



Breast Cancer: Knowledge and Perceptions of Chinese Women in Hong Kong

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Abstract

This study explored the knowledge of breast cancer risk factors and employed the Health Belief Model (HBM) to examine the perception and barriers of breast cancer screenings of Hong Kong Chinese women using a structured questionnaire. Of the 496 respondents, 70.8% and 77.0% considered a family history of breast cancer and prior history of benign breast problems as risk factors respectively. However, over 40% were unsure of other risk factors including age, early age at menstruation, late age at menopause, childlessness and oral contraceptive use. About 80% regarded breast cancer as a serious illness and 88.7% acknowledged that both mammography and breast self examination (BSE) could help early detection of the disease. Nevertheless about 68% had never had a mammogram, and the most important perceived barriers were not knowing how the test was done (81.3%) and the cost (63.0%). Only 31.9% did not practice BSE, and not knowing how to perform BSE was the primary perceived barrier.

Keywords: Breast cancer, Risk factors, Health belief model, Screenings, Perceived barriers, Hong Kong

1. Introduction

Breast cancer is the most common cancer in women worldwide (World Health Organization, 2005). In Hong Kong, breast cancer, the third leading cause of female cancer deaths after lung and colorectal cancers, accounted for 9.8% of all female cancer deaths in 2006 (Hong Kong Department of Health, 2007). The incidence of breast cancer in Hong Kong has risen since 1994 and the most obvious increase is among the 30-49 age groups (Hong Kong Department of Health, 2004). It is estimated that one in 23 women would develop breast cancer by age 75 (Hong Kong Department of Health, 2006).

Breast self-examination (BSE) and mammography are methods for early breast cancer detection. Although BSE is considered as cost-free, simple, non-invasive intervention (Norman and Brain, 2005), its benefit is controversial (Harvey et al., 1997; Thomas et al., 2002). There is also doubt in the cost-effectiveness of mammography screening. However, both BSE and mammogram are effective preventive measures to detect breast diseases. When detected at the early stage, breast cancer is curable, with a 100% 5-year survival rate for stage 0 and I (American Cancer Society, 2007). It is important for women to be aware of the importance of early screening.

In Taiwan, the Department of Health launched a 3-year breast cancer screening campaign in 1999, and a total of one million women aged 35 or older received physical examinations by nurses and were referred to mammogram screening and/or breast ultrasound if suspicious abnormalities were found. Also BSE was recommended and had been the policy for breast cancer prevention (Huang et al., 2001). In Hong Kong, both BSE and mammography are not recommended for general female population and there is no centrally organized population based breast cancer screening program in Hong Kong. The high risk group (that is those with prior history of breast cancer, family history of breast cancer, or under hormone replacement therapy) is recommended to consult professionals to determine the appropriate surveillance. (Hong Kong department of Health, 2004).

In Hong Kong, most women are unaware of risk factors of breast cancer and preventive practices (Chua et al., 2005). There was a low frequency of mammogram screening (Leung et al., 2008) and BSE even though majority of women perceived health as the most important entity (Fung, 1998). The lack of knowledge on screening was discovered to be a major barrier that prevented many women from carrying out preventive actions (Abdullah et al., 2001; Chua et al., 2005). Improved healthcare provider-patient communication was important for promoting breast health and screening

program (Abdullah et al., 2001). A community-based outreach program that aimed at raising the awareness of BSE practice and breast health in Hong Kong was conducted in May 2002 to March 2003. It was discovered that 93.3% of the 777 participants were willing to practice BSE regularly after intervention (Chan et al., 2007). To develop breast cancer educational programs and prevention campaigns, it is crucial to comprehend Hong Kong women's knowledge, perception and awareness of breast cancer.

Previous research conducted in Hong Kong has focused on knowledge, perception and behavior of only BSE (Fung, 1998), mammography screening (Chua et al., 2005; Chor et al., 2008) or clinical breast examination (CBE) (Chan et al., 2002). Abdullah et al. (2001) studied breast cancer screening behaviors of women who attended a well-women clinic. Little is known about women's knowledge of breast cancer risk factors and source of breast cancer information that is essential in planning breast health awareness programs. The aims of the present study are to explore Hong Kong Chinese women's knowledge of breast cancer risk factors and their perceptions of the benefits and barriers to both BSE and mammography screening. Results of the present study can provide additional imperative information, particularly the knowledge of risk factors, which bridges the gap from previous studies.

2. Theoretical Framework

The theoretical framework employed in the current study was the Health Belief Model (HBM). The HBM model, first proposed by Hochbaum, Leventhal, Kegeles and Rosenstock in the 1950s (Rosenstock, 1966), was designed to apply to various health-related decision making problems. The HBM assumes that an individual's perception of the susceptibility and severity of an illness produces the readiness to take a health action to reduce the health threat. The model includes four dimensions: (a) perceived personal susceptibility to a disease, (b) perceived severity if contracted the disease, (c) perceived benefits of a particular health action and (d) perceived barriers taking a particular health action (Rosenstock, 1974). The concept of health motivation, that is defined as an individual's health concern will result in behaviors to promote health, was later added into the HBM (Becker, 1974).

The HBM has been used in different cultures and health delivery systems to explain preventive health behaviors. Studies have employed the HBM to understand breast cancer screening behaviors of Asian women (e.g. Yi and Prows, 1996; Choudhry et al., 1998; Han et al., 2000) and Chinese American women (e.g. Lu, 1995; Hoeman et al., 1996; Yu and Wu, 2005; Lee et al., 2007). Fung (1998) used the HBM to examine the BSE practice of sample of 124 Chinese women in Hong Kong, and concluded that BSE practitioners had higher perceived susceptibility and fewer perceived barriers to breast cancer. The HBM used in the current study could shed more lights on the relations between the beliefs of HBM variables and breast cancer screening behaviors.

3. Methods

3.1 Sample and setting

The study was a cross-sectional survey using an anonymous structured questionnaire in English. The target subjects were Chinese women aged 20 years or greater. Survey responses were collected through a convenience sample in urban public areas including subway stations and shopping locations (in Hong Kong Island and Kowloon) in winter 2006. In the process of conducting the survey, two trained interviewers arbitrarily handed out the questionnaires to 1000 Chinese females, who were told about the survey's objective, methods and confidentiality. A total of 496 Chinese women (49.6%) agreed to participate in the study and completed the questionnaires via face-to-face interviews in Cantonese.

3.2 Survey instrument

The survey instrument was an anonymous questionnaire designed to ascertain the knowledge and perception of breast cancer. The questionnaire comprised of questions on (1) information about subjects' demographic characteristics, (2) sources of breast cancer and screening information, (3) knowledge of breast cancer risk factors, (4) perceived susceptibility and severity of breast cancer (5) perceived benefits of BSE and mammography and (6) perceived barriers to take screening.

Respondents were requested to answer "yes", "no" or "uncertain" to nine items regarding breast cancer risk factors, that were based on the guidelines of the American Cancer Society (2005) and the questionnaires employed by Paul et al. (1999), Odusanya (2001) and Pöhls et al. (2004). These items were (1) age, (2) family history of breast cancer, (3) previous history of benign breast problems, (4) early age of menstruation (age 12 or before), (5) late age at menopause (age 55 or after), (6) childlessness, (7) no breastfeeding, (8) oral contraceptive use and (9) hormone replacement therapy (HRT) at postmenopause. Respondents were also asked to name other risk factors to assess whether the respondents had good knowledge of breast cancer risk factors.

Statements of the HBM variables (perceived susceptibility, perceived severity, perceived benefits and perceived barriers) were formulated with reference to Champion's (1993) HBM instrument and other resembled statements used in similar studies (Stillman, 1997; Han et al., 2000; Jirojwong and Manderson, 2001). Respondents were requested to rate these statements using a five-point Likert scale, on which 1 indicated strong disagreement and 5 indicated strong agreement.

Three susceptibility items measured respondents' beliefs of the likelihood of getting breast cancer. Seven items related to the seriousness of breast cancer evaluated severity. The benefits of obtaining BSE and mammography were assessed by four items that asked about the perceived usefulness and value of these preventive measures. Respondents who had never had mammography screening and were aged ≥ 40 , and who did not practice BSE in the past month were asked to rate the items on the barriers to performing these actions. These barriers included knowledge of these preventive measures, availability of free time, fear of positive results, embarrassment; and additional barriers of discomfort and cost for obtaining a mammogram.

A pilot study on 20 Chinese women from a convenience sample was conducted at subway stations and the sequence of some questions was rearranged. Internal consistency reliability of the HBM subscales was examined and the alpha coefficient ranged from 0.69 (perceived susceptibility) to 0.75 (perceived barriers).

3.3 Data analysis

Descriptive statistics were employed to describe the demographics of the subjects, knowledge of breast cancer risk factors and HBM variables. Pearson's Chi-square tests were used to examine the association between categorical variables. To determine whether there were differences in scores of the HBM variables among various demographic characteristics, ANOVA was used.

4. Results

4.1 Demographic characteristics of respondents

Table 1 presents the demographic characteristics of the respondents. The majority of the women was aged 30-49 years (56.8%), married (63.1%), employed (65.8%), had attained secondary education (51.6%) and a monthly income $\leq$ HK\$10,000 (48.2%). All the respondents had heard of breast cancer. Most women in the study had heard of mammography (67.9%) and BSE (94.4%).

4.2 Source of health information

Mass media, such as newspaper and television, is the major information source of breast cancer (73.2%) and BSE (60.3%), followed by doctors or health care providers (16.1% for breast cancer information; 25.9% for BSE information). However, women got information of mammography primarily from doctors/health care providers (50.7%) and relatives or friends (24.3%).

The main information sources were further examined for a relationship with respondents' demographic characteristics. In addition to mass media, women who were at the age of 60 and above ($\chi^2=27.47$, $df=6$, $p=0.00$), retired ($\chi^2=23.67$, $df=8$, $p=0.00$) and had primary education ($\chi^2=22.09$, $df=4$, $p=0.00$) tended to obtain breast cancer information from doctors/health care providers. Further, full time housewives ($\chi^2=23.67$, $df=8$, $p=0.00$) and women having monthly income $\leq$ \$10,000 ($\chi^2=13.64$, $df=6$, $p=0.00$) would get the information from relatives and friends. In relation to mammography, women at age 60 and above ($\chi^2=17.74$, $df=6$, $p=0.01$) and those having monthly income over \$30,000 ($\chi^2=12.63$, $df=6$, $p=0.04$) would acquire information from doctors/health care providers. Regarding BSE, women with primary education ($\chi^2=24.82$, $df=4$, $p=0.00$) were more likely to get information from relatives and friends.

4.3 Knowledge of risk factors

Over 70% of the respondents considered a family history of breast cancer (70.8%) and prior history of benign breast problems (77.0%) as risk factors. Full-time housewife ($\chi^2=16.46$, $df=8$, $p=0.03$) and women with college education ($\chi^2=17.33$, $df=4$, $p=0.00$) were more likely to acknowledge family history of breast cancer as a risk factor. The recognition of history of benign breast problems as a risk factor was more associated with housewife ($\chi^2=77.38$, $df=8$, $p=0.00$). Besides, 54% believed hormone replacement therapy (HRT) to influence breast cancer risk; and the retired ($\chi^2=42.12$, $df=8$, $p=0.00$) tended to be more likely to agree with this. Nevertheless, all women were uncertain about age as an important breast cancer risk factor. Further, only 11.3% of the women agreed no breastfeeding as a risk factor. Over 40% of the women were indecisive regarding early age at the first menstrual period, late age at menopause, childlessness and oral contraceptive use as risk factors; and no association between these responses and the demographic parameters was discovered.

Respondents were requested to nominate other breast cancer risk factors in addition to the specific ones asked in the questionnaire. All women were unable to state other risk factors such as high-fat diet, alcohol consumption, lack of exercise and being overweight. Two respondents named emotion or stress to be a factor.

4.4 Attitudes and beliefs about breast cancer

Table 2 presents the frequency distribution of responses to the statements of the HBM variables. Majority of women believed breast cancer was unavoidable and 44.1% were worried about getting the disease. Significant differences were found between HBM belief variables and some demographic data. Women, who were at age < 29 ($F=2.79$, $p=0.17$),

students ($F=0.67$, $p=0.00$), had monthly income $>\$50,000$ ($F=2.91$, $p=0.01$) and higher education ($F=3.80$, $p=0.02$) thought they would have lower vulnerability of getting the illness.

The majority regarded breast cancer as a serious illness and 93.0% knew that the disease was curable if detected early. Perceived severity scores differed significantly among age groups ($F=9.28$, $p=0.00$), education ($F=24.51$, $p=0.00$) and employment ($F=6.26$, $p=0.00$). Women who were younger than age 29, students and had college education, having the lowest scores, tended not to consider breast cancer as a serious disease.

Over 70-80% of the respondents acknowledged that both mammography and BSE could help early detection of breast abnormality and breast cancer. The perceived benefit scores were not significantly different among demographic characteristics.

4.5 Barriers to preventive actions

Out of a total of 266 respondents aged ≥ 40 , 68.05% of them ($n=181$) stated they had never had a mammogram. The most important perceived barriers to having a mammogram were not knowing how the test was done (81.3%) and the cost (63.0%) (Table 3 (a)). Scores of perceived barriers to mammography were significantly different by age ($F=6.19$, $p=0.00$), education ($F=3.65$, $p=0.03$) and income ($F=2.44$, $p=0.04$). Women, who were at the age ≥ 70 , had college education and monthly income $>\$40,000$, had fewer perceived barriers.

Only 31.9% of the respondents reported that they did not practice BSE in the past month. Not knowing how to perform BSE was the primary perceived barrier (Table 3 (b)). The perceived barrier scores were not different among demographic parameters.

5. Discussion

All the women surveyed had heard of breast cancer and their primary source of health information was from the mass media. This finding is consistent with the study conducted by the Family Planning Association of Hong Kong (1996), and reveals the efforts of the promotion campaigns by the Hong Kong Health Department and other organizations such as the Hong Kong Breast Cancer Foundation and Hong Kong Cancer Fund in exposing the public to the disease. Promotion activities reported by the media; and billboards and advertisements placed in subway stations effectively expose the public to breast cancer. Further, the women's lifestyle programs on television and magazines may also account for the increased media exposure of the disease.

Over half of the respondents, who had heard of BSE ($n=468$), acquired BSE information from mass media, whereas of 337 interviewees who had heard of mammography, only 13.4% obtained information of mammography screening from the same source. These results reflect the lack of comprehensive breast health education; and it can infer that breast cancer promotion campaigns fail to convey information of breast cancer screenings (particularly mammography screening) successfully.

Generally, women in the study had poor knowledge of the breast cancer risk factors. Half of the women were doubtful about the early age at menstruation, late age at menopause, childlessness as risk factors that, in fact, they are. Another 42.5% were indecisive about oral contraceptive use as a risk factor. The meta-analysis by Kahlenborn et al. (2006) revealed a small significant risk increase for premenopausal breast cancer among women who used combined oral contraceptives. Nevertheless, the absolute risk was very small. It is crucial for women to understand both the risks and benefits of oral contraceptives.

Over 50% women surveyed believed HRT to be a risk factor. At present, the association of breast cancer risk and HRT is inconclusive. Some studies discovered an increased breast cancer risk in post-menopausal women related to HRT (Beral and Million Women Study Collaborators, 2003; Stahlberg et al., 2004) while other research did not (Espíe, et al., 2007; Cortés-Prieto and Juez-Martel, 2007). Since HRT has become more significant with increasing age, it is important for women to understand the advantages and disadvantages of hormone therapy, so that fears can be cleared (Beckmann et al., 2003).

Age as another major risk factor was poorly understood since all women surveyed were unsure of age as a factor. This finding is in accordance with the study conducted by Paul et al. (1999). This misconception may lead to under-estimation of the importance of regular screening by older women if they mistakenly believe the younger age groups as the groups most at risk. Preventive measures (i.e. mammography screening and BSE) not being recommended by the Hong Kong Health Department may explain women's lack of understanding of age as a risk factor. Instead, women with a family history of breast cancer are recommended to access medical professionals for appropriate regular surveillance (Hong Kong Department of Health, 2004). This further explicates why the majority of the women surveyed (70.8%) agreed family history of breast cancer as a significant risk factor.

Only 11.3% women surveyed realized the benefit of breastfeeding of reducing breast cancer risk although the breastfeeding rate rose from 50% in 1997 to 70% in 2006 and the exclusive breastfeeding rate for 4-6 months increased from 6.0% to 13.5% for the same period (Center for Health Protection, 2007). This poor recognition of no breastfeeding

as a risk factor is plausibly because of the strong emphasis on the long-term health benefits for babies at breastfeeding promotions. In addition, the awareness and acceptance of breastfeeding in Hong Kong are fairly low. There are limited breastfeeding areas in public places; and the Hong Kong government is urged to legislate proper facilities for breastfeeding (The Standard, 2007).

It is presumed that strong beliefs in perceived benefits and/or susceptibility and seriousness tend to take up the preventive actions. However only 31.95% women aged ≥ 40 had ever had a mammogram in this study. This finding of discrepancy between perceived beliefs and actual screening undertaking is similar to the previous study by Fung (1998), and also indicated the inadequate information received by women. Lack of knowledge about screening to be the major barrier supports the findings of other studies (McPhee et al., 1997; Abdullah et al., 2001). To increase the acceptance of mammography screening, it is essential to disseminate the information in an easily understandable way.

Financial cost was another major reason for the reluctance to access mammography screening, particularly to the lower income groups. This finding is compatible with other studies (e.g. Chua et al., 2005; Lee et al., 2007). At present, organized population-based screening program is not established in Hong Kong. A government-subsidized screening program was set up in 1991. However, women who use the government-funded screening services need to pay a charge that is similar to the cost of the private sector (Leung et al., 2008). There are also doubts in the cost-effectiveness of this preventive intervention. The study by Wong et al. (2007) indicated that mammography for Hong Kong women might not be cost effective under the current scarce public health resources. Since mammogram screening is a low priority in public health care and is not recommended to the general female population, most women are unaware of its actual benefits.

About 68.0% women in the study had practiced BSE. This percentage was higher than other previous local studies (Fung, 1998; Abdullah et al., 2001; Chan et al., 2007). This increase in BSE practice can be explained by acceptance of the health education and promotion campaigns of the government and other non-government organizations, such as the Pink Revolution. Further, the cost-free nature of BSE also attracts women to perform this preventive action.

Not knowing how BSE is done was the primary reasons for not performing BSE by the non-practicers. Most women were unsure what to look for at BSE. The correctness and accuracy of performing BSE was discovered to be associated with instructions of doing this preventive intervention (Chie et al., 1993). Lack of accuracy in performing BSE would reduce the competence of early lump detection (Champion, 1992). Thus, it is crucial to demonstrate the techniques in BSE performance in breast health education.

5.1 Limitations of the study

The present study is exploratory in nature. In interpreting the findings, its limitations should be kept in mind. Since this study was based on a convenience sample, both selection and responder bias should not be ignored. The response rate was 49.6% that reflected the unwillingness in questionnaire survey participations because the public is concerned about the ubiquitous use of survey. Thus, the sample may not be representative and may affect the ability to make inferences about the knowledge level of breast cancer of Chinese women. And the results may not be generalized to the Chinese female population in Hong Kong and should be interpreted cautiously.

6. Conclusion

The results of this study reveal that Chinese women in Hong Kong have poor knowledge of breast cancer risk factors, and limited understanding of screenings despite the efforts of breast cancer prevention campaigns of both the government and non-government organizations. The lack of inclusive knowledge of breast cancer would lead to a low priority in prevention health care. It is crucial to convey breast cancer information in comprehensible manner and the health literacy of the general female population needs to be taken into consideration when delivering this information. It is also important for health care professionals to advise and help disseminate breast health information and screening program to women. Further, future research should be directed to the understanding of the knowledge and perception of breast cancer of minority women, such as Thais, Filipinos, Indians and Pakistanis in Hong Kong so that comprehensive breast health programs and campaigns can be developed to the general female population.

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Table 1. Demographic characteristics of respondents

	Total Number	Percentage (n) (%)
Age		
20-29	100	20.2
30-39	130	26.2
40-49	152	30.6
50-59	80	16.2
60-69	28	5.6
≥70	6	1.2
Marital Status		
Single	183	36.9
Married	313	63.1
No of child =0	85	27.2
No of child =1	133	42.5
No of child =2	67	21.4
No of child ≥3	28	8.9
Education		
Primary	44	8.9
Secondary	256	51.6
College or above	196	39.5
Employment		
Full-time	84	16.9
Housewife		
Employed	326	65.8
Unemployed	31	6.3
Retired	29	5.8
Students	26	5.2
Monthly Income (in HK\$)		
≤\$10,000	239	48.2
\$10,001-\$20,000	154	31.0
\$20,001-\$30,000	73	14.7
\$30,001-\$40,000	16	3.3
\$40,001-\$50,000	8	1.6
>\$50,000	6	1.2
Total (N)	496	

Table 2. Responses to statements on Health Belief Model variables

Statement	Strongly Disagree (%)	Disagree (%)	Uncertain (%)	Agree (%)	Strongly Agree (%)
Perceived susceptibility					
1. Breast cancer is unavoidable	1.6	17.7	8.7	61.7	10.3
2. I worry about getting breast cancer	7.5	24.2	24.2	36.3	7.8
3. I am likely to get breast cancer as others	10.1	24.2	29.2	32.3	4.2
Perceived severity					
1. Breast cancer is a serious disease	1.0	8.7	10.5	64.9	14.9
2. Cause of death if untreated	0.4	4.2	10.5	42.1	42.8
3. Breast has to be removed	1.6	24.0	33.5	30.6	10.3
4. Cause problems in sexual relationship	4.2	30.0	31.3	29.2	5.3
5. Being a burden to family members	3.0	12.3	17.9	55.0	11.8
6. Would affect work/social life	5.4	24.0	14.3	48.8	7.5
7. Can be cured if detected early	0.6	1.4	6.0	59.3	32.7
Perceived benefits					
1. Help early detection of abnormal mass	0	1.4	9.9	77.4	11.3
2. If detected early, period of treatment can be reduced	0.2	1.4	12.5	70.0	15.9
3. Prevent anxiety	0.4	6.0	21.6	63.5	8.5
4. Effective in detecting abnormality in breast	0	2.0	22.6	64.3	11.1

Table 3. Responses to statements on perceived barriers to (a) mammography and (b) breast self examination

(a) Perceived barriers to mammography (n =181)

Statement	Strongly Disagree (%)	Disagree (%)	Uncertain (%)	Agree (%)	Strongly Agree (%)
Do not know how the test is done	3.3	9.9	5.5	72.4	8.9
No free time	13.3	37.6	12.1	36.5	0.5
Discomfort	14.4	39.8	9.3	34.8	1.7
Embarrassment	18.8	34.8	7.2	36.5	2.7
Fear of positive result	22.1	50.8	6.6	19.4	1.1
Cost	13.3	20.4	3.3	52.5	10.5

(b) Perceived barrier to breast self examination (n =158)

Statement	Strongly Disagree (%)	Disagree (%)	Uncertain (%)	Agree (%)	Strongly Agree (%)
Do not know how BSE is done	7.0	38.0	13.3	37.3	4.4
No Free Time	15.8	62.7	8.2	12.7	0.6
Embarrassment	24.1	55.1	10.8	10.0	0
Fear of discovering abnormality	18.4	46.8	15.2	19.6	0