

# Risk Factors for Breast Cancer among Women Attending In Selected Hospitals of Dhaka City

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## ABSTRACT

Breast cancer is the most frequently diagnosed cancer among women both in the developed and the developing world and leading cause of cancer death in women. A hospital based case control study was carried out among 70 women with breast cancer and 70 women without breast cancer to analyze the risk factors associated with development of breast cancer in selected hospitals of Dhaka city. A semi-structured questionnaire comprise socio-demographic and socioeconomic related information, reproductive and obstetric related factor, hormonal Contraceptive and Hormone Replacement Therapy use, life style related factor (personal habit, dietary habit, physical activity etc). In adjusted odds ratios (ORs) and 95% confidence intervals for significant risk factors were obtained from logistic regression analysis. Significant risk was found among nonworking women (OR 2.7, 1.03-7.1), positive family history of cancer (OR 2.3, 1.02-5.2) and early menarche (OR 3.4, 1.5-7.9). Family history of cancer, early menarche may play significant role in developing breast cancer in Bangladeshi women.

**Key words:** Bangladeshi women, BMI, Breast cancer and Risk factor.

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## INTRODUCTION

In 2012 it was estimated that worldwide, 1.7 million people were diagnosed with breast cancer, accounting for around twelve percent of all new cancers. Statistics shows between 2008 to 2012 a brisk increase in incidence and mortality of breast cancer among women globally. Breast cancer scenario varies significantly in different geographical areas. Although developed countries report higher rates of breast cancer incidence, but the incidence and mortality of breast cancer is also increasing in developing countries (WHO, 2013). In Bangladesh there is no national survey on cancer, however a hospital-based cancer registry report showed lung cancer in men (25.5%), breast cancer (25.6%) and cervical (21.5%) in women are the leading cancers in

Bangladesh (Talukder et al., 2009). In developed countries several epidemiological studies explored smoking, induced abortion, contraceptive intake, personal history of breast disease, family history of breast cancer are found potential risk factors in developing breast cancer, some of them are modifiable (Kuru et al., 2002; Ebrahimi et al., 2002; Ozmen et al., 2009).

Some other literature showed breast cancer association with reproductive factor and diet; like, early menarche, menopause, body mass index [BMI] after menopause, past use of postmenopausal hormones, high intakes of animal proteins and red meat (Graham et al., 2004; Lee et al., 1991; Yuan et al., 1988). Due to urbanization and Industrialization and a Shift towards western lifestyle in

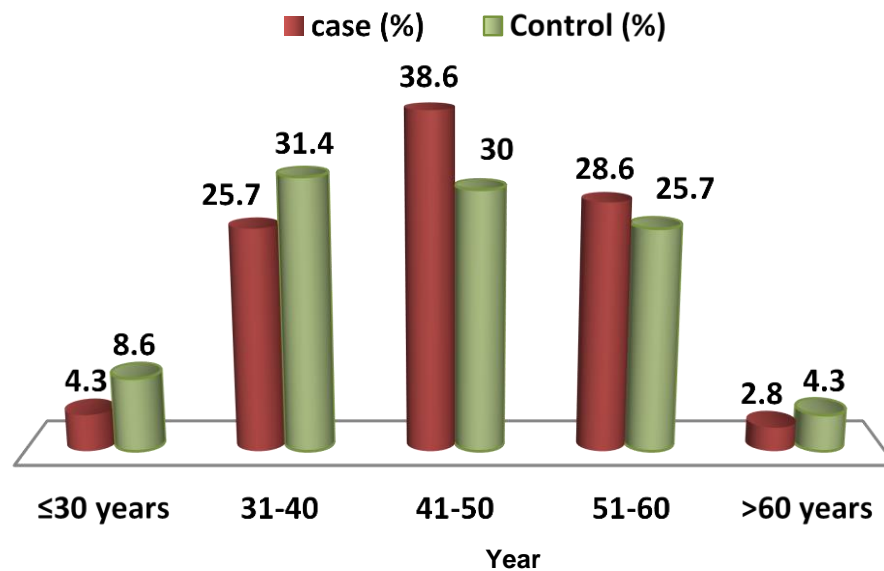


Figure 1. Bar diagram showing distribution of respondents by age.

the less developed countries breast cancer becomes a crucial public health problem and a prime cause of cancer death among women (WHO, 2013). This current study was an attempt to analyze the risk factors associated with development of breast cancer among the women to control the rising burden of breast cancer.

## METHODOLOGY

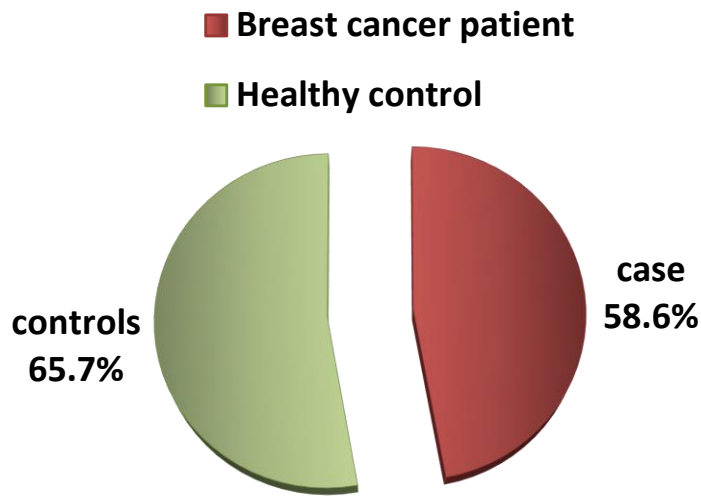
This hospital based case control study was carried out during September to December 2012 among 70 cases of women with breast cancer and 70 controls (healthy). Cases were selected from the breast cancer patients who attended National Institute of Cancer Research and Hospital (NICRH) and Ahmed Medical Centre (AMC) for either follow up or chemotherapy. Attendants of patients of medicine Out Patient Department at Bangladesh Medical College Hospital (BMCH) and Shaheed Suhrawardy Medical College Hospital (ShSMC) were included as control group keeping the age as matching factor. The data was collected by semi-structured interviewer administered questionnaire. Socio-demographic and socio-economic related information, reproductive and obstetric related factor, Hormonal Contraceptive and Hormone Replacement Therapy use and Life style related factor (personal habit, dietary habit, physical activity etc) were gathered through face to face interview and for BMI, weight and height were measured. To minimize bias weight and height of cancer patients were taken from the hospital record at the time of diagnosis, because after chemotherapy some patients lost their weight. Primarily the questionnaire was

designed in English but before data collection it was translated into Bengali. Written consent was taken and Identity was kept confidential. Pre testing of the questionnaire was done in NICRH. After the completion of data collection, data was screened for any discrepancy. Final analysis was done with SPSS version 16. Unadjusted odds ratio was generated for all the variables with 95% confidence interval and only significant factors were considered as candidate for binary logistic regression. A binary logistic regression model was generated to assess the risk factor of breast cancer in comparison to non-breast cancer control adjusting for possible confounder.

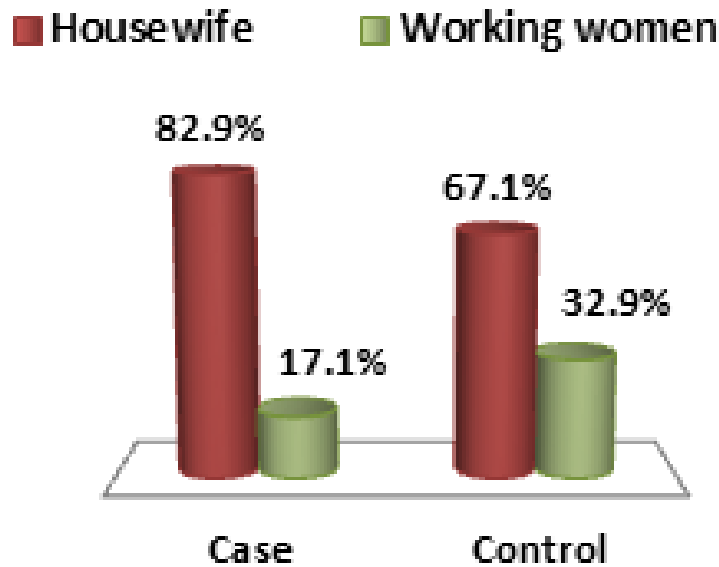
## RESULTS

### Socio-Demographic and Socio-Economic Factors

In socio-demographic variables no significant differences were found among age ( $p = 0.644$ ), religion ( $p = 0.17$ ), marital status ( $p = 1.00$ ), monthly family income ( $p = 0.76$ ), and educational status ( $p = 0.384$ ). 41-50 age groups showed highest breast cancer patient (38.6%), where 31.4% healthy controls were in 31-40 age groups (Figure 1). Mean age of cases were  $46 \pm 8.9$  years and controls were  $44.41 \pm 9.97$  years. Mean monthly family income were among cases  $22,471 \pm 16,039$  BDT and among controls  $25,760 \pm 15,712$  BDT. Non-breast cancer groups (65.7%) were more educated than breast cancer patient (58.6%) (Figure 2). Cases had maximum percentage of non-working women (82.9%) than healthy control group (67.1%) (Figure 3). Breast cancer was found



**Figure 2.** Pie chart showing 58.6% cases and 65.7% controls had educational level secondary and above.



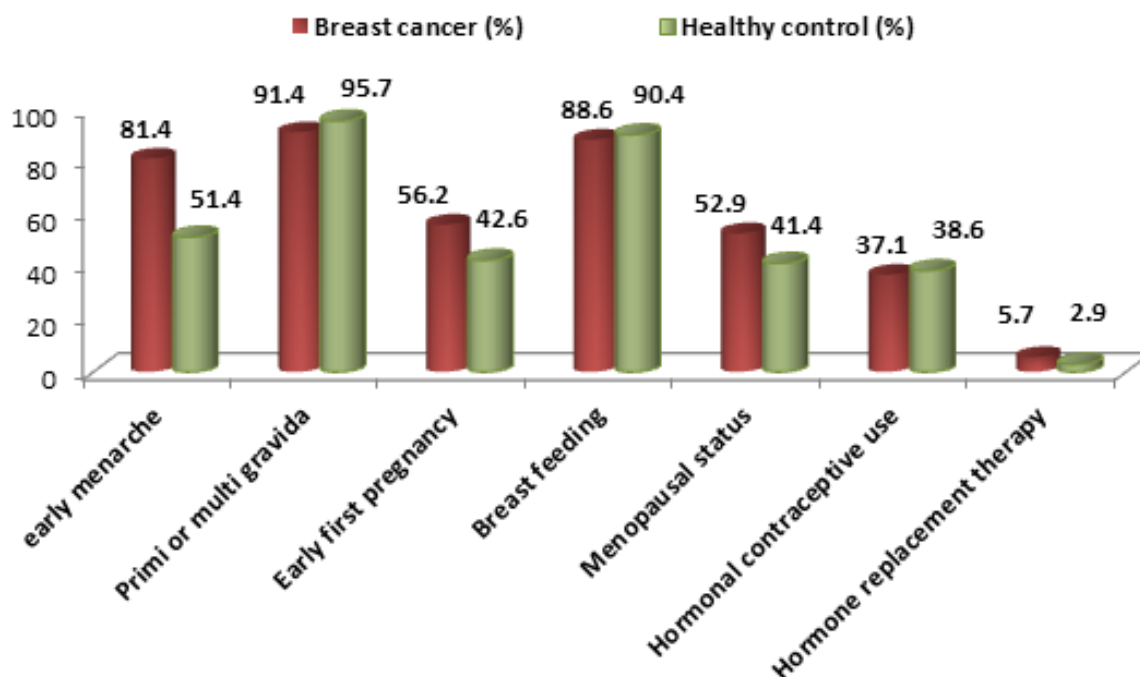
**Figure 3.** Bar diagram showing 82.9% women in case and 67.1% women in control were housewives.

2.4 times (95% CI 1.07, 5.3) at risk among non-working women (Housewives) compare to working women (Table 2).

**Reproductive and Obstetric Related Matters and Use of Hormonal Contraceptive and HRT**

Early menarche was found increase the risk of breast cancer 4 times (95% CI 1.9, 8.9). Mean age of menarche was 12.59±1.42 years among the cases and 13.24 ±1.44

years among the controls. 81.4% breast cancer patients had early menarche before thirteen years old (Figure 4). No risk was found with early marriage and early 1st pregnancy. Mean age of marriage among the cases was 17.99±5.97 years and among the controls was 18.91±4.95 years and mean age of 1st pregnancy among the cases was 19.44±4.93 years and among the controls was 20.88±4.64 years. Early first pregnancy (<20 years) among breast cancer respondents were 56.2% (OR 1.7 (95%CI, 0.9, 3.4)) (Figure 4). No risks were found with



**Figure 4.** Bar diagram showing distribution of by reproductive and obstetric related matters and hormonal contraceptive and HRT use. Early menarche (<13 years) were found 81.4% in Cases (OR 4 (95%CI, 1.9, 8.9)) and early first pregnancy (<20 years) among cases were 56.2% (OR 1.7 (95%CI, 0.9, 3.4)).

**Table 1.** Showing family history of breast cancer and family history of any other cancer among cases (n=70) and controls (n=70).

Factors		Cases no (%)	Controls no (%)	OR (95% CI)
Family history of breast cancer	Yes	21 (30)	11 (15.7)	2.3 (1.01, 5.2)
	No	49 (70)	59 (84.3)	
Family history of any cancer	Yes	32 (45.7)	17 (24.3)	2.6 (1.3, 5.4)
	No	38 (54.3)	53 (75.7)	

frequency of pregnancy, breast feeding, menopause, hormone replacement therapy (HRT) and use of hormonal contraceptive. Breast cancer and non-cancer group showed very close response in these factors (Figure 4). Mean age of menopause among cases were  $45.19 \pm 5.26$  years and among controls were  $48.38 \pm 5.32$  years.

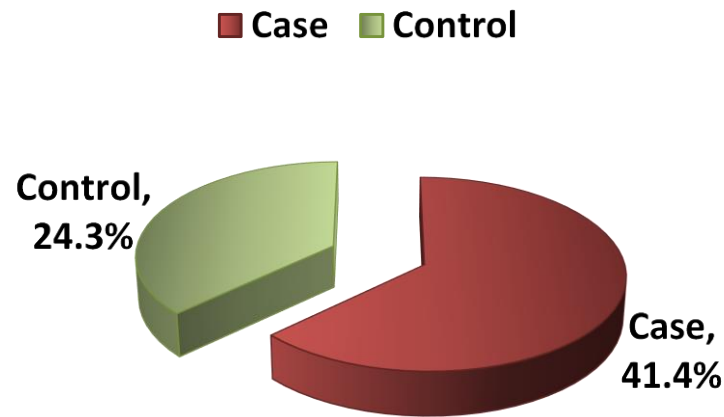
### Life Style Related Factor

Current study showed that family history of breast cancer increases the risk 2.3 times (95% CI 1.01, 5.23), family history of any cancer (including breast cancer) increases 2.6 times (95% CI 1.28, 5.4) (Table 1) and overweight (BMI  $\geq 25$ ) increases risk 2.2 times (95% CI 1.07, 4.6). 41.4 % breast cancer patients were overweight, however only 24.3% non-cancer control groups were overweight among total 70 cases and 70 controls (Figure 5). No significant risk was found with exposure to X-ray. This

study also revealed that smokeless tobacco consumption (case -20% and controls - 18.6%) and taking caffeinated drink such as tea/coffee do not increase the risk. No respondent in both groups was found as smoker. No significant effect on breast cancer was found with less vegetables intake ( $p = 0.245$ ), Extra salt intake ( $p = 0.724$ ) and fatty food ( $p = 0.122$ ), protein diet intake through dairy and red meat ( $p = 0.111$ ).

### Risk Factors Analysis by Logistic Regression

Occupation (house wife), positive family history of cancer, early menarche, BMI  $\geq 25$  were found as significant risk factors of breast cancer and these factors were further assessed by binary logistic regression model. Among them early menarche (OR 3.4; 95% CI 1.5, 7.9), positive family history of any cancer (OR 2.3; 95% CI 1.02, 5.2) and non-working women (OR 2.7; 95% CI 1.03, 7.1) were found to be associated with breast cancer risk (Table 2).



**Figure 5.** Distribution according to BMI. 24.3% respondents were overweight among 70 controls and 41.4% respondents were overweight among 70 cases.

**Table 2.** Showing results of logistic regression model for factors associated with breast cancer risk.

Factors	Case [No, %]	Control [No, %]	OR (95% CI)	P value
Age≤30 years	3 (4.3)	6 (8.6)		
31-40 years	18 (25.7)	22 (31.4)		
41-50 years	27 (38.6)	21 (30)	0.99 (.95, 1.03)	0.644
51-60 years	20 (28.6)	18 (25.7)		
>60 years	2 (2.9)	3 (4.3)		
Occupation (Housewife)	58 (82.9)	47 (67.1)	2.7 (1.03, 7.1)	0.043*
Age menarche (<13 years)	57 (81.4)	36 (51.4)	3.4 (1.5, 7.9)	0.004*
Age at 1 <sup>st</sup> pregnancy (<20 years)	36 (56.2)	29 (42.6)	1.1 (0.52, 2.6)	0.736
Positive family history of cancer	32 (45.7)	17 (24.3)	2.3 (1.02, 5.2)	0.044*
BMI (Overweight)	29 (41.4)	17 (24.3)	1.9 (0.8, 4.3)	0.136

[\* significant risk factors after binary logistic regression analysis].

## DISCUSSION

We are aware that this hospital based study has some potential biases such as selection biases and information bias (interview bias, recall bias and reporting bias). One form of hospital admission bias, the problem is that hospitalized individuals are more likely to suffer from many illnesses or symptoms. Thus they are probably not representative of the target population and due to short sample size this may not reflect the true outcomes. In other socio-demographic variables no significant association were established in educational level. More than 55% of cases and controls had secondary or more educational level (Figure 2). Education was not a significant risk factor. Tavani et al. (1997), Helmrich et al. (1983) reported that the years of education increase the risk of breast cancer. In this study, significant association was found among non-working women (Table 2). In a study where Hansen (2001) found breast cancer risk predominantly more among Danish women who work at night.

In reproductive related factors, early menarche below 13 years appeared as strong risk factor in this study (Table 2). In many studies conducted in Turkey, Italy and Japan (Kuru et al., 2002; Talamini et al., 1985; Negri et al., 1988; Yuasa and MacMahon, 1970) support this, but in some studies the age at menarche was not found to be a risk factor (Tavani et al., 1997; La Vecchia et al., 1987; Romieu et al., 1996; Talamini et al., 1996; Yoo et al., 1992). No association was detected among Nullipara women, which is similar to some reports preceded by meta-analysis of Nordic countries and study conducted in Nigeria (Ewertz et al., 1990; Adebamowo and Adekunle, 1999). On the other hand study by Tavani et al. (1997) Talamini et al. (1985) and Ebrahimi et al. (2002) showed breast cancer risk decreases with high parity. This study showed early marriage, 1<sup>st</sup> pregnancy before 20 years have no effect on breast cancer. Age at first full-term pregnancy has been considered more important to the risk of developing breast cancer than parity by the studies conducted in Mexico, Italy, Turkey, Japan and Beijing (Romieu et al., 1996; Tavani et al., 1997; Talamini et al.,

1985, 1996; Kuru et al., 2002; Yuasa and MacMahon, 1970; Tao et al., 1988). It is well documented that breast feeding practice decreases breast cancer risk (Kuru et al., 2002; Ozmen et al., 2009; Kim et al., 2007; Shantakumar et al., 2007; Lee et al., 2003). In this study, no significant association was found among breast feeding and breast cancer.

Hormonal contraceptive use and HRT is a known risk factor (Weir, 2007). Current study revealed that hormonal contraceptive use (both in the form of progesterone only pill and combined pill) and HRT had no effect on breast cancer. Though, Kuru et al. (2002) found hormonal contraceptive use as a risk factor among Turkish women, but somehow similar to some studies conducted among Italian (Talamini et al., 1985) and United States women (Malone, 1993). It is thought to be, HRT is not well documented or women might ignore their post-menopausal symptoms in Bangladesh. The study findings revealed positive family history of breast cancer is one of the factor (OR 2.3) (Table 1). This is similar to some other studies, accomplished among the Italian (Tavani et al., 1997; Negri et al., 1988; La Vecchia et al., 1987), Mexican (Romieu et al., 1996), Japanese (Yoo et al., 1992), Iranian (Ebrahimi et al., 2002) population showed a positive family history of breast cancer is associated with an increased breast cancer risk. In another study, family history was not found to be a risk factor (Adebamowo et al., 1999).

This study finding also indicated that positive family history of any cancer increases risk of breast cancer 2.6 times (Table 1). It is known that some genes mutation such as BRCA1 BRCA2, ATM, p53, CHEK2, PTEN and CDH1 lead to inherit different cancers (ACS 2014; NCI 2014; RFBC 2014). So, first degree relative having this genes mutation may increase the risk many times. No significant associations were found between betel nut, less vegetable, less fatty food, red meat, consumption, and breast cancer risk. Exposure of the female breast to ionizing radiation in infancy increases the risk of breast cancer later in life (Hildreth, 1989) but, no association was found in this study. However, duration and frequency of exposure were not investigated here. And no respondent was found who previously exposed to radiation other than X-ray like, radiotherapy. BMI  $\geq 25$  was found associated with increase breast cancer risk 2.2 times in unadjusted odds ratio. This findings supports the study findings done by La Vecchia et al. (1987), Ozman et al. (2009), though some studies showed an inverse relationship between BMI  $\geq 25$  and breast cancer risk (Harrison et al., 2010; Vatten, 1992). Tobacco consumption is a well-known risk factor for cancer. Also several recent analyses have suggested an increased risk of breast cancer among women who smoked cigarettes (Cui Y 2006; Christopher IL 2005). No association was found among breast cancer and smokeless tobacco consumption in this research. During

the data collection, we did not get any smoker. Smoking for women is a social barrier in Bangladesh. Very few (1.5%) women smokes in the form if bidi or cigarette. Only smoking prevalence among women is 1.5% (Barkat et al., 2012).

## CONCLUSION AND RECOMMENDATIONS

The study findings suggest that non-working women, positive family history of cancer and early menarche were found to be significantly associated with increased breast cancer risk. Emphasis on regular screening for early diagnosis especially who has family history of cancer, early menarche and those who are non-working women are recommended.

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