

Population-based Mammographic Screening in Singapore: What are Participants' Views?

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Abstract

Mammographic screening for breast cancer has been shown to be an effective tool for reducing mortality from the disease in many studies in the West, if high technical quality and acceptance by the target population are achieved. The objective of the Singapore Breast Screening Project was to determine if the same results could be obtained among local women by inviting a random sample of 69 500 women aged 50 to 64 years for a screening mammogram over two years. To date, the compliance rate among the women invited has been 41.7%. The objective of the present substudy was to determine participants' views on the accessibility and acceptability of organised mammographic screening. Of the three hundred women interviewed, 85% were satisfied with the information given prior to the visit, while 67% needed to change the original appointment given. The majority were satisfied with aspects of the visit such as waiting time, privacy and explanation given during the test. However, 35.1% reported at least moderate discomfort during mammography. A substantial proportion (39.7%) of attenders felt that there was very little hope of cure even if cancer was detected early. When asked the most important reason for attending, most indicated they had taken the opportunity for a free check-up to be assured they were well. Almost all (95.7%) reported a willingness to be screened again, but most would not be willing to pay for a mammogram at the current rates.

Ann Acad Med Singapore 1998; 27:154-60

Key words: Acceptability, Breast cancer, Screening, Mammogram

Introduction

Breast cancer is the most common cancer among women in Singapore' and has been increasing in incidence since 1968. This rise is particularly marked among younger women, suggesting that the increase will take place at an even faster rate in future.² Over the past few decades, evidence has accumulated, largely from the West, that organised, population-based mammographic screening applied to women above 50 years of age is able to reduce mortality from breast cancer by about 30%.^{3,4} Many countries where breast cancer is a leading cause of death, such as the United Kingdom, Sweden and other parts of Europe and Canada, have begun systematic population screening programmes.⁵ Findings from pro-

spective studies on the effect of screening indicate that the primary determinants of an effective programme are the technical quality and the acceptance of screening by the target population.⁶

Early detection of breast cancer in Singapore has been carried out on an opportunistic basis in the Well Women clinics conducted in government polyclinics, and by private specialists and general practitioners using clinical breast examination and instruction in breast self-examination (BSE). The use of mammography is a more recent development and recent surveys suggest that fewer than 25% of women between the ages of 50 and 64 years have ever had a mammogram (personal communication, Straughan PT).

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The Singapore Breast Screening Project was initiated by the Ministry of Health in 1994 to determine the outcome of population-based mammographic screening in Singapore, in terms of the pick-up rate of breast abnormalities and, in the long-term, the ability of such a programme to reduce mortality from the disease. Over 2 years, 70 000 women between the ages of 50 and 64 years randomly selected from among Singapore female residents of that age group, were invited for a free mammogram at 1 of 2 hospital-based screening centres. Up to December 1996, the proportion of women responding to this invitation was 41.7% (personal communication, Ng EH). This is lower than the attendance rates reported in Europe which have ranged from 60% in Italy to 93% in parts of Scandinavia.⁷ It is also below the 70% estimated by the Forrest Report as the target necessary for the programme to achieve a 25% reduction in mortality.^{3,8}

The factors that determine or affect women's participation in a breast screening programme are generally referred to under the term acceptability, which has been described by the United Kingdom National Health Service Breast Screening Programme as including "anxiety, satisfaction, pain and discomfort, awareness of the programme and coverage".⁹ It encompasses aspects of organisation (e.g. accessibility of the screening centre), health beliefs and attitudes, consumer satisfaction (e.g. waiting time and discomfort), and anxiety generated by having a test among its key issues.

Because a reduction in breast cancer mortality is the ultimate aim of screening, how women in Singapore view the service has implications on how successful the programme will be. For this reason, a mammographic programme which is not perceived by the women themselves as acceptable will have a limited impact on breast cancer mortality. The objective of the present study, therefore, was to determine participants' views on the accessibility and acceptability of organised mammographic screening. It should be emphasised that the present study does not include non-attenders. We also sought to explore participants' reasons for choosing to attend, and to measure relevant attitudes towards breast cancer and the mammogram. It is hoped that this information will be useful in the planning and organisation of breast screening services in Singapore.

Subjects and Methods

This study was carried out as part of the Singapore Breast Screening Project undertaken by the Ministry of Health. The purpose of the Project was to determine the 'efficacy of population-based mammographic screening among Asian women, in terms of the detection rate of breast abnormalities. The target population for the Project was all female Singapore residents between the ages of 50 and 64 years. Altogether, 69 473 randomly selected

women in this age range were invited for screening. In addition, 1000 women from each of the age groups of 45-49 years and 65-70 years were also invited in order to determine the likely response of these age groups to a screening programme.

Screening was carried out in 2 major hospitals in the south (Singapore General Hospital) and central (Toa Payoh Hospital) regions of Singapore, with the target population divided according to proximity to these hospitals. Invitation letters in English and her mother tongue were sent to the homes of selected women. These letters explained that a mammogram was being offered free-of-charge as part of a nationwide study on breast cancer. An appointment date and time were affixed to the letter, and the recipient was invited to call the screening centre to confirm her attendance, to request a change in appointment, or for any other enquiries. A pamphlet explaining the procedure and giving information on what to expect was included with the invitation.

Women attending the Mammography Centre at the Singapore General Hospital in response to this invitation on 16 randomly selected days between 28 November and 21 December 1994 were selected as the study population for the purpose of this study. A lo-minute questionnaire was administered by a trained interviewer during their visit, after each woman had undergone mammography.

Apart from basic demographic information, the study instrument elicited data on the accessibility of the screening centre and of practical difficulties that might have been experienced. The influence of the respondent's social support group was also probed ("Has anyone ever talked to you about the mammogram?", "Who is/are this/these person(s)?", "Has this person ever encouraged you to go for a mammogram?"). This last question required the respondent to indicate the level of encouragement on an eight-point semantic differential scale (1 = strongly encouraged, 8 = did not encourage at all). For the purpose of analysis, responses were divided into 3 groups by degree of encouragement [encouraged (1-3), unsure (4-5), did not encourage (6-8)]. An open-ended question: "What was most important in making you decide to come for the mammogram?" was included.

The acceptability of the screening procedure was measured using a series of questions about the waiting time, discomfort experienced during the test and the provision of privacy and adequate explanation during the procedure. Eight-point semantic differential scales were used wherever appropriate. Finally, the respondent was also asked if she would be likely to attend again in 2 years' time.

As a measure of her attitude towards the benefits of mammography, the respondent was also asked to indicate her degree of concurrence with three statements:

1. "Even if breast cancer is detected early, there is very little hope of cure"
2. "Mammography cannot detect very small lumps in the breast"
3. "There are no harmful side effects to the mammo-gram"

Responses to these statements were coded on a similar scale (1 = strongly agree, 8 = strongly disagree) with uncertain responses scoring in the middle of the range.

The study instrument was translated into Malay and Chinese for the purpose of standardisation, and all interviews were conducted by the same trained field investigator.

Results

Out of the 447 women attending the screening programme during the study period, 300 women (67.1%) were approached and all consented to be interviewed. The respondents did not differ significantly from the target population in terms of ethnicity, age and other key demographic variables [$P > 0.05$ in all cases (Table I)]. However, compared with all women screened over the 2-year study period, our responders were slightly younger, and resided in smaller dwellings [50.5% in 1 to

3-room Housing and Development Board (HDB) flats compared with 39.0% for all women screened].

The mean age of the respondents for this study was 56.4 years. More than half (56.0%) had received no formal education and approximately the same proportion resided in the smaller (1 to 3-room) HDB flats (Table I). The percentage who had not been to school was not different from the national figures for women between the ages of 50 and 64 years (56.3% with no formal education).¹⁰

The overwhelming majority of women (97.7%) indicated that they had depended mainly on the invitation letter to explain why they needed to come for a mammo-gram. Only seven (2.3%) cited the mass media as the most useful source of this information. Most (85%) said that the information they had received prior to the visit was sufficient.

More than 90% of the attenders had consulted another, in most cases (91.5%) their spouse or other family members, before deciding to come for the test. A large proportion (93.4%) received encouragement to attend. Fewer than 1 in 5 (18.3%) knew someone who had been for a mammogram. Of the 52 women who received advice from these persons, the advice was positive in only one-

TABLE I: DEMOGRAPHIC CHARACTERISTICS OF THE PARTICIPANTS INTERVIEWED, COMPARED WITH ALL ATTENDERS DURING THE STUDY PERIOD*, AND WITH ALL WOMEN SCREENED

Characteristic		% of respondents (n) (n = 300)	% of all women attending during study period (n) (n = 447)	% of all women screened (n = 28231)**
Ethnic group	Chinese	83.0 (249)	83.5 (373)	84.2
	Malay	7.0 (21)	3.8 (17)	5.6
	Indian	5.7 (17)	7.2 (32)	4.9
	Others	4.3 (13)	5.6 (25)	5.4
Age group (y)	45 to <50	3.6 (11)	2.2 (10)	
	50 to <55	39.7 (119)	33.1 (148)	30.0
	55 to <60	34.3 (103)	36.7 (164)	38.1
	60 to <65	19.7 (59)	22.6 (101)	26.8
	Above 65	2.7 (8)	5.4 (24)	5.1
Highest educational level	No formal education	56.0 (168)	55.0 (246)	61.2
	PSLE	20.3 (61)	24.4 (109)	18.6
	GCE 'O' or 'N' level	15.0 (45)	13.6 (62)	13.9
	GCE 'A' level/ diploma/degree	8.7 (26)	6.7 (30)	6.3
Type of dwelling	HDB 1 to 3-room flat	50.3 (151)	51.2 (229)	39.0
	HDB 4-room flat	23.0 (69)	25.7 (115)	} 45.8
	HDB 5-room/executive flat	16.0 (48)	13.7 (61)	
	Private flat or landed property	7.3 (22)	6.9 (31)	15.1
	Others	3.3 (10)	2.5 (11)	
Marital status	Single	3.7 (11)	5.2 (23)	4.3
	Married	90.7 (272)	91.1 (407)	79.8
	Divorced/widowed	5.7 (17)	3.8 (17)	15.9

* based on χ^2 statistic, $P > 0.05$ for all variables listed

** figures in this column are based on women in the 50 to 64 age-group at the time of randomisation

half (51.9%) of cases (Table II).

In terms of ease of attending for screening, about two-thirds of the women needed to change the original appointment given to them (Table III). Fewer than half eventually needed to take time off work or make domestic arrangements, particularly for child care, in order to attend. These arrangements were not difficult to obtain in most cases, with only 23 (7.6% of all respondents) reported some degree of difficulty.

Attendees appeared to be positive towards most areas of the screening experience (Table IV). Although the waiting time for the majority (87.7%) was reported to be more than 30 minutes, this was felt to be within expectations in 56% of the cases, and above expectations in 41.3%. The privacy afforded during mammography, and the instructions and explanation given by the radiographer as the test was taking place were satisfactory for almost all the attendees. However, more than 1 in 3 (35.1%) complained of at least moderate discomfort during the mammogram, with most of the rest scoring in the middle of the scale.

Attendees were divided on their view of the advantages of early detection, with almost 40% of the opinion that there was still "very little hope of cure" (Table V).

Surprisingly, only a small proportion (15%) were convinced of the ability of the test to detect very small lumps in the breast. However, most (78%) believed that mammography had few or no side effects.

When we compared the prevalence of these beliefs

TABLE III: PARTICIPANTS' REPORTS CONCERNING THE ACCESSIBILITY OF SCREENING MAMMOGRAPHY

	Response	Number	%
Change of appointment	Required	201	67.0
	Not required	99	33.0
Special arrangements required to keep appointment	Time off work	91	30.3
	Child care arrangements	40	13.3
	Domestic arrangements	2	0.7
	Did not require	167	55.7
Difficulty in getting time off work (n = 91)	Difficult (1-3)*	12	13.2
	Uncertain (4-5)	2	2.2
	Not difficult (6-8)	77	84.6
Difficulty in making child care or domestic arrangements (n=30)	Difficult (1-3)*	6	20.0
	Uncertain (4-5)	3	10.0
	Not difficult (6-8)	21	70.0

* Eight-point scale offered; 1 = very difficult; 8 = not difficult at all

TABLE II: PRIOR INFORMATION AND ADVICE ON MAMMOGRAPHY OBTAINED BY THE PARTICIPANTS INTERVIEWED

	Response	Number	%
Which item most useful in explaining reason for mammogram	Invitation letter	293	97.7
	Mass media	7	2.3
	Pamphlet	0	0.0
	Telephone enquiry	0	0.0
Need for more information about mammogram	Not necessary (1-3)	255	85.0
	Unsure (4-5)	45	15.0
	More information required (6-8)	0	0.0
Advised by someone concerning mammogram?	Yes	272	90.7
	No	28	9.3
Who advised? (n = 272)	Spouse	86	31.6
	Other family members	163	59.9
	Friends	18	6.6
	Doctor/health care provider	3	1.1
	Other	2	0.7
Type of advice received (n = 272)	Encouraged to attend (1-3)*	254	93.4
	Unsure (4-5)	17	6.3
	Did encourage (6-8)	1	0.4
Family or friends ever had mammogram?	Yes	55	18.3
	No	245	81.7
Who were they? (n = 52)	Family	22	42.3
	Friends	29	55.8
	Both	1	1.9
Advice received from persons who had been for mammogram (n = 52)	Encouraged to attend (1-3)*	27	51.9
	Unsure (4-5)	22	42.3
	Did not encourage (6-8)	3	5.8

*Eight point scale offered; 1 = strongly encouraged; 8 = did not encourage at all

TABLE IV: PARTICIPANTS' VIEWS ON THEIR SCREENING EXPERIENCE

	Response	Number	%
Waiting time*	Less than 10 minutes	0	0.0
	10-20 minutes	14	4.7
	20-30 minutes	23	7.7
	Longer than 30 minutes	263	87.7
Assessment of waiting time	Shorter than expected	124	41.3
	As expected	168	56.0
	Longer than expected	8	2.7
Level of discomfort during procedure due to pressure	Comfortable (1-3)**	27	9.0
	Uncertain (4-5)	167	55.9
	Moderately uncomfortable (6-7)	102	34.1
	Very uncomfortable	3	1.0
Privacy during the procedure	Adequate (1-3)**	292	97.3
	Uncertain (4-5)	7	2.3
	Inadequate (6-8)	1	0.3
Explanation from staff during procedure	Adequate (1-3)**	294	98.0
	Uncertain (4-5)	6	2.0
	Inadequate (6-8)	0	0.0

* from appointment time

** Eight-point scale offered; 1 = very comfortable; 8 = very uncomfortable, or 1 = adequate, no need for more; 8 = strong need for more (privacy, explanation)

and attitudes among various socio-demographic subgroups, we found that more highly educated women were more likely to express belief in the advantages of early detection, and were better informed of the efficacy and safety of the test (Kruskal-Wallis ANOVA $P < 0.05$ for association between educational level and response to each of these three statements). There was no difference between ethnic groups for statements 2 and 3, but Chinese were more likely than other ethnic groups to believe in early detection as advantageous ($P = 0.025$). Beliefs did not vary significantly with age. Interestingly, belief in the advantages of early detection was positively associated with past history of a Pap test, supporting the relationship between this attitude and the adoption of various forms of preventive health behaviour.

When asked what the most important reason for attending was, a large proportion of women gave answers which suggested a passive acceptance of the invitation for screening, rather than a proactive approach to preventive health. Figure 1 summarises the main categories of answers given, of which typical responses included:

- "They (the Ministry of Health) asked me to come, and it's free of charge, so I came"
- "Actually, I didn't want to come, but my daughter said: 'Since you have been chosen, why not take the opportunity of having a free check-up?'"
- "I wanted to know if there was any growth (in my breasts)"

TABLE V: PARTICIPANTS' RESPONSES TO STATEMENTS ON BELIEFS AND ATTITUDES HELD ABOUT MAMMOGRAPHY

Statement/response	Number	%
1 Benefits of early detection ("Even if breast cancer is detected early, there is very little hope of cure")*		
Agree	119	39.7
Disagree	143	47.7
Unsure	38	12.7
2 Efficacy of the test ("Mammography cannot detect very small lumps in the breast")*		
Agree	154	51.3
Disagree	45	15.0
Unsure	101	33.7
3 Costs of the test ("There are no harmful side effects to the mammogram")		
Agree	234	78.0
Disagree	2	0.7
Unsure	64	21.3

* These statements were deliberately phrased in the negative to reduce bias in response

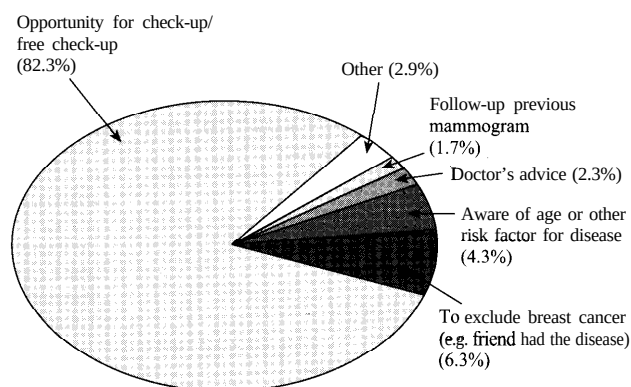


Fig. 1. Most important reason for participating in screening given by the 300 women interviewed.

Almost all the attenders (95.7%) indicated that they would be willing to be screened again in two years' time if invited. However, 16% felt that they should not be charged for the service, and 72% said that they considered anything up to \$50 to be a reasonable amount to pay for the test. Only 3% and 9.3% were willing to pay up to \$75 and \$100, respectively.

Discussion

We seek here to present a profile of women responding to a postal invitation for a free mammogram, with regard to their attitudes towards screening, their self-reported accessibility to the test and their screening experience. Our findings provide a basis for tailoring screening efforts to facilitate participation among those willing to attend. The reasons for non-attendance, and

factors associated with attendance are reported elsewhere" and are not intended to be addressed by the present study, as our sample population comprises attenders only. As mentioned earlier, care should be taken in extrapolating the results of this study to all screening attenders: although the women invited during the study period were similar in ethnic, educational status and marital status to the larger population, they tended to be slightly younger and less advantaged socio-economically.

Nevertheless, this study reveals several interesting features of the women who chose to attend for screening. Even among this group, the feeling that cancer is incurable is still relatively prevalent, with close to 40% agreeing that "even if cancer is detected early, there is very little chance of a cure". Previous studies which examined views of Singapore women have suggested that a belief in the benefits of early detection, and a confidence in the ability of the medical profession to intervene successfully may be one of the key motivators to breast screening.¹² It would be worthwhile exploring the effect of using this message in public education to encourage screening.

A large proportion (93.4%) of attenders had received some form of encouragement from their friends or family members. It is worth noting that those who spoke with someone who had experienced the test reported less than encouraging comments in almost half of the cases. Our previous qualitative studies¹² suggest that discomfort is a major concern among those who have had a mammogram, and this "barrier" is commonly passed on to friends and relatives. The experience in the United Kingdom suggests that anxiety about discomfort can be lessened by a sympathetic staff, and by the design of the screening centre.¹³ It is important that women feel able to express their fears and that the atmosphere at the centre is calming rather than clinical or, worse, claustrophobic. The impression left with the participant will determine if she subsequently advises other women for or against mammography.

Our results also show that the most important reason for attending cited was the need for a check-up, to be assured that all was well. Several women also expressed their decision as a passive response to a letter sent by the Ministry of Health. These reasons are similar to those described in the United Kingdom¹⁴ where 41% of women expressed the desire to make sure nothing was wrong, and 25% gave a reason such as "my doctor sent me" or "I just got the letter". It follows that many attenders correctly understand screening as being applied to asymptomatic women. At the same time, the (shrug) "might-as-well-go" view underlines the importance of removing barriers to screening for women willing to attend. In this regard, the fact that two-thirds needed to change their appointment suggests that retaining this

flexibility in future programmes is very important.

Among the women interviewed, the screening experience was generally acceptable. Slightly more than one-third experienced at least moderate discomfort during the procedure. This compares with the 53.3% who reported at least moderate discomfort in the Scottish Breast Screening Programme's acceptability study.¹⁵

Conclusions

In summary, this study provides a basis for incorporating participants' views in the planning for a local mammographic screening programme. It suggests that in many aspects, women in the study population were satisfied with their screening experience. At the same time, it emphasises the need for retaining the current flexibility in scheduling appointments, and in making special effort to create an atmosphere which will minimise the momentary discomfort felt during the test. It also identifies some of the attitudinal barriers to screening which were prevalent even among women choosing to attend. In the planning for future programmes, it is also worth noting that the majority of the women interviewed felt that anything up to \$50 was a reasonable amount to pay for a mammogram.

Acknowledgements

The authors would like to thank the women who participated in this survey, the staff of the Singapore General Hospital Mammography Centre for their help and cooperation and Miss Angela Chan for conducting the interviews. The Singapore Breast Screening Project is funded by the National Medical Research Council, Singapore Cancer Society and The Ministry of Health Endowment Fund.

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