

Singaporean Women's Perceptions and Barriers to Breast
and Cervical Cancer Screening

By Junyang Wang

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Thesis submitted in partial fulfillment of
the requirements for the degree of Masters of Science
in Duke Global Health Institute in the Graduate School
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ABSTRACT

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Abstract

Objectives: To understand the key factors guiding women's decision of whether or not to use breast and cervical cancer screening services (in order to determine how to cost effectively increase screening uptake in following conjoint).

Methods: We conducted eight focus groups, with Singaporean women aged between 40 and 64 for breast cancer screening, and between 25 and 64 years for cervical cancer screening, to identify the key factors that drive cancer screening. Using the Health Belief Model to guide our focus group questions, we analyzed the responses and compared similarities and differences among screeners and non-screeners.

Results: Singaporean women understand the severity of both breast and cervical cancer and fear the associated lifestyle challenges that come with a cancer diagnosis. With the exception of several non-screeners in the breast cancer group, all women reported they believed they were at risk of developing cancer. All women reported the benefits of early detection and accuracy of preventative screening. Both screeners and non-screeners feared cancer detection during screening and saw the screening clinic as a place of possible cancer diagnosis.

Conclusion: How women perceive their cancer diagnosis, accepting the cancer reality or succumbing to fatalist beliefs, greatly impacts their decision to screen. Screeners were more likely to report that they had recommendations from friends, referrals from doctors, and influences from promotion campaigns. Non-

screeners were more likely to have perceive fatalistic views (lack of control over a diagnosis (fatalism) was a unique barrier reported by non-screeners.

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1. Background

1.1 A Global Burden: Breast and Cervical Cancer

Among women, breast and cervical cancer account for a large percent of worldwide deaths today. The leading type of malignancy among women is breast cancer, yet cervical cancer is more common in some African nations (Cancer, 2014). From 1980 to 2000, global breast cancer incidence increased at an annual rate of 3.1% whereas global cervical cancer incidence increased by 0.6% (Forouzanfar et al., 2011). Challenges of modernization bring lifestyle changes, including urbanization, diet, obesity, tobacco and alcohol use, changes in reproductive patterns, chronic infection and increasing lifespans that all contribute to an ever-increasing cancer burden in Asian countries (Sankaranarayanan, Ramadas, & Qiao, 2014).

Although there are few recent descriptive reports detailing the epidemiology of breast cancer among Southeastern Asian populations, several studies show the incidence of breast cancer is rising in Asian countries; breast cancer is the most common cancer among Asian women and is expected to continue to grow for the next decade (Shin et al., 2010). Cervical cancer follows closely behind breast cancer and is the second most common cancer among Southeast Asian women. Although cervical cancer rates are decreasing in Singapore, they are dropping less rapidly among Chinese than any other

population (Cheah, Looi, & Sivanesaratnam, 1999). Still, South Asian women tend to be at lower risk for breast cancer than their white or black counterparts by 18% and 15%, respectively (Januszewski, Tanna, & Stebbing, 2014).

1.2 Singapore: Country Background

An island republic with a total population of 5.31 million, Singapore has a diverse resident demographic that consists of Chinese (74.2%), Malays (13.3%), Indians (9.2%), and other ethnic groups (3.3%) (Health, 2012). The majority of women are between the ages of 15-64, with a median age of residents at 37.2 years (Health, 2012; Statistics, 2005). Along with Malaysia, Brunei, Indonesia, East Timor and the Philippines, Singapore constitutes the peninsular and island countries of South-East Asia. These countries have a unique shared ethnicity, consisting of Chinese elements mixed with Austromalaysian influence and geographical contiguity that allows for useful grouping for studies of chronic disease prevalence as well as underlying risk factors. The Southeast Asian countries share many similar health problems, in particular an increasing cancer rate and an underlining need to develop a coordinated approach to research and control to halt the spread of disease (Moore et al., 2010).

Singapore differs from the other Southeast Asian countries in having an exceptional majority of Chinese and a high level of economic development that exerts a major influence on lifestyle, translating into a unique demographic to

study cancer incidence and mortality. As Singapore passes through the demographic transition, chronic non-communicable diseases will become more critical to address (Dans et al., 2011). Singapore would benefit greatly by identifying and establishing modern cancer screening services to face an already increasing growing cancer burden.

Among Asia, Singapore has the highest age-adjusted breast cancer incidence of any Asian nation or city, closely matching those of the West (Ng et al., 1998). A study in Malaysia found low cancer survival rates because of late presentation are higher among individuals of non-Chinese background (Leong, Chuah, Kumar, & Yip, 2007), posing an interesting challenge when implementing country wide programs in a population as diverse as Singapore.

1.3 Singapore: Breast and Cervical Cancer Prevalence

Cancer is the leading cause of death in Singapore, accounting for 29.3% of all deaths in 2009 (Ministry of Health Singapore, 30 June 2011). Ministry of Health data show that cancer made up 17.8% of all disability-adjusted life-years lost in 2004, with colorectal and breast cancer among the most common cancers locally (Phua, Chua, Ma, Heng, & Chew, 2009). Among women, the most common types of cancers include breast, colorectal, lung and cervical cancers (Singapore, 2010).

Since 1968, the incidence of breast cancer in Singapore has tripled, becoming the most common cancer among women (Adeline Seow, 2004). From 1980 to 2003, breast cancer mortality rates increased from 13.9 per 100,000 population to 14.8 per 100,000, becoming the second leading cause of cancer-related deaths in women. Among women aged 50–69 years old, the crude mortality rate for breast cancer was 47 per 100,000 compared to 16 per 100,000 in the 40–49 years age group in 2003 (Registry of Births and Deaths, 2004). While previous studies have shown that cancer detection technology in Singapore can compare to the mammography services in the West, participation is still relatively low. Reasons for relatively poor uptake are unknown but hypothesized to include high fees, poor attitudes towards breast cancer, and perceived low efficacy of early detection among the women (A. Seow et al., 1997; Straughan & Seow, 1995).

Cervical cancer incidence in Singapore ranks fifth among female cancers and is the second most common female genital tract cancer. Although it has shown a slight decline at 1.4% per annum since the 1960s, the incidence is still relatively high at 10.6 per 100,000 women/year from 1998–2002. Compared with Malay and Indian women, Chinese women seem to have a substantially higher risk for cervical cancer (almost 50–60%). The incidence of cervical cancer among women within the 35–64 years age is 21.9 per 100,000/year (Adeline Seow, 2004). Previous studies suggest that women who attend pap smear screening tend to be

conducted in private clinics and tend to be better educated, suggesting over-screening in a select group of women and a need for more outreach to socially disadvantaged women with less education (Ministry of Health, 2001).

1.4 Screening intervention efficacy

Screening programs can aid in the early detection of several of these cancers and allow for successful treatment. Which cancers are suitable candidates for population-level screening programs is contingent on the availability of: (i) diagnostic tools which can be used in routine population-level screenings; and (ii) effective treatment interventions. Breast and cervical cancer both satisfy these criteria. Breast cancer can be detected using mammograms and screening has been shown to decrease mortality in women aged 50 and over (Organization, 2002). Cervical cancer can be detected through the use of Papanicolaou (Pap) smear screening and routine screenings have been shown to reduce cancer-related mortality (Organization, 2005).

The national cancer management plan for common cancers implemented strategies that spanned primary to tertiary services, including early disease detection, effective treatment, and rehabilitation (Ministry of Health, 2000). Singapore's focus on breast and cervical cancer screening programs are a direct result of population based programs that have shown significant survival benefits in the screened population for these malignancies (Organization, 2002, 2005).

Two national-level cancer screening programs have been initiated in Singapore: The National Breast Screening Program, BreastScreen Singapore (BSS), launched in January 2002 to provide mammography services for women aged 40 and over (Wang, 2003); and the National Cervical Screening Program, CervicalScreen Singapore (CSS), launched in August 2004 to provide regular Pap smear screening to women aged 25-64 (Yeoh, Chew, & Wang, 2006a).

These screenings are offered at both private general physicians and at polyclinics (at subsidized cost). The goal of the BSS program is to achieve an enrollment target of 70% participation by women in this age group by 2008 whereas CSS aims to achieve coverage of 80% of the targeted women attending for regular screening by 2010. Mammography screening has only been recently introduced in Singapore in the 1990s and still has relatively low adoption rates, probably due to the high fees and low perceived efficacy of early detection among women. Pap smear has been provided in Singapore since 1964, but only 50% within the targeted age group of 35-64 years had undergone pap smear screening within the recommended triennial screening (Yeoh, Chew, & Wang, 2006b). Payment is in cash though, from July 2011 onwards, patients will also be able to use their Medisave account to pay breast cancer screenings (Ministry of Health Singapore, 30 June 2011).

Although these programs have been effective at increasing the reach of cancer screening programs, many Singaporeans do not receive screenings

consistently with recommended guidelines (Ministry of Health Singapore). Despite the availability of information and recent increased accessibility to national cancer screening programs, knowledge and awareness alone are not sufficient enough for the adoption of preventative health screening. The reasons for lower than expected uptake in these programs remain unexplained (Yeoh et al., 2006a). In addition, there is a particular concern for low screening adoption among women who are less educated (Ministry of Health Singapore). There are few studies specifically addressing the increasing burden of breast and cervical cancers among women and why they choose not to screen. To our knowledge, no other studies have fully investigated the qualitative reasons women choose not to screen, especially the difference in behavior between screeners and non-screeners.

There is a need to understand cancer screening and implement effective interventions for this population. The primary aim of this study is to identify the key factors in the decision to undergo screening programs separately for breast and cervical cancers. A secondary aim of this study is to use the results from this qualitative study to develop a following conjoint study to cost-effectively increase the reach of the programs for all Singaporean women, including those with lower incomes and education. Special attention will focus on the extent to which targeted information such as the allowance of Medisave funds, modest incentives, bundling screenings with other services (such as flu shots) can increase screening uptake.

Because breast cancer incident rates are not as high in South Asian women as their White or Black counterparts (Januszewski et al., 2014), cost-effectiveness of mammogram services among Asians has been debated (Wong, Kuntz, Cowling, Lam, & Leung, 2007). However, in women with high-risk characteristics, such as BRCA1/2 mutations, additional MRI screening in combination with regular mammograms have been shown to be cost-effective (Taneja et al., 2009). Pap smear was found to be highly cost-effective in clinical trials and economic studies of HPV vaccines in various countries (Techakehakij & Feldman, 2008). In addition, the new HPV vaccination for cervical cancer is a cost-effective strategy and provides a possible strategy to reduce the impact of HPV infection (Lee, Tay, Teoh, & Tok, 2011). To our knowledge, there are no newer studies that explore rates of adoption of cancer screening services in comparison to other preventative medical services that may explain why women do not go in for cancer screening.

The data gathered will be used to design a better national screening program targeting the women who are not currently screening. Understanding the state of public knowledge about cancer risks and cancer screening programs will aid in targeting ongoing public information campaigns and make programs more effective. If detected early enough, both breast and cervical cancers are treatable and potentially curable. Simple and cost-effective tests are available which can be used to detect cancer before symptoms appear (Society, 2014).

1.5 Health Belief Model Conceptual Framework

The majority of women's knowledge of and access to breast and cervical cancer screening research has been conducted almost exclusively in Western countries (USA, UK, Australia, Canada, and Sweden) that employ organized cervical screenings (Markovic, Kesic, Topic, & Matejic, 2005). The lack of a more holistic international view of cancer screenings suggests a need to understand how differences in medicine, health seeking behavior, and cultures of other countries affect adoption of cancer screening. The use of theory to help construct and explain women's preventative cancer screening challenges is critical to building upon previous findings (Rimer & Glanz, 2005). Several theories were considered upon forming this study, but we eventually considered to use the Health Believe Model (HBM).

The HBM focuses on determining perceptions of the threat posed by a health problem (susceptibility, severity), the benefits of avoiding the threat, and factors influencing the decision to act (barriers, cues to action, and self-efficacy) to diagnose what is encouraging or discouraging people from participating. An understanding of how susceptible the target population feels to the health problem, whether they believe it is serious, and whether they believe action can reduce the threat at an acceptable cost is an important first step at understanding the low rates of screening adoption. Because we wanted to explore the factors

influencing an individual's choice to screen, our study used the HBM to understand challenges to increasing cancer screening rates. Therefore, this study attempts to better understand the barriers and challenges to screening behavior among Singapore women. Following a Health Belief Model (HBM), we attempt to address women's knowledge, beliefs, and social attitudes towards the health care system, physicians, and media's influence on women's cervical cancer screening practices.

2. Purpose of the Study

The objective of the qualitative inquiry is to gain an in-depth understanding of women's breast and cervical cancer screening behavior with a particular focus on:

- Women's perception of susceptibility and severity to breast and cervical cancers
- Impact of individual knowledge regarding existence of screening services for these cancers
- Perceived barriers and motivations for seeking breast and cervical cancer screening among screeners and non-screeners

The qualitative data will contribute independently to our understanding of women's preferences, knowledge, and potential misconceptions regarding breast and cervical cancer screening programs as well aid in the development of a future conjoint analysis survey questionnaire.

3. Methods

We performed a review of the literature on the utilization of breast and cervical cancer screening services, with a special focus on barriers to uptake and strategies that have proven successful in overcoming these barriers in other settings. Using past studies to guide our design, we decided to conduct a series of focus groups in order to qualitatively uncover issues within the Singaporean context. The goal of the literature review and focus groups is to identify the key factors that guide the decision to undergo cancer screening. Our focus group strategy is described below.

3.1 *Setting and Study Population*

We conducted focus groups (FGs) with Singaporean women aged 40 to 64 for breast cancer screening and between 25 to 64 years for cervical cancer screening. These age groups are those targeted by the National Breast and Cervical Screening Programs, respectively. We used purposive sampling to provide a range of demographic characteristics (age, marital status, and socioeconomic position measured through education and type of housing) and used a survey company to recruit matching participants from their database (See Table 1 and 2). We identified screeners as those who follow Singapore Health Promotion Board screening guidelines. Mammogram screeners are women who screened in the last year (if aged between 40 and 49) and in the last 2 years (if

aged 50 and above). Pap smear screeners are women who screened in the last 3 years. Phone calls were made to check their eligibility and interest to participate in the study. Participants were then sent a formal letter of invitation from Duke-NUS to participate in our study.

For each session, 10 potential participants will be invited but only up to 8 of them will form the focus group. Excess participants will be turned away and still given the same incentives as those who complete the focus group session. Participants who completed the discussion were reimbursed with \$70 supermarket voucher each. The FG method was chosen as it encourages communication between people, helping them to explore and clarify their own views and beliefs regarding various aspects of breast and cervical cancer screening (Kitzinger, 1995). The FGs were stratified according to screeners and non-screeners of cancer screening services, language spoken (English or Mandarin), and type of program (cervical or breast cancer screening). We hired two moderators, identified by the survey company, to adapt to the primary language of each session, one for the English session and one for the Chinese session. For the Chinese session, the Chinese moderator directly transcribed into English.

3.2 Health Belief Conceptual Framework

An interview guide developed by the research team based on the Health

Belief Model served as the starting point for the FGs. (Gillam, 1991; Janz & Becker, 1984) The Health Belief Model (HBM) is widely used in the Public Health field to address an individual's choice to participate in health programs (Rimer & Glanz, 2005). The HBM focuses on determining perceptions of the threat posed by a health problem (susceptibility, severity), the benefits of avoiding the threat, and factors influencing the decision to act (barriers, cues to action, and self-efficacy) to diagnose what is encouraging or discouraging people from participating. An understanding of how susceptible the target population feels to the health problem, whether they believe it is serious, and whether they believe action can reduce the threat at an acceptable cost is an important first step at understanding the low rates of screening adoption.

Because we want to explore the factors influencing an individual's choice to screen, our study used the HBM to understand challenges to increasing cancer screening rates. An interview guide developed by the research team based on the Health Belief Model served as the starting point for the focus groups. Under this framework, we included open-ended questions to assess participants' perceived susceptibility to breast/cervical cancer, perceived severity of breast or cervical cancer, perceived benefits of screening for these cancers, perceived barriers for undergoing screening, and perceived motivations for screening. The focus group facilitator used prompts, probing questions and laddering techniques to uncover the participants' personal values, ensuring that all participants had an equal

opportunity to contribute to the discussion. Participants were encouraged to discuss and debate the questions among themselves so that ensuing discourse reveals participants' thoughts and feelings. This method of interviewing encourages participants to explore meaning and understanding using their own language and experiences, and often takes research down unexpected avenues. Each topic was conducted until the same themes were repeated and no new themes emerge. Our broad approach to understanding and identifying the factors of prevention uptake allowed us to uncover themes that might have been overlooked in the existing literature.

3.3 Demographics

Participants in the breast cancer group were primarily Chinese middle aged women who were housewives or unemployed after obtaining their secondary degree education. The majority of women in the breast cancer screening group were in the 50-59 age group, with a median age of the all breast cancer focus group participants being 53. Highest education level achieved spanned from Primary to University level setting but the majority held a Secondary degree education. Among occupations, the majority of individuals were stay at home mothers/housewives which differed from the members of the cervical cancer groups who were white collar technical workers (see Table 1).

Table 1: Summary Table, Breast Cancer Focus Groups N = 4, total number of women = 32

Age		Marital Status	
40 - 49	7	Single	4
50 - 59	19	Married	28
60 +	6		
Education		Occupation	
Primary or Less	5	Professional	3
Secondary	17	Technical-white collar worker	2
A Level	3	Service Industry Employee	1
Polytechnic	5	Self Employed/Freelancer	6
University	2	Part Time/Tutor/Assistant	6
		Home Worker/Unemployed	12
		Retired	2
Race			
Chinese	30		
Indian	1		
Pakistani	1		

Participants in the cervical cancer group were primarily Chinese middle aged women who work in technical-white collar occupations after obtaining their secondary degree education. The majority of women in the cervical cancer screening group were in the 47-55 age group, with a median age of the all cervical cancer focus group participants being 51. Highest education level achieved spanned from Primary to University level setting but the majority held a Secondary degree education. Among occupations, the majority of individuals were employed in the white-collar technical occupations (see Table 2).

Table 2: Summary Table, Cervical Cancer Focus Groups N = 4, total number of women = 32

Age	Marital Status
------------	-----------------------

25-34	6	Single	9
35-46	8	Married	20
47-55	10	Divorced	3
56-65	8		
Education		Occupation	
Primary or Less	2	Professional	5
Secondary	12	Technical-white collar worker	11
A Level	5	Service Industry Employee	3
Polytechnic	7	Part Time/Tutor/Assistant	8
University	6	Home Worker/Unemployed	2
		Retired	3
Race			
Chinese	28		
Malay	2		
Indian	2		

3.3 Data Analysis

Data collection included video and audio recording that was later transcribed verbatim by professional translation services provided by the survey company. The interviews were digitally recorded for transcription and translation and then entered into Excel for coding. In general, our data analysis followed standard thematic analysis involving (1) immersing oneself in the data and becoming familiar with the data; (2) generating initial codes; (3) searching for themes; (4) reviewing and refining themes; (5) defining and naming themes, and (6) producing a report (Braun & Clarke, 2006).

All focus groups transcripts were first coded to highlight important responses. Coding was done by two members of the research team who coded each session separately but met afterwards to compare results. Using this report,

the research team compiled all the coded focus group transcripts to produce a master coding frame for both breast and cervical cancer FGs. This master coding frame was updated upon completion of each transcript with new codes or modifications to existing codes to better fit responses. With a list of codes from the master coding frame, thematic analysis was used for consolidating important themes that women responded to by answering the research questions. This unique master coding frame was then used to identify patterns and key narratives underlying the discussions within each relevant cancer group. The themes were identified in each transcript and then cross-checked by sharing the results with the entire team. The research team discussed the final coding themes and reached a consensus on the emergence of themes and interpretation of patterns. Discursive analysis was also used to analyze topics that may not have been brought up in every session due to the unique flow of each focus group conversation, but uncovered deep insights that helped to explain the variance of cancer screening behavior. Combined, these two methods are not dependent on any theoretical framework but provided adequate flexibility for analysis.

Similarities and differences among focus groups were compared by using discursive and thematic analysis, categorizing emerging patterns. Specifically, we designed our study to separate screeners and non-screeners to try and understand underlying patterns in responses that would explain the difference in

screening behavior. The results of the analysis is summarized in a table and possible explanations for screening differences detailed in the discussion section. The findings from these focus groups will then be used to design a conjoint analysis survey aimed at using targeted information, estimating the relative importance of select factors, and identifying how incentives (such as use of Medisave funds, advertisements, and other strategies identified via the focus groups) can be used to increase screening uptake.

4. Results

4.1 Breast Cancer

Table 3: Summary of Findings - Health Belief Model and Breast Cancer

Topics	Themes
Perceived Susceptibility	<ul style="list-style-type: none"> • Risk factors include diet, family history, absence of sexual activity, stress, radiation emitted from machines, and age • Women’s perceptions of personal breast cancer risk ranged from 0% to 50% irrespective of screening experience • Non-screeners reported lower personal risk than screeners, with many non-screeners reporting a 0% chance of developing cancer
Perceived Cancer Severity	<ul style="list-style-type: none"> • Perceived severity of cancer diagnosis fell into four main categories: increased social stigma, adapting to life with cancer, fears of unknown treatment, and loss of identity as a woman • Women feared removing their breasts and how cancer treatment can demoralize and make them feel as if they were “not wholesome-not a whole lady” • Having cancer impacts many life functions and forces the individual to adopt many lifestyle changes • Even if the cancer is treatable, women report a post-op fear of being a family burden, feeling like a financial burden, and associate cancer with a “death penalty”
Perceived Mammography benefits	<ul style="list-style-type: none"> • Despite general awareness of mammograms many individuals do not screen • Women reported mammograms provide accurate readings yet doubt they can catch cancer in early stages • Non-screeners reported relying upon self-checks before going in for a mammogram
Perceived Barriers	<ul style="list-style-type: none"> • Primary barriers to mammogram screening include: fear of cancer detection, screening pain, side effects, and belief that screening is “looking for trouble” • Some women reported possible side effects from radiation from technology, including mammograms

	<ul style="list-style-type: none"> • Fear of cancer detection is a big barrier and women often choose not to go because they feel “you are looking for trouble” • Both screeners and non-screeners feared cancer detection during screening and saw the screening clinic as a place of possible cancer diagnosis • Fear of screening pain is a common concern among screeners and non-screeners, especially bad peer experiences that discourage screening
Cues to Action	<ul style="list-style-type: none"> • Motivation for screening vary from women to women but there is noticeable difference between screeners and non-screeners • Screeners generally tend to have more support from family or friends to get screening • Non-screeners reported relying on self-diagnostics and do not get a mammogram until the diagnosis identifies an abnormality

Topic 1: Perceived Susceptibility: Breast Cancer Knowledge/Personal Risk

Accurate knowledge about risk factors for cervical cancer was a predominant theme among all focus groups. Overall, women reported an understanding of factors contributing to breast cancer that include diet, family history, absence of sexual activity, stress, radiation emitted from machines, and age. Women’s perceptions of personal breast cancer risk ranged from 0% to 50% irrespective of screening experience. However, non-screeners reported lower personal risk than screeners, with many non-screeners believing they had a 0% chance of developing cancer. One non-screener reported that *“I have so many illness, I think there’s is no space for it. (laughter) I’m diabetic, I have rheumatism, I have crooked feet, I’m asthmatic, I drink, I smoke, I’m just enjoying life la, if it has to have come it’ll come. I don’t think so, touchwood la, because no family history.”* (A7) In the

absence of adequate knowledge about breast cancer risk factors, some women readily admitted their ignorance by stating “I don’t know”. In general, women had high cancer awareness and believed they were personally at risk regardless of focus group.

Topic 2: Perceived Severity: Breast Cancer Challenges

Thematic analysis identified four primary challenges and fears women have when facing breast cancer: increased social stigma, adapting to life with cancer, fears of unknown treatment, and loss of identity as a woman. Women who had not screened before reported more concern about cancer treatments and expressed more fears associated with unknown treatment. *“... I don’t know like...what kind it would be? Will needles be involved? Because I’m afraid of them. Even when I go for an operation, will you make me go sleep first before jabbing me...”* (A5)

Both screeners and non-screeners reported fears of losing their womanhood and husbands as a consequence of breast cancer. Women spoke to the difficulties associated with removing their breasts and how the physical side effects of cancer treatment demoralize and make them feel as if they were “not wholesome-not a whole lady”. *“...Apart from losing the breast, she has to suffer from other side effects of the treatments. She lost her hair and her eyebrows. She felt that she was no longer like a woman. She felt really miserable...”* (E5) This fear of losing their identity was a recurring theme in other areas following cancer diagnosis. In addition to losing their woman-hood, women reported fear of losing their job,

losing their husband, and losing their friends to cancer stigma. Women elaborated on stories of colleagues who suffered great physical and mental challenges associated with breast cancer.

“...My colleague had breast cancer and she shut herself up initially and she became very depressed. We also did not know what to say to comfort her. She was very lost and she didn’t know people around her would view her and her sickness. She felt that she was such an unfortunate person. She wondered why she would end up in that state. So I think it is a very complicated state of mind...” (E7)

These second-hand stories shared by friends and family who had been diagnosed with cancer detail the complicated physical and emotional suffering that participants fear. Having cancer impacts many life functions and forces the individual to adopt many lifestyle changes. *“...There are many things on the mind of a woman who is confirmed having breast cancer. Really. Really. To her, it is like a death penalty unless that person is very strong. If it is someone who is not so brave, she won’t be able to take it...” (E7)* Even if the cancer is treatable, women report a post-op fear of being a family burden, feeling like a financial burden, and not being able to take anymore pressure, as if cancer was a “death penalty”.

Topic 3: Mammogram Knowledge/Test Experience

Thematic analysis identified most women had knowledge of mammograms. Although all individuals are aware of mammograms, responses to what the procedure is like, the pain threshold, cost, how often, and where to get a mammogram varied. As expected, screeners had greater knowledge than

non-screeners about mammogram services and were more accurate in providing information on actual screening procedure. Most women reported that the mammogram was painful and was a barrier to screening. Perceived costs of the mammogram varied from being free at public clinics to costing over 200\$ after subsidy at private clinics. The range of supposed screening frequency varied from every half year to every two years, with non-screeners reporting the latter. *“I just heard that a mammogram is to detect the cells of the cancer, then uh, but I heard some say ah, mammogram sometimes they cannot detect also. then those who went for mammogram, still they get breast cancer. Is what i heard la...(A6)* Although both screeners and non-screeners believe they are personally at risk for breast cancer and that the mammogram was an accurate reading, women in both groups mentioned that mammograms cannot detect cancer if the cancer is early stage.

Topic 4: Fears of Mammogram/Barriers to Cancer Screening

Women readily discussed barriers to promoting or maintaining preventative screening practices. Thematic analysis identified four primary barriers to getting a mammogram: fear associated with cancer detection, screening pain, inconvenience, and belief that screening is “looking for trouble”. Inconvenience included location to nearest mammogram service provider, long waiting queues, absence of reminder appointments, inconvenient appointments, and general procrastination. Because breast cancer awareness has been an issue raised by the government, many individuals are aware of the risks but may find

it difficult to adapt their lifestyles to accommodate for screening. *“I think our generation should be pretty aware and pretty well informed but maybe my mother’s generation or something, then people may not want to go. I think nowadays-“* (B5)

Older individuals may not be as knowledgeable as the younger generation and their relative lack of knowledge may be an influential barrier.

One unique side effect both screener and non-screener reported was the possibility of radiation emission inducing cancer. Increasing prevalence of technology and effect radiation emitted from machines all have negative effects on our bodies, including mammograms. Several women reported potential radiation emitted from technological machines today. One screener shared that a media program made her believe that even mammograms have enough radiation to trigger and induce breast cancer itself.

“ I watched a Taiwan TV programme and they advocated that if there is no good reason, you should not go for a mammogram. They said that mammogram will affect the tissues/cells in your breast . You may turn from “healthy” to “unhealthy”. Ah...” (F1)

Women reported screening pain to be a significant barrier to getting a mammogram. Women who have screened before report everything from slight physical uncomfortableness to terrible pain associated with mammograms. Some screeners reported that they now use self-checks rather than go in for a mammogram. Non-screener choose not to screen because of a fear of screening pain supported by colleague experiences who have screened. Similarly, their reports associate mammography with pain, discomfort, and sometimes can lead

to bleeding. Even when they are armed with the knowledge that early cancer detection is important and beneficial, non-screener report the fear of pain as a bigger barrier.

"I would go. Actually I felt, the whole thing is, is important to know. even though it is far or costs a little bit more, you know, i think its, its important. (laughter). the reason why i didn't go is because there are a lot of friends who went through, they said "eh very painful you know, very painful you know" oh my very painful."(A5)

The fear of cancer detection upon screening remains one of the largest barriers to screening. Both screeners and non-screener reported fear in going to mammogram clinic because they associate it with risk of cancer detection.

Although both screeners and non-screener feared cancer detection, non-screener tended to report subsequent fears of unknown treatment, ineffective treatment, the stress associated with waiting for the test result, and a general lack of control over the overwhelming cancer diagnosis.

*"After my last test, the nurse told me to go back to wait for the letter or a call. (*laugh) They said they may call me for further examination if there is a need. They gave you two possibilities. I kept thinking whether I would be receiving a letter or a call. I was anxiously waiting for two weeks." (E6)*

Many non-screener also reported a common assumption that women often choose not to go because "you are looking for trouble if you go test". This belief that you will get cancer if you screen is a primary barrier and deterrent to screening behavior. Even screeners empathized with their fellow non-screener colleague's fears of detecting cancer upon mammogram screening. *"yah...some people would think in that way. Without checking, they are fine but after going for one,*

something bad will happen to them. So they don't want to check." (F3) The idea that cancer screening is similar to "asking for trouble" remained a common theme throughout all focus groups. We propose that how one perceives a cancer diagnosis plays a vital role in determining how they choose to overcome this general fear of cancer detection further in our discussion.

Topic 5: Motivations for Mammogram

Motivations and cues to screen vary from women to women. The most common reported factors that motivated screening behavior were: doctor's referral, peer and family influence, lower screening costs, and a detection of abnormal lumps. Screeners reported more support and pressure from others to get screening, whereas non-screeners primarily relied on self-diagnostics and would not get a mammogram until the self-diagnosis identified an abnormality.

Women who had a family history or had an awareness and knowledge of cancer in their family were more likely to undergo mammograms. Women also mentioned the importance family, relatives, and peers played in pushing one to go in for a screening. *"Actually I wanted to go. But I didn't- I was too lazy to do anything about it until my friend pushed me to go."* (B5) Discussion groups focusing on education and raising awareness of preventative screening practices also served to motivate individuals to see mammograms as regular and important to complete. *"Yeah, but actually err also procrastinated a long time until like in a discussion group, then everybody has done, I'm the only- two of us, there's two of us, so*

they said you two better go". (B6) Finally, women reported a doctor's referral, irrespective of public or private physician as long as they are a trusted medical authority figure, as primary motivations to screen. "Not exactly, because err they're private. I think they... they push you to the front. I go to my gynae and she recommended. Yeah so..." (B3)

Women reported detection of abnormal lumps through self-examination as a primary motivation for first time screenings. Both screeners and non-screeners rely on self-examination as a first line measure of diagnosis, however non-screeners solely rely on self-examination and do not use mammograms. *"...I think for this breast hor, we can do self-examination so I am not so worried. If you feel any hard lumps, you should see a doctor immediately." (E4)* Women who experienced finding an abnormality were much more likely to consult their doctor and undergo screening. Although identifying a lump is a primary motivation to go for a check-up, not all individuals will adopt preventative screening practices.

"It's only when we have lump.. I had a lump once, I was.. I was terrified, but then.. It just went la. You just pray to god then it just goes. (laughter) Ya.. You just pray.. (laughter) Because you, you. Like, like your family member advice you, eh tomorrow better go and check, then you just pray, oh god, please, then morning you see its gone. then YAY. (laughter) you know, but if you have a lump then you worry, you know, then you worry about your breast, otherwise.. it's public." (A7)

Participants vary drastically in their decision to screen. As illustrated by the above example, women still fear the diagnosis of cancer and may rather not worry about screening until abnormalities are discovered.

4.1 Cervical Cancer

Table 4: Summary of Findings - Health Belief Model and Cervical Cancer

Topics	Themes
Perceived Susceptibility	<ul style="list-style-type: none"> • All women reported knowing they are at risk for cervical cancer • Risk factors include lifestyle, diet, stress, smoking, family history of cervical cancer, number of sexual partners, and sexual activity
Perceived Cervical Cancer Severity	<ul style="list-style-type: none"> • Screeners reported greatest challenges being: fear of death, fear of ineffective treatment, fear of being a family burden, and fear of suffering due to treatment. • Non-screeners reported their greatest challenges were: high social stigma, loosing work, blaming oneself, loosing will to live and suicide • In general, there is a difference between how screeners and non-screeners perceive a cervical cancer diagnosis • Screeners tend to accept cancer reality but also focus on ways of moving forward • Non-Screeners struggle more with a defeated reality of cancer, often mentioning the denial and lack of control in accepting cancer reality
Perceived Pap Smear Benefits	<ul style="list-style-type: none"> • Despite general awareness of pap smears many individuals do not screen • Women have poor knowledge of pap smear procedures • Women believe pap smears provide accurate readings yet doubt they can catch cancer in early stages • Some women reported possible side effects such as scraping of the cells in the cervix and bleeding
Perceived Barriers	<ul style="list-style-type: none"> • Primary barriers to pap smear include: screening pain, anxiety with screening results, discomfort with procedure/male

	<p>doctor, and a belief that you will get cancer if you look for it</p> <ul style="list-style-type: none"> • Both screeners and non-screeners mentioned that individuals avoid cancer screening because they would rather not know they have cancer • Women reported feeling uncomfortable with the sensitive nature of the procedure, the cold instruments, the vulnerability, and the lack of empathy from the doctor, irrespective of gender
Cues to Action	<ul style="list-style-type: none"> • Doctor’s advice is the primary source of screening motivation • Even if participants have a friend or family motivator, some participants still struggle with undergoing cancer screening

Topic 1: Perceived Susceptibility: Cervical Cancer Knowledge/Personal Risk

Thematic analysis identified that women’s knowledge about cervical cancer risk factors centered around lifestyle, diet, stress, smoking, family history, number of sexual partners, and sexual activity. There was no significant difference in responses to cervical cancer knowledge between screeners and non-screeners. Different from breast cancer focus groups, all women believed they were personally at risk for cervical cancer, irrespective of screening experience. In the absence of adequate knowledge about breast cancer risk factors, some women readily admitted their ignorance by stating “I don’t know”. Regardless of screening experience, all women reported that cancer treatment is more effective if caught in early stages.

Topic 2: Perceived Severity: Cervical Cancer Challenges

Discursive analysis identified that all women perceived the severity of having cervical cancer, albeit none had any personal experience and only a few reported knowing someone facing cervical cancer. In the absence of adequate knowledge, women referenced what they heard and feared from knowledge of other types of cancer diagnoses. *"...Maybe the pain that I will go through and I don't know when I'll pass off"* (D8) Several participants mentioned the lifestyle changes demanded by a cancer diagnosis.

"...it actually affects everything around you. From your family, your personal, your work life, your social life, everything is affected...They will see you or you will always carry a stigma with you when people found out that you were once a survivor, cancer survivor" (C6)

Screeners and non-screeners reported different challenges associated with having a cancer diagnosis. Among screeners, challenges of having cancer include several different kinds of fears: fear of death, fear of ineffective treatment, fear of being a family burden, and fear of suffering due to treatment. On the other hand, non-screeners reported less control over a diagnosis like cancer than their screener counterparts. Non-screeners reported the greatest challenges associated with a cervical cancer diagnosis were: high social stigma, losing work, blaming oneself, losing the will to live and suicide.

Although both non-screeners and screeners reported social stigma associated with being diagnosed with cancer, only non-screeners reported feelings of blaming oneself and losing the will to live. *"And it feels like you did it you know? I don't know why but it feels like you caused it."* (C1) When asked what it

would be like to have a cancer diagnosis, one non-screener reported that *"I think the person herself might go in denial, she might just give up, suicidal."* (C7) There is a difference between how screeners and non-screeners approach acceptance of a cancer diagnosis. Non-Screeners struggle more with a defeated reality of cancer, often mentioning the denial and lack of control in accepting cancer reality. Screeners tend to accept cancer reality but also focus on ways of moving forward.

Topic 3: Perceived Benefits: Pap Smear Knowledge/Test Experience

Women were aware of pap smears but readily admitted their ignorance to the procedure details. Almost all participants believed the test to be accurate but some noted that the test fails to detect cancers at early stages. Poor knowledge of pap smears was a predominant theme among all focus groups. Non-screeners reported having little knowledge and shared more concerns over the procedure: intrusiveness, pain, or discomfort with the sensitive nature of the procedure. Women who did have knowledge and opted to share their statements generally reported positive experiences with pap smears.

One screener, however, mentioned that the fear of pain from screening was a direct result of a bad experience and that she would not go for screening again. *"....Because I have been scared. Because the last time I did it, I was having pain. At the clinic, I tried to bear with it. It was also a male doctor, Then after that, I told myself I won't do it again. And truly, I did not do it again."* (G1) Perceived costs of the pap smear varied from being free at the cancer center to costing over 100\$ at private

clinics. The range of supposed screening frequency varied from every year to every three years, with non-screener reporting the latter. Responses to when women should start screening ranged from starting when sexually active to beginning at the age of fifty.

Topic 4: Perceived Barriers: Fears of Pap Smear/Barriers to Cancer Screening

Thematic analysis identified that fear of cancer detection was a primary barrier to cancer screening among all women. Beyond the fear of cancer detection, women reported fears associated with pap smear itself that prevented screening behavior including: fear of screening pain, anxiety with screening results, discomfort with procedure/male doctor, and a belief that you will get cancer if you look for it. Fear of screening pain was a unique concern shared among non-screener who had never undergone the procedure more than screener who had already had a pap smear. One non-screener mentioned that listening to others share pap smear experiences made her fear screening even more: *“Ya. But after all the sharing especially you (C6)... you said it’s not only the entrance right, you say it’s quite deep in right. More scary now” (C4)* All women, even those who have screened before, reported experiencing fear and anxiety associated with screening because of the possibility of cancer detection.

“Actually, honestly speaking, all of us here have done it before, right? We all feel alright. We didn’t feel any ill-effects. But there is still fear and anxiety. If not, it is ok. Like she said (looking at G8), we were worried about the result. During the test, we were wondering whether it would be very painful. laugh” (G1)

Women reported feeling uncomfortable with the sensitive nature of the procedure, the cold instruments, and the vulnerability and exposure they put themselves in. Non-screeners generally report fears of pain and feeling uncomfortable with male doctors performing such a test. Screeners who had undergone the procedure had a diverse range of opinions based on their experience. Some shared similar concerns with non-screeners and shared their concerns of vulnerability “on the table” with male doctors who were “unpleasant” and made the examination uncomfortable. Others reported they preferred male doctors than women doctors because women are rough and less empathetic. The theme of empathy was a common desire among all women. Women reported wanting to receive support through this stressful and sensitive procedure.

“Yes because male is more empathetic. Female, little bit you also cry or scream, you know that kind of thing. They not empathetic it's like all women can do it you can do it. Male is different they will be like, oh yes yes it's very painful, you know very empathetic” (D5)

A recurring theme that was repeated by women in both groups was the “belief that you will get it [cancer] if you look for it”. One participant said it's the fear of cancer detection that prevents individuals from going. *“... 'mo tai ji chui tai ji' (nothing better to do) (laughter) may be if you don't go for any check-up then nothing will happen. But if you go, some kind of problems will appear. 'Jia lat' !(it's too bad) (H4)* Both screeners and non-screeners mentioned that individuals avoid cancer screening because they would rather not know they have cancer. *“...Many people*

are scared of the result so they don't want to go for it. They rather not know about it. That is their thinking. Sometimes, they also fear the pain. Because not everyone can handle..."(G3) In this "ignorance is bliss" perspective, women reported not knowing about a cancer diagnosis may allow you to live a happier and carefree life by ignoring the possibility of getting cancer. *"Like she said (looking at G3), you rather live happily without knowing it. *laugh"* (G1) The belief that "you will get it if you look for it" mentality is a primary barrier to undergoing cancer screening.

Although women know that early detection is beneficial, the fears associated with being diagnosed with cervical cancer may be too overwhelming. Screeners and non-screeners differ in how they accept cancer reality that further impacts their screening decision. Furthermore, the belief that you will get cancer if you are looking for it adds additional risk of cancer detection and prevents women from seeking preventative behavior, choosing to ignore and live a blissfully ignorant life instead.

Topic 4: Cues to Action: Pap Smear Motivation

A doctor's order for a pap smear still remains the most influential motivator for cervical cancer screening. Some women reported they would prefer to follow the recommendations of a trusted family doctor, but many still report they would follow the doctor's advice even they didn't have any relationship and trust in him/her. *"Will follow recommendation even if don't really trust."* (C8) On the other hand, other women reported that they would have

more faith in a doctor they are friends with, and not any doctor. *“Unless it’s my doctor friend. Because normal doctor they tell you all kinds of thing.”* (C7) Friends, family, and even cancer survivor stories remain important motivators for cancer screening. *“If someone has done it and she gives me the assurance that it’s only surface thing ah then I will go (C4)”*

Still, even if participants have a friend or family motivator, some participants still struggle with undergoing cancer screening. One participant urged her mother to start cervical cancer screening but still has not gone herself. *“So for 58 years she never did it. So I dragged her to the clinic... So she believes that if you don’t do you wont get it ”* (C1) Despite being a motivation for her mother, surprisingly, this participant reports she has not yet undergone screening and is still scared about going. *“I dare not go, I don’t know why I very scared. Everytime they ask me to go but I dare not go”* (C1)

The primary motivation for cervical cancer screening appear to be a doctor’s recommendation. Different from breast cancer, cervical cancer is less common and harder to have relatives or peers that have undergone such experiences. Women therefore turn to medical authority, despite some being skeptical of a doctor’s trustworthiness, women lack the knowledge of cervical cancer and are primarily motivated by a doctor’s referral to go for a pap smear.

5. Discussion

Overall, our study adds to the existing literature on Singaporean women's challenges to cancer screening and uncover important areas for future research. Previous studies show that cultural and social norms may prevent the adoption of sensitive screening procedures, including breast and cervical cancers. In some Asian countries, despite understanding and believing in cancer risk, women did not report early detection was important because the social norms restricted discussing matters of sexual health and how to adopt sensitive practices (Andrew Smith & Biddle, 1999; Bosompra, 2001). Straughan and Seow (2000) found that early detection in Singapore was not found to be important.

Contrary to these findings, our study concludes that Singaporean women are aware of the benefits of early breast and cervical cancer detection, regardless of their screening history. Seow and fellows (1995) found that only 58.9% of Singaporean women felt themselves at equal risk of getting cancer as others. Our study found a wide variation of women's perceptions of personal breast cancer risk, ranging from 0 to 50% irrespective of screening experience. Non-screener reported lower personal risk of developing breast cancer which might explain a lack of motivation to adopt preventative screening practices. Singaporean women who participated in the FGs understand severity of cancer and fear the associated lifestyle challenges that come with a cancer diagnosis. Despite reporting high screening accuracy, a large majority of eligible Singaporean women do not adopt screening practices and remain non-screener.

Although cost of women's screening services such as pap smear is higher in Asian countries compared to western countries (Ross, Nunez-Smith, Forsyth, & Rosenbaum, 2008), our study found that cost was not a significant reason for not screening. Previous studies mention that the fee for screening prevented women from attending (Hewitt, Devesa, & Breen, 2004). However, our study finds that while many participants mentioned cost as a barrier to screening, further analysis revealed that cost of screening was not the most significant barrier. One non-screener admitted that she would screen, despite the cost, but has difficulty facing other barriers to screening such as pain and discomfort.

"I would go. Actually I felt, the whole thing important to know. Even though it is far or costs a little bit more, you know, I think it's important. (laughter) The reason why I didn't go is because there are a lot of friends who went through, they said "eh very painful you know, very painful you know" oh my very painful." (A5)

Inconveniences of screening in clinics, including travel and lost time, have been reported as barriers to cancer screening by women (Oon et al., 2011). Screening cost was another inconvenience but not the main barrier to adoption. Although most women in both focus groups would prefer reduced if not free cancer screening services, there are still those who reported no amount of subsidy would incentivize them to go.

In a comparison between screeners and non-screeners from each cancer group, thematic analysis identified two unique differences that might explain screening behavior; how women perceive a cancer diagnosis and how much motivational support to go for screening were two unique differences between

screeners and non-screeners. Among the breast cancer focus group, motivation to screen from social support was unique among screeners. Screeners were more likely to report that they had recommendations from friends, referrals from doctors, and influences from promotion campaigns. Within cervical cancer focus groups, the perceived lack of control over a diagnosis (fatalism: a belief that one is powerless to alter a cancer reality) was a unique barrier reported by non-screeners. Although screeners also shared a fear of cancer detection, they did not report similar fatalism but focused on ways of moving forward instead.

5.1 Cancer Diagnosis: Fatalism versus Acceptance

The literature on fear of cancer detection is varied and limited in the Singaporean context. Previous studies on Singaporean women's perceptions on mammography found that there was no relationship between attendance and a sense of 'fatalism' (a belief that one is powerless to alter a fated cancer reality) (A. Seow et al., 1997). In contrast to a study of women from Great Britain, non-screeners were significantly more likely to feel that 'one should not go looking for trouble,' and expressed a fear that you will get cancer if you screen (French et al., 1982). Women reported a fear associated with knowing one had cancer and believed it was better to remain ignorant of cancer. Both screeners and non-screeners feared cancer detection during screening and saw the screening clinic as a place of possible cancer diagnosis. How women perceive their cancer

diagnosis, accepting the cancer reality or succumbing to fatalist beliefs, greatly impacts their decision to screen.

Cancer screening (both mammogram and pap smear) is a very intrusive and quite uncomfortable procedure. Regardless of previous experience, individuals expose themselves to the sensitive nature of the test and resulting possibility of a life threatening diagnosis. Both screening and non-screening women reported fear of cancer detection upon screening because of the belief that “you will get cancer if you look for it”. Furthermore, both screeners and non-screeners reported knowing that early detection is beneficial. Therefore, screeners and non-screeners do not differ in knowledge and benefits of cancer screening, but are influenced by other barriers or motivations.

Our study shows screeners and non-screeners report a difference in perception of a cancer diagnosis. Cervical cancer screeners tend to accept cancer reality but also focus on ways of moving forward. *“Cause usually when they say you have cancer the first thing is denial. So have to learn to accept and say okay I have cancer, what is the step that you are going to do, that is how a person has to think forward” (D7)* Although screeners still report great fear of having cancer, they believe they still retain control and that cancer is not necessarily a “death penalty”. Because screeners do not fixate on the cancer diagnosis, but rather focus on how to adapt to a life with cancer, they may be more likely to prioritize preventative screening behavior to identify and prevent cancer earlier instead of waiting until it is too late.

On the other hand, non-screener struggle more with a fatalistic belief that one is powerless to alter a fated cancer diagnosis, often mentioning their lack of choice and loss of control. *“If you have it, you have no choice but to face it.”* (G5) Non-screener were also more likely to report difficulties associated with a cancer diagnosis including high social stigma, losing work, blaming oneself, losing the will to live, and suicide. *“And it feels like you did it you know? I don’t know why but it feels like you caused it”* (C1) *“I think the person herself might go in denial, she might just give up, suicidal.”* (C7) Within the breast cancer focus groups, women reported the fear of losing their womanhood, physical and mental suffering, and financial burdens contributing to a rhetoric of feeling of helplessness over an overwhelming cancer diagnosis. This constructed “death penalty” perspective of a cancer diagnosis is a significant barrier for women and may serve to be the primary barrier for non-screener.

Fatalism and the Media

The volume of news coverage on cancer has been found to play a role in promoting fatalistic beliefs about prevention because of information overload (Niederdeppe & Levy, 2007). Research shows that people with negative views about cancer are more likely to avoid cancer information, suggesting that people with higher levels of cancer fear and fatalism are less likely to learn about positive developments made in the field of cancer control (Miles, Voorwinden, Chapman, & Wardle, 2008). This means that the people who would benefit most from this information appear to be least likely to be exposed to it, possibly providing an

opportunity to attempt specific multi-component interventions.

If fatalistic beliefs about cancer prevention are largely attributable to passive distribution of cancer information, particularly among individuals who have negative views of cancer, health educators might want to address these concerns using multi-component interventions (media and education) that allow individuals to take action instead of fixating on the fear and fatalism. This may shift the focus of passive fatalism from a diagnosis of cancer to active acceptance and positive behavior change. One study has shown that a brief media and nursing intervention targeting cancer fatalism among senior citizens in the southern United States was successful in reducing fatalistic beliefs about cancer survivorship, suggesting that cancer fatalism is modifiable (Powe & Weinrich, 1999). Targeted education efforts could help alleviate fatalistic beliefs about cancer prevention. Future research should work to clarify sources of cancer fatalism and assess the impact of specific interventions to reduce cancer fatalism.

Use of Multi-component Interventions

Due to the limitations in both the scope of this study it is not possible to draw any strong conclusions in regards to models or programs to promote early detection and/or uptake of screening services or practices. However, according to the limited literature available, the effectiveness of multi-component interventions (incorporating both media and education) have been shown to be effective at increasing screening, such as populations who may view cancer fatalistically.

Multi-Component Interventions have the ability to reach otherwise

difficult to target populations. The use of personal and mail invitations, and the delivery of face-to-face education and personal invitations hold promise for targeting women who have never tested before. In a study among Asian women in Leicester who had never been tested before, personal home visits were most effective at getting women to screen (McAvoy & Raza, 1991). Research on community cancer advocates and culturally sensitive programming have showed high acceptability and reaching previously hard to reach immigrant Chinese women in Australia (Koo, Kwok, White, D'Abrew, & Roydhouse, 2012; Kwok, Koo, D'Abrew, White, & Roydhouse, 2011).

Within Singapore, public relations firm Leo Burnett conducted a month-long campaign event that combined an innovative bubble popping session (way for women to get rid of their excuses and go for that mammogram), media and press, and educational take-home materials, the Leo Burnett Singapore campaign reminded women of how the benefits of a mammogram outweigh the silly excuses given and take action to protect themselves against Breast Cancer. According to their results, the total number of mammogram appointments booked at NHDG-SingHealth Polyclinics, restructured hospitals as well as participating private hospitals and independent screening centers between October to December 2013 alone, increased to 16,500 (compared to last year's registered a total of 8,430 mammograms).

Further studies should investigate the deeper significance with how women personally understand and view their cancer diagnosis. Our study did

not distinguish between women's personal beliefs versus reports of perceived social norms on a cancer diagnosis. The way women come to accept cancer or feel enfeebled by it may help to explain the difference between screeners and non-screeners. Understanding this difference would allow investigators to better target non-screeners and implement programs to increase screening uptake.

5.2 Social Support: Key Motivator

Unique to the breast cancer focus groups, social support was commonly cited as a motivating influence to go for a mammogram among screeners. Screeners were more likely to report that they had recommendations from friends, referrals from doctors, and influences from promotion campaigns. Women who did not have as much support and encouragement to go for mammography screening were more likely to be a non-screener. In particular, the motivational influence of family, friends or someone with breast cancer have the most significant impact on whether a woman screens or not (McCance, Mooney, Field, & Smith, 1995). Previous studies suggest family member support is particularly important in adopting mammography (P. T. Straughan & A. Seow, 2000) if not the most important predictor of cancer screening (A. Seow et al., 1997). Unlike previous findings by Straughan and Seow (2000), however, our study found the support of close friends and physicians were also important in motivating screening behavior.

When women were asked about their motivations to go for mammography, screeners reported encouragement and support from others that influenced their decision to undergo a mammogram. Screeners were more likely to report that they had recommendations from friends, referrals from doctors, and influences from promotion campaigns.

"I go to my gynae and she recommended. Yeah so..." (B3) "Actually I wanted to go. But I didn't- I was too lazy to do anything about it until my friend pushed me to go..." (B5) "Yeah, but actually err also procrastinated a long time until like in a discussion group....there's two of us, so they said you two better go." (B6)

Despite fear of going in for a mammogram, family support and encouragement play a significant role in preventative screening practice. What seems to be most important in determining screening behavior is support, any kind of support: be it friend, family or professional medical advice.

"...I dare not to go but my children always ask me, it's better to go because early stage can be cured. they said, you go and, if anything wrong, touchwood ah, early stage it can be cured rather than you don't know then at the end ah, sometime times if you don't die (inaudible), that's true you know but (inaudible), better not otherwise go through all the hassle, so we are very afraid to go." (A8)

Although we did not compare what was the most influential motivator, many women reported they would listen to the advice that family, friends, and cancer survivors gave them. For cervical cancer, however, women seemed to be more likely to be influenced by medical authority and listen to a doctor's referral.

Previous studies show that women who lacked social support are less likely to screen (Allen, Sorensen, Stoddard, Colditz, & Peterson, 1998). Women who did not adhere to screening guidelines or breast self-exam or mammograms

also admitted less social support and motivation from their network (Katapodi, Facione, Miaskowski, Dodd, & Waters, 2002). Low mammography intention is significantly associated with lack of family and physician support (Han, Williams, & Harrison, 1999). Indeed, in our study, women who did not report significant family or physician support as motivations to screen were more likely to be non-screeners. Interestingly, however, non-screeners were as likely to suggest that enlisting friends to group screen would be good motivation for future campaigns.

In addition to peer and family support, traditional media methods of empowering educational knowledge was also reported to play a role in encouraging screening.

"Many people think that they won't be that "lucky". They think they won't get it. They don't know the importance of it. So I think campaign and education are very important They have to let our people know that this can happen to them due to our lifestyle and diet. They don't have that kind of education to know that this can happen to them. This is like driving. We think that accident won't happen to us." (E5)

Women report that education and knowledge can help be a trigger for others to start thinking about cancer screenings and not simply avoid the issue. Although most women believe they are at risk for breast cancer, they may all rationalize their risk differently. Similar to how driving a car imposes risks of an accident, women believe they are at risk but may think the possibility is so unlikely that they need not worry about it. However, unlike the car accident, cancer screening is a personal condition that produces unwanted lifestyle

challenges, unknown fears, anxiety and stress associated with a cancer diagnosis. Therefore, women who do not have as much support may choose to avoid stressing about a cancer diagnosis and choose not to screen altogether until it is too late. Future studies can look into how medical professionals, friends, family, and media all influence the decision making process to get a screening and whether these are temporary or long term behavior changes to get screened.

5.3 Limitations

The purpose of our study was to gain broad knowledge and uncover deep insight on how women perceive challenges to cancer screening that may help explain the low adoption rates in Singapore. While our study contributes important findings to the current literature, there are several limitations in our design that could be implemented in future studies.

Because of our small qualitative design with eight focus groups and small sample size, this study does not purport to be widely generalizable. We used an external survey company, Qcube Pte Ltd, to select participants based on purposive sampling of a range of demographic characteristics (age, marital status, and socioeconomic position measured through education and type of housing). We cannot say how representative the sample is as this is a non-probability sample. The demographic profile of focus group participants may show some dissimilarity to that of the whole country, and may have over-represented the beliefs and attitudes of a few women selected through purposive sampling compared to a randomly selected population of Singaporean women in general.

Because we used two different moderators to separately conduct the Chinese and English focus groups, there was a lack of consistency among specific questions asked. Moderators were told to use the focus group guide and ask probe questions, but allow the conversation to proceed in a semi-structured format. Moderators were often inconsistent with flow of questions and in some

cases forget to ask certain questions that further limited our ability to compare the differences between screeners and non-screeners.

Although we wanted to conduct our focus groups based on separation of screeners and non-screeners, women who had screened before still ended up in the non-screening focus groups. These individuals were noted and their responses treated as if they were screeners. However, their presence in the non-screening focus group may have influenced and steered the conversation based on experience with screening. Further studies should separate women by experience of screening. Therefore, true non-screeners can be differentiated from women who have had screening experience and stopped or women who screen regularly (true screeners). By basing a comparative study on experience with screening, we may be able to more easily probe for the unique barriers or motivating influences for preventative breast and cervical cancer screening.

Because our focus group guides were separated by screeners and non-screeners, it was difficult to ask certain questions pertaining to screening details. For example, details on screening behaviour could not be asked to non-screeners who had never gone for a cancer screening before. While we asked screeners *“What motivated **you** to go for your last mammogram”*, we could only ask non-screeners *“Why do you think **some women** go for a mammogram?”* The non-parallel format of certain guiding questions may have produced different responses based on the perspective individuals were answering from. This may have contributed to screeners mentioning more motivating factors to screen whereas

non-screeners were not prompted to personally answer what motivated them to screen.

Although the Health Belief Model is a well-regarded theory and has been used for many studies related to breast and cervical cancer screening behavioral studies, women didn't always respond to questions in first person, making it difficult to understand what they personally believed compared to what they think social norms dictate. Studies using a Theory of Planned Behaviour approach to ask participants to reflect back upon how they came to their decision on cancer screening behaviour offer a more personalized approach to understanding individual barriers and motivations.

Future studies should use parallel questioning and ask members to reflect upon personal motivating factors or barriers that would help a non-screener chose to screen. Similarly, we did not include any questions on self-efficacy and an individual's feeling of control over seeking preventative health behaviour. Despite our lack of questions targeting self-efficacy, women still reported a fear of cancer detection and associated fatalism or lack of control over their cancer reality. Further research can use self-efficacy to probe the depth which with fatalism and other barriers related to a loss of control explain low screening adoption. By specifically designing research questions that ask participants about their own screening behavior and confidence in performing such behavior, we might have been able to find more extreme differences on Singaporean women's personal attitudes towards screening.

Conclusion

Our findings contribute to the understanding of Singaporean women's preferences, knowledge, and potential misconceptions of breast and cervical cancer screening. While it is difficult to recommend specific health policy measures, our study implies several suggestions for future studies or programs that attempt to address screening uptake. Singaporean women know they are susceptible to cancer and understand the benefits of early screening, but still choose not to screen, suggesting that targeted campaigns addressing the most important barrier to cancer screening may have more effect than general awareness campaigns.

Because both screeners and non-screeners see the screening clinic as a place of possible cancer diagnosis and more attention should also focus on addressing patient fears of cancer diagnosis possibly with the use of multi-component interventions. Non-screeners, however, uniquely viewed a cancer diagnosis as a death penalty, whereas screeners chose to look at options to move forward. Multicomponent-strategies to address the fatalistic belief of a cancer diagnosis are recommended to target non-screeners that are not being reached by current intervention. On the other hand, screeners reported peer and family support as a key screening motivator, suggesting successful cancer screening programming should continue to leverage the use of peer and family support as motivation to screen.

Both screeners and non-screeners reported socioeconomic barriers to

screening (cost, location, inconvenience, gender of doctor) and recommended removing such barriers for increased adoption. Private and public health system officials would be advised to encourage preventative screening uptake by keeping them free of charge and reducing the amount of wait times for exams. Moving forward, our qualitative study will help develop a conjoint survey questionnaire that will be used to evaluate participant willingness to pay for preventative screening services. Combined, both qualitative focus group and quantitative conjoint studies can uncover insights that can be used to recommend and implement a national strategy to increase breast and cervical cancer screening uptake among Singaporean women.

APPENDIX A: FOCUS GROUP GUIDE EXAMPLE

Focus group guide (Mammogram Non-Screeners)

Section	Topic	Time (minutes)
1	Introduction	5
2	Awareness of breast cancer and available treatment	15
3	Knowledge of mammogram	15
4	Motivations and barriers for mammogram	25
	BREAK	10
5	Increasing uptake for screening programs	20
6	Incentives for screening	15
Total time		

Part 1: Introduction

Duration	Discussion
5mins	<p>Moderator to greet and welcome participants</p> <p>Moderator self-introduction</p> <p>Purpose of focus group discussion</p> <ul style="list-style-type: none"> - To understand what you think about mammogram screenings <p><i>Ground rules:</i></p> <ul style="list-style-type: none"> - Session will be recorded - Confidentiality of comments and responses - Everyone is encouraged to contribute - No right or wrong answers/opinions - Express any views, positive or negative as long as it is truthful - Opinion different from others should be voiced too even if it is not shared by the group - Be open-minded - Speak clearly and allow one person to speak at one time - Turn off mobile phones and devices <p><i>Ice breaker</i></p> <ul style="list-style-type: none"> - Name - Hobbies, number of kids

Part 2: Awareness of breast cancer and available treatment

Duration	Discussion
15mins	<p><u>Topic: What do you know about the risk of breast cancer and what the available treatments are?</u></p> <p><i>Probe question:</i> What is the risk of getting breast cancer?</p> <p><i>Further questions if needed:</i></p> <ul style="list-style-type: none"> - Who do you think is more likely to get breast cancer?

	<ul style="list-style-type: none"> - Compared to others of the same age group, do you think you are more or less likely to get breast cancer? [DON'T NEED TO GIVE PROBABILITIES] Why? - Are there any health/lifestyle behaviors that could increase or decrease one's risk of getting breast cancer? <p><i>Probe question:</i> What do you think are the most important challenges facing a woman who is diagnosed with breast cancer?</p> <p><i>Further questions if needed:</i></p> <ul style="list-style-type: none"> - What are the side effects of cancer treatment like? - What is the cost of cancer treatment? - How does diagnosis of cancer impact work, social and family life? - How effective are available cancer treatments at curing cancer? - Do you think breast cancer can be treated effectively if it is detected early?
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Part 3: Knowledge of mammogram

Duration	Discussion
15mins	<p><u>Topic: What do you know about mammogram?</u></p> <p><i>Probe question:</i> What have you heard about mammogram and from where?</p> <p><i>Further questions if needed:</i></p> <ul style="list-style-type: none"> - Under what circumstances should one start going for regular mammogram screening? - How often should one go for a mammogram? - How much do you think a mammogram screening costs? <p><i>Probe question:</i> What do you think are potential risks/side effects of mammogram?</p> <p><i>Further questions if needed:</i></p> <ul style="list-style-type: none"> - How accurate do you think is the mammogram test? - Are there any ill effects of regular use of mammogram?

Part 4: Motivations and barriers for mammogram

Duration	Discussion
25mins	<p><u>Topic: What are the main motivations and barriers for mammogram?</u></p> <p>[NON-USERS] <i>Probe question:</i> Why do you think some women go for a mammogram?</p>

	<p>[NON-USERS] <i>Probe question:</i> Why have you not had a mammogram or why did you stop going for mammogram?</p> <p><i>Further questions if below barriers were mentioned:</i></p> <ul style="list-style-type: none"> - Difficulty in scheduling a convenient appointment for screening – What is a suitable appointment time (day of the week, time)? - Amount of time spent in the clinic – What is the longest time acceptable time? - Cost – What is the highest price you are prepared to pay? - [NON-USERS] Prefer not to know – go to next probe question <p><i>Probe question:</i> When you hear of cancer screening do you fear being told that you have cancer?</p> <p><i>Further questions if needed:</i></p> <ul style="list-style-type: none"> - Do you fear treatment cost? - Do you fear becoming a burden to your family? - Do you fear that your quality of life would be affected? - Do you fear that cancer treatments might not be effective? <p>[NON-USERS, IF FEAR OF KNOWING NOT MENTIONED AS BARRIER]</p> <p><i>Probe question:</i> Does fear of knowing influence your decision of not screening?</p> <p><i>Probe question:</i> Of all the barriers that we just discussed, which do you think are most important for a woman like you?</p> <p><i>Further questions if needed:</i></p> <ul style="list-style-type: none"> - Why are these most important?
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Part 5: Increasing uptake of screening program

Duration	Discussion
5mins	<p><u>Topic: Encouraging regular screening</u></p> <ul style="list-style-type: none"> - Please write down on the piece of paper either <ol style="list-style-type: none"> 1. one improvement to the current mammogram screening that you think would increase its attractiveness, or 2. what they would say to a friend to convince her to take mammogram for the first time
15mins	<p><i>[MODERATOR TO COLLECT PAPERS AND READ OUT PROPOSALS ONE AT A TIME. ASK PARTICIPANTS WHETHER THEY THINK IT WILL WORK.]</i></p> <p><i>Probe questions for those who think it will work:</i> What do you like about this?</p> <p><i>Probe questions for those who think it will work:</i> What do you not like about this?</p>

Part 6: Incentives for screening

Duration	Discussion
15mins	<p data-bbox="467 237 1323 300"><u>Topic: What could be done to encourage a woman like you to go for a mammogram regularly?</u></p> <p data-bbox="467 342 1323 478">[ASSUME SCREENING COSTS ARE AS CURRENTLY CHARGED. WHEN DISCUSSING EACH QUESTION, INCENTIVES FROM PREVIOUS QUESTIONS IN THIS SECTION DO NOT CARRY OVER, UNLESS EXPLICITLY STATED.]</p> <p data-bbox="467 520 1198 583"><i>Probe question:</i> Whose advice matters the most to you when considering going for a mammogram?</p> <p data-bbox="467 594 812 625"><i>Further questions if needed:</i></p> <ul data-bbox="516 625 1323 730" style="list-style-type: none"> - If the doctor recommended you to go for regular mammogram (as a preventive measure), would you follow his/her recommendation? Why? <p data-bbox="467 772 1274 835"><i>Probe question:</i> If you were able to get a mammogram at the same time with your other regular health check-ups, would you go for it?</p> <p data-bbox="467 877 1323 940"><i>Probe question:</i> What do you think about allowing regular screeners to pay lower cancer treatment costs than non-screeners?</p> <p data-bbox="467 951 803 982"><i>Further questions if needed:</i></p> <ul data-bbox="516 982 906 1014" style="list-style-type: none"> - Is this fair? Why or why not? <p data-bbox="467 1056 1323 1119"><i>Probe question:</i> If mammogram were offered to you free of cost, would you take it?</p> <p data-bbox="467 1129 803 1161"><i>Further questions if needed:</i></p> <ul data-bbox="516 1161 771 1192" style="list-style-type: none"> - Why or why not? <p data-bbox="467 1234 1323 1339"><i>Probe question:</i> If, in addition to a mammogram being free-of-charge, you were also offered a cash incentive, how much would make you go for screening?</p> <p data-bbox="467 1350 803 1381"><i>Further questions if needed:</i></p> <ul data-bbox="613 1381 1198 1518" style="list-style-type: none"> ○ If cash were not available, would you accept: Vouchers? ○ Lower insurance premiums? ○ Medisave top-up?

APPENDIX B: PARTICIPANT INFORMATION SHEET AND FOCUS GROUP CONSENT FORM

PARTICIPANT INFORMATION SHEET & CONSENT FORM (FOCUS GROUP)



1. **Project title**
Awareness of Cancer Screening Survey (ACCESS) – Focus groups

2. **Principal Investigator and co-investigator(s), if any, with the contact number and organization.**

<i>Name</i>	<i>Organization and Contact Number</i>
Principal Investigator:	
Dr Eric Finkelstein	Professor Health Systems and Services Research, Duke-NUS Graduate Medical School eric.finkelstein@duke-nus.edu.sg ; (65) 6516 2338
Co-Investigators:	
Dr Marcel Bilger	Assistant Professor Health Systems and Services Research, Duke-NUS Graduate Medical School marcel.bilger@duke-nus.edu.sg ; (65) 6601 2330
Dr Chetna Malhotra	Assistant Professor Health Systems and Services Research, Duke-NUS Graduate Medical School chetna.malhotra@duke-nus.edu.sg ; (65) 6516 5692
Dr Gilberto de Lima Lopes, Jr.	Senior Consultant in Medical Oncology Assistant Director for Clinical Research, Assistant Professor of Oncology Department: Medical Oncology Institution: The John Hopkins Singapore International Medical Centre & John Hopkins University School of Medicine
Dr Young Kyung Do	Assistant Professor

	Health Systems and Services Research, Duke-NUS Graduate Medical School young.do@duke-nus.edu.sg ; (65) 6516 2790
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3. What is the purpose of this research?

You are invited to participate in a research study. This information sheet provides you with information about the research. The Principal Investigator (the research doctor or person in charge of this research) or his/her representative will also describe this research to you and answer all of your questions. Read the information below and ask questions about anything you don't understand before deciding whether or not to take part.

The aim of this study is to understand the key factors guiding women's decision of whether or not to use cancer screening services (separately for breast and cervical cancer) and to determine how to cost effectively increase screening uptake. The focus groups will be used to identify the key factors that drive the decision to attend a screening exam.

4. Who can participate in the research? What is the expected duration of my participation? What is the duration of this research?

Women aged 25-64 who are citizens or permanent residents of Singapore, who are English-speaking or Mandarin-speaking, and who agree to be audio-taped and video-taped, can take part in the research. Your involvement will be a 90-minute discussion. Fieldwork will be conducted in August/September 2013. No translator will be present during the focus group.

5. What is the approximate number of participants involved?

Up to 8 participants will be involved in each focus group discussions. We will be conducting 8 focus group sessions involving 64 participants in total.

6. What will be done if I take part in this research?

You will be asked to take part in a 90-minute.

You will be expected to take part in a group discussion moderated by a researcher. The discussion topics may include the following:

- perception of susceptibility to breast and cervical cancers
- awareness and knowledge regarding existence of screening services for these cancers
- barriers and motivations for seeking breast and cervical cancer screening

The focus group discussion will be audio-taped and video-taped.

7. How will my privacy and the confidentiality of my research records be protected?

Your identifiable information will be de-linked from data collected at the earliest possible stage of the research. Identifiable information will never be used in a publication or presentation.

All research data (soft and hard copies) will be kept securely at the National University of Singapore (NUS) for a minimum of 10 years after research completion, following which the data will be destroyed. This is to allow time for the write-up of findings as well as a complete retrospective audit of the data, if necessary.

8. What are the possible discomforts and risks for participants?

No more than minimal risk is expected as a consequence of your participation.

9. What is the compensation for any injury?

Not applicable.

10. Will there be reimbursement for participation?

You will be given a \$70 voucher for completing in the focus group discussion.

11. What are the possible benefits to me and to others?

The knowledge gained will benefit the public in the future by contributing to the provision of cancer screening in Singapore.

12. Can I refuse to participate in this research?

Participation is entirely voluntary. You can refuse to participate or inform the study team that you would like to withdraw from the programme at any time without giving any reasons.

13. Whom should I call if I have any questions or problems?

Please contact Junxing Chay at 6601 1253/junxing.chay@duke-nus.edu.sg for all research-related matters.

For an independent opinion regarding the research and the rights of research participants, you may contact a staff member of the National University of Singapore Institutional Review Board (Attn: Mr Chan Tuck Wai, at telephone 6516 1234 or email at irb@nus.edu.sg).

Consent Form

Project title:

Awareness of **Cancer Screening Survey (ACCESS)** – Focus Groups/In-depth Interviews

Principal Investigator with the contact number and organization:

Dr. Eric Finkelstein, Professor, Duke-NUS Graduate Medical School
Tel: (65) 6516 2338

I hereby acknowledge that:

1. My signature is my acknowledgement that I have agreed to take part in the above research.
2. I have received a pamphlet (or a copy of this information sheet) that explains the use of my data in this research. I understand its contents and agree to donate my data for the use of this research.
3. I can withdraw from the research at any point of time by informing the Principal Investigator and all my data will be discarded.
4. I will not have any financial benefits that result from the commercial development of this research.

I agree / do not agree (PLEASE CROSS OUT) to the audio-taping and video-taping of the focus group discussion.

Name and Signature (Participant)

Date

Name and Signature (Consent Taker)

Date

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