European Journal of Oncology Nursing 16 (2012) 505–511

Contents lists available at SciVerse ScienceDirect

European Journal of Oncology Nursing

journal homepage: www.elsevier.com/locate/ejon

Psychometric properties of the Chinese Breast Cancer Screening Beliefs questionnaire

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Keywords:
Breast cancer screening
Chinese
Psychometrics
Reliability
Validity

A B S T R A C T

Background: Breast cancer is the most common type of cancer in women. The Chinese Breast Cancer Screening Beliefs (CBCSB) questionnaire was developed to measure Chinese–Australian women's beliefs, knowledge and attitudes about breast cancer and breast cancer screening.
Purpose: To assess the psychometrics of the modified version CBCSB in a Chinese-speaking community.
Methods: Two items in the original CBCSB were removed because they were not applicable to the Hong Kong setting, which resulted in an 11-item CBCSB. A total of 730 women aged at least 18 years old without a history of breast cancer self-completed the questionnaire.
Results: Based on 730 Chinese-speaking women with mean age of 43 years, the three hypothesized subscales of the CBCSB had Cronbach's alpha ranging between 0.69 and 0.75. Non-responses to the items were at most only 3.3%. The corrected item-total correlations for the hypothesized subscales ranged from 0.35 to 0.63 and were higher than those for the competing subscales. As hypothesized, the frequency of health practices was significantly associated with all subscales of the CBCSB. Confirmatory factor analysis showed an adequate fit for the hypothesized three-factor structure of the modified CBCSB questionnaire.
Conclusions: The 11-item CBCSB questionnaire was culturally appropriate, reliable and valid in a Chinese-speaking community setting. It can be used to gain understanding of Chinese-speaking women's beliefs, knowledge and attitudes about breast cancer and breast cancer screening. It may also serve as an outcome for the development and assessment of public education programs for breast cancer screening.

Introduction

Breast cancer is the most common cancer in women across most, if not all, ethnic groups. In Hong Kong, breast cancer is the third leading cause of cancer deaths among women, accounting for 10.3% of all cancer deaths in 2008 (Hospital Authority, 2011). Over the last two decades, the age-standardized incidence rate of female breast cancer has been steadily increased from 30.9 to 46.8 per 100,000 standard population (Hospital Authority, 2011).

Given that the causes of breast cancer remain largely unknown, early detection procedures, including breast self-examination, clinical breast examination, and mammography, are considerably important as secondary preventive measures. A previous meta-analysis showed that in particular, mammographic screening may reduce the risk for breast cancer-related death by 30% (Leung et al., 2002). As a result, some Western countries, such as Australia and United Kingdom, have implemented national screening programs to provide mammograms for women in the target age group (Australian Cancer Council, 2011; NHS Cancer Screening Programmes, 2011). In Hong Kong, however, there is currently no population screening of breast cancer or official recommendation for breast cancer screening practices. The Well Women Clinics organized by the Tung Wah Group of Hospitals were the first and presently the largest comprehensive self-referred breast cancer screening program established in Hong Kong. Their services were provided on an out-of-pocket basis and health insurance does not cover the cost of a mammogram if it is requested for preventive purposes. In addition, there were also Breast Health Centres which perform breast cancer screening. They offered a fee waiver to low-income people whose income and asset do not exceed a pre-defined limit.

Research has shown the attitudes and knowledge about breast cancer, and screening practices among Chinese women are generally unfavorable (Kwok and Sullivan, 2007; Tan et al., 2007). In addition, the concept of preventive health care has a low priority among the Chinese population in Hong Kong (Chua et al., 2005). In Hong Kong,

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doi:10.1016/j.ejon.2012.01.001

42% of women refused to participate in annual mammography screening and clinical breast examination (Chua et al., 2005), and approximately 68% of women had never had a mammogram (Yan, 2009). Moreover, in a Hong Kong women clinic where women were seeking care, the rate of routine breast self-examination was also as low as 44% (Abdullah and Leung, 2001). While there is a need to examine the attitudes, knowledge of, and barriers to breast cancer screening or specifically, to mammography (Chua et al., 2005; Yan, 2009), no studies had used an adequately tested instrument. An instrument is considered adequate if both its reliability and validity have been evaluated and found to meet certain criteria. Unfortunately, to our knowledge, there has been no adequately tested instrument for assessing the attitudes, knowledge of, and barriers to breast cancer screening in Hong Kong.

In response to this literature gap, the Chinese Breast Cancer Screening Beliefs (CBCSB) Questionnaire was originally developed to assess Chinese–Australian women's beliefs, knowledge and attitudes towards breast cancer and screening practices. An initial pool of 32 items was developed from a comprehensive literature review in the field, and in-depth interviews conducted with Chinese–Australian women. The items were grouped under three dimensions: Attitudes towards general health check-ups (4 items), knowledge and perception about breast cancer (11 items), and mammographic screening practices (17 items). After careful assessment of the content validity, cultural appropriateness and psychometric performance, the CBCSB was reduced to 13 items loading onto three factors. The three factors represent three domains: 1) attitudes to general health checkups, which explore whether women engaged in general health checkups in the absence of signs and symptoms; 2) knowledge and perceptions about breast cancer, which explore cultural beliefs around breast cancer, and 3) barriers to mammographic screening, which explore personal and practical issues perceived by women to hinder their participation in breast screening. The 13-item CBCSB has been demonstrated to be reliable and valid in measuring the beliefs, knowledge and attitudes about breast cancer and breast cancer screening of 292 Chinese–Australian women. A detailed description of the development and psychometric evaluation of the CBCSB can be found in Kwok et al. (2010).

However, the 13-item CBCSB was tested in a Chinese sample from an English-speaking community and may not be directly applicable in a Chinese-speaking community due to potential cultural differences. For instance, language was found to be a main barrier to mammography among Chinese–Australian women in Australia (Kwok et al., 2005). However, this item would not be applicable in a Chinese-speaking community in Hong Kong. Evaluating the cultural adaptability of the CBCSB in a Chinese-speaking community was thus desirable. Therefore, this study aimed to assess the psychometric performance of the modified CBCSB in Chinese-speaking women living in Hong Kong.

Methods

Participants

We planned to recruit 700 women who were at least 18 years old. However, those with a history of breast cancer or those who were unable to read traditional Chinese were excluded. A total of 31 centers of non-profit organizations covering different parts of Hong Kong participated in subject recruitment. Women who visited these centers were approached by research assistants to assess their study eligibility. All eligible women were invited to participate in the study. Those who were willing to participate were asked to sign an informed consent form before they completed a questionnaire.

The planned sample size of 700 women was sufficient for a confirmatory factor analysis of the 11-item CBCSB questionnaire, using either the minimum requirement of 500 subjects or the rule of thumb of 20 subjects per item and allowing a small percentage of incomplete or problematic questionnaires (Comrey and Lee, 1992; Hair, 2010).

Instruments

A questionnaire was self-administered and included the following components.

Modified CBCSB questionnaire

The modified CBCSB questionnaire was derived from the original 13-item CBCSB developed for Chinese–Australians (Kwok et al., 2010). The two items in the "Barriers to mammographic screening" subscale of the original CBCSB questionnaire were removed: one item about the difficulty in arranging transportation to get a mammogram and the other item about the ability to speak English. These items were not applicable in Hong Kong, a city with an efficient and comprehensive public transportation system. In particular, all public healthcare centers are accessible by public transportation. Moreover, most, if not all, practicing healthcare professionals in Hong Kong speak Cantonese. The resulting modified CBCSB questionnaire included 11 items in three subscales: attitudes towards general health check-ups (4 items); knowledge and perceptions about breast cancer (4 items); and barriers to mammographic screening (3 items). All of the items were rated on a 5-point Likert scale, with 1 corresponding to the lowest attitude, least knowledge or greatest barrier. A brief description of the items is provided in Fig. 1. For each subscale, the total score was standardized in the range between 0 and 100 for assessment, i.e. (total score − minimum total)/(maximum total − minimum total). For instance, the score of a subscale of 4 items = (total score − 4)/(20 − 4). A higher subscale score indicated better attitude, more knowledge or lower barrier.

Demographics and screening practices

The demographic information collected included age, marital status, education level, and employment status. Five items assessed the frequency of health check-up, such as the general health check-up, dental check-up, Pap smear, breast self-examination, clinical breast examination and mammography.

Statistical analysis

The demographic information and other clinical characteristics of the study participants were summarized using descriptive statistics. The modified CBCSB was scored identically to how the original version was scored (Kwok et al., 2010). Case mean substitution was used for non-responded items within the subscale when participants provided at least 50% of valid responses to the other subscale items.

The modified CBCSB was first assessed for its item performance. Specifically, the internal reliability was assessed using Cronbach's alpha. The correlated item-total correlations for the subscales were then examined. Moreover, the association between items and their competing subscales was assessed using the Spearman rank correlation coefficient.

The clinical validity was examined by using clinical criteria that should be associated with the CBCSB. First, we hypothesized that the subscale scores were positively associated with the frequency of health practices, including the general health check-up (0–4), dental check-up (0–4), Pap smear (0–4), breast self-examination (0–3), clinical breast examination (0–4) and mammogram (0–3), with 0 indicating that the health practice had never been