Knowledge and Practices on Breast Cancer among Bangladeshi Female University Students: A Cross-sectional Study

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Objective: Breast cancer (BC) is the leading and most prevalent form of cancer among women in Bangladesh and worldwide. The objectives of this study were to assess the existing knowledge on breast cancer and the practices of breast self-examination among female Bangladeshi university students.

Method: A cross-sectional study was carried out among the 276 female university students. Data were collected by face-to-face interview by using a pre-tested questionnaire.

Results: The study results indicate that most of the participants were well informed about breast cancer. Predominantly mentioned signs of breast cancer was a lump in the breast followed by pain in the breast or nipple. The correct responses of breast cancer risk factors were exposure to radiation (58.20%), positive family history (47.6%), obesity (46.9%), lack of physical exercise (43.6%) and smoking (43.2%). The students were well informed about breast self-examination for early diagnosis, but they were not properly informed about frequency. Only 17% reported that they practiced breast self-examination. Respondent's age, religion, marital status, having a problem in Breast and practices of breast self-examinations were significantly associated (p<0.05) with the knowledge scores in different aspects of breast cancer.

Conclusion: The findings of this study indicate that the female students had inadequate knowledge on different aspects of BC and low compliance to recommended BSE practices. Initiating BC educational programs among university students is highly recommended for the early detection and treatment of this increasingly alarming disease.

Introduction

Globally, Breast cancer (BC) is one of the most common types of cancer among females which poses a global public health concern [1] and the second leading cause of cancer deaths among the females in Bangladesh (16.9%) [2]. Globally more than 1 million new cases of BC are diagnosed every year, and the incidence rate is increasing rapidly both developed and developing countries [3]. It is also reported that more than half (60%) of the BC deaths occur in economically developing countries [4]. Bangladesh is still lacking a National Cancer Registry [5]. So far no exertion has been made toward making population-based cancer registries or a central cancer registry to supply

comprehensive across the country information. Therefore, the incidence and prevalence rate of breast cancer is mostly unknown in Bangladesh [6]. Though the causes of BC are not fully known, different studies have shown that risk for BC is due to a combination of some factors, among them some are modifiable and some are non-modifiable [7-8]. Some of the risk factors for BC are; Older age, early menarche, late menopause, physically inactive, overweight or obesity, having dense breasts, use of different hormone therapy, oral contraceptives, exposure to radiation, genetic mutation, alcohol consumption etc. [8-9].

Even though breast cancer is a leading cause of cancer death among Bangladeshi women, numerous women are totally uninformed of their ailment since social disgrace connected to sexual organs [10]. Adequate knowledge and awareness about the signs and symptoms and early breast cancer detection through breast self-examination (BSE) or clinical breast examination (CBE) or mammogram, is crucial to reducing breast cancer-related morbidity and mortality [9-11-12]. Unfortunately, only a few women practice those methods to examine their breasts [13]. Though only BSE is not an effective tool to early detection of BC but it is simple, non-invasive, convenient, inexpensive and available to all women, which helps the woman in early detection of any abnormal lump or mass in her breast [12] but, a percentages of women don't even know how to perform BSE [13-14].

Several cross-sectional studies on Knowledge, Attitude and Practice (KAP) of BC have been conducted among the Bangladeshi women [15-16], female university students in Jordan [12], Uganda [4], Yemen [13], Saudi Arabia [17-18] and health workers in Turkey [19]. However, very little is known about knowledge, attitudes, and practice regarding BC and BSE among Bangladeshi female university students. Only one study was found where the researcher investigated the knowledge level and practices regarding only BSE [20]. To the best of our knowledge, no studies were found regarding knowledge level on different aspects of BC e.g. etiology and prognosis, risk factors, signs of BC, practices of BSE etc. in Bangladesh. Therefore, the objectives of this study were to 1) assess the existing knowledge on different aspects of BC among the female university students; 2) evaluate the practices of BSE among the students and 3) assess the difference of the knowledge scores among the female university students based on their socio-demographic characteristics. This study is important in providing information on knowledge and BSE practice among female university students in Bangladesh. This study may be useful to the governmental and non-governmental organizations in the design of interventions aimed at effective prevention of breast cancer at the national level.
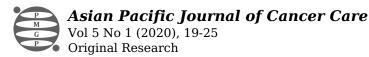
Materials and Methods

Study design and setting

This descriptive cross-sectional study was carried out among the female university students of Patuakhali Science and Technology University, Bangladesh from March to April 2019. It is the first and largest public university in the southern region of Bangladesh.

Sample size and sampling technique

Considering the total number of female students enrolled in this university (1200), Margin of error (5%), Confidence Interval (95%), a sample size of 292 participants was calculated. Hoping to get a response rate of 90%, and adding 10% for non-response, resulting in a sample of 320 female students. The major selection criteria of the participants were a regular student of the university and willing to participate in the survey. There was no age restriction during the selection process. Students who refused to take part in the study, or did not complete the questionnaire were excluded from the study.

Being fully residential university all students live in the university dormitory. Hall attach number which was obtained from the provost office of two female dormitories in the university was used as a sampling frame. Simple random sampling technique was used to select the study participants from the sampling frame.

Data collection tools and technique

A self-administered pre-tested questionnaire was used to collect data from the respondents. The questionnaire includes three sections. The first section contained socio-demographic information of the respondents including age, marital status, level of study, faculty, permanent residential status, family history of BC etc. The second section was used to assess participants' knowledge of BC using 28 Yes/No/Don't know items divided into four aspects; including BC etiology and prognosis (6 items), BC risk factors (10 items); BC signs (7 items), and BSE (5 items). The assessment was done by scoring breast cancer knowledge computed by giving "1" to the correct answer, and "0" for the wrong and 'do not know' answers. Furthermore, total obtain marks were calculated separately for each of the aspects of BC for each of the students. Then it was converted into percentages to assess the knowledge scores. This section was obtained from previous published studies in India and Eritrea [9-21]. The last section of the questionnaire was used to assess the participant's practices of BSE and it was obtained and modified from previously published papers in Uganda and Nigeria [4-22].

Ethical consideration

Ethical approval for this study was obtained from the Institutional Ethical Committee (IEC) of Patuakhali Science and Technology University (Ref. No. PSTU/ IEC/2019/02). Written informed consent and was obtained from each of the participants, containing the contact address of the researcher for possible communication. The purpose, the process, and the confidentiality of the data was described in the consent form. They were informed that there will be no financial or other incentives for participating in the study and that their participation is voluntary. They were also told that they may withdraw the participation in the study at any time after initial participation, without any prejudice or penalty.

Data analysis

Descriptive statistics were used to describe demographic and main study variables. Results were expressed in frequency and percentage for categorical variables while quantitative variables were reported as mean and standard deviation. Bivariate analysis was done using independent sample t-test (for binary variables) and ANOVA (for more than two variables) to assess the difference between knowledge scores on different aspects of BC based on participant's socio-demographic characteristics. $p < 0.05$ was considered statistically significant. All the data were analyzed using IBM SPSS (version 23) and Microsoft word (2013) was used to tabular representation of data.

Results

A total of 276 female university students participated in the study with the mean age of 20.93 (±1.73). More than thee fourth of the participants were Muslim (76.8%). The majority of the participants were unmarried (92.4%). Most of them were an undergraduate students and studied in biological science faculty. More than half of the participants came from an urban area (61.2%). Most of the participants had no personal history of a breast problem and they did not attend any seminar on breast cancer (96% and 92.8% respectively) (Table-1).

Variables	Frequency	Percentage
Age (years)		
≤21	166	60.1
≥22	110	39.9
Mean ± SD (min-max)	20.93 ± 1.73 (18-25)	
Age at menarche		
Mean ±SD (min-max)	12.51 ± 0.96 (10-14)	
Religion		
Muslim	212	76.8
Hindu	64	23.2
Marital status		
Unmarried	255	92.4
Married	21	7.6
Level of study		
Undergraduate	242	87.7
Graduate	34	12.3
Faculty		
Biological science	210	76.1
Engineering	26	9.4
Business studies	40	14.5
Permanent residence		
Rural area	107	38.8
Urban area	169	61.2
Monthly expenditure		
<5000 BDT	239	86.6
≥5000 BDT	37	13.4
Family history of breast cancer		
Absent	218	79.0
Present	14	5.1
Don't know	44	15.9
Know about a breast cancer patient		
No	212	76.8
Yes	64	23.2
Have any breast problem		
Yes	11	4.0
No	265	96.0
Attend any workshop or seminar on breast cancer		
Yes	20	7.2
No	256	92.8
Total knowledge score (0-28)		
Mean ± SD (min-max)	12.35 ± 4.83 (4-26)	

Table 1: Socio-demographic Characteristics of the Respondents (n=276).

Knowledge on different aspects of breast cancer is summarized in Table 2. Breast cancer was reported as the most common cancer among women (82.1%) by the participants. It was observed that 61.2% of participants believed that early diagnosis of breast cancer improved treatment outcomes. Only 21.6% (59) knew that it occurs in old age. Table 2 also shows that lump in the breast was the predominantly mentioned signs of breast cancer followed by pain in the breast or nipple. More than half of the respondents (54.2%) stated that dissimilarity in the size of a breast or nipple is the major sign of breast. Besides that, about 41.8% of the respondents stated that discharge from the breast or nipple, swelling or a lump in the armpit (38.2%), change in the size of

the breast (54.2%) and discoloration/ dimpling of the breasts (37.8%) are the major signs of breast cancer. Inverted nipples were the least (37.5%) mentioned the sign and symptoms of breast cancer. The correct responses of breast cancer risk factors were exposure to radiation (58.20%), positive family history (47.6%), obesity (46.9%), lack of physical exercise (43.6%) and smoking (43.2%). The students were well informed about breast self-examination for early diagnosis but they were not properly informed about frequency (examine monthly). However, 42.3% of students knew the use of the palm of the hand during breast self-examination.

Knowledge on different aspect of breast cancer	Correct response N(%)
Breast Cancer etiology and prognosis	
i. It is the most common cancer in women	224 (82.1)
ii. It occurs more in old age	59 (21.6)
iii. It can be inherited	101 (37.0)
iv. It can present as painless breast lump	158 (57.9)
v. Early diagnosis improves treatment outcome	167 (61.2)
vi. It may be curable with early detection	172 (63.0)
Risk Factors of Breast Cancer	
i. Positive family history	130 (47.6)
ii. Unmarried or without children	64 (23.4)
iii. Old age	48 (17.6)
iv. Early menarche	40 (14.7)
v. Late menopause	74 (27.1)
vi. Consumption of fatty food	95 (34.8)
vii. Lack of physical exercise	119 (43.6)
viii. Smoking	118 (43.2)
ix. Obesity	128 (46.9)
x. Exposure to radiation	159 (58.20
Signs of breast cancer	
i. Inverted nipples	103 (37.5)
ii. Swelling or a lump in the armpit	105 (38.2)
iii. Dissimilarity in size of breast or nipple	149 (54.2)
iv. Pain in the breast or nipple	160 (58.2)
v. Discharge from the breast or nipple	115 (41.8)
vi. A change in the skin texture such as dimpling	104 (37.8)
vii. Lump in the breast	235 (85.5)
Breast Self-Examination (BSE)	
i. It helps in early diagnosis	221 (82.8)
ii. It is recommended to be done monthly	73 (27.3)
iii. Suitable time to do BSE is 7 days after the start of menstruation	65 (24.3)
iv. It is done in front of mirror	83 (31.1)
v. Palm of the hand should be used while doing BSE	113 (42.3)

Table 2: Knowledge on Breast Cancer among the Female University Students (n=276).

Most of the participants became acquainted shown the knowledge of breast cancer from a family member (23.6%) followed by the internet (19.6%). Nearly one-fifth of the participant's source of knowledge about breast cancer was friends (18.8%) (Table-3).

Source	Frequency*	Percentage
Friends	52	18.8
Family member	65	23.6
Doctor	11	4.0

News paper	37	13.4
Television	37	13.4
Internet	54	19.6
Social campaign	14	5.1
Others**	6	2.2

Table 3: Participants Source of Knowledge about Breast Cancer (n=276).

*Responses were mutually exclusive; **Others includes; book, magazine and seminar.

Next, we assessed the actual situation of breast self-examination practice. More than half of the participants did not hear about BSE (53.4%) and 83% of the participant did not practice BSE. Among the positive responder for BSE practice, 62.2% did it once a month. Among the negative responder for BSE practice, 25.1% think they don't have any breast problem and 16.5% don't do it for her carelessness. About 27.3% of the negative responder was planning to perform BSE (Table-4).

variables	Frequency	Percentage
Heard about breast self-examination		
Yes	129	46.7
No	147	53.4
Practice breast self-examination		
Yes	45	16.3
No	231	83.7
Frequency of practice of breast self-examination (n=45)		
Once a week	5	11.1
Once a month	28	62.2
Once a year	12	26.7
Reasons for not practicing breast self-examination (n=231)		
I don't have breast problem	58	25.1
I don't think I should	14	6.1
I just don't feel like doing it	32	13.9
I leave it for doctors and nurses to do	6	2.6
Carelessness	38	16.5
Laziness	32	13.9
I don't know	51	22.1
Planning to perform breast self-examination (n=231)		
Yes, in the next month	42	18.2
Yes, not in the next month	21	9.1
No	49	21.2
I don't know	119	51.5

Table 4: Student's Practices of Breast Self-examination (BSE).

Table-5 shows the associations between knowledge scores of breast cancer and socio-demographic characteristics. The average mean score is higher in most cases among the students aged ≥22 years. In this study, age and religion of the student were associated with student knowledge. In addition faculty and permanent residence of the student were not associated with student knowledge on breast cancer. However, there was the highest significant association between BSE

knowledge and BSE practice (*p*<0.001). Level of the study and having breast problem was significantly associated with knowledge on BSE and knowledge on BC sign respectively (*p*<0.05).

	N					
Age						
≤21	166	51.81 ± 24.20	34.16 ± 19.23	50.52 ± 24.99	37.95 ± 23.67	42.71 ± 17.64
≥22	110	55.30 ± 21.52	37.09 ± 18.29	50.26 ± 22.79	48.00 ± 32.30	46.23 ± 16.51
P value		*0.221*	*0.207*	*0.931*	0.003**	*0.097*
Religion						
Muslim	212	53.07 ± 23.73	36.13 ± 19.37	52.09 ± 23.97	43.77 ± 28.96	45.11 ± 17.34
Hindu	64	53.65 ± 21.51	32.66 ± 17.01	44.87 ± 23.85	35.94 ± 22.86	40.79 ± 16.64
p value		*0.861*	*0.197*	0.035*	0.048*	*0.079*
Marital status						
Unmarried	255	53.20 ± 23.74	34.51 ± 18.85	50.31 ± 24.54	41.88 ± 28.16	43.78 ± 17.58
Married	21	53.17 ± 15.47	45.24 ± 16.61	51.70 ± 18.33	42.86 ± 23.90	48.13 ± 12.30
p value		*0.996*	0.012*	*0.800*	*0.878*	*0.268*
Level of study						
Undergraduate	242	52.96 ± 24.08	35.04 ± 18.78	50.83 ± 24.75	40.58 ± 25.27	43.82 ± 17.42
Graduate	34	54.90 ± 15.64	37.35 ± 19.74	47.48 ± 18.84	51.76 ± 40.93	46.22 ± 16.11
p value		*0.649*	*0.505*	*0.449*	0.028*	*0.448*
Faculty						
Biological science	210	52.94 ± 22.95	35.90 ± 19.37	49.39 ± 22.59	42.38 ± 29.21	44.08 ± 17.41
Engineering	26	51.92 ± 22.76	31.15 ± 17.04	57.14 ± 26.49	41.54 ± 19.53	43.96 ± 15.54
Business studies	40	55.42 ± 25.14	35.00 ± 17.39	51.43 ± 25.01	40.00 ± 25.21	44.38 ± 17.88
p value		*0.791*	*0.479*	*0.291*	*0.882*	*0.994*
Permanent residence						
Rural area	107	51.87 ± 22.11	35.79 ± 17.32	48.73 ± 21.75	41.50 ± 24.67	43.49 ± 16.05
Urban area	169	54.04 ± 23.88	35.03 ± 19.85	51.48 ± 25.48	42.25 ± 29.71	44.51 ± 18.01
p value		*0.449*	*0.744*	*0.357*	*0.827*	*0.635*
Have any breast problem						
Yes	11	53.03 ± 28.69	29.09 ± 18.68	64.94 ± 30.21	43.64 ± 17.47	45.78 ± 19.15
No	265	53.21 ± 23.01	35.58 ± 18.88	49.81 ± 22.69	41.89 ± 28.19	44.04 ± 17.21
p value		*0.980*	*0.265*	0.041*	*0.839*	*0.744*
Practice BSE						
Yes	45	58.52 ± 24.26	38.44 ± 21.20	53.02 ± 28.18	55.11 ± 32.23	49.37 ± 20.35
No	231	52.16 ± 22.89	34.72 ± 18.38	49.91 ± 23.26	39.39 ± 26.20	43.09 ± 16.44
p value		*0.093*	*0.227*	*0.490*	0.000***	*0.056*

Table 5: Bivariate Analysis of Factors Associated with Knowledge Scores on Different Aspect of Breast Cancer.

*Significant at p<0.05, **Significant at p<0.01, ***Significant at p<0.001

Discussion

The results ofthe study disclosed the knowledge of breast cancer including risk factors and breast self-examination of university female student leading towards early detection of breast cancer and increase chances of survival. In the current study, 58.2% of the student agreed that breast cancer may present as pain in the breast or nipple. This was similar to the findings from one study in Saudi
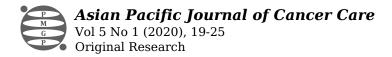
Arabia [18] and higher than a similar study in the same country [23]. Only 1.75% accepted that nipple discharge might be a symptom of breast cancer and 23% participants agreed that it may present as a breast lump in a study of Saudi Arabia [23], which is much lower than another study (65.3% & 55.3% respectively) in Saudi Arabia [18], as well as the current study (41.8% & 85.5%). In the present study, the knowledge about the risk factor of breast cancer was significantly lower than the study of Rabia but significantly higher than Alam,s Study. As for example Alam finds that only 39.1% of the participant knew that heredity is a factor of breast cancer, 13.8% agreed that risk of breast cancer increases with advancing age, 15.95% knew that regular exercise may reduce the risk [24], in contrast to the proportion of participants in our study which is 47.6%,17.6%,43.6% respectively and was 77.3%,93.3%,62.7% respectively in the study of Rabia [18]. Among the risk factors with sufficient evidence,nearly half (47.6%) of the participants in the current study accurately marked that positive family history increased the risk of developing breast cancer in female students. In a study conducted among urban women in Ahmedabad city revealed 27.6% of their participants were aware that family history increases breast cancer risk [25]. However, another study reported 60% of women were aware of the importance of familial history [21], while a study among South Indian women reported only 13% of women with this knowledge [26]. In the study, 63% of participant believed that breast cancer is curable with early detection which is lower (68%) than the study done by Neha [21] but higher (41.4%) than Michael's study [22]. In a study in Delhi, 76% responder thought BSE helps in early diagnosis [21] which is lower than our study (82.8%) but in Nigeria, the result was higher (87.2%) than our result [22]. Our results indicate that only 16.3% of our participants perform BSE regularly with frequency ranging from once a month in 62.2% subjects to once a year in 26.7%. Where the practice rate was 49.1% and 34.9 % in the participant of Delhi [21] and Nigeria [22] (respectively). Another study done by Choudhary revealed that only 12% of the participants practiced BSE monthly [27]. However, the practice of BSE among nurses is higher in some studies than in the present study [28-30]. The results of our study suggest that a higher age group (≥22) had been associated with their knowledge on the aspect of breast self-examination where a study in Delhi among the age group less than 30 was associated too [21]. In the present study, the knowledge on aspect of breast self-examination was significantly lower in student who had lower educational status (undergraduate student) ($p \leq 0.05$), we found the same evidence from multiple Indian studies which found relatively higher knowledge on breast self-examination among populations with higher educational attainments like urban women, school teachers and nurses [31-32]. Our results indicate that the history of breast cancer in a family significantly influenced the knowledge of signs of breast cancer. In addition, a study done by Neha was also significant with knowledge of signs of BC and family history [21]. Knowledge on BSE was significant at $p < 0.001$ with the practice of BSE. The high difference between knowledge of BSE and actual practice by the participant shows that acceptability of BSE is still low with almost four-fifths of the participants in the current study have never been practicing it.

In conclusion, this was the first study to assess the KAP of female Bangladeshi university students about breast cancer. The findings of this study indicate that the female students had inadequate knowledge on different aspects of BC and low compliance to recommended BSE practices. Such research findings point out the significance of raising student's awareness with respect to BC and practices of BSE for early detection of this increasing alarming disease. It is necessary to establish an institutional framework and national policy guidelines to increase the adequate dissemination of information about the risk factors, sign-symptoms, importance of BSE practices and other recommended approaches to control the disease. It will be useful in the early detection and reporting of breast cancer for better treatment.

Limitations

Our present study is not without limitations. Firstly, it is limited by the self-reported data which might have influenced the results through respondent bias. The study is also limited by a relatively small sample size and recruiting sample from only one university, so generalization of the whole country was not possible. However, being the first study to investigate this topic among such target

population groups in Bangladesh will open the door for further studies in such an important field. Country representative studies are recommended to overcome such limitations.

Acknowledgments

Authors Contribution

MSA and TM conceptualize and wrote the first draft. MSA analyzed the data. MSA and AS reviewed the literature. AS and HMS reviewed the paper. All authors approved the final version of the manuscript.

Statement Conflict of Interest

Authors have no conflict of interest to disclose.
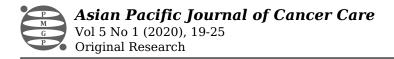
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