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Delay in Diagnosis and Treatment of Breast Cancer among the Patients Attending a Public and Private Hospital

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ABSTRACT

Background: Breast cancer is the most common malignancy and the leading cause of cancer-related mortality among women worldwide. Delay in diagnosis and treatment is associated with advanced stage at presentation and poor prognosis. ***Methods:*** A cross-sectional study was conducted among 236 women with diagnosed breast cancer attending a public hospital (National Institute of Cancer Research and Hospital, NICRH) and a private hospital (Ahsania Mission Cancer Hospital). Participants were selected using purposive sampling. Data were collected through face-to-face interviews using a pretested semi-structured questionnaire. Delays were categorized as patient delay, diagnosis delay, treatment delay, system delay, and total delay. Associations were assessed using Pearson's chi-square test. ***Results:*** Mean age of participants was 45.42±8.52 years; 41.5% had primary education, 89.8% were housewives, and 22.5% had a monthly family income of 6000–10,000 BDT. Most (66.5%) resided in urban areas. More than half of the respondents experienced patient delay (mean 4.5 months). Mean treatment delay was 2.10±2.30 months (nearly half of respondents), diagnosis delay 1.6±1.96 months (nearly half), system delay 3.80±4.00 months (nearly two-thirds), and total delay 7.58±6.65 months (nearly two-thirds). When comparing public vs. private hospital, statistically significant differences were observed for treatment delay ($p=0.004$), diagnosis delay ($p=0.004$), and system delay ($p<0.001$); all delays were longer in the public hospital. Multiple factors contributed to delays, and total delay showed a highly significant association with the responsible factors. ***Conclusion:*** Delays in breast cancer diagnosis and treatment are substantial, particularly in public hospital settings. Public health education, reliable referral pathways, health system strengthening, and screening programs are needed to reduce the burden of delayed presentation.

KEYWORDS: Breast Cancer, Diagnostic Delay, Treatment Delay, Public Hospital, Private Hospital, Bangladesh.

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INTRODUCTION

Breast cancer is the most frequently diagnosed malignancy among women worldwide and the leading cause of cancer-related death in females. According to the International Agency for Research on Cancer (IARC), an estimated 2.3 million new cases of female breast cancer were diagnosed in 2020, representing one in every eight cancers diagnosed globally. In the same year, approximately 685,000 women died from the disease, making breast cancer the fifth leading cause of cancer mortality overall [1]. Notably, breast cancer mortality rates are paradoxically higher in transitioning (low- and middle-income) countries (15 per 100,000) compared to transitioned (high-income) countries (12.8 per 100,000), despite substantially lower incidence rates in transitioning countries (29.7 vs. 55.9 per 100,000). As highlighted by Sung and colleagues, this disparity is largely attributable to late-stage presentation. Therefore, strategies promoting early detection followed by timely and appropriate treatment are urgently needed, particularly through implementation of evidence-based, resource-stratified guidelines [2]. In Bangladesh, breast cancer is a leading cause of mortality among women. Data from GLOBOCAN 2020 reported 13,028 newly diagnosed cases, with an age-standardised incidence rate of 17 per 100,000. A hospital-based study from the National Institute of Cancer Research and Hospital (NICRH) reported a mean age of 41.8 years at diagnosis, with more than 56% of cases occurring among reproductive-aged women [3]. Up to 2015, breast cancer remained the number one cancer among Bangladeshi women. Several factors contribute to the rising trend: low public awareness, limited trust in healthcare facilities, inadequate screening programs, improper treatment practices, financial constraints, and reluctance to seek hospital care. According to IARC, in 2018 there were 12,764 new breast cancer cases in Bangladesh. The cost of available treatment is high relative to per capita income, and health education programs on breast cancer are insufficient particularly in rural areas. The Bangladesh Maternal Mortality Survey (2010) reported that breast cancer accounts for 21% of deaths among women aged 15–44 years [4]. Delay in breast cancer detection remains a major concern because of its negative impact on survival. Diagnostic delay may worsen tumour characteristics, increase tumour size, and raise the risk of metastatic lymph nodes. Studies have shown that delayed confirmation significantly increases mean tumour size, with notable variations across hospitals [5].

Conceptual Framework of Delay

Delay in diagnosis and treatment of cancer is generally divided into two broad categories: patient delay and provider (system) delay. Patient delay is defined as the time from first symptom onset to first medical consultation. Provider delay covers the period from first consultation to definitive diagnosis and treatment [6]. Evidence indicates that patient delay exceeding three months is associated with lower survival, whereas such an association is not consistently found for provider delay [7]. However, provider delay remains important because it reflects health system efficiency. Multiple factors contribute to delay. A systematic review identified low educational attainment, lack of awareness about breast cancer and its detection methods, type of initial symptoms, fear of disease or treatment, use of traditional medicine, financial difficulties, poor access to healthcare, delayed referrals, misdiagnosis, and false reassurances [8]. Physicians' misunderstanding of early symptoms (e.g., reassuring patients without biopsy), long waiting times for diagnostic confirmation, scarcity of diagnostic centers, heavy patient loads, and poor provider-patient communication are also frequently reported [9]. In Bangladesh, alternative medicine use is a major contributor to delay. Akhtar and colleagues found that 46.5% of breast cancer patients first sought help from alternative medicine, with homeopathy being the most common (86%), and the use of alternative medicine was significantly associated with patient delay ($p=0.019$) and total delay ($p<0.0001$) [11]. Furthermore, a population-based survey reported that only 64.2% of Bangladeshi women were aware of any breast cancer screening method, and the most common reason for not undergoing screening was "no symptoms" (92%), highlighting a critical knowledge gap [12]. Medical treatment for breast cancer includes neoadjuvant or adjuvant therapy based on biological subtyping. Hormone-positive cancers respond to endocrine therapies (tamoxifen or aromatase inhibitors), which reduce recurrence by nearly half [10]. The COVID-19 pandemic has exacerbated late diagnosis and treatment interruptions, particularly in low- and middle-income countries. A WHO survey in 2020 found that cancer treatment was disrupted in over 40% of countries, with increased delays and abandonment of therapy [10].

Rationale and Justification of the Study

By the end of 2020, 7.8 million women had been diagnosed with breast cancer in the preceding five years, making it the world's most prevalent cancer. It accounts for more disability-adjusted life years (DALYs) than any other cancer [10]. Delayed presentation of symptomatic breast cancer is consistently associated with lower survival; thus, understanding the factors that influence delay is essential for designing effective interventions [9]. In Bangladesh, although some information exists on breast cancer, core problems related to delay – especially differences between public and private healthcare settings – have not been adequately addressed. Most previous studies were conducted in single institutions or did not compare delays across different types of hospitals. This is a critical gap because public and private hospitals differ substantially in patient volume, resources, waiting times, costs, and quality of care. Delayed diagnosis and treatment likely affect prognosis and survival. Metastasis and its complications account for 90% of breast cancer deaths; therefore, early diagnosis and timely treatment can substantially reduce the disability burden. Every year, cancer causes premature death and disability for hundreds of thousands of women and their families, perpetuating the poverty cycle in low-resource and fragmented health systems. The present study was designed to fill this gap. The findings will be useful for further research and for national policy implications, ultimately aiming to reduce mortality and morbidity from breast cancer and to lessen the burden of delayed diagnosis and treatment in Bangladesh.

Research Question

What are the factors associated with delay in diagnosis and treatment of breast cancer among patients attending a public hospital and a private hospital in Dhaka, Bangladesh?

OBJECTIVES

General Objective:

To identify the factors associated with delay in diagnosis and treatment of breast cancer among patients attending a public and a private hospital.

Specific Objectives:

1. To determine the duration of delay in diagnosis and treatment of breast cancer among the respondents.
2. To identify the factors related to delay in diagnosis and treatment.
3. To compare the factors related to delay in diagnosis and treatment between public and private hospitals.
4. To determine the common risk factors of breast cancer among the respondents.
5. To describe the socio-demographic characteristics of the respondents.

Operational Definitions (used in this study)

- **Patient delay:** >3 months between symptom discovery by the patient and first visit to a physician.
- **System delay (provider delay / doctor delay):** >1 month between the initial medical consultation and the beginning of definitive treatment. System delay is the sum of diagnosis delay and treatment delay.
- **Diagnosis delay:** time between the first clinical consultation and cancer diagnosis.
- **Treatment delay:** time between diagnosis and beginning of treatment.
- **Total delay:** patient delay + system delay.

METHODS

This was a hospital-based cross-sectional study was conducted to identify the factors associated with delay in diagnosis and treatment of breast cancer and to estimate the overall delay among patients attending a public and a private hospital in Dhaka, Bangladesh. This study was carried out at the National Institute of Cancer Research and Hospital (NICRH), Mohakhali, Dhaka (a public tertiary cancer centre) and Ahsania Mission Cancer Hospital, Uttara, Dhaka (a private cancer hospital), Bangladesh. The study was conducted over a 12-month period from 1st January 2021 to 31st December 2021. The study population comprised women with histologically or clinically confirmed breast cancer aged ≥18 years attending the selected hospitals during the study period. A purposive sampling technique was employed. The sample size was determined by applying the formula $n = (Z^2pq)/d^2$, where $Z = 1.96$ (95% confidence interval), $p = 0.19$ (expected prevalence of breast cancer in Bangladesh, based on GLOBOCAN 2020), $q = 0.81$, and $d = 0.05$ (absolute precision). The calculated sample size was 236 women, and all 236 eligible participants were enrolled in this study. A pre-tested, semi-structured questionnaire was used for face-to-face interviews by the principal investigator for data collection. Information was collected on socio-demographic characteristics, risk factors, health-seeking behaviour, economic factors, barriers to healthcare, and various delays (patient, diagnosis, treatment, system, total). The questionnaire was initially developed in English, translated into Bengali, and back-translated to ensure accuracy. Pre-testing was done at Bangabandhu Sheikh Mujib Medical University (BSMMU). Best effort was placed to collect accurate and non-discriminative data. All women with diagnosed breast cancer aged ≥18 years attending the study hospitals during the study period were included. Refusal to participate and serious illness (unable to respond) were the exclusion criteria. The study was approved by the Institutional Review Board (IRB) of the National Institute of Preventive and Social Medicine (NIPSOM) (Approval No: NIPSOM/IRB/2021/18; Date: 13-12-2021)., Bangladesh, and written permission was obtained from the ethical committees of both participating hospitals. Written informed consent was given by all participants in response to the explanation of the aims and methods of the study. The identity of those filling out the survey was always respectfully kept anonymous, and all data was treated confidentially. Data entry and analysis were done using SPSS software version 23. Data were analyzed with descriptive statistics (frequencies, percentages, means, standard deviations) and inferential statistics (Pearson chi-square test). Statistical significance was set at $p < 0.05$ and $p < 0.01$ levels respectively.

Inclusion Criteria

- Women with histologically or clinically confirmed breast cancer
- Age ≥18 years
- Willing to participate and provide written informed consent

Exclusion Criteria

- Patients who were seriously ill (unable to respond)
- Those who declined to participate

RESULTS

A total of 236 women with diagnosed breast cancer were included in the study, with 118 participants recruited from the private hospital and 118 from the public hospital. The mean age of the respondents was 45.42 ± 8.52 years (range, 26–70 years). Overall, most participants were Muslim (97.3%), married (92.8%), and housewives (89.8%). Two-thirds of the respondents resided in urban areas (66.5%), and more than half were from Dhaka division (55.1%). Marked socioeconomic differences were observed between the two hospitals. Women attending the public hospital had substantially lower family income and lower educational attainment than those attending the private hospital. Additional sociodemographic details are presented in Table 1.

Table 1. Sociodemographic characteristics of respondents by hospital type

Characteristic	Overall	Private hospital (n=118)	Public hospital (n=118)
Age, mean ± SD (years)	45.42 ± 8.52	45.86 ± 8.41	44.98 ± 8.65
Muslim	229 (97.3)	116 (98.3)	113 (95.8)
Married	219 (92.8)	110 (93.2)	109 (92.4)
Primary education or less	142 (60.2)	52 (44.1)	90 (76.3)
Secondary education or higher	94 (39.8)	66 (55.9)	28 (23.7)
Housewife	212 (89.8)	103 (87.3)	109 (92.4)
Monthly family income, mean ± SD (BDT)	23,508.47 ± 17,746.50	34,966.10 ± 18,308.81	12,050.85 ± 5,705.89
Monthly family income ≤15,000 BDT	112 (47.5)	21 (17.8)	91 (77.1)

Note. Values are presented as n (%) unless otherwise indicated. Primary education or less includes illiterate and primary-level education. Secondary education or higher includes secondary, higher secondary, graduate, and postgraduate education.

Regarding reproductive and selected clinical characteristics, 51.3% of respondents were postmenopausal, 98.3% were parous, and 75.4% had breastfed all their children. The history of oral contraceptive pill use was reported by 69.5% of participants and was more common in the public hospital (85.6%) than the private hospital (53.4%). A family history of breast cancer was reported by 17.8% of respondents, while 56.4% had at least one comorbidity. Hypertension and diabetes mellitus were the most frequently reported comorbid conditions in both settings.

Table 2. Reproductive and selected clinical characteristics by hospital type

Variable	Overall (n=236)	Private hospital (n=118)	Public hospital (n=118)

Postmenopausal	121 (51.3)	64 (54.2)	57 (48.3)
Parous	232 (98.3)	115 (97.5)	117 (99.2)
Breastfed all children	178 (75.4)	80 (67.8)	98 (83.1)
History of oral contraceptive pill use	164 (69.5)	63 (53.4)	101 (85.6)
Tobacco-chewing habit	47 (19.9)	28 (23.7)	19 (16.1)
Family history of breast cancer	42 (17.8)	23 (19.5)	19 (16.1)
Any comorbidity	133 (56.4)	77 (65.3)	56 (47.5)

Note. Values are presented as n (%). Percentages for private and public hospitals are calculated within each hospital (n=118 per group).

The most frequently reported first symptom was a breast lump (63.1%), followed by breast pain (33.5%) and nipple disfigurement (18.2%). More than two-thirds of the respondents (67.4%) sought treatment from local or alternative providers before reaching specialized cancer care; this pattern was more frequent among women attending the public hospital than the private hospital (75.4% vs. 59.3%). The mean duration of local treatment was 4.42 ± 5.00 months. Only 30.1% of respondents reported that their families were able to bear the costs of diagnosis and treatment. Healthcare-facility barriers were common overall (59.7%) and were substantially more frequent among women attending the public hospital than the private hospital (85.6% vs. 33.9%). The most reported barriers were long queues in health services (33.1%), unavailability of hospital beds (27.1%), delayed dates for operation/radiotherapy/chemotherapy (19.9%), and delayed, repeated, or incorrect reports (16.9%). Respondent satisfaction with treatment also differed markedly by hospital type; 60.2% of women in the private hospital reported satisfactory treatment compared with 17.8% in the public hospital.

Table 3. Presentation, care-seeking pathway, and healthcare access indicators by hospital type

Variable	Overall (n=236)	Private hospital (n=118)	Public hospital (n=118)
Breast lump as first symptom	149 (63.1)	72 (61.0)	77 (65.3)
Breast pain as first symptom	79 (33.5)	30 (25.4)	49 (41.5)
Nipple disfigurement as first symptom	43 (18.2)	20 (16.9)	23 (19.5)
Sought local treatment before specialist care	159 (67.4)	70 (59.3)	89 (75.4)
Duration of local treatment, mean ± SD (months)	4.42 ± 5.00	4.94 ± 6.38	3.90 ± 2.99
Family able to bear diagnostic/treatment costs	71 (30.1)	48 (40.7)	23 (19.5)
Any barrier within health facilities	141 (59.7)	40 (33.9)	101 (85.6)
Diagnosed on the third consultation	111 (47.0)	41 (34.7)	70 (59.3)
Treatment rated satisfactory	92 (39.0)	71 (60.2)	21 (17.8)

Note. Values are presented as n (%) unless otherwise indicated. Diagnostic consultation data refers to diagnosis on the third hospital consultation. Local treatment included homeopathic, Ayurvedic, and informal providers before presentation to specialist cancer care.

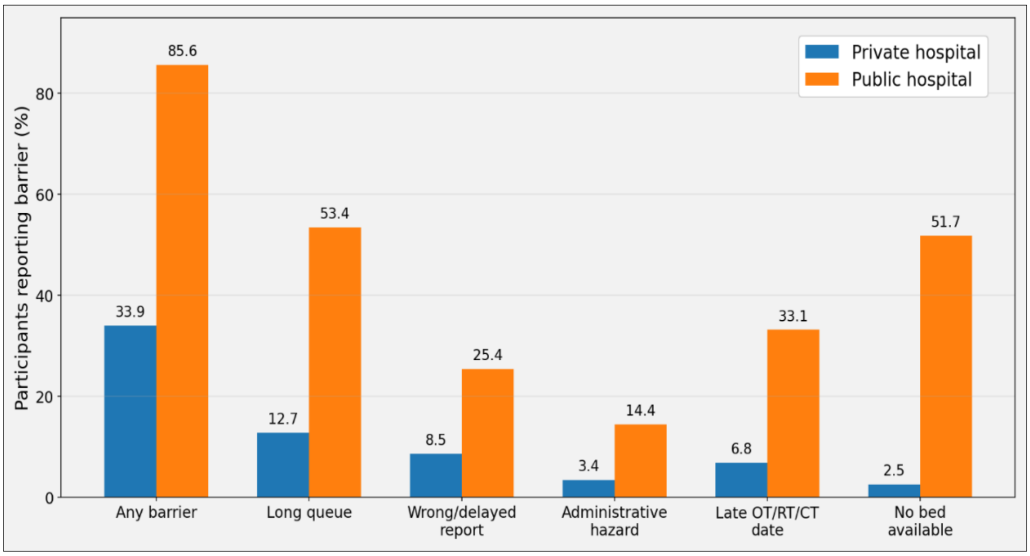

Figure 1. Healthcare-facility barriers reported by respondents in the private and public hospitals
Note. OT/RT/CT denotes operation, radiotherapy, and chemotherapy. Percentages are calculated within hospitals.

At the time of interview, stage III breast cancer was the most common disease stage (33.5%), followed by stage II (25.8%) and stage IV (21.2%). Advanced disease was more frequent in the public hospital, where 37.3% had stage III disease and 28.8% had stage IV disease. By contrast, stage II disease was the most common presentation in the private hospital (31.4%). The mean duration of illness was 22.61 ± 10.12 months. Delays in diagnosis and treatment were common. Overall, 57.2% of respondents experienced patient delay, 41.5% diagnosis delay, 49.2% treatment delay, 61.0% system delay, and 64.0% total delay. The mean patient delay was 4.5 months; mean diagnosis delay was 1.60 ± 1.96 months; mean treatment delay was 2.10 ± 2.30 months; mean system delay was 3.80 ± 4.00 months; and mean total delay was 7.58 ± 6.65 months. Diagnosis delay, treatment delay, and system delay were all significantly more frequent among women attending the public hospital, whereas patient delay did not differ significantly between hospital settings.

Table 4. Disease stage and delay patterns by hospital type

Outcome	Overall (n=236)	Private Hospital (n=118)	Public Hospital (n=118)	p value
Stage 0–I	46 (19.5)	30 (25.4)	16 (13.6)	—
Stage II	61 (25.8)	37 (31.4)	24 (20.3)	—
Stage III	79 (33.5)	35 (29.7)	44 (37.3)	—
Stage IV	50 (21.2)	16 (13.6)	34 (28.8)	—
Patient delay	135 (57.2)	62 (52.5)	73 (61.9)	0.148
Diagnosis delay	98 (41.5)	38 (32.2)	60 (50.8)	0.004
Treatment delay	116 (49.2)	47 (39.8)	69 (58.5)	0.004
System delay	144 (61.0)	59 (50.0)	85 (72.0)	0.001
Total delay	151 (64.0)	69 (58.5)	82 (69.5)	—

Note. Values are presented as n (%). P values are from Pearson's chi-square tests for the hospital comparison of individual delay outcomes. Total delay is shown descriptively because a hospital-wise significance test was not reported in the thesis chapter.

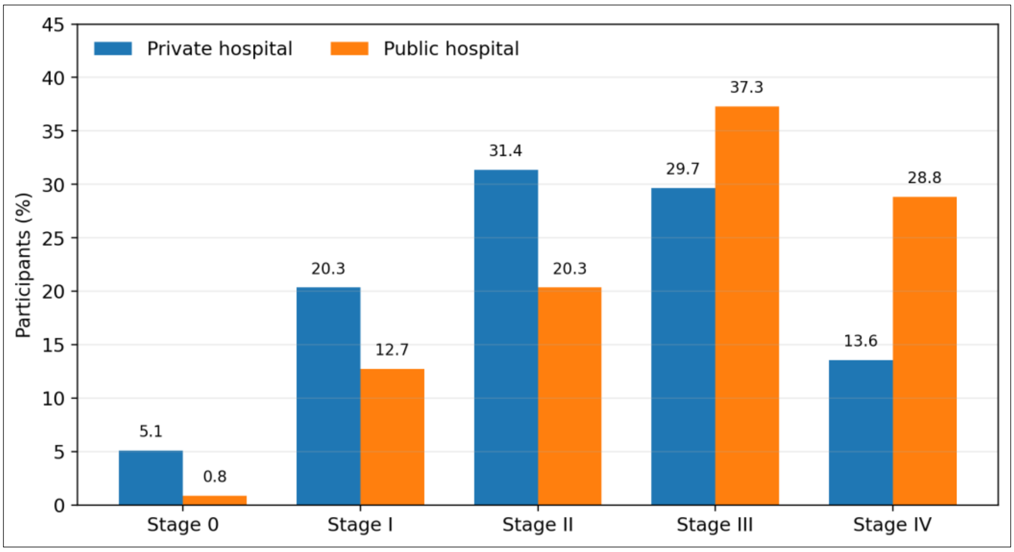

Figure 2. Stage distribution of breast cancer by hospital type

Note. Percentages are calculated within hospitals.

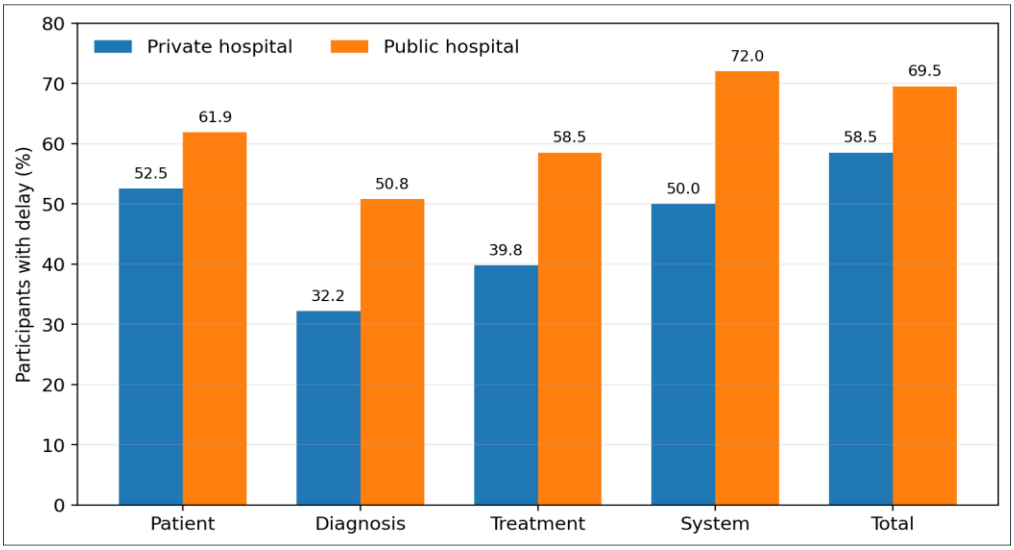

Figure 3. Prevalence of patient, diagnosis, treatment, system, and total delay by hospital type

Note. Percentages are calculated within hospitals.

Cross-tabulation of total delay with selected explanatory factors showed that economic problems, lack of knowledge, the use of local treatment facilities, shyness or embarrassment about the disease, pandemic-related disruption, and transportation-related factors were significantly associated with total delay. In contrast, mental distress, patient negligence, doctor misguidance, and personal or family problems were not significantly associated with total delay after recalculation from the reported cell counts (Table 5).

Table 5. Association between total delay and selected reported contributing factors

Factor	Delay (n=151)	No delay (n=85)	χ^2	p value

Economic problems	64 (42.4)	50 (58.8)	5.886	0.015
Lack of knowledge	35 (23.2)	85 (100.0)	128.419	<0.001
Use of local treatment facilities	141 (93.4)	18 (21.2)	128.975	<0.001
Mental distress	14 (9.3)	12 (14.1)	1.303	0.254
Shyness/embarrassment about the disease	12 (7.9)	26 (30.6)	20.638	<0.001
Patient negligence	37 (24.5)	21 (24.7)	0.001	0.972
Doctor misguidance	7 (4.6)	2 (2.4)	0.773	0.379
Personal or family problems	45 (29.8)	23 (27.1)	0.199	0.655
Pandemic-related disruption	48 (31.8)	41 (48.2)	6.263	0.012
Transportation-related factors	68 (45.0)	57 (67.1)	10.591	0.001

Note. Values are presented as n (%) within total-delay status columns. Chi-square statistics and p values were recalculated from the reported 2×2 cell counts in the thesis chapter to correct internal inconsistencies in the original inferential table. The thesis also reported a significant association with healthcare service/utilization barriers, but the source table contained inconsistent cell counts; therefore, that row is not reproduced here without verification from the original SPSS output.

In summary, the findings show a substantial burden of delayed diagnosis and treatment among women with breast cancer, particularly among those receiving care in the public hospital. Public-sector patients also reported greater economic hardship, more frequent use of local treatment before specialist care, more healthcare-facility barriers, and more advanced diseases at the time of presentation.

DISCUSSION

This study demonstrates that delays in breast cancer diagnosis and treatment remain substantial among women attending both public and private hospitals in Bangladesh. More than half of the respondents experienced patient delay, nearly half treatment delay, about two-fifths diagnosis delay, and almost two-thirds system delay and total delay. Importantly, diagnosis delay, treatment delay, and system delay were significantly more frequent among women attending the public hospital, whereas patient delay did not differ by hospital type. These findings indicate that barriers operate at multiple levels, but health-system constraints after first presentation are particularly pronounced in the public sector [8,9,14,20]. The socio-demographic profile of the respondents (mean age 45.4 years, mostly married, Muslim, urban, housewives, low education) is consistent with hospital-based breast cancer studies from Bangladesh and other low- and middle-income countries (LMICs). The mean age is comparable to the Bangladeshi study by Alam et al. (41.8 years) and by Akther et al. (42 years) [3,13]. The concentration of cases in middle-aged women reflects the pattern in South Asian populations, where breast cancer often presents at a relatively younger age than in Western screening populations [3,13]. Low education and limited economic resources emerged as key factors. Only 30.1% of families could afford the cost of diagnosis and treatment, and financial coping often depended on husbands, sons, donations, selling property, or borrowing. These findings align with studies from Bangladesh, Nigeria, and broader LMIC reviews, where poverty and low education were repeatedly identified as major contributors to late presentation [4,8,12,15,20]. A breast lump was the most common first symptom (63.1%), yet stage III disease was the most frequent at presentation, and stages III–IV were more common in the public hospital than in the private hospital. This paradox – a recognizable symptom but advanced stage – suggests failures in symptom appraisal, timely help-seeking, referral, and diagnostic work-up. Similar patterns have been reported in Bangladeshi studies and systematic reviews of LMICs [11,13,14,18,20]. The use of local/traditional treatment before reaching specialised care is striking. More than two-thirds of respondents sought help from local providers, most commonly homeopathy, with a mean duration of 4.42 months. This finding is higher than the 40% reported by Akther et al. [13] but consistent with Akhtar et al., who found that alternative medicine use was common and significantly associated with patient delay and total delay [11]. Inappropriate early care pathways remain a major obstacle to timely diagnosis, reflecting low awareness, easier access to informal care, lower upfront cost, and uncertainty about symptom seriousness [8,11,13,20]. Healthcare system barriers were substantially higher in the public hospital (85.6%) than in the private hospital (33.9%). In the public sector, long queues, delays or repetition in reports, postponement of procedure dates, and bed shortages were observed more frequently. Women in the public hospital also required more consultations before diagnosis and reported markedly lower satisfaction. These findings provide a plausible explanation for why diagnosis, treatment, and system delays were all significantly greater in the public hospital. They are consistent with earlier literature showing that provider delay is shaped by long waiting times, delayed referral, heavy patient load, and poor communication [6,8,9,14]. Patient delay did not differ significantly between hospital groups, even though it affected >57% of the total sample. This suggests that barriers before first medical consultation – lack of knowledge, reliance on local treatment, economic hardship, fear, and transportation constraints – are similar across both groups. The mean patient delay of about 4.5 months is clinically important, as delays >3 months have been associated with poorer survival [7,18]. Although lower than the 89% reported from Uganda [16], it still represents a substantial missed opportunity for earlier diagnosis. Total delay was significantly associated with economic problems, lack of knowledge, treatment from local facilities, transportation barriers, healthcare service and utilisation problems, shy feeling about the disease, doctor's misguidance, and pandemic disruption. These results are consistent with systematic reviews identifying socioeconomic status, symptom interpretation, fear, traditional medicine use, health-service inefficiency, and geographic access as recurrent determinants of delayed breast cancer diagnosis in LMICs [8,9,14,19,20]. The association with pandemic-related factors is plausible, as WHO documented widespread disruption of cancer services during COVID-19 [10].

The descriptive findings on reproductive history, oral contraceptive use, family history, and comorbidities are useful for characterising the study population but should not be interpreted as causal risk factors due to the cross-sectional design and lack of a comparison group. Nevertheless, they highlight the complexity of patient backgrounds and suggest that awareness and counselling strategies need to be tailored.

Limitations of The Study

The study was conducted in only two hospitals (one public, one private) in Dhaka; therefore, findings may not be representative of all breast cancer patients in Bangladesh.

CONCLUSION

This study found that delays in breast cancer diagnosis and treatment are substantial among women attending both public and private hospitals in Dhaka, Bangladesh. Patient delay, diagnosis delay, treatment delay, system delay, and total delay were all common, with diagnosis, treatment, and system delays significantly higher in the public hospital. Delayed care was associated with lack of knowledge, financial constraints, use of local treatment providers, transportation difficulties, healthcare system barriers, and pandemic-related disruption. These findings indicate that both patient-level and health-system factors contribute to late diagnosis and treatment, particularly in the public sector.

Recommendations

Strategies to minimize delays should focus on improving public awareness of early breast cancer symptoms, discouraging reliance on informal treatment providers, and strengthening referral and diagnostic pathways. Public hospitals particularly need improved service efficiency, including shorter waiting times and better access to investigations and treatment. Financial support mechanisms for low-income patients should also be expanded.

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REFERENCES

1. International Agency for Research on Cancer, 2020. Latest global cancer data: Cancer burden rises to 19.3 million new cases and 10.0 million cancer deaths in 2020. Press release, 292, p.15.
2. Stephens, K., 2021. Female Breast Cancer Surpasses Lung as the Most Commonly Diagnosed Cancer Worldwide. AXIS Imaging News.
3. Alam, N.E., Islam, M.S., Ullah, H., Molla, M.T., Shifat, S.K., Akter, S., Aktar, S., Khatun, M.M., Ali, M.R., Sen, T.C. and Chowdhury, K., 2021. Evaluation of knowledge, awareness, and attitudes towards breast cancer risk factors and early detection among females in Bangladesh: A hospital-based cross-sectional study. PloS one, 16(9), p.e0257271.
4. Shamsi, T., 2021. The burden of breast cancer in Bangladesh-current and future and financing treatment with link to a willingness to pay. International Journal of Community Medicine and Public Health, 8(11), p.5525.
5. Lameijer, J.R., Voogd, A.C., Pijnappel, R.M., Setz-Pels, W., Broeders, M.J., Tjan-Heijnen, V.C. and Duijm, L.E., 2020. Delayed breast cancer diagnosis after repeated recall at biennial screening mammography: an observational follow-up study from the Netherlands. British journal of cancer, 123(2), pp.325-332.
6. Facione, N.C., 1993. Delay versus help-seeking for breast cancer symptoms: a critical review of the literature on patient and provider delay. Social science & medicine, 36(12), pp.1521-1534.
7. Afzelius, P., Zedeler, K., Sommer, H., Mouridsen, H.T. and Blichert-Toft, M., 1994. Patient's and doctor's delay in primary breast cancer: Prognostic implications. Acta Oncologica, 33(4), pp.345-351.
8. Gebremariam, A., Addissie, A., Worku, A., Assefa, M., Kantelhardt, E.J. and Jemal, A., 2019. Perspectives of patients, family members, and health care providers on the late diagnosis of breast cancer in Ethiopia: A qualitative study. PloS one, 14(8), p.e0220769.
9. Ramirez, A.J., Westcombe, A.M., Burgess, C.C., Sutton, S., Littlejohns, P. and Richards, M.A., 1999. Factors predicting delayed presentation of symptomatic breast cancer: a systematic review. The Lancet, 353(9159), pp.1127-1131.
10. World Health Organization, 2021. Breast cancer now most common form of cancer: WHO taking action. URL: https://www.who.int/news/item/03-02-2021-breast-cancer-now-most-common-form-of-cancer-who-taking-action
11. Akhtar, K., Akhtar, K. and Rahman, M.M., 2018. The use of alternative medicine is delaying health-seeking behavior by Bangladeshi breast cancer patients. European journal of breast health, 14(3), p.166.
12. Islam, R.M., Bell, R.J., Billah, B., Hossain, M.B. and Davis, S.R., 2016. Awareness of breast cancer and barriers to breast screening uptake in Bangladesh: A population-based survey. Maturitas, 84, pp.68-74.
13. Akther K, Hossain KJ, Kawsar AA, Hossain S, Das SR. Perceptions on breast cancer pattern: Medical help

seeking among breast cancer patients. *Bangladesh Medical Research Council Bulletin*. 2018;44(1):39-44.

14. Brand NR, Qu LG, Chao A, Ilbawi AM. Delays and barriers to cancer care in low- and middle-income countries: A systematic review. *The Oncologist*. 2019;24(12): e1371-e1380.
15. Ibrahim NA, Oludara MA. Socio-demographic factors and reasons associated with delay in breast cancer presentation: A study in Nigerian women. *The Breast*. 2012;21(3):416-418.
16. Odongo J, Makumbi T, Kalungi S, Galukande M. Patient delay factors in women presenting with breast cancer in a low-income country. *BMC Research Notes*. 2015; 8:467.
17. Pace LE, Mpunga T, Hategekimana V, Dusengimana JMV, Habineza H, Bigirimana JB, et al. Delays in breast cancer presentation and diagnosis at two rural cancer referral centers in Rwanda. *The Oncologist*. 2015;20(7):780-788.
18. Richards MA, Westcombe AM, Love SB, Littlejohns P, Ramirez AJ. Influence of delay on survival in patients with breast cancer: A systematic review. *The Lancet*. 1999;353(9159):1119-1126.
19. Kailemia PN, Lee EC, Taylor C, Renfrew MJ. Exploring determinants of, and interventions for, delayed presentation of women with breast symptoms: A systematic review. *European Journal of Oncology Nursing*. 2020; 44:101677.
20. Sobri FB, Bachtiar A, Panigoro SS, Ayuningtyas D, Gustada H, Yuswar PW, Nur AA, Putri RCRA, Widihidayati AD. Factors affecting delayed presentation and diagnosis of breast cancer in Asian developing countries women: A systematic review. *Asian Pacific Journal of Cancer Prevention*. 2021;22(10):3081-3092.