



## Gender differences in the use of colorectal cancer tests among older Chinese adults



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### A B S T R A C T

#### Keywords:

Colorectal cancer  
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Chinese  
Gender difference

**Purpose:** The study aimed to explore the gender difference in using colorectal cancer (CRC) tests among Chinese aged 50 years or over.

**Methods:** A cross-sectional study was conducted in 2004 Chinese older adults through anonymous telephone survey which covered socio-demographic variables, health status, use of complementary therapy, health-related perceptions and use of CRC tests.

**Results:** The uptake rate of flexible sigmoidoscopy (FS)/colonoscopy was 14% for males and 10% for females, with males significantly more likely to have had the test after adjusting for their differences in socio-demographics, health status, use of complementary therapies, health-related perceptions and recommendation received from health professionals (adjusted OR = 1.5, 95% CI: 1.1–2.0,  $p = 0.005$ ). The uptake of fecal occult blood test was nearly the same (19%) for both genders. Further interaction analyses indicates that the effect of a family history of cancer on the uptake of a FS/colonoscopy is significantly weaker in males than in females (the interaction odds ratio = 0.4, 95% CI: 0.2–0.8,  $p = 0.011$ ), whereas a male perceived that visiting a doctor is good for health will be more likely to have an uptake of a FS/colonoscopy than a female with such perception (the interaction odds ratio = 2.1, 95% CI: 1.1–3.8,  $p = 0.018$ ).

**Conclusions:** The uptake of CRC tests was low in this average-risk population. More effort is needed to educate the public about the importance and benefits of CRC tests. In view of the gender differences in some determinants of FS/colonoscopy uptake, particular attention should be given to develop gender-specific strategies to improve the rate.

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### Introduction

Colorectal cancer (CRC) is a major cause of morbidity and mortality throughout the world. It accounts for over 9.8% of all cancer incidence, is the third most common cancer worldwide and the fourth most common cause of death (Globocan, 2010). It affects men and women almost equally, accounting in 2008 for over 17.3% of the incidence and 8.2% of the mortality (610,000 deaths) (Globocan, 2010).

With its rapid economic growth over the past 20 years, China has become the second largest economy in the world (Barboza, 2010). There has been a growing trend of adopting Westernised dietary habits among wealthy Chinese, who are consuming more meat but less cereals and vegetables (Sung et al., 2008b). CRC is actually now the fourth leading cause of cancer death in China (The Ministry of Health of the People's Republic of China, 2010) and, given the vast population (over 1.3 billion), has become a substantial disease burden on the country, particularly in the more developed and wealthier regions.

Cancer screening increases the chance of early detection of cancer and is therefore a preventive measure of mortality. The three screening tests commonly used to screen CRC are the faecal occult blood test (FOBT), flexible sigmoidoscopy (FS) and colonoscopy.

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These tests are recommended by the [Cancer Expert Working Group \(CEWG\) \(2010\)](#) for populations at average risk, aged between 50 and 75. The recommended screening frequencies are: annual or biennial FOBT, FS every five years or colonoscopy every ten years ([Cancer Expert Working Group on Cancer Prevention and Screening, Centre for Health Protection, Hong Kong Department of Health, 2010](#)). However, the rate of uptake of CRC testing remains low. According to a local study, only 9.9% of participants reported that they had ever undergone CRC tests ([Sung et al., 2008a](#)).

Many studies have investigated factors that affect people's participation in CRC tests, and gender has always been identified as an important predictor. A review concentrating on older people of 65 or above showed that more than half of such studies had found women were less likely to be screened than men, regardless of the presence of health insurance ([Guessous et al., 2010](#)). Several studies have explored gender difference in CRC test rates among people aged 50 or above, and found that more men than women are currently tested for CRC ([Brawarsky et al., 2003](#); [Peterson et al., 2007](#); [Wardle et al., 2005](#)).

Several studies have reported that men prefer a different type of screening method from women. Four studies found that more men underwent FS or colonoscopy ([Brawarsky et al., 2003](#); [Green and Kelly, 2004](#); [Griffin et al., 2009](#); [Janz et al., 2003](#)), while five others reported that more women used FOBT ([Frederiksen et al., 2010](#); [Green and Kelly, 2004](#); [Ioannou et al., 2003](#); [McQueen et al., 2006](#); [Parente et al., 2009](#)). Although such studies did show there was a difference, two reported that the results of gender difference in CRC test preference were not statistically significant ([Griffin et al., 2009](#); [McQueen et al., 2006](#)).

Differences in the uptake of CRC test between genders may be explained in several possible ways. There is a belief that colorectal cancer is a male disease, with women feeling they are less vulnerable to the disease, and often expressing a fear of pain and embarrassment in the case of endoscopic screening. Moreover, preparations for the endoscopic procedure are a major barrier as more women than men believe that the degree of laxative intake is abusive and intolerable, and are therefore less likely to participate in CRC testing ([Friedemann-Sánchez et al., 2007](#)). On the other hand, men have also been considered less enthusiastic than women about health-promoting or disease-preventing behaviour in general. Men seem to have a lower level of health knowledge than women and are therefore less likely to be aware of the value of preventive behaviour ([Beier and Ackerman, 2003](#)).

Most cancer examinations are for sex-specific types, such as prostate, cervical or breast cancers, and the CRC test is the only one involving both genders. It is interesting to explore whether or not differences in the uptake rates of CRC testing exist between men and women in Chinese societies. In our previous study ([So et al., 2012](#)), we identified determinants associated with the uptake of CRC testing, including socio-demographics, health status, use of complementary therapy and health-related perceptions. Numerous studies have shown that recommendation from health professionals is a significant factor in influencing the uptake rate ([Bellizzi et al., 2011](#); [Brenes and Paskett, 2000](#); [Gilbert and Kanarek, 2005](#); [Palmer et al., 2011](#); [Sung et al., 2008a](#)). The present study aims to explore gender difference in the use of CRC tests among Hong Kong Chinese aged 50 years or more, with adjustment for their differences in the above determinants and for recommendations from health professionals. Furthermore, we also want to examine if the effects of those determinants and recommendations on the use of CRC tests vary between the two genders in this population.

## Materials and methods

The methodology of the present study has been described in detail in our previous publication ([So et al., 2012](#)). In brief, it was

a cross-sectional telephone survey conducted with a population consisting solely of Hong Kong Chinese residents aged 50 or above living in domestic households. Anonymous telephone interviews, using a structured questionnaire, were conducted by the telephone survey team of the Centre for Epidemiology and Biostatistics of the Chinese University of Hong Kong. Telephone numbers were randomly selected from up-to-date residential directories which covered over 95% of Hong Kong households. The interviews were conducted from 6:30 pm to 10:30 pm to avoid over-representing the non-working population. In the case of households with two or more eligible members, the one whose birthday was closest to the date of the interview was invited to join the study. At least three attempts at different times on various days of the week were made before 'non-contact' status was assigned to any number, to ensure the survey results were not biased by high non-contact or non-response rates.

A structured questionnaire, which took about 30 min to complete, was used in the study to collect information on socio-demographic characteristics, health status, use of complementary therapies, health-related perceptions and use of CRC tests. The final section was adopted with modifications from the 2005 cancer module of the National Health Interview Survey ([Centers for Disease Control and Prevention, 2006](#)). The section on complementary therapy covers the five most common types used in Chinese societies ([Ahn et al., 2006](#)): (1) acupuncture, (2) cupping, (3) herbal medicine, (4) bone setting and (5) Chinese massage. Each item was rated on a four-point scale (0 = never, 1 = once only, 2 = occasionally, 3 = on a regular basis), and the total index score was calculated by summing all the item scores.

## Statistical analyses

The survey findings were summarized and presented using appropriate descriptive statistics. Characteristics of socio-demographics, health status, use of complementary therapies and health-related perceptions between the two genders were compared using Pearson chi-square or Fisher's exact tests, as appropriate, and those characteristics with *p* values of <0.25 were considered to be potential confounding factors ([Mickey and Greenland, 1989](#)) and adjusted for in subsequent comparisons between the genders. Binary logistic regression analysis was employed to compare the use of CRC tests of the two genders, with or without adjustment for the potential confounders. For those CRC tests in both genders, stepwise multivariable logistic regression analyses were conducted to identify determinants associated with the tests, including socio-demographics, health status, use of complementary therapies and health-related perceptions. Then a further multivariable logistic regression was performed to examine the interaction terms between those determinants and gender after adjusting for the main effects of the determinants. The results of the logistic regressions were presented by the odds ratios (OR) together with the 95% confidence intervals (CI) of the factors identified in each corresponding model. All statistical analyses were performed using SPSS 18.0 (SPSS Inc., Chicago, IL.). All statistical tests involved were two-tailed and the level of statistical significance was set at 0.05.

## Results

### Socio-demographic characteristics

A total of 2004 participants (1002 of each gender) completed the survey and were included in the study (response rate = 67%). The gender-specific age distribution of the sample collected was comparable to the local general population in 2007 ([Census and Statistics Department, 2007](#)). The characteristics of the participants stratified

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