.9 (4.0)	11 (0–19)
Junior college / equivalent	182 (18)	13.4 (3.8)	14 (2–19)
University / college / postgraduate	201 (20)	14.6 (3.2)	15 (1–19)
Monthly income (SGD)	(n = 969)		
< 999	413 (43)	9.9 (4.5)	10 (0–19)
1,000–1,999	203 (21)	10.6 (4.2)	11 (1–19)
2,000–2,999	164 (17)	12.7 (3.9)	13 (2–19)
3,000–3,999	98 (10)	14.1 (3.5)	15 (2–19)
≥ 4,000	91 (9)	14.8 (3.3)	15 (1–19)
Housing	(n = 967)		
3-room flat	162 (17)	9.8 (4.6)	10 (0–19)
4-room flat	286 (30)	10.2 (4.4)	11 (0–18)
5-room flat	344 (35)	12.3 (4.3)	13 (0–19)
Private property	175 (18)	13.5 (3.9)	14 (3–19)
Know someone with breast cancer?	(n = 1,000)		
No	606 (61)	10.7 (4.6)	11 (0–19)
Yes	394 (39)	12.5 (4.1)	13 (0–19)

SD: standard deviation

upon completion. In order to facilitate understanding of the questions and increase the response rate, a research coordinator was present to help the respondents. For those who were illiterate, the research coordinator would read the questions to them and record their answers. All data collected was made anonymous, stored and controlled by the authors.

The questionnaire focused on basic essential knowledge that would affect screening and treatment practices as well as common local myths and misconceptions about breast cancer. Basic demographic variables such as age, race, educational level, monthly income and type of housing were included. A validity test on the questionnaire was not performed. The first part of the questionnaire contained questions regarding risk factors, natural disease progression, symptoms, screening and treatment of breast cancer. The second part of the questionnaire was targeted at the women's own practices with respect to screening. Based on the national breast cancer screening programme in Singapore,<sup>(12)</sup> 40 years is the recommended age to commence screening mammography. We included questions that focused on breast self-examination (BSE) for all women and screening mammography for women aged 40 years and above. We also included questions to

determine where the respondents acquired their breast cancer information and whether they knew of any friends or relatives with breast cancer. These questions were then scored – one point for the correct response and zero for a wrong or “not sure” response. A correct response was based on the current practice and literature.<sup>(4,12)</sup> Scoring did not include the respondents' personal perceptions and practice. The maximum attainable score was 19.

The data was entered into the Statistical Package for the Social Sciences (SPSS) version 12.0 (SPSS Inc, Chicago, IL, USA) and analysed. Frequency distributions were employed to describe the data. The mean and median knowledge scores for the demographics, i.e. age group, race, educational level, monthly income, type of housing and knowing someone with breast cancer, were presented. The median knowledge score of our respondents was 12 (95% confidence interval [CI] 11.8–12.2) (Maritz-Jarrett method). Therefore, we defined respondents with a knowledge score of 12 and above as having high knowledge and those below 12 as having low knowledge of breast cancer. A comparison of the respondents' knowledge of breast cancer was made using the chi-square test or the Fisher's exact test. Logistic regression was performed to adjust for age groups, race, educational level, income, type of housing and knowing

**Table II. Respondents' breast cancer knowledge.**

Demographics	Knowledge		p-value (univariate)	p-value (multivariate)	Adjusted OR (95% CI)*
	Low (%)	High (%)			
Age group (years)	(n = 1,000)		< 0.01	0.03	
< 30	85 (45)	102 (55)		0.96	1.0 (0.53–1.94)
30–39	49 (32)	103 (68)		0.22	0.65 (0.33–1.28)
40–49	138 (47)	158 (53)		0.07	0.59 (0.33–1.05)
50–59	104 (45)	127 (55)		0.02	0.50 (0.28–0.88)
≥ 60	87 (65)	47 (35)		1.0	–
Race	(n = 1,000)		< 0.01	0.01	
Chinese	291 (42)	409 (58)		1.0	–
Malay	122 (67)	60 (33)		< 0.01	1.83 (1.21–2.77)
Indian	40 (50)	40 (50)		0.48	1.22 (0.70–2.14)
Others	10 (26)	28 (74)		0.20	0.57 (0.24–1.35)
Educational level	(n = 999)		< 0.01	< 0.01	
No formal education	47 (81)	11 (19)		< 0.01	8.33 (3.32–20.91)
Primary school	110 (85)	20 (15)		< 0.01	20.60 (9.59–44.26)
Secondary school	225 (53)	203 (47)		< 0.01	4.08 (2.38–7.01)
Junior college / equivalent	46 (25)	136 (75)		0.09	1.65 (0.93–2.91)
University / college / postgraduate	35 (17)	166 (83)		1.0	–
Income group (SGD)	(n = 969)		< 0.01	0.01	
< 999	258 (63)	155 (37)		< 0.01	3.33 (1.50–7.36)
1,000–1,999	108 (53)	95 (47)		0.02	2.67 (1.17–6.05)
2,000–2,999	56 (34)	108 (66)		0.10	1.98 (0.88–4.45)
3,000–3,999	21 (21)	77 (79)		0.28	1.63 (0.67–3.97)
≥ 4,000	10 (11)	81 (89)		1.0	–
Housing	(n = 967)		< 0.01	0.02	
3-room flat	102 (63)	60 (37)		< 0.01	2.29 (1.30–4.05)
4-room flat	162 (57)	124 (43)		0.01	2.06 (1.23–3.46)
5-room flat	134 (39)	210 (61)		0.04	1.69 (1.03–2.76)
Private property	46 (26)	129 (74)		1.0	–
Know someone with breast cancer?	(n = 1,000)		< 0.01	< 0.01	
No	324 (54)	282 (46)		1.0	–
Yes	139 (35)	255 (65)		< 0.01	2.27 (1.64–3.14)

\*OR > 1 indicates higher likelihood of having low knowledge of breast cancer.

someone with breast cancer. A p-value of < 0.05 was considered to be statistically significant. Similar analyses were performed for the practice of BSE and mammogram attendance.

## RESULTS

There were 1,000 respondents who consented to participate in and completed the survey (100% response rate). They were mostly Chinese (70%), with 53% aged 40–60 years. More than half (56%) had at least a secondary school education level. However, a large proportion (43%) reported a monthly income of less than S\$1,000. The majority (63%) resided in four- or five-room government-subsidised housing (Table I). Based on the national statistics from the Ministry of Health 2005,<sup>(14)</sup> the respondents were relatively similar to the general population of Singapore, especially in terms of racial distribution and age groups. The women surveyed had high scores for their general knowledge of breast cancer and disease progression. The majority was aware that breast cancer is the most common type of female cancer in Singapore (83%) and that early detection of breast cancer is curable (91%). Most women knew that breast cancer could be fatal (81%) and 70% were aware that breast cancer could metastasise.

The respondents generally fared poorly on the risk factors, screening and treatment questions. Two-fifths (40%) of those surveyed were not aware that increasing age was associated with a higher incidence of breast cancer. 39% of the respondents were ignorant of positive family history being a risk factor for breast cancer. About two-thirds (61%) of the women were unaware that prolonged use of hormone replacement therapy (for more than five years) after menopause was associated with an increased risk of breast cancer. More than a third (39%) thought they would not develop breast cancer if they did not have any risk factors. A fair proportion (41%) believed in the common local myth of larger breasts being a risk factor for breast cancer. Two-thirds (61%) of the women were able to list at least one symptom of breast cancer correctly (29% named one symptom and 32% named two symptoms). The most frequent symptoms named were palpable breast lump and nipple discharge. However, half (52%) of the women thought that pain was a common feature of breast cancer lumps.

With respect to BSE, almost three-quarters (72%) of the women were unsure of the frequency and about a quarter (27%) thought that a normal BSE meant that further screening was not necessary. While a third (36%) were

**Table III. Practice of breast self-examination (BSE).**

Demographics	Practise BSE		p-value (univariate)	p-value (multivariate)	Adjusted OR (95% CI)*
	No (%)	Yes (%)			
Age group (years)	(n = 991)		< 0.01	< 0.01	
< 30	126 (69)	57 (31)		< 0.01	0.21 (0.11–0.37)
30–39	72 (48)	79 (52)		0.03	0.53 (0.30–0.95)
40–49	121 (41)	173 (59)		0.14	0.68 (0.41–1.13)
50–59	82 (36)	147 (64)		0.87	0.96 (0.58–1.60)
≥ 60	60 (45)	74 (55)		1.0	–
Race	(n = 991)		0.104	0.03	
Chinese	339 (49)	353 (51)		1.0	–
Malay	73 (40)	108 (60)		< 0.01	1.74 (1.19–2.55)
Indian	35 (44)	45 (56)		0.42	1.23 (0.74–2.04)
Others	14 (37)	24 (63)		0.31	1.47 (0.70–3.07)
Educational level	(n = 990)		< 0.01	< 0.01	
No formal education	41 (72)	16 (28)		< 0.01	0.24 (0.10–0.54)
Primary school	56 (44)	72 (56)		0.97	1.01 (0.54–1.90)
Secondary school	171 (40)	253 (60)		0.63	1.12 (0.70–1.79)
Junior college / equivalent	82 (45)	100 (55)		0.97	0.99 (0.62–1.58)
University / college / postgraduate	111 (56)	88 (44)		1.0	–
Income group (SGD)	(n = 961)		0.221	0.21	
< 999	197 (48)	214 (52)		0.26	1.93 (0.79–2.46)
1,000–1,999	79 (40)	120 (60)		0.03	1.97 (1.08–3.61)
2,000–2,999	74 (45)	89 (55)		0.12	1.58 (0.89–2.82)
3,000–3,999	49 (51)	48 (49)		0.25	1.45 (0.78–2.70)
≥ 4,000	47 (52)	44 (48)		1.0	–
Housing	(n = 959)		0.755	0.96	
3-room flat	74 (46)	85 (54)		0.99	1.00 (0.61–1.65)
4-room flat	137 (48)	148 (52)		0.84	1.05 (0.67–1.64)
5-room flat	149 (44)	191 (56)		0.64	1.10 (0.73–1.67)
Private property	79 (45)	96 (55)		1.0	–
Know someone with breast cancer?	(n = 991)		< 0.01	0.28	
No	302 (50)	298 (50)		0.28	0.85 (0.64–1.14)
Yes	159 (41)	232 (59)		1.0	–
Knowledge	(n = 991)		0.036	0.04	
High	232 (43)	302 (57)		1.0	–
Low	229 (50)	228 (50)		0.04	0.72 (0.52–0.99)

\*OR > 1 indicates higher likelihood of practising BSE.

unsure, 8% believed that the radiation from a mammogram was dangerous and could increase one's risk of breast cancer. About two-thirds (64%) of the women were able to correctly name a place that conducted mammogram screening. With regard to treatment, more than half of the women (51%) thought that mastectomy was the only available treatment. A third (34%) were unsure if the ipsilateral arm would be crippled and lose all function after a mastectomy, and a small fraction (4%) of the women believed it to be so. An encouraging 69% of the women were aware that adjuvant therapy, i.e. chemotherapy and radiotherapy, besides surgery, might be necessary for the treatment of breast cancer. The survey found that a quarter (26%) of the women respondents felt that men would be less attracted to women who have had breast cancer surgery, while a third (32%) were unsure. The majority of the respondents (66%) received breast cancer information from the television. Posters were the next commonest source of information (50%). Other sources included family members (34%), their family physician (14%) and formal teaching (11%).

The mean total score for the knowledge questions was

11.4 (standard deviation 4.5) and the median score was 12. Increasing age, Malay race, lower educational level, lower income, small housing size and not knowing anyone with breast cancer resulted in lower knowledge scores (Table I). Using the median score of 12, those with a score of below 12 were defined as having low knowledge and those with a score of 12 and above had high knowledge. Multivariate analysis showed that those above 60 years of age compared to those aged 50–59 years were more likely to have low knowledge (odds ratio [OR] 2.0, 95% CI 1.36–3.57). However, Malay respondents, those with a lower educational level (secondary school and below), lower monthly income (below S\$2000) and poor housing (3-, 4-, 5-room flats) were more likely to have low knowledge. Respondents who did not know anyone with breast cancer were also more likely to have low knowledge (Table II).

Only half (53%) of the respondents did regular BSE. Univariate analysis showed that age, educational level, knowing someone with breast cancer and knowledge score significantly influenced the BSE rates. However, after adjusting for covariates, those below the age of 40 years, with no formal education and with low knowledge

**Table IV. Reasons cited by women aged  $\geq 40$  years for not attending screening mammography (n = 278).**

Reasons	No. (%)
I have never thought about it.	89 (32)
I have no breast problems, so a mammography is not necessary.	66 (24)
My doctor has not recommended that I have one.	39 (14)
I do not have the time.	23 (11)
It is too expensive.	26 (8)
Fear of pain.	12 (4)
Other reasons.	19 (7)

were less likely to practise BSE (Table III). For women aged 40 years and older, 43% have not had a screening mammogram. The two commonest reasons cited were “not having thought about it” (32%) and “not having any breast problems” (24%) (Table IV). Of those who had gone for a screening mammogram, 72% went on their own initiative, 6% thought they had breast cancer symptoms, while 5% were motivated by a relative or friend diagnosed with breast cancer. Only 5% were advised by their doctors and the remaining 12% quoted other reasons. Univariate analysis showed that factors that significantly influenced screening mammogram attendance were age, race, educational level, housing, knowing someone with breast cancer and knowledge score. Although higher monthly incomes was correlated with higher mammogram rates, it did not reach significance. However, logistic regression analysis showed that Malay respondents, those aged 40–49 years and those without a formal education were less likely to have gone for a screening mammogram. Those who did not know anyone with breast cancer, those with low knowledge and who did not practice BSE were also less likely to have attended a screening mammogram (Table V).

## DISCUSSION

With one of the highest incidences of breast cancer in Asia, Singapore is the only country in Asia that has a national breast cancer screening programme.<sup>(12)</sup> This was launched in January 2002 with much public education about breast cancer and screening. A high level of public awareness and understanding of the disease is reflected in the high scores for general knowledge and disease progression in our survey. Notably, most (91%) believed that early stage breast cancer is curable. This was an improvement from the findings of the 1994 Singapore Breast Screening Project, where 39% felt that there would be little hope of cure even when breast cancer was detected early.<sup>(15)</sup> However, our results revealed a poor understanding of the risk factors and misconceptions about treatment and screening. Worrying findings included 39% of respondents who believed that they were immune to developing breast cancer in the absence of risk factors, 27% who thought that having a normal BSE did not require them to go for mammogram screening and 44% who were not sure or believed that the radiation from

mammography could cause breast cancer. These erroneous beliefs could account for the poor mammogram rates of our respondents.

Regarding treatment, almost half were not aware of breast-conserving surgery, believing that a mastectomy was always necessary. More than a third were unsure or believed that the arm on the affected side would be crippled after surgery. In addition, more than half were either unsure or believed that men would be less attracted to women who had breast cancer surgery. Several Western studies have shown that cultural beliefs and attitudes influence the breast cancer stage at diagnosis.<sup>(16–18)</sup> Although there has not been any similar study in an Asian population, it is likely that the misconceptions that surfaced from our survey could lead to a delay in seeking treatment. Poor knowledge in the elderly is not surprising as many public education materials are in English. Therefore, those who are illiterate or do not understand English would not be adequately informed. In addition, Asian women tend to be more conservative than their Western counterparts, and issues concerning cancer and the female body are often taboo topics, especially among the elderly. Tan et al reported that, between 2000 and 2003, 21.5% of women in Singapore presented with stage III or IV breast cancer.<sup>(19)</sup> These tended to be elderly, nulliparous women. However, their study did not look into the reasons for their late presentation.

The results of our survey suggest that those with a lower educational level are less well informed. Similarly, those in the lower socioeconomic group (reflected by lower income and smaller housing) had lower scores. Several Western studies have shown that low socioeconomic class is associated with late-stage breast cancer at presentation and a higher mortality rate.<sup>(20–23)</sup> However, similar data is lacking in an Asian population. This lack of knowledge may be because the current public education materials are too complex for their understanding and/or due to a lack of interest on their part. The authors suggest further studies to determine the reasons and ways to reach out to the population at risk. Women who knew someone with breast cancer were more likely to have better knowledge. Having someone close (a friend or relative) with breast cancer could heighten one’s awareness of the disease and result in an increased understanding of the condition.

Several recent reports have questioned the usefulness of BSE as a screening tool.<sup>(24–26)</sup> Despite several studies on BSE showing no significant reduction in breast cancer mortality, women are still encouraged to practise it.<sup>(27)</sup> Our study showed that those who practised BSE were more likely to go for screening mammograms. In the survey based on the 1994 Singapore Breast Screening Project, women who attended other screening programmes were also more likely to go for screening mammograms.<sup>(28)</sup> Our study suggests that knowledge affects practice. Consistent factors

**Table V. Attendance at screening mammogram.**

Demographics	Attend mammogram		p-value (univariate)	p-value (multivariate)	Adjusted OR (95% CI)*
	No (%)	Yes (%)			
Age group (years)	(n = 657)		< 0.01	< 0.01	
40–49	148 (50)	146 (50)		< 0.01	0.37 (0.20–0.67)
50–59	74 (32)	155 (68)		0.44	0.79 (0.44–1.43)
≥ 60	56 (42)	78 (58)		1.0	–
Race	(n = 678)		< 0.01	< 0.01	
Chinese	173 (37)	292 (63)		1.0	–
Malay	88 (62)	41 (32)		< 0.01	0.34 (0.21–0.56)
Indian	22 (40)	33 (60)		0.87	0.95 (0.48–1.87)
Others	10 (34)	19 (66)		0.62	0.79 (0.32–1.99)
Educational level	(n = 677)		< 0.01	< 0.01	
No formal education	43 (78)	12 (22)		< 0.01	0.24 (0.08–0.69)
Primary school	59 (53)	52 (47)		0.67	1.21 (0.50–2.90)
Secondary school	132 (40)	199 (60)		0.45	1.33 (0.63–2.82)
Junior college / equivalent	30 (28)	78 (72)		0.32	1.51 (0.68–3.34)
University / college / postgraduate	28 (39)	44 (61)		1.0	–
Income group (SGD)	(n = 658)		0.11	0.90	
< 999	157 (48)	173 (52)		0.33	0.65 (0.28–1.54)
1,000–1,999	56 (44)	72 (56)		0.48	0.72 (0.29–1.79)
2,000–2,999	40 (42)	55 (58)		0.41	0.68 (0.27–1.71)
3,000–3,999	19 (38)	31 (62)		0.64	0.78 (0.28–2.18)
≥ 4,000	16 (29)	39 (71)		1.0	–
Housing	(n = 661)		< 0.01	0.11	
3-room flat	67 (56)	52 (44)		0.02	0.45 (0.23–0.87)
4-room flat	98 (53)	88 (47)		0.21	0.67 (0.36–1.25)
5-room flat	83 (38)	137 (62)		0.34	0.76 (0.43–1.35)
Private property	37 (27)	99 (73)		1.0	–
Know someone with breast cancer?	(n = 678)		< 0.01	0.06	
No	198 (51)	193 (49)		0.06	0.69 (0.47–1.01)
Yes	95 (33)	192 (67)		1.0	–
Breast cancer knowledge	(n = 678)		< 0.01	< 0.01	
High	100 (29)	242 (71)		1.0	–
Low	193 (57)	143 (43)		< 0.01	0.41 (0.27–0.62)
Practise BSE?	(n = 657)		< 0.01	< 0.01	
No	154 (59)	109 (41)		< 0.01	0.31 (0.21–0.46)
Yes	124 (31)	270 (69)		1.0	–

\*OR > 1 indicates higher likelihood of attending screening mammogram.

that influenced BSE and screening mammogram rates were educational level and having high knowledge. Among the women who were aged 40 years and above, 57% had gone for a screening mammogram. Of these, 72% went on their own initiative. This is an improvement when compared to the response rate of 41.7% in the 1994 Singapore Breast Screening Project, where the women had been invited for free screening mammograms.<sup>(29)</sup> Concurring with the study by Seow et al,<sup>(28)</sup> these women were those with higher education qualifications. However, in our study, the type of housing was not an independent predictor of mammogram attendance.

It is interesting to note that among our Malay respondents, although they were more likely to have low knowledge, they were more likely to practise BSE but less likely to go for screening mammography. Further studies to determine their reluctance to attend mammographic screening would be useful. As most of the respondents cited public media (television and poster) as their main sources of information, the authors suggest that specific myths and

misconceptions identified in our study be the focus of future public education materials. To reach out to the elderly, it may be necessary for public education materials to be in languages other than English (even in local dialects). It has been shown that doctors have a strong influence on the uptake of mammogram attendance.<sup>(30)</sup> However, our survey showed that only 14% obtained information from their family physician and 14% of those who have not gone for a mammogram cited failure of recommendation by their doctors as the reason. We suggest that primary healthcare physicians be encouraged to provide more opportunistic health education and screening.

The authors acknowledge several limitations of this study. Although attempts were made to survey women that were reflective of the general population, the fact that the survey was conducted within the hospital premise could result in a biased study group. As public education materials are readily available throughout the hospital, the study group may be better informed. If this were the case, it would make our findings more worrisome. Those who

attend the hospital often reside near the hospital. Hence, they may not be entirely representative of women in the rest of the country. Subgroup analysis (e.g. race) may not yield meaningful results because of the small sample size. Although the research coordinator's role was to assist in the understanding of the questions, there may still be potential bias in the respondents' replies.

As such a survey had not been previously conducted, we designed one to cover a wide range of topics on breast cancer. We did not delve into greater details on each of the topics. This was to keep the questionnaire short so that we would have good quality responses. Nonetheless, we feel that our study has resulted in several useful findings that could help us improve on our public education strategy. A larger scale study on specific areas could be conducted in the future. Breast cancer is the most common cancer among women in Singapore. Despite the national screening programme, there remain many myths and misconceptions about breast cancer. This could have a negative impact on screening attendances, resulting in delayed diagnosis and treatment. Equipped with a better understanding of the common misconceptions and which groups of women are lacking in knowledge, more effective public education could be targeted to these groups.

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