RESEARCH COMMUNICATION

Breast and Colorectal Cancer Screening and Associated Correlates among Chinese Older Women

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Abstract

   Objective: To explore the participation rates for breast and colorectal cancer screening and identify associated correlates among elderly women. Methods: Logistic regressions were conducted using data collected in 2006 from 1,533 elderly women aged 60 years or above who had completed a screening instrument, the Minimum Data Set-Home Care, while applying for long-term care services at the first time in Hong Kong. Results: The participation rates for breast and colorectal cancer screening among frail older Chinese women were 3.7% and 10.8% respectively. Cognitive status was inversely associated with the likelihood of participation in screening (breast: OR = 0.66, 95%CI = 0.47-0.94; colon: OR = 0.81, 95%CI = 0.66-0.99), as was educational level with the likelihood of participation in breast cancer screening (no formal education: OR = 0.20, 95%CI = 0.06-0.61, some primary education: OR = 0.31, 95%CI = 0.10-1.00). Conclusion: The delivery of cancer preventive health services to frail older women is less than ideal. Cognitive status and educational level were important factors in cancer screening behaviour. Tailor-made strategic promotion programmes targeting older women with low cognitive status and educational levels are needed to enhance awareness and acceptance within this vulnerable group.

   Keywords: Breast cancer screening - colorectal cancer screening - older Chinese women - cognitive status

Introduction

   Maintaining older women's health will become a major challenge to health systems (World Health Organisation, 2009). Women comprise more than half the total world population, with almost half of them living in the Southeast Asia or Western Pacific regions (United Nations Population Division, 2007). Because women tend to live longer than men, they represent a growing proportion of all older people: 55% of adults aged 60 or more in 2007 were women. As the older population continues to grow, from 473 million in 2009 to a projected 1.6 billion by 2050 (UNPD, 2009), the importance of preventive health care for older women increases, as the costs associated with the care of older women are expected to be significant.

   Breast, cervical and colon cancers are the most common forms of cancer afflicting women (WHO, 2008), and current guidelines recommend that all women aged 65 or older are screened for these three types (Smith et al., 2010; Sung Lau et al., 2008). Cervical screening, on the other hand, is not generally encouraged among women over 70, particularly those who have had normal tests during their reproductive years (Smith et al., 2010). A number of variables have been reported to affect the likelihood of taking of cancer preventive measures in older adults, including sociodemographic factors such

as age, race, marital status, education, financial status, insurance, and access to resources (Heflin et al., 2002; Kosiak et al., 2006; Bolen et al., 2007; Liu et al., 2008; Schonberg Leveille et al. 2008; Schonberg York et al., 2008), and health-related factors such as self-rated health status, number of chronic illnesses, and mental and physical health (Messecar, 2000; Heflin et al., 2002; Resnick, 2003; Bolen et al., 2007; Schonberg Leveille et al. 2008). However, none of these studies were conducted in the Western Pacific region, which has far more older people than any other area in the world (WHO, 2003).

   Hong Kong has one of the most rapidly growing aging populations in the world (HK Planning Department, 2009). Several studies have examined the participation rates for breast and colorectal cancer screening separately - among older Chinese adults, and have reported that the use of such screening was sub-optimal, identifying several factors associated with the likelihood screening among these adults (Chor et al., 2008; Sung Choi et al., 2008; So et al., 2011). However, none of these studies has examined participation in both types of screening in one sample of frail older women in Hong Kong, or examined age-related factors such as functional disability or cognitive status.

   The aims of the current study were to examine the use of breast and colorectal cancer screening by community-dwelling women aged 60 or above who had sought

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long-term care services in Hong Kong. This population represents a majority of frail older women living in Hong Kong regardless of their financial status, since long-term care is a need-based service here and there are no financial restrictions on applying for it. The study also identifies demographic, lifestyle and health-related variables that are (separately) associated with either of the cancer screening types. The study hopes to generate important and unique information that will enhance the planning, promotion and delivery of cancer preventive services such as health screening for frail elderly women, with the goal of detecting or preventing problems before they become symptomatic.

Materials and Methods

Data

This is a secondary analysis of data collected in 2006 from a large cohort of community dwellers applying for long-term care services in Hong Kong. With the implementation of a central waiting list for government-subsided long-term care services, the Minimum Data Set-Home Care (MDS-HC) instrument has been mandated for use in screening applicants since November 2003 (Lai et al., 2008). Assessments are conducted primarily through direct questioning of the client and the primary caregiver, as well as further in-depth assessment based on observation and a review of secondary documents where necessary. A detailed account of the assessment procedure is given in Leung et al. (2011). A total of 10,331 clients on the central waiting list completed the MDS-HC in 2006. The present study included 1,536 women aged 60 or above who lived in a private home, had no prior or current home care services and were not referred from clinical settings. Three women who did not describe their living arrangements were excluded, resulting in the final sample of 1,533. This secondary data analysis was approved by the research ethics committee of the University of Hong Kong.

Measures

Breast and colorectal cancer screening: The MDS-HC covers a breast examination and mammogram for breast cancer, and a stool test and endoscopy for colorectal cancer. Participants were asked to indicate whether they had taken either of the screening types during the past two years, with the two variables coded as 1 = yes and 0 = no.

Health-related variables: Based on previous studies, five health-related variables measured by the MDS-HC were included in the current analysis. Physical disability was measured by activities of daily living (ADL) and instrumental activities of daily living (IADL). The scoring of ADL was based on the hierarchical form validated by Hirdes (1996). The ADL items were classified into three categories according to when the loss of physical abilities was first noted and the extent of help required: early loss (dressing and hygiene), mid loss (transfer, locomotion and toileting), and late loss (bed mobility, eating). The ADL hierarchy scores range from 1 to 10, with higher scores indicating more dependence (Morris et al., 1995). The IADL score is based on seven items measuring the

respondents' dependency level in carrying out seven activities (meal preparation, ordinary housework, managing finance, managing medication, phone use, shopping and transport). The IADL scale has been shown to have good psychometric properties among older Chinese adults (Leung et al., 2011), with scores ranging from 0 to 21, higher scores indicating more dependence. The Cronbach alpha values for ADL and IADL in the current sample were 0.77 and 0.72 respectively.

Cognitive functioning was measured by the MDS Cognitive Performance Scale (CPS) (Morris et al., 1994), which has been validated against the Mini-Mental State Examination (Hartmaier et al., 1995). The CPS is a hierarchical scale based on five items in the MDS-HC (short-term memory, cognitive skills for daily decision-making, making oneself understood, comatose, and total dependence in eating). The CPS ranges from 0 to 6, with higher scores indicating greater impairment. The Cronbach alpha value for CPS was 0.68 in the current sample.

Medical condition was assessed by the presence or absence of six types of diagnosed chronic disease, including heart disease, neurological disease, musculoskeletal disease, psychiatric disorders, cancer and diabetes. A continuous variable was created by counting the total number of chronic diseases. In addition, we also included self-rated health, a dichotomous variable, in the analysis.

Lifestyle: Two dichotomous items related to lifestyle, smoking and excessive alcohol consumption, as measured by the MDS-HC were included in the analysis. Participants were asked whether they (1) smoked or chewed tobacco daily, and (2) felt the need to reduce their alcohol

Table 1. Demographics, Lifestyle, Health Status and Use of Cancer Screening Among Chinese Older Women (n=1533)

Demographics	
Age, M±SD (range)	80.4±7.2 (60-102)
Education, n (%)	
No formal education	1073 (70.0%)
Some primary education	430 (28.0%)
Secondary education and above	30 (2.0%)
Marital status, n (%)	
Married	392 (25.6%)
Widowed	1049 (68.4%)
Other	92 (6.0%)
Living alone, n (%)	365 (23.8%)
Lifestyle	
Smoking	39 (2.5%)
Excessive alcohol consumption	8 (0.5%)
Health-related variables	
Number of chronic diseases, M±SD (range)	2.2±1.1 (0-6)
IADL, M±SD (range)	13.1±6.0 (0-21)
ADL, M±SD (range)	0.6±1.0 (0-6)
Self-rated poor health, n (%)	552 (36.0%)
CPS, M±SD (range)	1.5±0.9 (0-6)
Outcome measures, n (%)	
Breast cancer screening	57 (3.7%)
Colorectal cancer screening	165 (10.8%)

IADL, instrumental activities of daily living (range: 0-21); ADL, activities of daily living (range: 0-10); CPS, cognitive performance scale (range: 0-6)

Table 2. Factors Associated with the Use of Breast and Colorectal Cancer Screening in Chinese Older Women

	Breast cancer screening			Colorectal cancer screening		
	Yes (n = 57) M±SD or n(%)	No (n = 1,476) M±SD or n(%)	Adjusted OR (95%CI)	Yes(n = 165) M±SD or n(%)	No (n = 1,368) M±SD or n(%)	Adjusted OR (95%CI)
Age	78.3±7.8	80.5±7.2		80.1±7.1	80.5±7.3	
Education level						
No formal education	32(56.1)	1041(70.5)	0.20 (0.06–0.61)**	112(67.9)	961(70.2)	
Some primary education	21(36.8)	409(27.7)	0.31 (0.10–1.00)	49(29.7)	381(27.9)	
Secondary education and above	4(7.0)	26(1.8)	1	4(2.4)	26(1.9)	
Marital status						
Married	13(22.8)	379(25.7)		32(19.4)	360(26.3)	
Widowed	40(70.2)	1009(68.4)		121(73.3)	928(67.8)	
Other	4(7.0)	88(6.0)		12(7.3)	80(5.8)	
Living alone	13(22.8)	352(23.8)		43(26.1)	322(23.5)	
Smoking	1(1.8)	38(2.6)		2(1.2)	37(2.7)	
Excessive alcohol consumption	0(0)	8(0.5)		0(0)	8(0.6)	
Number of chronic diseases	2.5±1.0	2.2±1.1	1.25 (0.99–1.58)	2.3±1.1	2.2±1.1	1.13 (0.98–1.30)
IADL	11.3±6.0	13.2±6.0		13.2±5.4	13.1±6.1	
ADL	0.5±0.9	0.6±1.0		0.7±1.0	0.6±1.0	
Self-rated poor health	16(28.1)	536(36.3)		69(41.8)	483(35.3)	
CPS	1.3±0.9	1.5±0.9	0.66 (0.47–0.94)*	1.4±0.8	1.5±0.9	0.81 (0.66–0.99)*

*p<0.05; **p<0.01; IADL, instrumental activities of daily living (range: 0-21); ADL, activities of daily living (range: 0-10); CPS, cognitive performance scale (range: 0-6)

consumption or whether others had expressed concern about their drinking during the past 90 days.

Demographics: Certain demographic variables were also included in the analysis: age, education level (no formal education, some primary education, secondary education and above), marital status (married, widowed and other, including never married, separated or divorced), and whether the subject lived alone. Information on the financial resources of the participants was not available and therefore excluded from the analysis.

Data analysis

Bivariate and multivariate analyses were performed to identify factors associated with each of the two screening types. In the bivariate analyses, the independent t-test was used to compare continuous variables, with the chi-square test used for categorical variables. Factors associated with each of the five outcome measures (use of the four preventive measures or non-use of all four measures) in the bivariate analyses with a p-value less than 0.2 were included in the multivariate logistic regression model with backward elimination, using the Wald test to obtain a better picture of the effect of associated factors on use of the preventive measure. Data were analysed using SPSS19.0, with p-values less than 0.05 considered statistically significant in the final logistic regression models.

Results

Table 1 summarises the demographic characteristics, health status and use of cancer screening of the 1,533 respondents. The average age was 80.4 years (SD = 7.2), 68.4% were widowed, 23.8% lived alone and 2% had at least some secondary education. Additionally, 2.5% reported smoking or chewing tobacco daily and 0.5% excessive alcohol consumption. Overall, 93.9% of the respondents had at least one chronic disease, their mean ADL, IADL and CPS scores were low, and 36% reported

being in poor health. During the past two years, 10.8% had undergone colorectal cancer screening and 3.7% had had a breast examination or mammogram. Most respondents (87.1%) had received neither of the preventive measures, with only a few receiving one (11.4%) or both (1.6%).

Table 2 shows the results of multivariate logistic regression for factors associated with participation in breast and colorectal cancer screening. In the case of the first type, the bivariate analyses showed that five factors were associated with using tests during the past two years: age, education level, number of chronic diseases, IADL score and CPS score. The final logistic regression results revealed that women with lower education levels and higher CPS scores were less likely to receive screening tests for breast cancer. In the case of colorectal cancer screening, four factors were associated in the bivariate analyses with the use of screening: marital status, number of chronic diseases, self-rated poor health and CPS score. Only the CPS score remained statistically significant in the logistic regression model, and respondents with greater cognitive impairment were less likely to have received the colorectal screening test.

Discussion

This study was conducted to extend previous research on participation in beast and colorectal cancer screening among frail older women in Hong Kong. The participation rates are extremely low, suggesting that delivery of cancer preventive services to older women is less than ideal, and that there is thus a need to increase the availability and visibility of these two preventive measures in Hong Kong. The results were in line with Liang et al.'s study (2004), which found that cancer fatalism was evident among Chinese older women, who believed that 'people have no control over life and death, and so regular health checkups or cancer screenings are of little concern'. The study also identified important factors affecting participation in

breast and colorectal cancer screening, highlighting the importance of developing strategic promotion programmes for cancer screening that are directed specifically towards older women and which enhance this vulnerable group's awareness and acceptance of screening.

Our findings highlighted the importance of cognitive status in the screening participation rates of frail older women applying for long-term care services. Cognitive impairment appeared consistently to predict a lower rate of screening tests for breast and colon cancer after controlling for the effect of other potential covariates, which is consistent with the findings of Heflin et al. (2002). However, unlike other reports in the literature (Bynum et al., 2005; Bolen et al., 2007; Schonberg, Leveille et al., 2008), we found that the association of health-related measures, including self-rated health status and functional disability (ADL and IADL), with the screening participation rates were insignificant. Present results show that cognitive impairment as measured by CPS is the single most important factor associated with screening among older frail women, as variations in the likelihood of participating in breast and colorectal cancer screening deriving from health status and functional disability are also accounted for by CPS. Given the cross-sectional nature of the study, however, it is also possible that respondents who had undergone cancer screening were more health-conscious and might have better self-perceived health. Further studies using a longitudinal study design are warranted to test this hypothesis.

Consistent with a previous study (Chor et al., 2008), the current findings also suggest that education levels have differential effects on breast cancer screening rates among frail older women, but also indicate that age and marital status have no such effect. The mixed results regarding age and marital status might possibly be due to the fact that the current sample of older women applying for long-term care services is thought to be relatively homogeneous, in that most belong to the oldest age group (62% were 80 or older), have no formal education and are widowed. However, no demographic information was reported in Chor et al.'s study (2008) for comparison. Nevertheless, our findings suggest that we should develop special health programmes to target frail older women with low education levels to promote breast cancer screening.

The current study had several limitations. First, because of the nature of the cross-sectional design, the associations observed could not be regarded as casual, and the results should be further examined in longitudinal studies to establish the temporal validity of the associations found. Second, financial information was not available, although many studies have reported income and insurance status as important determinants of adopting cancer prevention measures (Walter and Covinsky, 2001; Heflin et al., 2002; Bolen et al., 2007). In Hong Kong, endoscopies and mammograms are often used for diagnosis rather than screening and, if suspected health problems do exist, most elderly people will seek help from public service rather than private providers. In this way, financial status may not play an important role in screening participation rates, which might also explain the low take-up of colorectal (10.8%) and breast (3.7%)

screening in the sample, and why only a few significant correlates for these two preventive measures could be identified. Finally, our cohort primarily comprised women who were first-time applicants for long-term care services, so the generalisability of the findings to older women in the general population is uncertain. However, understanding cancer screening within the long-term care service applicants is important in its own right, because these are the people who are expected to be frailer and in greatest need for medical and health services.

In conclusion, the study shows that the participation rates for breast and colorectal cancer screening are suboptimal, and that cognitive status seems to be an important factor in the promotion of screening among older women who have sought long-term care services in Hong Kong. The current study extends research in health promotion to a specific population of frail elderly women. With this information, health providers in Hong Kong can more appropriately target programmes and policies to reduce disparities in access to services and treatment for cancer prevention.

Acknowledgements

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