Journal of Chemical Health Risks

www.jchr.org

JCHR (2026) 16(2), 697-704 | ISSN:2251-6727

Treatment Delay and Management Challenges in Patients with Cervical Cancer at a Tertiary Care Facility

Dr. Monowara Begum[1], Dr. Sabiha Islam[2*], Dr. Tanzila Halim[3], Dr. Sadia Jabeen Khan[4], Dr. Anjuman Ara[5], Dr. Mahmud -Un-Nabi[6]

[1]Associate Professor, Department of Gynaecological Oncology, Bangladesh Medical University, Dhaka, Bangladesh

[2]Associate Professor, Department of Obstetrics &Gynaecology, Bangladesh Medical University, Dhaka, Bangladesh

[3]Associate Professor, Department of Obstetrics &Gynaecology, Bangladesh Medical University, Dhaka, Bangladesh

[4]Associate Professor, Department of Gynaecological Oncology, National Institute of Cancer Research & Hospital (NICRH), Dhaka, Bangladesh.

[5]Assistant Professor, Department of Obstetrics &Gynaecology, Bangladesh Medical University, Dhaka, Bangladesh

[6]Assistant Professor, Department of Anaesthesia, Analgesia &Intensive Care Medicine, Bangladesh Medical University, Dhaka, Bangladesh

Corresponding Author: *Dr. Sabiha Islam, Associate Professor, Department of Obstetrics & Gynaecology, Bangladesh Medical University, Dhaka, Bangladesh*

(Received: 05 January 2026 Revised: 15 February 2026 Accepted: 05 March 2026)

KEYWORDS

Cervical cancer; treatment delay; healthcare access; oncology management; Bangladesh.

ABSTRACT:

Background: Cervical cancer is a major public health issue, particularly in low and middle income countries with common delayed diagnosis and treatment. Limited screening access, inadequate healthcare infrastructure and socioeconomic barriers lead to late presentation and poor outcomes. Timely diagnosis and treatment are critical for improving survival. This study assessed treatment delay and management challenges among cervical cancer patients at a tertiary care facility in Bangladesh.

Methods: This retrospective observational study was conducted in the Department of Gynecological Oncology at Bangladesh Medical University, Dhaka, from January to December 2025. A total of 511 patients with histopathologically confirmed cervical cancer were included. Sociodemographic characteristics, clinical features, treatment modalities and delay patterns were extracted from hospital records using a structured tool. Data were analyzed using SPSS version 25.0.

Results: Most patients were aged 40-49 years (31.7%) and the majority resided in rural areas (62.2%). Squamous cell carcinoma was the predominant type (83.6%). More than half were diagnosed at advanced stages (Stage III–IV). Concurrent chemoradiotherapy was the most common treatment (55.8%). A substantial proportion delayed seeking consultation for over three months (44.2%). Additionally, 42.9% experienced treatment delays exceeding 60 days. Rural residence, lower education, advanced stage at diagnosis and visiting multiple facilities before referral were significantly associated with delayed treatment.

Conclusion: Treatment delays are a significant challenge in cervical cancer management. Addressing patient awareness, referral pathways and healthcare infrastructure is essential to improve timely access to cancer treatment.

Introduction

Cervical cancer remains a major public health concern worldwide, particularly in low- and middle-income countries where access to screening, early diagnosis and timely treatment is limited. According to global cancer estimates, cervical cancer is one of the most common malignancies among women and continues to contribute substantially to cancer-related morbidity and mortality worldwide [1]. Recent global data indicate that hundreds

Journal of Chemical Health Risks

www.jchr.org

JCHR (2026) 16(2), 697-704 | ISSN:2251-6727

of thousands of new cases and deaths occur annually, with the highest burden concentrated in resource-constrained settings [2].

Persistent infection with high-risk types of human papillomavirus (HPV) is recognized as the primary etiological factor for cervical cancer development [3]. Despite the availability of preventive measures such as HPV vaccination and organized screening programs, many women in developing countries are diagnosed at advanced stages of the disease. Late presentation significantly reduces the chances of successful treatment and long-term survival [4]. Consequently, cervical cancer remains a leading cause of cancer deaths among women in many parts of the world.

The World Health Organization has introduced a global strategy aimed at eliminating cervical cancer as a public health problem through widespread vaccination, effective screening and timely treatment [5]. However, implementing these strategies remains challenging in many low-resource settings. Structural limitations within healthcare systems, limited availability of diagnostic facilities and socioeconomic barriers often contribute to delays in diagnosis and treatment initiation [6].

Delayed diagnosis and treatment are critical determinants of disease progression and survival outcomes in cervical cancer patients. Studies have demonstrated that prolonged intervals between symptom onset and first medical consultation often lead to diagnosis at advanced stages [7]. Similarly, delays between confirmed diagnosis and treatment initiation can adversely affect treatment outcomes and overall survival [8]. In many low- and middle-income countries, patients frequently encounter multiple barriers before reaching specialized oncology services, including referral delays, limited awareness and financial constraints.

Previous studies conducted in different regions have reported significant delays in cervical cancer management. Research in Ethiopia found that several patients experienced prolonged diagnostic delays due to inadequate health system capacity and late health-seeking behavior [9]. Similarly, investigations in other developing countries have shown that patients often visit multiple healthcare facilities before receiving appropriate referral and definitive treatment [10]. These delays may result in disease progression, increased treatment complexity and poorer prognosis.

Socioeconomic and demographic factors also play an important role in influencing treatment delays. Limited education, rural residence and low household income have been consistently associated with delayed access to cancer care [11]. In addition, insufficient infrastructure for oncology services, including radiotherapy facilities and trained personnel, contributes to extended waiting times for treatment in many resource-limited settings [12].

Bangladesh, like many developing countries, faces considerable challenges in the timely diagnosis and management of cervical cancer. Although tertiary care centers provide specialized treatment, many patients reach these facilities after substantial delays. Understanding the patterns and determinants of treatment delay is essential for improving cancer care delivery and optimizing patient outcomes.

Therefore, this study aimed to assess treatment delay and management challenges among cervical cancer patients treated at a tertiary care facility in Bangladesh. By examining sociodemographic characteristics, clinical features and healthcare system factors associated with treatment delays, this study seeks to provide evidence that may inform strategies to improve timely diagnosis and management of cervical cancer in similar resource-limited settings.

Materials & Methods

This hospital-based retrospective observational study was conducted in the Department of Gynecological Oncology at Bangladesh Medical University (BMU), Dhaka, Bangladesh. The study period extended from January to December 2025. The study population consisted of women diagnosed with cervical cancer who received evaluation or treatment at the department during the study period. A total of 511 patients who fulfilled the eligibility criteria were included in the final analysis.

Selection Criteria:

Inclusion criteria

- Women diagnosed with histopathologically confirmed cervical cancer during the study period.
- Patients managed or treated at the Department of Gynecological Oncology, BMU.

Journal of Chemical Health Risks

www.jchr.org

JCHR (2026) 16(2), 697-704 | ISSN:2251-6727

- Patients whose clinical records contained complete information regarding diagnosis, treatment timeline and management.

Exclusion criteria

- Patients with incomplete or missing medical records regarding the treatment timeline.
- Patients diagnosed with other gynecological malignancies.
- Patients who received initial treatment at another institution with unavailable records.
- Patients with recurrent cervical cancer.

Data Collection Procedure

Data were collected retrospectively from hospital medical records, oncology registries and patient management files maintained at the Department of Gynecological Oncology, Bangladesh Medical University. A structured data extraction form was developed to ensure systematic and consistent retrieval of information. The data collection tool included sections on sociodemographic characteristics, clinical presentation, histopathological findings, stage at diagnosis, treatment modalities and treatment timelines.

Trained research assistants reviewed individual patient records and extracted relevant information using the standardized form. Sociodemographic variables included age, residence, educational status, monthly household income and marital status. Clinical variables included histopathological subtype, stage of disease according to the International Federation of Gynecology and Obstetrics (FIGO) staging system and primary treatment modality received. Treatment delay variables included the interval from symptom onset to first medical consultation, time from confirmed diagnosis to initiation of treatment and overall treatment duration.

The number of healthcare facilities visited before referral to the tertiary center was also recorded to assess referral pathway complexity. Treatment initiation delay was defined based on the time interval between histopathological confirmation and commencement of definitive treatment. Information was verified through cross-checking of oncology registers and patient case sheets to ensure data accuracy and reliability. All data were anonymized during extraction to maintain patient confidentiality.

Statistical Analysis

Data were analyzed using Statistical Package for the Social Sciences (SPSS) version 25.0. Descriptive statistics were used to summarize sociodemographic and clinical characteristics, presented as frequencies and percentages. Associations between categorical variables and treatment delay were assessed using the chi-square test. A p-value less than 0.05 was considered statistically significant.

Results

Table 1. Sociodemographic Characteristics of Cervical Cancer Patients (N = 511)

Variable	Category	Frequency (n)	Percentage (%)
Age Group (years)	≤39	108	21.1
	40–49	162	31.7
	50–59	138	27
	≥60	103	20.2
Residence	Rural	318	62.2
	Urban	193	37.8
Educational Status	No formal education	204	39.9
	Primary (1–5 years)	158	30.9
	Secondary (6–10 years)	104	20.4

Journal of Chemical Health Risks
www.jchr.org
JCHR (2026) 16(2), 697-704 | ISSN:2251-6727

	Higher secondary or above	45	8.8
Monthly Household Income	<15,000 BDT	217	42.5
	15,000–30,000 BDT	181	35.4
	>30,000 BDT	113	22.1
Marital Status	Married	442	86.5
	Widowed/Divorced	69	13.5

Table 1 presents the sociodemographic characteristics of the cervical cancer patients. The largest age group was 40–49 years (31.7%), followed by 50–59 years (27.0%). Patients aged ≤39 years accounted for 21.1%, while those aged ≥60 years constituted 20.2%. Most participants resided in rural areas (62.2%), whereas 37.8% were from urban locations. Regarding education, 39.9% had no formal education, 30.9% had primary education and 20.4% completed secondary education. Only 8.8% had higher secondary education or above. Monthly household income was less than 15,000 BDT for 42.5% of participants, while 35.4% earned between 15,000 and 30,000 BDT and 22.1% earned more than 30,000 BDT. The majority of patients were married (86.5%), whereas 13.5% were widowed or divorced.

Table 2. Clinical Characteristics and Treatment Modalities of Patients (N = 511)

Variable		**Frequency (n)**	**Percentage (%)**
Histopathological Type	Squamous cell carcinoma	427	83.6
	Adenocarcinoma	61	11.9
	Other types	23	4.5
FIGO Stage at Diagnosis	Stage I	58	11.4
	Stage II	156	30.5
	Stage III	217	42.5
	Stage IV	80	15.7
Primary Treatment Modality	Surgery alone	52	10.2
	Radiotherapy alone	120	23.5
	Concurrent chemoradiotherapy	285	55.8
	Palliative treatment	54	10.6

Table 2 describes the clinical characteristics and treatment modalities of the patients. Squamous cell carcinoma was the most common histopathological type, accounting for 83.6% of cases. Adenocarcinoma represented 11.9% of cases, while other histological types constituted 4.5%. Regarding stage at diagnosis, 42.5% of patients were diagnosed at FIGO Stage III, followed by Stage II (30.5%). Stage IV accounted for 15.7% of cases, while only 11.4% were diagnosed at Stage I. In terms of treatment modality, concurrent chemoradiotherapy was the most frequently used approach (55.8%). Radiotherapy alone was used in 23.5% of patients, while 10.2% underwent surgery alone. Palliative treatment was provided to 10.6% of patients.

Journal of Chemical Health Risks

www.jchr.org

JCHR (2026) 16(2), 697-704 | ISSN:2251-6727

Table 3. Patterns of Treatment Delay Among Cervical Cancer Patients (N = 511)

Treatment Interval		Frequency (n)	Percentage (%)
Time from Symptom Onset to First Medical Consultation	≤1 month	97	19
	1–3 months	188	36.8
	>3 months	226	44.2
Time from Diagnosis to Treatment Initiation	≤30 days	103	20.2
	31–60 days	189	37
	>60 days	219	42.9
Overall Treatment Duration	≤8 weeks	146	28.6
	>8 weeks	365	71.4

Table 3 presents the patterns of treatment delay among cervical cancer patients. Regarding the interval between symptom onset and the first medical consultation, 19.0% of patients sought care within one month. Approximately 36.8% sought consultation between one and three months after symptom onset. A substantial proportion of patients (44.2%) waited more than three months before seeking medical care. The time from diagnosis to treatment initiation was ≤30 days for 20.2% of patients. About 37.0% initiated treatment within 31–60 days, whereas 42.9% experienced a delay exceeding 60 days. Regarding overall treatment duration, 71.4% of patients required more than eight weeks to complete treatment, while 28.6% completed treatment within eight weeks.

Table 4. Factors Associated with Delayed Treatment Initiation (>60 days) (N = 511)

Variable		Delay ≤60 days n (%)	Delay >60 days n (%)	p-value
Residence	Urban (n=193)	128 (66.3)	65 (33.7)	<0.001
	Rural (n=318)	164 (51.6)	154 (48.4)	
Education Level	≤Primary (n=362)	183 (50.6)	179 (49.4)	0.003
	≥Secondary (n=149)	109 (73.2)	40 (26.8)	
Stage at Diagnosis	Stage I–II (n=214)	142 (66.4)	72 (33.6)	0.001
	Stage III–IV (n=297)	150 (50.5)	147 (49.5)	
Number of Health Facilities Visited Before Referral	≤2 facilities (n=236)	155 (65.7)	81 (34.3)	<0.001
	≥3 facilities (n=275)	137 (49.8)	138 (50.2)	

Table 4 shows factors associated with delayed treatment initiation exceeding 60 days. Rural patients experienced a higher proportion of treatment delay (48.4%) compared with urban patients (33.7%) and the association was statistically significant (p<0.001). Patients with an education level ≤primary had a higher delay rate (49.4%) than those with secondary education or higher (26.8%) (p=0.003). Advanced stage disease (Stage III–IV) was associated with greater delay (49.5%) compared with early-stage disease (33.6%) (p=0.001). Patients who visited three or more health facilities before referral

Journal of Chemical Health Risks

www.jchr.org

JCHR (2026) 16(2), 697-704 | ISSN:2251-6727

experienced more delays (50.2%) compared with those visiting two or fewer facilities (34.3%) ($p<0.001$).

Discussion

This study examined treatment delay and management challenges among cervical cancer patients treated at a tertiary care center in Bangladesh. The findings demonstrate substantial delays in healthcare seeking, diagnosis-to-treatment initiation and overall treatment duration. Sociodemographic factors, disease stage and health system pathways were significantly associated with delayed treatment initiation.

The demographic distribution of the study population indicates that the majority of patients were between 40 and 59 years of age. This age pattern aligns with the epidemiological profile of cervical cancer reported globally, where the disease is most frequently diagnosed in middle-aged women [1]. Cohen et al. described that cervical cancer incidence typically peaks in women aged 35–55 years due to prolonged exposure to persistent high-risk human papillomavirus infection [3]. Similar age distributions have been documented in studies conducted in sub-Saharan Africa and other low-resource settings [13].

A notable proportion of patients in the present study resided in rural areas and had limited educational attainment. Rural residence and low education have consistently been identified as determinants of delayed health-seeking behavior in cervical cancer patients. Mwaka et al. reported that women from rural communities often experience barriers related to transportation, healthcare accessibility and awareness of cancer symptoms [10]. Similarly, Kaku et al. observed that lower educational status is associated with delayed reporting of gynecological symptoms and reduced utilization of cancer screening services [11]. These socioeconomic disparities contribute to late presentation and delayed treatment initiation.

The clinical profile observed in this study revealed that squamous cell carcinoma was the predominant histopathological type, accounting for more than four-fifths of cases. This finding is consistent with global literature indicating that squamous cell carcinoma represents the most common subtype of cervical cancer [3]. Adenocarcinoma and other histological variants occur less frequently but may present diagnostic and therapeutic challenges.

The stage distribution of patients highlights a critical concern regarding late-stage presentation. More than half of the patients were diagnosed at Stage III or IV disease. Late-stage diagnosis remains a persistent problem in many low- and middle-income countries due to limited screening coverage and delayed healthcare utilization. Tekalign and Teshome reported that late-stage presentation among cervical cancer patients remains highly prevalent in resource-limited settings [14]. Similarly, Wassie and Fentie identified that delayed diagnosis significantly increases the likelihood of advanced-stage disease at presentation [15].

Treatment patterns in the present study indicate that concurrent chemoradiotherapy was the most frequently administered modality. This reflects the advanced stage distribution of the disease in the study population. According to international clinical guidelines, concurrent chemoradiotherapy is the standard treatment for locally advanced cervical cancer [16]. Annede et al. emphasized that combined modality therapy plays a central role in the management of Stage II–IV cervical cancer, particularly when surgical options are limited [17].

The analysis of treatment delay patterns revealed that a large proportion of patients waited more than three months before seeking medical consultation after symptom onset. Patient delay in seeking care is a well-recognized barrier in cervical cancer control. Allahqoli et al. reported that lack of symptom awareness, cultural beliefs and fear of cancer diagnosis often contribute to prolonged delays in initial medical consultation [7]. Similar observations were reported by Ouasmani et al., who found that patient-related factors play a substantial role in delayed diagnosis among women with cervical cancer [18].

In addition to patient delay, health system factors contributed significantly to delayed treatment initiation. More than forty percent of patients experienced delays exceeding 60 days between diagnosis and treatment initiation. Previous research has demonstrated that prolonged intervals between diagnosis and treatment are associated with poorer clinical outcomes. Chen et al. found that extended waiting times before treatment can negatively affect survival among cervical cancer patients

Journal of Chemical Health Risks

www.jchr.org

JCHR (2026) 16(2), 697-704 | ISSN:2251-6727

[8]. Furthermore, Hanna et al. reported that delays in cancer treatment initiation are associated with increased mortality across several cancer types [19].

The present study also found that patients who visited multiple healthcare facilities before referral experienced significantly greater delays in treatment initiation. Complex referral pathways and fragmented healthcare systems have been widely recognized as contributors to delayed cancer care in low-resource settings. Brand et al. highlighted that patient in low- and middle-income countries frequently encounter multiple healthcare providers before reaching specialized oncology services [6]. These systemic inefficiencies can prolong diagnostic intervals and postpone definitive treatment.

Another important finding of this study is the significant association between rural residence and delayed treatment initiation. Distance from specialized oncology centers and limited healthcare infrastructure in rural regions often create logistical barriers for timely cancer care. Ambroggi et al. emphasized that geographical distance can significantly influence access to cancer diagnosis and treatment services [20].

The prolonged overall treatment duration observed in this study further reflects systemic challenges in cancer care delivery. Limited radiotherapy capacity, high patient load and resource constraints may contribute to extended treatment timelines in tertiary hospitals. Abdel-Wahab et al. reported that shortages of radiotherapy infrastructure remain a major barrier to timely cancer treatment in many developing countries [12].

Overall, the findings of this study underscore the multifactorial nature of treatment delays in cervical cancer management. Both patient-related factors and health system limitations contribute to delays that may adversely affect clinical outcomes. Addressing these challenges requires integrated strategies that focus on improving awareness, strengthening referral systems and expanding access to oncology services.

Limitations and Recommendations

This study was conducted at a single tertiary center using retrospective data, which may limit generalizability. Future multicenter prospective studies are recommended. Strengthening screening programs, improving referral pathways and expanding oncology infrastructure may help reduce treatment delays and improve patient outcomes.

Conclusion

This study highlights the significant treatment delays among patients with cervical cancer managed at a tertiary care center in Bangladesh. A large proportion of patients presented with advanced disease stages and experienced prolonged intervals before treatment initiation. Sociodemographic factors, healthcare access barriers, and complex referral pathways substantially contributed to these delays. Strengthening early detection strategies, improving referral systems, and expanding oncology service capacity are essential to ensure timely management and improve clinical outcomes for patients with cervical cancer.

Funding: None

Conflicts of interest: There are no conflicts of interest.

References

1. Bray F, Laversanne M, Sung H, Ferlay J, Siegel RL, Soerjomataram I, Jemal A. Global cancer statistics 2022: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA: a cancer journal for clinicians. 2024 May;74(3):229-63.
2. Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, Jemal A, Bray F. Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA: a cancer journal for clinicians. 2021 May;71(3):209-49.
3. Cohen PA, Jhingran A, Oaknin A, Denny L. Cervical cancer. The Lancet. 2019 Jan 12;393(10167):169-82.
4. Small Jr W, Bacon MA, Bajaj A, Chuang LT, Fisher BJ, Harkenrider MM, Jhingran A, Kitchener HC, Mileshkin LR, Viswanathan AN, Gaffney DK. Cervical cancer: a global health crisis. Cancer. 2017 Jul 1;123(13):2404-12.
5. World Health Organization. Global strategy to accelerate the elimination of cervical cancer as a public health problem. World Health Organization; 2020 Dec 31.
6. Brand NR, Qu LG, Chao A, Ilbawi AM. Delays and barriers to cancer care in low-and middle-

Journal of Chemical Health Risks

www.jchr.org

JCHR (2026) 16(2), 697-704 | ISSN:2251-6727

income countries: a systematic review. The oncologist. 2019 Dec 1;24(12): e1371-80.

7. Allahqoli L, Dehdari T, Rahmani A, Fallahi A, Gharacheh M, Hajinasab N, Salehiniya H, Alkatout I. Delayed cervical cancer diagnosis: a systematic review. European review for medical and pharmacological sciences= Revue européenne pour les sciences médicales et pharmacologiques= Rivista europea per le scienze mediche e farmacologiche. 2022;26(22):8467-80.
8. Chen CP, Kung PT, Wang YH, Tsai WC. Effect of time interval from diagnosis to treatment for cervical cancer on survival: a nationwide cohort study. PloS one. 2019 Sep 4;14(9): e0221946.
9. Dereje N, Addissie A, Worku A, Assefa M, Abraha A, Tigeneh W, Kantelhardt EJ, Jemal A. Extent and predictors of delays in diagnosis of cervical cancer in Addis Ababa, Ethiopia: a population-based prospective study. JCO Global Oncology. 2020 Feb; 6:277-84.
10. Mwaka AD, Garimoi CO, Were EM, Roland M, Wabinga H, Lyratzopoulos G. Social, demographic and healthcare factors associated with stage at diagnosis of cervical cancer: cross-sectional study in a tertiary hospital in Northern Uganda. BMJ open. 2016 Jan 1;6(1): e007690.
11. Kaku M, Mathew A, Rajan B. Impact of socio-economic factors in delayed reporting and late-stage presentation among patients with cervix cancer in a major cancer hospital in South India. Asian Pac J Cancer Prev. 2008 Oct 1;9(4):589-94.
12. Abdel-Wahab M, Gondhowiardjo SS, Rosa AA, Lievens Y, El-Haj N, Polo Rubio JA, Prajogi GB, Helgadottir H, Zubizarreta E, Meghzifene A, Ashraf V. Global radiotherapy: current status and future directions—white paper. JCO global oncology. 2021 Jun; 7:827-42.
13. Sengayi-Muchengeti M, Joko-Fru WY, Miranda-Filho A, Egue M, Akele-Akpo MT, N'da G, Mathewos A, Buziba N, Korir A, Manraj S, Lorenzoni C. Cervical cancer survival in sub-Saharan Africa by age, stage at diagnosis and Human Development Index: A population-based registry study. International Journal of Cancer. 2020 Dec 1;147(11):3037-48.
14. Tekalign T, Teshome M. Prevalence and determinants of late-stage presentation among cervical cancer patients, a systematic review and meta-analysis. PloS one. 2022 Apr 27;17(4): e0267571.
15. Wassie M, Fentie B. Prevalence of late-stage presentation and associated factors of cervical cancer patients in Tikur Anbesa Specialized Hospital, Ethiopia: institutional based cross-sectional study. Infectious Agents and Cancer. 2021 May 11;16(1):30.
16. Chuang LT, Temin S, Berek JS, Management and Care of Patients with Invasive Cervical Cancer Resource-Stratified Guideline Expert Panel. Management and care of patients with invasive cervical cancer: ASCO resource-stratified guideline rapid recommendation update. JCO Global Oncology. 2022 Mar;8: e2200027.
17. Annede P, Gouy S, Haie-Meder C, Morice P, Chargari C. Places respectives de la radiothérapie et de la chirurgie dans les cancers du col utérin. Cancer/Radiothérapie. 2019 Oct 1;23(6-7):737-44.
18. Ouasmani F, Hanchi Z, Haddou Rahou B, Bekkali R, Ahid S, Mesfioui A. Determinants of patient delay in seeking diagnosis and treatment among Moroccan women with cervical cancer. Obstetrics and gynecology international. 2016;2016(1):4840762.
19. Hanna TP, King WD, Thibodeau S, Jalink M, Paulin GA, Harvey-Jones E, O'Sullivan DE, Booth CM, Sullivan R, Aggarwal A. Mortality due to cancer treatment delay: systematic review and meta-analysis. bmj. 2020 Nov 4;371.
20. Ambroggi M, Biasini C, Del Giovane C, Fornari F, Cavanna L. Distance as a barrier to cancer diagnosis and treatment: review of the literature. The oncologist. 2015 Dec 1;20(12):1378-85.