Factors related to delay in cervical cancer diagnosis and treatment among women in Bangladesh: A cross-sectional study

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ABSTRACT
Background
Bangladesh has a large proportion of women at risk of developing cervical cancer. Though it is considered preventable, it is the second commonest cancer of women in Bangladesh. This study explored the factors influencing the delays in seeking cervical cancer care.

Material and methods
Three hundred and ninety nine (399) randomly selected women with cervical cancer attending clinical care in a tertiary hospital were enrolled. Both quantitative and qualitative methods were followed. Face-to-face interviews using a semi-structured and in-depth questionnaire were carried out. The univariate analysis measured the association with statistical significance set at p<0.05. Content and context analyses were performed for a qualitative segment of the study.

Results
The mean age of the respondent was 54.3 years (Mean ± SD, 54.3±11.7). The median duration of primary, secondary and tertiary delays was 45, 45 and 60, respectively. The association between primary delay and personal factors, e.g., lack of knowledge, was statistically significant (p<0.05). Economic factors were closely associated with secondary delay (p=0.000). Issues like healthcare facilities were significant for tertiary delay (p=0.000).

Conclusion
This study identified multiple factors that can be addressed to reduce delays regarding cervical cancer diagnosis and treatment. Steps to reduce these delays can be expected to improve clinical care and the outcome of this cancer in women in Bangladesh.

Keywords
Cervical cancer, delays, diagnosis, treatment, Bangladesh

Background

Cancer is one of the major non-communicable diseases and accounts for 13% of all deaths worldwide [1]. It is estimated that the incidence of new cancer cases will reach 21.4 million, and about 13 million will die by 2030 [2]. Cervical cancer is the fourth most common cancer affecting women leading to more than half a million new cases and 341,831 deaths worldwide [3]. An estimated 85% of new cases are diagnosed in low-and-middle-income countries, whose mortality rate is almost seven times higher than in developed countries [4]. In developed countries like Canada, the incidence rate has declined annually by 3% since 2009 [4]. This has been attributed to adoption of widespread screening programs designed to detect early pre-cancerous lesions often caused by Human Papilloma Virus (HPV) infection. Vaccination of adolescent girls against HPV is expected to reduce further the incidence rate of cervical cancer [5]. Women in developing countries are far behind those in developed countries in terms of attending screening programs for cervical cancer (19% vs 63%) [6]. In Asia, India and Thailand have the highest uterine cervix cancer incidence rates [3].

Bangladesh has a population of 54.38 million women aged 15 years and older at risk of developing cervical cancer [7]. It is the second most frequent cancer among women in Bangladesh, and most cases are caused by HPV infection. Around 12,000 women are diagnosed yearly with cervical cancer, and more than 6,500 patients die [7]. A recent population-based study reported that the prevalence of all types of HPV infection is 7.7% [8]. The World Health Survey found that the coverage of cervical cancer screening in Bangladesh is only 1%, whereas the average is 19% in developing countries [9].

Cervical cancer is largely preventable with measures like HPV vaccination and early detection through screening programs. For women in developing countries like Bangladesh, seeking healthcare is not straightforward, as men often play the role of key decision-makers [10]. Women in Bangladesh present with advanced stages of cervical cancer (stage III-IV) in 80% of cases, many with fatal outcomes [11]. Around twenty hospitals care for cancer patients in the country [11]. These centers struggle to provide quality care due to the burden of patients, lack of the required number of oncologists, and financial constraints. Patients often have to wait for an extended period for services like radiotherapy. Little is known about the various issues concerning the delay in presenting for managing cervical cancer in Bangladesh. With underdeveloped cancer care facilities for women, it is essential to explore the factors behind the delay in seeking healthcare in Bangladesh for cervical cancer, including diagnosis, treatment and follow-up in healthcare facilities.

Material and methods
Study design and the participants

A cross-sectional study was carried out on women receiving care for cervical cancer or already completed treatment (on follow-up) at the Oncology Unit of a tertiary-level hospital in Dhaka in Bangladesh. Cancer management facilities like screening, chemotherapy, radiotherapy, immunotherapy, surgical oncology service, and palliative care are available here. Both qualitative and quantitative methods were followed. Study participants were selected randomly. Every alternate day was chosen for data collection.

For the quantitative method, the sample size was calculated utilizing the formula described by Peduzzi *et al*. (n=10k/p, where n= sample size, k= frequency of covariates, and p= prevalence of delay in diagnosis and treatment of cervical cancer). In this study, the following values were determined: k=19 and p=0.5. Assuming 5% of participants were non-responders, the final sample size was 399. An arbitrary 5 % of the sample was interviewed for the qualitative method [12].

Data collection instrument and technique
Quantitative

The study's objectives were explained to each participant after a brief introduction. Written consent was obtained from each interviewee before proceeding with the rest of the interview. A semi-structured questionnaire was developed and pre-tested before conducting a face-to-face interview with each participant. For pre-testing, ten sample data were collected from the National Institute of Cancer Research and Hospital in Dhaka using the questionnaire. After pre-testing, feedback was taken from the respondents, and then the instrument was refined as required.

Qualitative

In-depth interviews were conducted with respondents (20 in total) using standard guidelines. A question guide was used to remind the topics to be covered. The investigator created a warm and friendly environment for the participants to speak openly and interact spontaneously. Special attention was given to the participants who may feel uncomfortable being open. Individual interviews were recorded through written notes and a voice recorder.

Data analysis

Quantitative

Data editing and cleaning were performed according to a pre-fixed daily schedule. Descriptive and inferential statistical data analyses were completed with SPSS v16 software. Appropriate statistical tests (e.g., chi-square test) were applied to determine the relationship between dependent and independent variables. Statistical significance was considered with a p-value of <0.05.

Qualitative

Transcripts of the recorded interviews were prepared using word processing software (Microsoft Word 2007). A

summary of each interview was created. Summarized transcripts were encoded. Theme and sub-theme were identified from encoded data. Content and context analysis was done to determine relationships between themes and sub-themes.

Ethical consideration
The Ethical Review Committee of the relevant institute approved the study. Prior permission was obtained from the appropriate authority of the tertiary hospital. Ethical guidelines provided by the Ethical Review Committee were followed carefully.

Operational Definitions
The standard definition of delay in the diagnosis and treatment of cancer is yet to be determined. Research published in recent years utilized an operational definition of delay covering the time period from the first symptom to diagnosis or treatment. A literature review showed that the classification of delay regarding consultation with a physician, diagnosis, and treatment is arbitrary. Pack and Gallo defined patient delay as undue delay in consulting a physician of 90 days or more [13]. Subsequent studies on the delay of different types of cancer diagnoses did not always follow this time duration of 90 days [14].

For the purpose of this study, different types of delays were classified as follows −
- Primary delay is the interval between the onset of signs and symptoms and first contact with a healthcare provider.
- Secondary delay – The period between first contact with a medical person and confirmed diagnosis.
- Tertiary delay – The time period between confirmed diagnosis and initiation of treatment.
- Short-time delay – In this study, short-time delay was operationalized as a delay of less than 45 days.

Primary delay- If the participant went to a medical person within 45 days of her sign and symptoms of carcinoma cervix appearing.
Secondary delay- If the participant was confirmed diagnosed with carcinoma cervix within 45 days of first contact with a healthcare provider.
Tertiary delay - If the participant initiated her treatment within 45 days of confirming the diagnosis.
- Long-time delay – Here long-time delay was operationalized as a delay of more than 45 days.

Results
The mean age of the respondent was 54.3 years (Mean ± SD, 54.3±11.7) (Table 1). The majority of the participants were Muslim, and married. A good number of them were literate. Most of the respondents were housewives (82.7%). About half of the respondents' family income was less than Bangladeshi Taka (BDT) 25,000 (US$ 312) (Table 1).

Table 1: Demographic and socio-economic characteristics of women with cervical cancer (n=150)

Variables	Frequency	Percentage
Age (years)		
< 40	21	14.0
41 to 60	83	55.3
>60	46	30.7
Mean ± SD		54.3±11.7
Religion		
Muslim	135	90.0
Hindu	13	8.7
Others	2	1.3
Marital status		
Married	112	74.7
Widow	38	25.3
Respondent's occupation		
Service	14	9.3
Business	12	8.0
House-wife	124	82.7
Husband's occupation		
Service	43	28.7
Business	82	54.7
House hold work	25	16.7
Educational status of the study participants		
Illiterate	23	15.3
Primary	30	20
Secondary	36	24
Higher Secondary	34	22.7
Graduate/Postgraduate	27	18
Educational status of the participants' husbands		
Illiterate	0.0	0.0
Primary	10	6.7
Secondary	19	12.7
Higher Secondary	37	24.7
Graduate/Post Graduate	84	56
Monthly family income of participants (BDT)		
<25000	72	48
25001 to 50000	58	38.7
>50000	20	13.3

The median delay duration was highest in commencing treatment after a confirmed diagnosis (60 days). The primary and secondary delay duration was equal (45 days) (Figure 1).
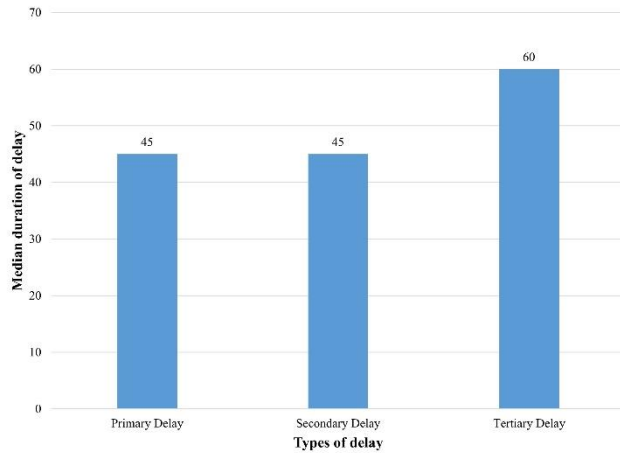
Figure 1: Median duration of primary, secondary and tertiary delay

The association between primary delay and economic, social, personal as well as healthcare facility factors was highly significant (p<0.05) except family factor (p=0.325) (Table 2). All factors were responsible for the primary delay except the personal one was observed to be more frequent in getting medical attention by health care providers in more than 45 days (long time delay).

Table 2: Association between primary delay and related factors

Variable	Short time delay Frequency (%)	Long time delay Frequency (%)	Total Frequency (%)	Chi-square	p-value
Economic				7.205	0.007*
Yes	17 (39.5)	26 (60.5)	43 (100)		
No	68 (63.6)	39 (36.4)	107 (100)		
Familial				1.073	0.325×
Yes	16 (48.5)	17 (51.5)	33 (100)		
No	68 (58.6)	48 (41.4)	116 (100)		
Social				12.973	0.000*
Yes	13 (32.5)	27 (67.5)	40 (100)		
No	72 (65.5)	38 (34.5)	110 (100)		
Personal				4.626	0.040* (Fisher's Exact Test)
Yes	83 (58.9)	58 (41.1)	141 (100)		
No	2 (22.2)	7 (77.8)	9 (100)		
Health facility issues				8.574	0.003*
Yes	4 (23.5)	13 (76.5)	17 (100)		
No	81 (60.9)	52 (39.1)	133 (100)		

×p>0.05, statistically not significant, *p<0.05, statistically significant

Table 3 shows the association between secondary delay and economic factor was statistically significant (p=0.000). Social factor as well as factors related to health care facilities

Table 3: Association between secondary delay and related factors

Variable	Short time delay Frequency (%)	Long time delay Frequency (%)	Total Frequency (%)	Chi-square	p-value
Economic				13.045	0.000*
Yes	18 (36.0)	32 (64.0)	50 (100)		
No	67 (67.0)	33 (33.0)	100 (100)		
Familial				0.033	0.857×
Yes	16 (55.2)	13 (44.8)	29 (100)		
No	69 (57.0)	52 (43.0)	121 (100)		
Social				4.626	0.040* (Fisher's Exact Test)
Yes	2 (22.2)	7 (77.8)	9 (100%)		
No	83 (58.9)	58 (41.1)	141 (100)		
Personal				3.103	0.102× (Fisher's Exact Test)
Yes	82 (58.6)	58 (41.1)	140 (100)		
No	3 (30.0)	7 (70.0)	10 (100)		
Health facility issues				6.848	0.009*
Yes	51 (49.5)	52 (50.5)	103 (100)		
No	34 (72.3)	13 (27.7)	47 (100)		

×p>0.05, statistically not significant, *p<0.05, statistically significant

were also found to be significant. The association between secondary delay and familial and personal factors was not statistically significant (p>0.05). Regarding the secondary delay, all but the personal factors were observed to be more frequent in getting a confirmed diagnosis by a health care provider beyond 45 days (long time delay).

This study showed that factors like economic and healthcare facilities were closely associated with the initiation of treatment after confirmed diagnosis (tertiary delay) (Table 4).

Table 4: Association between tertiary delay and related factors

Variable	Short time delay Frequency (percentage)	Long time delay Frequency (percentage)	Total Frequency (percentage)	Chi-square	p value
Economic				44.583	0.000*
Yes	36(32.1%)	76(67.9%)	112(100%)		
No	36(94.7%)	2(5.3%)	38(100%)		
Familial				0.006	0.938×
Yes	17(48.6%)	18(51.4%)	35(100%)		
No	55(47.8%)	60(52.2%)	115(100%)		
Social				4.775	0.059× (Fisher's
Yes	0(0.0%)	5(100%)	5(100%)		
No	72(49.7%)	73(50.3%)	145(100%)		

					Exact Test)
Personal					
Yes	63(48.1%)	68(51.9%)	131(100%)	0.003	0.953×
No	9(47.4%)	10(52.6%)	19(100%)		
Health facility issues					
Yes	36(35.0%)	67(65.0%)	103(100%)	22.424	0.000*
No	36(76.6%)	11(23.4%)	47(100%)		

×$p>0.05$, statistically not significant, *$p<0.05$, statistically significant

Discussion

Care-seeking behavior for cervical cancer is greatly influenced by social, familial, interpersonal, and financial factors. Left undetected and untreated, women with cervical cancer rapidly progress to fatal outcomes [6]. This study found that the median duration of primary delay was 45 days. A study in neighboring Nepal showed 57% of the patients had experienced longer median patient delay (primary delay) of more than 60 days [15]. Personal perceptions like fear of disease or lack of knowledge were noted as the reasons for the primary delay in the majority (94%) of the participants of this study. Limitations regarding the knowledge about the signs and symptoms of cervical cancer were common among the respondents. A study on ethnic minorities, including Bangladeshis living in the United Kingdom, described emotional barriers like feeling ashamed to be a significant factor in delaying seeking physician consultation [16]. Many of the respondents in this study thought it was a complication of taking oral contraceptives and would be cured within a few days. One of the participants said, "I thought it would be cured by having more children, and my internal female organ will be washed and cleaned during birth."

Access to cancer care facilities or long distances to the nearest primary healthcare center was identified as a barrier by 17% of participants. In Malawi, 22.7% of women had to travel a distance of five kilometers or more to avail of screening tests for cervical cancer [17]. Pelcastre-Villafuerte *et al*. found that one of the barriers related to the provision of free health services was long distance which limited women's accessibility to healthcare centers in Mexico [18]. The present study highlights the fact that in Bangladesh despite the accessibility of primary healthcare facilities, seeking healthcare is delayed by the majority of women due to a lack of knowledge or feeling embarrassed to visit a doctor after the appearance of sign-symptoms of cervical cancer [19]. The scenario is different in developed countries where women are screened for cervical cancer before the appearance of symptoms and signs resulting in a decrease in incidence and mortality rates since the 1960s [20]. During the interview, a respondent narrated, "I felt so embarrassed… thinking that doctor will examine my private parts."

The secondary delay includes delay on the part of the physician (delay in diagnosis) and delays due to weakness in the healthcare delivery system. In addition, important factors for this delay include lack of knowledge and absence of preventive practice [21]. Most (88.6%) of the participants in this study showed a lack of understanding of cervical cancer diagnostic procedures. One of them said "I took some pills given by the local doctor for my per-vaginal bleedings for a long time before attending for biopsy", thus delaying the diagnosis. This statement highlights a gap in patients' knowledge as well as the lack of skills of attending physicians. A study conducted in Mangalore, India showed a majority (81%) had a low level of knowledge about cervical cancer and its screening (85%) [22]. The present study reiterated the previous findings that personal barriers like lack of knowledge and fear of being diagnosed with cancer play an important role in secondary delay [16].

The screening program for cervical cancer was launched in Bangladesh in 2004. This free service is provided through 44 district hospitals and a few hospitals attached to medical colleges located in the district headquarters [23]. In urban areas, reproductive health care centers run by the government and non-government organizations (NGOs) provide screening services. According to our study, more than half of the respondents reported travelling long distances from diagnostic facilities as the main reason for health facility-related secondary delay. Around one in three participants pointed out financial constraints and a minority cited social factors for their secondary delay. A Danish study involving different types of cancer patients showed that well-off female respondents experienced shorter delays in cancer diagnosis [24]. In contrast, a study by Bourne *et al*. conducted in Jamaica reported that socio-economic factors delayed women from seeking cancer screening, early detection, and care [25].

Screening-positive women are referred to one of seven government-funded referral centers for confirmatory diagnosis and initiation of treatment [23]. In addition, different private hospitals provide diagnostic and therapeutic services for cervical cancer in Bangladesh [26]. Factors like fear of treatment, cost, and options of treatment, and adverse effects of chemo- and radiotherapy are the leading reasons for tertiary delay [27]. Perceived risks like fear of cancer treatment, lack of information about treatment options, and limited availability of cancer care centers were responsible for the tertiary delay as highlighted in our study. "I do not have any cancer hospital in my hometown, so I have come to the capital city for my cancer treatment", said one respondent. Most of the respondents also cited financial difficulties as the reason for not starting treatment immediately after diagnosis.

Emotional barriers like fear of disease, feeling of shame and embarrassment, lack of time due to household chores and low perceived risk of having cancer symptoms are common in women of South Asian origin including Bangladeshis [16]. These personal factors were found to be statistically significant in this study for the delay in seeking consultation with health care providers.

Adequate health services targeting the at-risk population for screening and treatment for cervical cancer are lacking in

Bangladesh [28]. A study by Ansink AC *et al.* found widespread awareness of cervical cancer among men and women at the community level. However, screening facilities were deemed acceptable only if the attending doctor was female [10]. Regarding the secondary delay, the health facility-related issues highlighted in our study were statistically significant (p<0.009).

Barriers to cancer care in a developing country like Bangladesh include the prohibitive cost of chemotherapy, radiotherapy, and surgery. This has led to the development of a women's cancer ward in the largest government-funded general hospital in the country [11]. In our study, economic factors emerged as a significant issue (p<0.05) in seeking treatment for cervical cancer. In a recent study published in Taiwan, a decreasing trend in delay in seeking cervical cancer treatment has been attributed to its national health insurance program which facilitates cancer care for the economically disadvantaged population [29].

The limited evidence on factors influencing the delay of cervical cancer treatment suggests lack of skilled healthcare providers, unavailability of equipment, cost of the procedure, and transportation are important determinants [6]. One of the significant findings (p<0.05) of this study is issues related to health facilities like the ones described above are affecting the time delay of seeking treatment after screening and diagnosis. A qualitative study in Peru illustrates these multiple barriers to obtaining treatment for cervical cancer [30].

A few of the limitations of this study need to be considered. One of the disadvantages of in-depth interviews was that the results obtained were not generalizable. Additionally, the content of the discussion with the interviewee was not comparable with each other. This qualitative method is considered acceptable to gain an understanding of the knowledge and perceptions of the respondents [31]. A third shortcoming of this study was the lack of insight and expert opinion that could be obtained through key informant interviews with healthcare providers. An option to find out the predictors of delay in this study would be to perform a logistic regression analysis.

Conclusion
Providing comprehensive cancer care is a major challenge in a resource-constraint country like Bangladesh. For women in this country, cervical cancer continues to be a large-scale mortality and morbidity burden. Hence it is important to highlight the factors attributable to the delay in consulting with a healthcare provider for the management of cervical cancer. Lack of knowledge, limitations in terms of the availability of screening programs, and expensive and limited treatment options are the major hindrance, according to our study. These findings suggest that raising knowledge about cervical cancer, strengthening healthcare delivery systems and financial support for covering costs (e.g., health insurance) may contribute to improving the cervical cancer scenario in Bangladesh.

Limitation and future scope of the study
The cross-sectional nature of the study does not allow us to infer causal relationships. The selection of a single center for study limits its ability to generalize the findings. Due to resource limitations, the surveyed sample size was smaller than the calculated sample size. To explore health system barriers, it is essential to interview health professionals providing cancer care.

Relevance of the study
This study explored the factors associated with different categories of delay an individual is likely to come across while seeking care for cervical cancer. Focused intervention for primary, secondary, and tertiary delays may potentially reduce these and thus help improve cervical cancer care.

Abbreviations
Bangladeshi Taka (BDT), Bangladesh University of Health Sciences (BUHS), Human Papilloma Virus (HPV), Non-Governmental Organization (NGO)

Authors' contribution
a. Study planning: MMH, NN, JA, BRA
b. Data collection: MMH, MSM
c. Data analysis/ interpretation: MMH, MSM
d. Manuscript writing: MMH, NN, MSM, JA, BRA
e. Manuscript revision: MMH, NN, MSM, JA, BRA
f. Final approval: MMH, NN, MSM, JA, BRA
g. Agreement to be accountable for all aspects of the work: MMH, NN, MSM, JA, BRA

Availability of data and materials
All data underlying the results are available as part of the article.

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