



# Awareness of breast cancer and barriers to breast screening uptake in Bangladesh: A population based survey



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## ARTICLE INFO

### Article history:

Received 2 October 2015

Received in revised form 2 November 2015

Accepted 3 November 2015

### Keywords:

Awareness  
Barriers  
Breast cancer  
Screening  
Bangladesh

## ABSTRACT

**Objectives:** To investigate the awareness of breast cancer (BCa) and BCa screening amongst women at midlife in Bangladesh.

**Methods:** A nationally representative cross-sectional survey of women aged 30–59 years was conducted in 7 districts of the 7 divisions in Bangladesh, using a multistage cluster sampling technique. The factors associated with the awareness of BCa and breast assessment of asymptomatic women were investigated separately, using multivariable logistic regression.

**Results:** Of the 1590 participants, mean age 42.3 ( $\pm 8.0$ ) years, 81.9% had ever heard of BCa and 64.2% of any methods of BCa screening, respectively. Awareness of BCa was associated with being aged 40–49 years (adjusted OR 2.04, 95% CI 1.46–2.84), aged 49–59 years (1.96, 1.32–2.91), being overweight (1.46, 1.07–2.01) and obesity (1.62, 1.01–2.62), while inversely associated with rural dwelling (0.37, 0.22–0.61), primary education (0.44, 0.27–0.70), having no education (0.23, 0.14–0.36) and parity (0.62, 0.44–0.87). Of the 750 women who were aware of clinical breast examination (CBE) or mammography, reasons provided for not undergoing screening included that they had no symptoms (92%) and that they did not know screening was needed (40%). 8% of women reported CBE. Women with no education were less likely to have undergone CBE (0.38, 0.14–1.04;  $p = 0.059$ ).

**Conclusion:** Lack of understanding of the assessment of asymptomatic women is the key obstacle to BCa screening uptake in Bangladesh. Health education programs, especially BCa awareness programs, have the potential to increase BCa awareness and down-staging of the disease.

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## 1. Introduction

Breast cancer (BCa) is the leading incident cancer amongst women in Bangladesh [1,2]. There is no national cancer registry in Bangladesh. Using data from India and Pakistan, it has been estimated that 30,000 Bangladeshi women are newly diagnosed with BCa annually [3]. Over 40% of women diagnosed with BCa in Bangladesh are premenopausal and most women present with locally advanced or disseminated disease [4]. Hence, in contrast to what is seen in developed countries, in Bangladesh, BCa is a disease of young women which conveys high morbidity and mortality

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due to presentation at a late stage. Access to breast surgery and radiotherapy is increasing across Bangladesh [5] such that morbidity and mortality could be significantly reduced if BCa was to be diagnosed at an earlier stage (clinical down-staging). Recognising this, BCa has been identified as a major target for early disease diagnosis by the Bangladesh Ministry of Health and Family Welfare [6]. Campaigns to educate women about the symptoms and signs of BCa have been proposed [6]. It has been reported that a breast health awareness program would be ineffective because of entrenched complex socio-cultural, economic, and health systems barriers that include gender inequity and human rights issues [3].

The Bangladesh Midlife Women's Health Study (BMWHS) is a population-based study to which 1590 women, aged 30–59 years, were recruited between September 2013 and March 2014, to better understand the health needs of Bangladeshi women at midlife [7]. This study has revealed that the major barrier to cervical cancer in

Bangladesh is a lack of understanding of the concept of screening asymptomatic people [8]. We now report on the knowledge and awareness of BCa and barriers to the utilization of methods for the early detection of BCa, using data from the BMWHS.

## 2. Methods

### 2.1. Study setting and participants

We recruited women from seven districts in Bangladesh, namely Barisal, Tangail, Comilla, Sathkhira, Rajshahi, Rangpur and Habigonj, using a multistage cluster sampling method to ensure a representative study sample. Seven main administrative divisions comprise the 64 administrative districts of Bangladesh. Women, aged 30–59 years were recruited from each of 7 districts randomly selected from the 32 districts offering opportunistic cervical cancer screening, as described in detail elsewhere [7]. We used the distribution of the 3.24 million women of the target age group in these districts in the 2011 housing and population census to determine the number of women to be recruited in each district, taking into account the ratio of urban to rural women in each district [9]. Within each district, there are enumeration areas (EAs) that are the smallest units with a defined area, and each includes on average 120 households [10]. The least number of women required in any single EA was 36 [7]. As a result, the household selection was an unequal probability systematic selection with 36 households per EA. The EAs within each district were selected randomly, and within each EA, the first household was selected randomly. Systematic sampling was then used to select the second, third or fourth household, depending on the number of eligible women in the EA. Only one eligible woman was recruited from each household. If a participant was not identified in a selected household, the adjacent household was approached. In accordance with multistage cluster design, sampling weight ensured representativeness of the sample at all stages [7,8].

The BMWHS was approved by the Monash University Human Research Ethics Committee, Melbourne, Australia and the Bangladesh Medical Research Council, Dhaka, Bangladesh.

### 2.2. Sample size

The sample size calculation was based on the previously reported prevalence of cervical cancer screening uptake (8.6%) [11], with a margin of error of  $\pm 2\%$ , amongst women at midlife. This gave a minimum sample size of 755. This figure was multiplied by the design effect of 2, as the urban and rural EAs were considered independently. The sample size was further increased by 5% to allow for non-sampling error, particularly non-response error. The final a priori sample size estimation was 1586 women. Given that the prevalence of uptake of clinical breast examination (CBE) 8%, we are appropriately powered for this study outcome [12].

### 2.3. Study questionnaire

The study questionnaire developed in English was first translated into Bengali after which translation accuracy was verified by an independent bilingual translator and further verified by back-translation. The questionnaire was piloted in 16 women, which led to minor refinement. Questions pertaining to personal, socio-demographic and household characteristics were obtained from the Bangladesh Demographic Health Survey questionnaire [13]. Questions about knowledge and awareness of BCa, and practices of BCa screening were formulated on the basis of an extensive review of the published literature. Nine questions pertained to BCa awareness and knowledge, and screening of BCa: have you ever heard of BCa? Have you or a member of your family had BCa? Can

you please tell me any symptoms which would indicate a woman has BCa? Have you ever heard about women having screening to find BCa? Do you know of any methods of BCa screening? Do you know how to check your breasts for lumps or other abnormalities (breast self-examination [BSE])? Did you ever check your own breasts for possible lumps (chaka), distortions or swelling? Have you ever had your breasts examined by a doctor, nurse, or other health professional (CBE)? Have you ever had a mammogram? The questionnaire also included a series of questions about potential barriers to screening of BCa. A household 'wealth index' was derived from variables such as housing materials, households assets and amenities, sources of water and type of toilet facilities used [13].

### 2.4. Data collection

Data collection was by structured interview as literacy in Bangladesh is low. Four female university graduates were trained to conduct the interviews. Training involved a two-week intensive program, mock interviews and field practice to ensure interview consistency. Participants were first given a verbal explanation of the objectives, general content and time commitment involved in participation, and assurance of confidentiality. Once verbal consent was obtained, the interviewer completed the study questionnaire based on participants' responses. Each day all the completed questionnaires were reviewed. When necessary, households were revisited the following day to clarify any ambiguities or to collect missing data.

### 2.5. Statistical analysis

BCa awareness (ever heard of BCa) and screening of BCa (CBE) were considered as two outcome variables. BCa awareness was investigated for all study participants, whereas screening of BCa was investigated only for those who had ever heard of CBE. We did not model for BSE and mammography due to small numbers in the cells. Simple and multivariable logistic regression analyses were used to evaluate the association between each of the outcomes and participants' socio-economic and demographic characteristics. Each household's 'wealth index' was ascertained using a principal component analysis and was presented as wealth quintiles [13,14]. Parity was treated as dichotomous for regression analyses, two or fewer children and more than two children, since "Boy or Girl, two-children are enough" as a significant slogan played vital role to reduce population growth rate in Bangladesh [15]. We considered 11 variables as potential predictors for both outcomes, however, husband's education and wealth quintiles were excluded from the multivariable logistic regression models due to multi-collinearity with women's education and place of residence respectively. A variable with a *P* value of less than or equal to 0.05 was considered significant. The area under the receiver operating characteristic curve (ROC) and the Hosmer and Lemeshow (H–L) *P* value were used to assess the models' discrimination and calibration performances. The first-degree interaction effect between independent variables was also investigated. All analyses were performed using statistical software packages STATA (version 12.0; StataCorp LP, College Station, Texas) and SPSS (version 20.0; SPSS Inc. Chicago, Illinois, USA).

## 3. Results

Of 1700 approached households, 1590 women agreed to participate in the study. Their mean age was 42.3 ( $\pm 8.0$ ) years and 73.8% resided in rural areas (Table 1). The majority (94.2%) were not employed outside the home, 88.9% were married, and 92.2% reported their religion as Islam. 40.2% of the women had no formal education and 12.0% had more than 10 years of education. 29.1%

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