

# Staging and Management of Cervical Cancer at the Colposcopy Clinic of Bangabandhu Sheikh Sheikh Mujib Medical University (BSMMU), Bangladesh

Ashrafun Nessa<sup>1</sup> Thrina Islam<sup>2</sup> Noor-E-Ferdousi<sup>3</sup> Anjuman Sultana<sup>4</sup> Kamrul Hasan Khan<sup>5</sup>  
Harun ur Rashid<sup>6</sup>

<sup>1</sup> Department of Gynaecological Oncology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Shahbag, Dhaka, Bangladesh

<sup>2</sup> Planning, Monitoring & Research Department, National Centre of Cervical and Breast Cancer Screening and Training, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh

<sup>3</sup> Department of Gynaecological Oncology, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh

<sup>4</sup> Medical Officer, Mugda Medical College, Directorate General of Health Services (DGHS), Ministry of Health and Family Welfare, Dhaka, Bangladesh

**Address for correspondence** Anjuman Sultana, FCPS (Obst & Gynae), House #32/A, Road # 6, Dhanmondi, Dhaka 1209, Bangladesh (e-mail: flora83.adiba@yahoo.com; anjumsultanaflora@gmail.com).

<sup>5</sup> Department of Pathology, Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh

<sup>6</sup> Planning, Monitoring and Research, Directorate General of Health Services (DGHS), Mohakhali, Dhaka, Bangladesh

## South Asian J Cancer

### Abstract



Anjuman Sultana

### Keywords

- ▶ Bangladesh
- ▶ cervical cancer
- ▶ colposcopy
- ▶ management
- ▶ staging

Cervical cancer (CC) ranks as the second most common cancer among women in Bangladesh. Unfortunately, due to late-stage diagnosis and inadequate treatment facilities, the mortality rate remains high. The stage at which CC is diagnosed plays a crucial role in predicting a woman's survival. This study aimed to determine the staging patterns of CC at presentation in the colposcopy clinic of Bangabandhu Sheikh Mujib Medical University (BSMMU) and the subsequent management provided to these women. This retrospective study was conducted at the BSMMU colposcopy clinic from January 2019 to June 2020. It included CC cases with known staging, spanning from January 2016 to June 2019. Data were collected from the colposcopy registry book, telephone interviews, and face-to-face discussions during follow-up appointments. The mean age of women diagnosed with CC was 48.59 years ( $\pm 2$  standard deviations). Among the 523 women studied, 107 (20.5%) were diagnosed at stage I, 124 (23.7%) at stage IIA, 240 (45.9%) at stage IIB, while the remaining 52 (9.90%) were diagnosed with Stage III and IV disease. Within the study population, 39 (7.5%) women underwent radical hysterectomy alone, 110 (21.00%) underwent radical hysterectomy followed by adjuvant therapy, and 184 (35.14%) received primary radiotherapy or concurrent chemoradiation. A significant portion of CC cases presented at an early stage, underscoring the importance of an effective screening program to prevent advanced-stage disease and enhance early detection rates. Establishing a patient navigation system immediately after diagnosis is crucial to prevent the loss of follow-up and ensure timely treatment. It is imperative to enhance the healthcare system's capacity to ensure timely treatment for cancer patients.

DOI <https://doi.org/10.1055/s-0043-1776288> ISSN 2278-330X

**How to cite this article:** Nessa A, Islam T, Noor-E-Ferdousi, et al. Staging and Management of Cervical Cancer at the Colposcopy Clinic of Bangabandhu Sheikh Sheikh Mujib Medical University (BSMMU), Bangladesh. *South Asian J Cancer* 2024;00(00):00–00

© 2024. MedIntel Services Pvt Ltd. All rights reserved.

This is an open access article published by Thieme under the terms of the Creative Commons Attribution-NonDerivative-NonCommercial-License, permitting copying and reproduction so long as the original work is given appropriate credit. Contents may not be used for commercial purposes, or adapted, remixed, transformed or built upon. (<https://creativecommons.org/licenses/by-nc-nd/4.0/>)

Thieme Medical and Scientific Publishers Pvt. Ltd., A-12, 2nd Floor, Sector 2, Noida-201301 UP, India

## Introduction

Cervical cancer (CC) is the fourth most common cancer in females around the world and the fourth leading cause of cancer death. It is estimated that 604,127 new cases occurred in 2020 that represent 7.7% of all female cancers worldwide. Total number of death due to CC was 341,831.<sup>1</sup> Approximately 90% of deaths from CC occurred in low- and middle-income countries (LMICs). It is the second most common cancer among women in Bangladesh. CC constitutes approximately 12% of female cancer in this country.<sup>2</sup> In developing countries, majority of the women with CC present with advanced disease, that often leads to high mortality and morbidity. The overall 5-year relative survival for early and localized cancers is 73.2% but can be as low as 7.4% for advanced stage disease.<sup>3</sup> In Bangladesh, facilities for radiotherapy are available only in few government institutions and expensive in the private sector. Due to the late stage at diagnosis and inadequate management facilities, mortality rate from CC is still high in Bangladesh.

In LMICs risk factors like early marriage, early pregnancy, multiple sexual partners, sexually transmitted diseases, lack of screening program and low socioeconomic condition play important role for increased death related to CC. Human papilloma virus (HPV) infections especially oncogenic type HPV16 and HPV18 are regarded as the main cause of developing CC.<sup>4</sup> CC can be prevented by primary prevention through vaccination and secondary prevention through screening. Screening can detect cervical precancer and cancer in early stage. Treatment of the precancer prevents conversion into malignancy and management of early CC reduces mortality and improve quality of life. Invasive CC initially spreads locally and then metastasizes to distant organs and cancer becomes an advanced disease with increase of stage. Staging at presentation is an important predictor for survival of women. It guides clinicians to plan the management. Staging is based on the results of physical examination, imaging scans, and biopsies. Clinical staging is mostly used for staging of CC as recommended by International Federation of Gynecology and Obstetrics (FIGO).<sup>5</sup> Radical hysterectomy is a well-adopted surgical treatment that can be performed for stage I and IIA disease. Radiotherapy is applicable for women with CC of all stages and usually practiced for the management of advanced CC. Advanced imaging techniques like magnetic resonance imagings (MRIs), positron emission tomography scans, and computed tomography (CT) scans also help in staging. Imaging is used to diagnose the metastasis and micrometastasis in distal organ that helps in improving the quality of treatment and survival rate.<sup>6</sup>

In LMICs, CC screening program is poorly developed, and majority of the cases are diagnosed in advanced stage of the disease. Patients with advanced stage diseases have poor prognosis compared with patients who present at early stage disease.<sup>7,8</sup> Therefore, diagnosis of early stage disease is crucial for good management plan for women with CC. With this vision, Government of Bangladesh (GOB) adopted a CC screening program since the year 2005. Visual inspection of cervix

with acetic acid (VIA) method was considered as a method of screening due to its simplicity, low cost, potential for immediate linkage with investigations/treatment, and the possibility of rapid training to the service providers. VIA method is introduced within the existing government health infrastructure at district and subdistrict level.<sup>9-16</sup> The GOB is trying to develop a nationwide population-based screening program through VIA for the women of 30 to 60 years of age with aim of performing the test every 5 years.<sup>16</sup> Till now approximately 431 VIA centers have already been established at primary, secondary, and tertiary level healthcare facilities in 64 districts of Bangladesh.<sup>15</sup> Screen-positive cases are being referred to the colposcopy clinics of tertiary care facilities (BSMMU/ MCHs), where evaluation and management are performed.<sup>12-14</sup> Fourteen government MCHs and BSMMU are functioning as referral centers through development of colposcopy clinics. During cervical screening, CC cases are incidentally diagnosed at different stages at VIA facilities and colposcopy centers. This retrospective cross-sectional study included women attending colposcopy clinic of BSMMU from January 2016 to June 2019. The main objective of this study was to find out the pattern of staging of CC at presentation and management offered to the women during the mentioned period. This study followed clinical staging mostly as FIGO staging 2014.<sup>5</sup>

## Materials and Methods

This retrospective study was performed at the colposcopy clinic of BSMMU from January 2019 to June 2020. Patients were recruited from the colposcopy registry books at BSMMU where data are being preserved during their first and subsequent follow-up visits. CC cases diagnosed at the colposcopy clinic with known staging from January 2016 to June 2019 were recruited in this study. If there was obvious cervical growth, clinical staging was performed during the same visit, cervical biopsy was collected for histopathological examination, and women were referred to the Department of Gynaecological Oncology or Clinical Oncology at BSMMU. In addition to that, colposcopy diagnosed, and histopathology confirmed CC cases detected during the same duration were included in the study.

Most of the women with CC had biopsy at the colposcopy clinic. Remaining had biopsy during examination under anesthesia (EUA) in the Department of Gynaecological Oncology at BSMMU. A good number of cases had EUA for confirmation of staging. In cases of advanced stage, disease staging was performed mostly by clinical examination at the colposcopy clinic. Women with early stage disease were referred to the Gynaecological Oncology and advanced stage disease were referred to the clinical oncology outpatient department at BSMMU for further evaluation and management. The sociodemographic and reproductive health characteristics, examination findings, treatment received, and follow-up data of study women were collected from the colposcopy registry books at BSMMU. The data entry and analysis were performed using Statistical Package for the Social Sciences (SPSS) Version 17.0. The present research

**Table 1** Distance of residence of patients from Dhaka

Name of districts	Frequency	Percentage	Distance of the residence from Dhaka in kilometers (Zero point) <sup>a</sup>
Dhaka	102	19.50	0–50 km
Narshingdi	46	8.80	51 km
Gazipur	36	6.90	37 km
Narayanganj	35	6.70	17 km
Munshiganj	19	3.60	27 km
Tangail	13	2.50	92 km
Manikganj	12	2.30	63 km
Brahmanbaria	24	4.60	109 km
Other districts	236	45.12	194.17km ± 97.16 (mean distance ± SD) (average distance 194.17km)
Total	523	100.00	

Abbreviation: SD, standard deviation.

<sup>a</sup>Distance Matrix. URL: <http://www.rhd.gov.bd/Documents/HDM/DistrictDistanceMatrix/Index.pdf> [last accessed 12–05–2020]

included data from January 2016 to June 2019 and therefore it considered clinical staging as previous FIGO staging (2014).<sup>5</sup> Imaging techniques like intravenous urography, X-ray, CT scan, MRI, colposcopy, endocervical curettage, hysteroscopy, cystoscopy, and proctoscopy are also supportive in staging and these were incorporated in FIGO staging 2022.

## Results

From January 2016 to June 2019, 575 (N) women with CC attended the colposcopy clinic of BSMMU. Among them, 52 patients were not included in the study due to unavailability of findings on staging and 523 patients of CC with known staging were recruited.

Among the 523 patients, 102 (19.50%) attended from Dhaka district, and 121 (30.80%) attended from other districts of Dhaka division with a distance from 20 to 70 km and rest of the study population attended from different far districts of Bangladesh (→ **Table 1**).

The mean age of the patients with CC was 48.59 (standard deviation [SD] ± 11.15) and the youngest patient was 26 years of age. Majority of the cases (333, 63.7%) presented between 31 and 50 years. Twenty-four women (4.6%) were younger than 30 years and 166 (31.7) were more than 50 years of age (→ **Table 2**). Majority of the patients (94.3%) were Muslim and rest 5.7% were Hindu. Mean age of first marriage was 15.18 ± 2.779 years and mean age of first delivery was 17.25 ± 2.913. Mean parity of the patients was 4.11 (SD ± 2.21).

Among the study population, 210 (40.2%) patients had staging done by EUA and staging of remaining patients was done by clinical examination and other investigations following FIGO staging. → **Table 3** shows the distribution of staging of CC patients according to age during diagnosis at BSMMU. Among 523 patients, about one-fifth (108; 20.7%) of patients presented with stage I and another one-fifth (123; 23.70%) presented with stage IIA disease. Almost half of the patients (240; 45.9%) were with stage IIB, 41 (7.8%) with

stage III, and 11 (2.1%) patients were with stage IV disease. Among the patients with stage I disease, majority (82, 75.90%) of patients were in the 31 to 50 age group, 10 (9.30%) women were less than 30 years of age, and 16 (14.90) were more than 50 years of age. Similarly, among the patients with stage IIA, 81 (65.80) patients were in the age group 31 to 50, 7 (5.60) patients were less than 30 years of age, and 35 (28.40) patients were more than 50 years of age. Among the patients of stage IIB, 108 (45%) patients were

**Table 2** Sociodemographic characteristics of the patients with cervical cancer (n = 523)

Characteristics		Number	Percentage
Age at diagnosis	21–30 years	24	4.6
	31–40 years	130	24.9
	41–50 years	203	38.8
	51–60 years	107	20.5
	>60 years	59	11.2
Age of marriage	< 15 years	292	55.8
	16–17 years	133	25.4
	≥18 years	98	18.7
Age of first delivery	Nullipara	12	2.3
	<15 years	137	26.2
	16–20 years	299	57.2
	21–25 years	70	13.4
	≥26 years	5	1.0
Religion	Muslim	493	94.3
	Hindu	30	5.7
Parity	Nullipara	12	2.3
	1–2	117	22.4
	3–4	190	36.3
	>4	204	39.0

**Table 3** Staging of cervical cancer according to the age group (n = 523)

Age group	Staging of disease					
	Stage I	Stage IIA	Stage IIB	Stage III	Stage IV	Total
	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)
21–30	10(9.30)	7(5.70)	7(2.90)	0(0.00)	0(0.00)	24(4.60)
31–40	48(44.40)	33(26.80)	41(17.10)	7(17.10)	1(9.10)	130(24.90)
41–50	34(31.50)	48(39.00)	108(45.00)	10(24.40)	3(27.30)	203(38.80)
51–60	11(10.20)	23(18.70)	56(23.30)	12(29.30)	5(45.50)	107(20.50)
61–70	2(1.90)	11(8.90)	23(9.60)	7(17.10)	1(9.10)	44(8.40)
71–80	2(1.90)	1(0.80)	2(0.80)	3(7.30)	1(9.10)	9(1.70)
81–90	1(0.90)	0(0.00)	3(1.30)	2(4.90)	0(0.00)	6(1.10)
Total	108(100.00)	123(100.00)	240(100.00)	41(100.00)	11(100.00)	523(100.00)

**Table 4** Histopathology types of CC patients (n = 523)

Histopathology type	Number	Percentage
Microinvasive squamous cell carcinoma	9	1.70
Squamous cell carcinoma	427	81.60
Adenocarcinoma	33	6.50
Papillary adenocarcinoma	3	0.60
Adenosquamous carcinoma	4	0.80
Clear cell carcinoma	2	0.40
Small cell neuroendocrine carcinoma	1	0.20
Histopathology result not available	35	6.70

Abbreviation: CC, cervical cancer.

in 41 to 50 years. In stage III and IV, maximum patients belonged to 51 to 60 years (29.30%, 45.50%, respectively). The peak age of presentation of CC was between 36 and 50 years of age and 55% of the cases presented during this time.

Among 523 women, 9 (1.40%) women had microinvasive squamous cell carcinoma, 427 (81.60%) had squamous cell carcinoma, and 33 (6.50%) had adenocarcinoma. Very small number of women had papillary adenocarcinoma, clear cell carcinoma, and small cell neuro endocrine carcinoma (→ Table 4).

Among the study population, 149 (28.50%) underwent radical hysterectomy with or without adjuvant therapy, 184 (35.14%) patients received radiotherapy with or without concurrent chemotherapy, and 152(29.10%) patients failed to avail treatment (→ Table 5).

→ Table 5 shows different treatment modalities according to the stages of the disease. Among 108 stage I patients, 37 (34.26%) patients underwent radical hysterectomy and adjuvant therapy was not advised due to early disease. Nine of these 37 cases were microinvasive squamous cell carcinoma and were suspected by VIA, evaluated by colposcopy and diagnosis was confirmed by histological examination. An-

other 37(34.26%) patients with stage I disease underwent radical hysterectomy followed by adjuvant therapy.

Among 123 patients with stage IIA disease, 73 (59.30%) patients underwent radical hysterectomy followed by adjuvant therapy, another 8 (6.6%) patients received radiotherapy or concurrent chemoradiation. Among 240 patients with stage IIB disease, 18 (7.50%) patients received radiotherapy and 133(55.40%) patients received concurrent chemoradiation. Furthermore, among 52 patients with stage III and IV disease, 6 received radiotherapy and 16 received concurrent chemoradiation. Altogether, among 523 study population, 152 (29.1%) did not attend BSMMU further and could not be followed up further.

## Discussions

The mean age of the study population with CC was 48.59 (SD ± 11.15) and median age was 48.00 years. Studies in India revealed that the median age of patients at presentation was 54 and 54.7 years<sup>17</sup> Detection of CC at comparatively lower age in the present study may be a reflection of earlier detection of CC patients in an unscreened population during a screening program.

In this study, 333 (63.7%) patients presented between 31 and 50 years of age. However, the peak age of presentation was from 36 to 50 years of age and 55% of the cases presented during this time. This indicates that women of 30 to 50 years should get the highest priority in the screening program in Bangladesh. There are resource limitations to execute CC screening program and particular attention to this group of women will pick up more precancer and early cancer. However, the findings of this study indicated that about one-third of the CC developed among women who were more than 50 years of age, and these women never had an opportunity to avail screening in their life time. Studies in India and Egypt also revealed increasing age of menopause as a significant risk factor for CC.<sup>18,19</sup> The World Health Organization (WHO) recommended upper limit of screening of women as 49 years of age,<sup>20,21</sup> and limiting screening at 49 years of age will fail to detect almost one third of the CC

**Table 5** Treatment modalities received by the patients according to the stages of the disease

Stage	Treatment modalities										Total
	Lost to follow-up	Radical hysterectomy (RH)	RH followed by adjuvant therapy	Concurrent chemoradiation (EBRT + ICRT)	Radiotherapy (EBRT + ICRT)	Palliative care	Refused treatment	Neoadjuvant therapy followed by RH			
	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	
Stage I	29 (26.90)	37 (34.26)	37 (34.26)	2 (1.90)	1 (0.90)	0 (0.00)	2 (1.90)	0 (0.00)	0 (0.00)	108 (100.00)	
Stage IIA	38 (30.90)	2 (1.60)	73 (59.30)	4 (3.30)	4 (3.30)	0 (0.00)	2 (1.60)	0 (0.00)	0 (0.00)	123 (100.00)	
Stage IIB	69 (28.80)	0 (0.00)	0 (0.00)	133 (55.40)	18 (7.50)	3 (1.30)	15 (6.30)	2 (0.80)	2 (0.80)	240 (100.00)	
Stage III	14 (34.10)	0 (0.00)	0 (0.00)	12 (29.30)	6 (14.60)	4 (9.80)	5 (12.20)	0 (0.00)	0 (0.00)	41 (100.00)	
Stage IV	2 (18.20)	0 (0.00)	0 (0.00)	4 (36.40)	0 (0.00)	4 (36.40)	1 (9.10)	0 (0.00)	0 (0.00)	11 (100.00)	
Total	152 (29.10)	39 (7.50)	110 (21.00)	155 (29.60)	29 (5.50)	11 (2.10)	25 (4.80)	2 (0.40)	2 (0.40)	523 (100.00)	

Abbreviations: EBRT, external beam radiotherapy; ICRT, intracavity radiation therapy.  
 Out of 523 patients, 66.2% were treated and 4.80% refused treatment and 29.1% lost to follow-up.

cases in Bangladesh and more in India. GOB adopted 60 years of age as the upper limit for CC screening.<sup>16</sup> Inclusion of higher age group in the CC screening program may be a reflection of stakeholder's view for covering the women with higher age of this unscreened population.

Mean age of marriage and first delivery of the study population were  $15.18 \pm 2.779$  and  $17.25 \pm 2.913$ , respectively. More than 80% of them were married before 18 years of age and had their first delivery before 20 years. A case-control study in Egypt reported young age at marriage (<18 years) as a significant risk factor for CC.<sup>19</sup> Though the legal age of marriage for women in Bangladesh is 18 years, a large proportion of marriages still take place before the women reach this age. Awareness on benefit of delaying marriage needs to be created for reducing risk of CC. In this study, mean parity of the patients was 4.11 (SD  $\pm 2.21$ ) and 490 (93.60%) patients were multipara and 204 (39%) were grand-multipara. A pooled analysis of 10 case-control studies by the International Agency for Research on Cancer (IARC) involving eight developing countries of Africa, South America, Asia, and Europe found that parity increased the risk of both invasive and in situ carcinoma of the cervix.<sup>22</sup> All this information indicate that parity is consistently associated with CC risk and declining parity should have a positive impact in reducing CC in developing countries. The GOB is proactive to provide high-quality family planning services for limiting childbirth. However, more efforts need to be given on this aspect as high parity is still common in this country.

About two-fifth (231, 44.2%) of this study population presented in early stage of the disease (stage I and IIA). The clinical stage of CC and the tumor size at the time of diagnosis are significant prognostic factors for CC. Therefore, eventual outcome of these early diagnosed cases in this study is likely to be promising with considerable decline of the mortality and further research is necessary with these early diagnosed cases. Almost similar proportion of early presentation of the disease was observed (**Table 6**) in studies at BSMMU (44.20%) and Dhaka Medical College Hospital (37.31%).<sup>23,24</sup> These findings reflected that a good proportion of patients presented with early stage disease at tertiary care centers with referral facilities for CC screen-positive women. A comparatively smaller proportion of women (24.37%) presented with early stage disease (stage I and IIA) to Delta Medical College and Hospital of Bangladesh, a cancer treatment center without referral facilities for screen-positive women.<sup>25</sup> This reflects that even a cancer care center without screen-positive management facility receives early stage disease because of having a national screening program at different level of healthcare system of the country. All these studies revealed that tertiary care centers of Bangladesh receive considerable number of early CC and a good number of them were in operable condition. Successful expansion of the screening program and improving population coverage is, therefore, one of the effective ways for reducing death from CC.

A study in Karnataka, India (stage I—7.36%, stage IIA—9.21%) and North East India (stage I—4.10%) revealed rela-

tively smaller proportion of CC cases with early disease and this was related to lack of awareness and absence of efficient screening program in the mentioned parts of India during the mentioned period.<sup>8,26,27</sup> On the other hand, comparatively higher proportion of patients presented with stage I disease in rural Kerala (12.80%) and Trivandrum (11.10%), where state is running national CC screening program.<sup>28,29</sup> These studies stressed on the importance of formulating public health policies with improving awareness and implementation of CC screening programs. Nepal developed screening services in limited areas. Study in Nepal showed closer proportion of patients presented with stage I and IIA disease (22.10%).<sup>30</sup> The finding is again probably related to strength of existing screening program in the mentioned areas. All these studies indicated that screening program helps in early detection and the program expansion and gradual improvement of population coverage are very important to prevent advanced stage disease.

In this study, approximately 55.80% of the CC presented with advanced disease (stage IIB, III, and IV). Even with the presence of existing developing national screening program throughout the country, this high number of patients with advanced disease is probably a reflection of the poor health-seeking behavior of women and absence of organized screening program with low screening coverage of the country. However, the proportion of advanced disease was quite lower than Karnataka (82.90%),<sup>26</sup> Nepal (80.90%),<sup>30</sup> where large number of women presented with advanced disease.

A timely intervention through rapid scale up of the program toward different levels of healthcare should help in improvement of the screening coverage. This study revealed that BSMMU received considerable number of early CC in operable condition through the screening program including nine microinvasive CC without obvious growth. Even adjuvant therapy was not necessary after Wertheim's hysterectomy among 37 (34.26%) of 108 stage I cases due to localized disease. It indicates that screening program helps in early detection and the program execution is very important to reduce the necessity of radiotherapy that is particularly important in countries like Bangladesh with very much inadequate radiotherapy facilities.

Altogether, among 523 study population, 152 (29.1%) women could not be contacted and followed up. Though many of them were operable, 29 (26.90%) patients with stage I and 38 (30.90) with stage IIA disease did not attend further and could not be contacted further over telephone. One of the important constrain of receiving treatment at the moment is inadequate treatment facilities and infrastructure problem. Patients may have to wait for several weeks for operation due to inadequate bed arrangement. Research in Dhaka Medical College focused on challenges of CC treatment in Bangladesh including inadequate treatment facilities in women's cancer ward. There was lots of barriers in establishment of women cancer ward in Dhaka Medical College.<sup>31</sup> In this study, approximately 80% patients attended from other districts than Dhaka and 50% from distant districts. About 70% of the patients who leaves in other districts than Dhaka could not be contacted further. With increasing diagnosis of CC,

**Table 6** Staging of cervical cancer in different countries

Author, year of publication, country	Number of study population	Year and place of study	Staging of the disease	
Present study	523	2016 to 2019 Bangabandhu Sheikh Mujib Medical University	Stage I Stage IIA Stage IIB Stage III Stage IV	108(20.70%) 123 (23.70%) 240 (45.90%) 41 (7.80%) 11 (2.10%)
Ferdous et al 2013 <sup>23</sup> Bangladesh	104	2007–2008 Bangabandhu Sheikh Mujib Medical University	Stage I Stage IIA Stage IIB Stage III Stage IV Staging Unknown	17(16.30%) 29 (29.90%) 34 (32.70%) 20 (19.2%) 2 (1.9%) 2 (1.9%)
Afroj et al 2017 <sup>24</sup> Bangladesh	67	2011 Dhaka Medical College Hospital	Stage IA Stage IB Stage IIA Stage IIB Stage IIIA Stage IIIB Stage IVA Stage IVB	0 (0.00%) 13 (19.40%) 12 (17.91%) 20 (29.85%) 1 (1.49%) 20 (29.85%) 1 (1.49%) 0 (0.00%)
Banu et al 2013 <sup>25</sup> Bangladesh	523	2011 Delta Medical College and Hospital	Stage IA Stage IB Stage IIA Stage IIB Stage IIIA Stage IIIB Stage IVA Stage IVB Staging Unknown	3 (0.83%) 23 (6.37%) 62 (17.17%) 123 (34.07%) 11 (3.04%) 100 (27.70%) 32 (8.865%) 7 (1.93%) 162 (30.975%)
Kaverappaet et al 2015 <sup>26</sup> India	380	2012 Tertiary-care cancer hospital in Mysuru, Karnataka	Stage IA Stage IB Stage IIA Stage IIB Stage IIIA Stage IIIB Stage IVA Stage IVB	5 (1.31%) 23 (6.05%) 35 (9.21%) 116 (30.52%) 24 (6.31%) 140 (36.84%) 31 (8.15%) 6 (1.58%)
Kataki et al 2018 <sup>8</sup> India	193	2010 Regional Cancer Centre, North East India	Stage I Stage II Stage III Stage IV	8 (4.10%) 109(56.50%) 69(35.80%) 7(3.60%)
Rita et al 2017 <sup>27</sup> Bihar, India	508	2015–2016 Mahavir Cancer Sanstha and Research Centre, Bihar	Stage I1 Stage II Stage III Stage IV	8(3.54%) 364 (71.65%) 116 (22.83%) 10 (1.9%)
Bindu et al 2017 <sup>28</sup> India	227	2014 Malabar Cancer Centre, Kerala	Stage I Stage II Stage III Stage IV Staging Unknown	29 (12.80%) 79 (34.8%) 73 (32.20%) 19 (8.4%) 27 (11.80%)
Mathew et al 2017 <sup>29</sup> India	316	2014–2015 Regional Cancer Centre, Trivandrum	Stage I Stage II Stage III Stage IV Staging Unknown	35 (11.10%) 101 (32.00%) 75 (23.7%) 33 (10.4%) 72 (22.78%)
Gyenwali et al 2014 <sup>30</sup> Nepal	110	2012 B.P. Koirala memorial Cancer Hospital (BPKMCH), Bharatpur, Chitwan and Bhaktapur Cancer Hospital, Bhaktapur	Stage IA Stage IB Stage IIA Stage IIB Stage IIIA Stage IIIB Stage IVA Stage IVB	3(3.00%) 15(13.60%) 6 (5.50%) 56 (50.90%) 3 (2.70%) 29 (26.40%) 1 (0.90%) 0 (0.00%)

adequate facilities for navigation of patients to diagnostic workup and appropriate treatment based on stage of the disease should be ensured. Gynecologic oncological operation and radiotherapy facilities should be made available at all tertiary care centers. Altogether, government should take necessary steps to improve the services.

In this study, approximately 292(55.80%) of the CC presented with advanced disease and among them 173 (59.24%) patients received radiotherapy with or without chemotherapy and 85 (29.10%) could not be followed up and their treatment modalities are not known. As BSMMU was not well equipped for radiotherapy, majority of the advanced disease were referred to other facilities for radiotherapy. However, in all the radiotherapy facilities, there is a long waiting list for treatment. Moreover, the overall facilities for radiotherapy are very much inadequate in Bangladesh and many equipment at tertiary centers are nonfunctional. Due to the late stage at diagnosis and inadequate management facilities, mortality rate from CC is high in Bangladesh. There is a big disparity regarding radiotherapy facility between developed and developing countries. In developed countries, there are at least one radiotherapy unit for every 250,000 people. A survey conducted among 20 LMICs in 2015 found that one radiotherapy unit was for every 5 million people and sometimes one unit for every 20 million people.<sup>32</sup> In these LMICs with a huge burden of advanced stage CC, the only option is treating with radiotherapy. There are 30 countries worldwide that do not have any radiation machine, of them, 15 countries were from Africa and Asia.<sup>33</sup> Loss of contact and treatment failure are well-known drawbacks. There may be other social constrains like ignorance, transport problems, lack of strong navigation system, and social support system for diagnosed patients.

## Conclusion

This study shows the majority of carcinoma cervix patients who attended BSMMU colposcopy clinic was outside of Dhaka city. The majority of them was married and experienced motherhood below 18 years of age. The predominant phase of cervical carcinoma observed at the colposcopy clinic at BSMMU, a secondary screening facility designed for the detection of early and preinvasive stages of cervical cancer, was found to be in an advanced stage. The majority of carcinoma cervix was squamous cell carcinoma type than adenocarcinoma. About one-third of patients attending the colposcopy clinic did not receive treatment and this situation is disappointing. The study also shows the numbers of carcinoma cervix is decreasing over the years. The whole scenario represents the health system of the country and its efficacy. Further study should be performed to address this gap and the government should emphasize the issues.

One of the main limitations of the study is that the reported stage distribution of CC is based on data from only one colposcopy center, which raises concerns about the generalizability of the findings to the entire country. Staging of the cancer was primarily determined through clinical methods, as advanced imaging modalities were not available due to financial constraints and lack of facilities.

This limitation could have affected the accuracy of the cancer staging. Another limitation is that approximately 10% of the CC patients included in the study did not have their stage ascertained. Additionally, one-third of the patients were lost to follow-up, and their treatment status remained unknown. These factors could have had an impact on the main outcome measures and introduced bias into the results. Lastly, the study lacks information on the recurrence status of CC among the patients after treatment and this limits the understanding of the long-term outcomes and effectiveness of the treatments provided.

## Recommendation

Women aged 30 to 50 years should get the highest priority in the screening program in Bangladesh. The GOB should provide more efforts to implement marriage law and provide high-quality family planning services for limiting childbirth. Screening program helps in early detection of CC and the program expansion and gradual improvement in population coverage are very important to prevent advanced-stage disease. One of the important constraints of receiving treatment is infrastructure problems and inadequate treatment facilities at the GOB level and high treatment costs at the private level. Appropriate evaluation and treatment services for CC should be established in all tertiary care centers and a navigation system for the patients immediately after diagnosis should be arranged. The capacity of health systems should be improved to ensure the treatment of cancer patients on time. In addition to this, measures to vaccinate adolescent girls can be performed. Moreover, woman's education and empowerment are important sociodemographic factors and need special attention to improve awareness and health-seeking behavior.

Bangladesh currently lacks a population-based cancer registry (PBCR), which is considered the gold standard for obtaining accurate information about cancer incidence in a specific population. PBCRs monitor all cancer cases within a defined area, providing a comprehensive and clearer understanding of cancer occurrences. Additionally, they play a crucial role in ensuring high-quality cancer care audits and identifying areas where healthcare can be improved. At present, Bangladesh relies on hospital-based cancer registries, but these may not fully represent the entire spectrum of cancer cases in the population. Such registries are likely to miss numerous cancer cases as they primarily capture data from patients who seek treatment within the hospital system. Individuals who do not have access to hospital care or choose to receive treatment outside hospitals will not be accounted for in these registries. To address this issue and enhance public health data systems at the national level, it is essential for the GOB and international agencies to take proactive measures. This includes improvements in civil registration and vital statistics systems, allowing for better monitoring of diseases and health outcomes. It is also crucial to maximize the use of available data to inform public health policymakers and decision-makers effectively. One significant step would be the establishment and strengthening of national cancer registries in Bangladesh. These PBCRs would



provide comprehensive and reliable data on cancer incidence, enabling better planning and resource allocation for cancer care and treatment. By incorporating data from all segments of the population, including those without hospital access, a more accurate and representative picture of cancer occurrences can be achieved. Overall, by taking necessary actions to improve the public health data system, especially in terms of cancer registries, Bangladesh can enhance its ability to address cancer-related challenges and make informed decisions to improve public health outcomes.

#### Authors' Contributions

Ashrafun Nessa helped in development of idea, data analysis and drafting, and editing and finalization of article. Thrina Islam contributed to data collection and analysis. Noor-E-Ferdousi was involved in data curation, literature review, and draft preparation. Anjuman Sultana helped in development of idea. Kamrul Hasan Khan was involved in reviewing and editing of article. Harun ur Rashid contributed to management, coordination, and supervision of research activity and finalization of article. All coauthors have seen and agree with the contents of manuscript.

#### Note

This study obtained ethical approval under the reference number BSMMU/2018/10365, granted on August 28, 2018. Additionally, the research received official approval from the Institutional Review Board of Bangabandhu Sheikh Mujib Medical University in Dhaka, Bangladesh. It is worth noting that this study adheres strictly to the principles and guidelines outlined in the Declaration of Helsinki, ensuring the ethical conduct of research involving human participants.

#### Data Availability Statement

Data sets used in this study are available from the corresponding authors on reasonable request.

#### Funding

None.

#### Conflict of Interest

None declared.

#### Acknowledgments

We are grateful to the Ministry of Health and Family Welfare, for their technical supports and active cooperation in developing the Cervical and Breast Cancer Screening Program. We wish to express our deepest gratitude to the patients, doctors, nurses, and paramedics related to the Cervical Cancer Prevention Program for their priceless support.

#### References

- Sung H, Ferlay J, Siegel RL, et al. Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin* 2021;71(03):209–249
- Globocan 2020. Lyon, France: World Health Organization; 2020 International Agency for Research on Cancer
- Sankaranarayanan R, Swaminathan R, Brenner H, et al. Cancer survival in Africa, Asia, and Central America: a population-based study. *Lancet Oncol* 2010;11(02):165–173
- Santos C, Muñoz N, Klug S, et al. HPV types and cofactors causing cervical cancer in Peru. *Br J Cancer* 2001;85(07):966–971
- FIGO Committee on Gynecologic Oncology. FIGO staging for carcinoma of the vulva, cervix, and corpus uteri. *Int J Gynaecol Obstet* 2014;125(02):97–98
- Villaseñor-Navarro Y, Pacheco-Bravo I, Reyes-Pérez JA, et al. Imaging in cervical cancer. *Cerv Cancer*; 2017:133–50
- Wabinga H, Ramanakumar AV, Banura C, Luwaga A, Namboozee S, Parkin DM. Survival of cervix cancer patients in Kampala, Uganda: 1995–1997. *Br J Cancer* 2003;89(01):65–69
- Kataki AC, Sharma JD, Krishnatreya M, et al. A survival study of uterine cervical patients in the North East India: hospital-cancer registry-based analysis. *J Cancer Res Ther* 2018;14(05):1089–1093
- Ahmed T, Ashrafunnessa, Rahman J. Development of a visual inspection programme for cervical cancer prevention in Bangladesh. *Reprod Health Matters* 2008;16(32):78–85
- Nessa A, Hussain MA, Rahman JN, Rashid MH, Muwonge R, Sankaranarayanan R. Screening for cervical neoplasia in Bangladesh using visual inspection with acetic acid. *Int J Gynaecol Obstet* 2010;111(02):115–118
- Basu P, Nessa A, Majid M, Rahman JN, Ahmed T. Evaluation of the National Cervical Cancer Screening Programme of Bangladesh and the formulation of quality assurance guidelines. *J Fam Plann Reprod Health Care* 2010;36(03):131–134
- Nessa A, Rashid MH, E-Ferdous N, Chowdhury A. Screening for and management of high-grade cervical intraepithelial neoplasia in Bangladesh: a cross-sectional study comparing two protocols. *J Obstet Gynaecol Res* 2013;39(02):564–571
- Nessa A, Naud P, Esmay PO, et al. Efficacy, safety, and acceptability of thermal coagulation to treat cervical intraepithelial neoplasia: pooled data from Bangladesh, Brazil and India. *Rinsho Fujinka Sanka* 2017;6(3–4):58–64
- Holme F, Kapambwe S, Nessa A, Basu P, Murillo R, Jeronimo J. Scaling up proven innovative cervical cancer screening strategies: challenges and opportunities in implementation at the population level in low- and lower-middle-income countries. *Int J Gynaecol Obstet* 2017;138(Suppl 1):63–68
- Bhatla N, Nessa A, Oswal K, Vashist S, Sebastian P, Basu P. Program organization rather than choice of test determines success of cervical cancer screening: case studies from Bangladesh and India. *Int J Gynaecol Obstet* 2021;152(01):40–47
- National Strategy for Cervical Cancer Prevention & Control Bangladesh (2017–2022), DGHS 2018
- Jain A, Ganesh B, Bobdey SC, Sathwara JA, Saoba S. Sociodemographic and clinical profile of cervical cancer patients visiting in a tertiary care hospital in India. *Indian Journal of Medical and Paediatric Oncology* 2017 Jul;38(03):291–295
- Ramachandran M, Kannan A, Kiyam W, Prasaad PR, Rao GB. PAP smear findings in premenopausal and post-menopausal women—a comparative study. *Res J Med Allied Sci* 2016;1(01):14–21
- El-Moselhy EA, Borg HM, Atlam SA. Cervical cancer: sociodemographic and clinical risk factors among adult Egyptian females. *Adv Oncol Res Treat.* 2016;1(106):1–7
- World Health Organization. WHO Guidelines for Screening and Treatment of Precancerous Lesions for Cervical Cancer Prevention. Geneva: World Health Organization Geneva 2013
- World health organization. Comprehensive Cervical Cancer Control: A Guide to Essential Practice. Second edition. Geneva: World health organization; 2014
- Muñoz N, Franceschi S, Bosetti C, et al; International Agency for Research on Cancer. Multicentric Cervical Cancer Study Group. Role of parity and human papillomavirus in cervical cancer: the IARC multicentric case-control study. *Lancet* 2002;359(9312):1093–1101

- 23 Ferdous J, Begum SA, Ferdous NE, Nahar Q, Khatun SF, Khatun S. Presentation of invasive cervical cancer in Bangladesh. *BSMMU J* 2013;6(01):29–32
- 24 Afroj S, Banu MA, Sultana S, Jahan R, Rahman S, Begum N. Clinicopathological profile of cervical cancer patients attending in a specialized hospital. *J Dhaka Med Coll* 2017;26(02):117–121
- 25 Banu PA, Rukhsana N, Yasmin J, Nahar L. Original article analysis on the incidence. Staging and Treatment of Carcinoma Cervix at Delta Medical College and Hospital of Bangladesh. *Delta Medical College Journal* 2013;1:4–9
- 26 Kaverappa VB, Prakash B, Kulkarni P, Renuka M. Sociodemographic profile of patients with cervical cancer in a tertiary-care cancer hospital in Mysuru, Karnataka. *Int J Med Sci Public Health* 2015;4(09):1187–1191
- 27 Rita R, Singh U, Trivedi V, Chauhan R, Kumari A. Determinants of survival of cervical cancer: a hospital based study. *Gynecol Obstet (Sunnyvale)* 2017;7(437):2161–0932
- 28 Bindu T, Kumar SS, Ratheesan K, Balasubramanian S. Factors associated with survival and lost to follow-up of cervical cancer patients in a tertiary cancer centre in rural Kerala. *Indian J Public Health* 2017;61(01):43–46
- 29 Mathew A, Sara George P, Kalavathy MC, Padmakumari G, Jagathnath Krishna KM, Sebastian P. Cancer incidence and mortality: District Cancer Registry, Trivandrum, South India. *Asian Pac J Cancer Prev* 2017;18(06):1485–1491
- 30 Gyenwali D, Khanal G, Paudel R, Amatya A, Pariyar J, Onta SR. Estimates of delays in diagnosis of cervical cancer in Nepal. *BMC Womens Health* 2014;14(01):29
- 31 Haque N, Uddin AFMK, Dey BR, Islam F, Goodman A. Challenges to cervical cancer treatment in Bangladesh: the development of a women's cancer ward at Dhaka Medical College Hospital. *Gynecol Oncol Rep* 2017;21(June):67–72
- 32 Grover S, Xu MJ, Yeager A, et al. A systematic review of radiotherapy capacity in low- and middle-income countries. *Front Oncol* 2015;4:380
- 33 Zubizarreta EH, Fidarova E, Healy B, Rosenblatt E. Need for radiotherapy in low and middle income countries – the silent crisis continues. *Clin Oncol (R Coll Radiol)* 2015;27(02):107–114