



A Mixed-Method Study on Care Pathway for Common Cancer at the Regional Cancer Centre in the Central State of India.

Arjumandbanu D Kapase^{1*}, Shubhra Agrawal Gupta², Prashant K Jaiswal³, Pradeep K Chandrakar⁴, Nirmal Verma⁵, Kamlesh K Jain⁶.

^{1,2,3} Department of Community Medicine, Pt. Jawaharlal Nehru Memorial Medical College Raipur, 492001, Chhattisgarh, India.

⁴Regional Cancer Centre, Raipur, 492001, Chhattisgarh, India.

⁵Government Medical College (GMC), Kanker, Chhattisgarh, India.

⁶Maa Padmavati Institute of Medical Sciences, Raipur, 492001, Chhattisgarh, India.



Correspondence:

Arjumandbanu D Kapase.

Department of Community Medicine, Pt. Jawaharlal Nehru Memorial Medical College Raipur, 492001, Chhattisgarh, India.

Email:

Karjumand1995@gmail.com

Received: 14-05-2026

Revised: 29-05-2026

Accepted: 05-06-2026

Published: 13-06-2026

Abstract

Background: Cervical cancer remains one of the leading causes of cancer-related morbidity and mortality among women in low- and middle-income countries. Delayed diagnosis and treatment continue to contribute substantially to adverse outcomes. This study assessed the sociodemographic profile of women with cervical cancer, examined their care pathways, measured delays across the cancer care continuum using the Andersen Model, and identified factors associated with cervical cancer. **Methods:** A mixed-method study was conducted among 139 women diagnosed with cervical cancer. Data regarding sociodemographic characteristics, healthcare-seeking behaviour, financial protection, and delays across the cancer care continuum were collected using a structured interview schedule and in-depth interviews. Descriptive analysis was performed for the quantitative part, and manual thematic analysis was conducted for the qualitative part. **Results:** The mean age of participants was 52.9 ± 9.8 years. The highest proportion belonged to the age group of 41–50 years (33.1%), followed by 51–60 years (30.9%). All participants were female. Most women resided in rural areas (71.2%), belonged to Scheduled Tribe communities (41.0%), and were illiterate (50.4%). A majority were engaged in unskilled occupations (83.5%) and lived in nuclear families (61.9%). Most participants were covered under Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (87.8%). Symptom neglect was highly prevalent, with 67.6% initially ignoring symptoms. A diagnostic delay exceeding 60 days was observed in 39.6% of participants. Median appraisal, illness, diagnostic, and treatment delays were 52, 60, 45, and 30 days, respectively. **Conclusion:** Women with cervical cancer experienced substantial patient-related and system-related delays. Rural residence, low literacy, socioeconomic disadvantage, poor symptom awareness, and delayed healthcare-seeking behaviour emerged as major barriers to timely diagnosis and treatment. Strengthening awareness programs, screening services, and referral pathways may facilitate earlier diagnosis and improve outcomes.

Keywords: Cervical cancer; diagnostic delay; mixed-method; rural women; cancer pathway; India.



This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC-BY) license (<http://creativecommons.org/licenses/by/4.0/>).

INTRODUCTION

Cervical cancer remains a major public health challenge worldwide and is particularly burdensome in low- and middle-income countries (LMICs). Despite advances in screening and vaccination, cervical cancer continues to account for substantial morbidity and mortality among women globally. According to GLOBOCAN 2022 estimates, cervical cancer remains among the leading cancers affecting women, particularly in developing countries where organized screening programs remain inadequate.¹

India contributes a significant proportion of the global cervical cancer burden. Although incidence rates have declined in some regions, delayed diagnosis, inadequate awareness, poor access to healthcare facilities, and socioeconomic inequalities continue to hinder early detection and treatment.^{2,3}

Timely diagnosis is critical because cervical cancer is highly preventable and treatable when detected early. However, delays may occur at multiple stages, including symptom recognition, help-seeking, diagnosis, referral, and treatment initiation.^{4,5} Understanding the factors contributing to these delays is essential for designing effective interventions.

The present study aimed to assess the sociodemographic characteristics, healthcare-seeking behavior, and delays across the cancer care pathway among women diagnosed with cervical cancer.

MATERIALS AND METHODS

Study Design and Setting

A hospital-based mixed-method study was conducted among women diagnosed with cervical cancer attending a tertiary care cancer treatment centre.

Study Participants

A total of 139 women with confirmed cervical cancer were included.

Data Collection

Information was collected using a pre-tested structured interview schedule covering:

- Sociodemographic characteristics
- Healthcare-seeking behavior
- Financial protection status
- Delays in the cancer care pathway
- Initial response following symptom recognition

Statistical Analysis

Data were entered and analysed using descriptive statistics. Results are presented as frequencies, percentages, means, medians, and interquartile ranges. A p-value <0.05 was considered statistically significant.

RESULTS

A total of 139 women diagnosed with cervical cancer were included in the study. The analysis focused on their sociodemographic characteristics, family profile, healthcare access, healthcare-seeking behavior, and delays experienced across the cancer care pathway.

Table 1. Sociodemographic Profile of Cervical Cancer Patients (n = 139)

The mean age of participants was 52.9 ± 9.8 years. Most women belonged to the 41–50 years (33.1%) and 51–60 years (30.9%) age groups. The majority were from rural areas (71.2%), indicating a higher burden of cervical cancer among rural populations.

Variable	Frequency (%)
Age 21–30 years	4 (2.9)
Age 31–40 years	12 (8.6)
Age 41–50 years	46 (33.1)
Age 51–60 years	43 (30.9)
Age 61–70 years	34 (24.5)
Mean age (years)	52.9 ± 9.8
Rural residence	99 (71.2)
Urban residence	40 (28.8)
Female	139 (100.0)

The majority of women were aged 41–60 years (64.0%). Rural residents constituted more than two-thirds of the study population.

Table 2. Social Characteristics

Most participants were Hindus (82.0%). Scheduled Tribe (41.0%) and Other Backward Class (38.8%) women constituted the largest social groups represented in the study.

Variable	Frequency (%)
Hindu	114 (82.0)
Christian	18 (12.9)
Muslim	6 (4.3)
Sikh	1 (0.7)
OBC	54 (38.8)
ST	57 (41.0)
General	21 (15.1)
SC	7 (5.0)

Table 3. Educational and Occupational Profile

More than half of the women were illiterate (50.4%), while only a small proportion had secondary or higher education. The majority were engaged in unskilled occupations (83.5%), reflecting a predominantly low socioeconomic background.

Variable	Frequency (%)
Illiterate	70 (50.4)
Primary education	33 (23.7)
Middle school	20 (14.4)
Secondary	6 (4.3)
High school	5 (3.6)
Higher secondary	5 (3.6)
Graduate	0
Unskilled occupation	116 (83.5)
Semi-skilled	18 (12.9)
Skilled	5 (3.6)

Table 4. Family Characteristics

Most participants were living with their spouses (80.6%) and belonged to nuclear families (61.9%). Approximately half (50.4%) had a family size of 5–6 members.

Variable	Frequency (%)
Living with spouse	112 (80.6)
No spouse	27 (19.4)
Nuclear family	86 (61.9)
Joint family	53 (38.1)

Table 5. Financial Protection and Access

A large proportion of women were covered under the AB-PMJAY scheme (87.8%). Nearly all participants lived within 5 km of a healthcare facility, with 48.2% residing within 0–2 km and another 48.2% within 3–5 km.

Variable	Frequency (%)
AB-PMJAY coverage	122 (87.8)
Other schemes	4 (2.9)
No coverage	12 (8.6)
Distance 0–2 km	67 (48.2)
Distance 3–5 km	67 (48.2)
Distance >5 km	5 (3.6)

Healthcare-Seeking Behaviour: Only 32.4% of women consulted a medical doctor after symptom recognition, whereas 67.6% initially ignored their symptoms. Factors responsible for the delay were mainly a lack of awareness 49.6% followed by the assumption of symptoms as normal 32.4% overall, indicating poor health-seeking behaviour and delayed presentation.

Risk Factors and Clinical Profile: The most common presenting symptoms were bleeding per vaginum with pain (23.7%), vaginal discharge (23.0%), and post-coital/postmenopausal bleeding (20.9%).

Tobacco use was reported by 53.2%, poor genital hygiene by 56.1%, and cloth menstrual absorbent use by 87.8%. Early reproductive and sexual risk factors were common, including early menarche (72.7%), first pregnancy at ≤15 years (59.7%), early marriage (59.8%), and sexual exposure before 18 years (100%).

None of the participants had received HPV vaccination, and none were screened.

Variable	Frequency (%)
Tobacco use	74 (53.2)
Poor genital hygiene	78 (56.1)
Cloth menstrual absorbent use	122 (87.8)
Menarche ≤ 12 years	101 (72.7)
First pregnancy ≤ 15 years	83 (59.7)
Early marriage ≤ 14 years	83 (59.8)
Sexual exposure < 18 years	139 (100.0)
HPV vaccination	0 (0.0)
History of Cancer Screening	0 (0.0)

Delays in Cancer Care Pathway: The median appraisal, illness, diagnostic, and treatment delays were 52, 60, 45, and 30 days, respectively. Diagnostic delay exceeding 60 days was observed in 39.6% of patients, while 25.9% experienced treatment delays of more than 30 days. These findings highlight significant delays at multiple stages of cervical cancer care.

The median delays observed were:

- Appraisal delay: 52 days
- Illness delay: 60 days
- Diagnostic delay: 45 days
- Treatment delay: 30 days

A diagnostic delay exceeding 60 days was reported in 39.6% of women. Treatment initiation beyond 30 days occurred among 25.9%.

Association of Determinants with Different Types of Delay among Cervical Cancer Patients (n = 139)

Determinant	Category	Appraisal Delay (Mean $\pm$ SD)	Illness Delay (Mean $\pm$ SD)	Scheduling Delay (Mean $\pm$ SD)	Diagnostic Delay (Mean $\pm$ SD)	Treatment Delay (Mean $\pm$ SD)	Total Delay (Mean $\pm$ SD)
Awareness	Yes	12.57 $\pm$ 15.07	2.00 $\pm$ 0.00	0.00 $\pm$ 0.00	13.00 $\pm$ 0.00	30.00 $\pm$ 0.00	57.57 $\pm$ 15.07
	No	99.42 $\pm$ 62.16	125.72 $\pm$ 125.90	2.81 $\pm$ 2.87	50.17 $\pm$ 108.90	34.38 $\pm$ 35.31	312.50 $\pm$ 219.91
	t (p)	-11.06 (<0.001)*	-11.29 (<0.001)*	-11.27 (<0.001)*	-3.92 (<0.001)*	-1.43 (0.157)	-12.77 (<0.001)*
Perception	Yes	87.25 $\pm$ 52.25	48.50 $\pm$ 12.77	1.53 $\pm$ 1.66	7.28 $\pm$ 1.97	29.50 $\pm$ 13.56	174.07 $\pm$ 41.69
	No	100.96 $\pm$ 70.73	173.41 $\pm$ 144.85	3.53 $\pm$ 3.26	79.46 $\pm$ 133.25	37.70 $\pm$ 43.90	395.05 $\pm$ 253.21
	t (p)	-1.31 (0.191)	-7.63 (<0.001)*	-4.70 (<0.001)*	-4.81 (<0.001)*	-1.56 (0.121)	-7.62 (<0.001)*
Pathway	Yes	111.24 $\pm$ 59.41	124.41 $\pm$ 135.02	2.65 $\pm$ 2.40	45.94 $\pm$ 106.95	30.06 $\pm$ 30.05	314.29 $\pm$ 212.01
	No	92.79 $\pm$ 64.03	118.80 $\pm$ 124.85	2.67 $\pm$ 2.93	48.63 $\pm$ 106.78	34.73 $\pm$ 35.05	297.62 $\pm$ 223.52
	t (p)	1.19 (0.248)	0.16 (0.873)	-0.04 (0.969)	-0.10 (0.924)	-0.59 (0.563)	0.30 (0.766)
Staging	Yes	85.81 $\pm$ 65.51	109.67 $\pm$ 130.11	2.83 $\pm$ 3.27	68.55 $\pm$ 124.59	22.11 $\pm$ 17.24	288.97 $\pm$ 232.32
	No	114.33 $\pm$ 55.13	140.00 $\pm$ 114.42	2.33 $\pm$ 1.72	6.00 $\pm$ 0.83	59.33 $\pm$ 46.13	322.00 $\pm$ 197.49
	t (p)	-2.68 (0.009)*	-1.40 (0.165)	1.17 (0.243)	4.87 (<0.001)*	-5.24 (<0.001)*	-0.87 (0.386)

(Yes = Awareness present; No = Awareness absent)

(Yes = Positive perception; No = Negative perception)

(Yes = Early stage I-II; No = Advanced stage III-IV)(Yes = Direct pathway to RCC; No = Indirect pathway with multiple providers)

(Yes = Screening done; No = Not screened)

Patients with awareness had significantly lower appraisal, illness, scheduling, diagnostic, and total delays (all $p < 0.001$), indicating a strong influence of awareness on early and overall phases of delay.

Qualitative Findings

Three major themes emerged from the interviews with women diagnosed with cervical cancer: presentation delay, healthcare-seeking delay, and treatment delay.

Theme 1: Presentation Delay

Symptom Misinterpretation and Normalization

Most women initially perceived abnormal vaginal bleeding, vaginal discharge, and lower abdominal pain as normal ageing changes, weakness, or common infections rather than warning signs of cancer.

“I had intermittent bleeding, but I thought it was because of age.”

“I thought the discharge was due to infection, which is common.”

Lack of Awareness and Psychosocial Barriers

Limited awareness of cervical cancer symptoms and screening contributed to delayed help-seeking. Fear, embarrassment, and hesitation regarding reproductive health concerns further delayed consultation.

“We did not know that excessive bleeding or frequent discharge could be dangerous.”

“I felt shy, so I did not consult a doctor in the beginning.”

Family and Financial Constraints

Women often prioritised family responsibilities and delayed care because of financial difficulties and dependence on family members for support.

“There was no one to accompany me, and going alone was difficult.”

“Money was the biggest problem. Going to the hospital means expenses for travel, tests, and medicines.”

Theme 2: Healthcare-Seeking Delay

Reliance on Informal Care

Many participants initially used home remedies or informal treatments before consulting qualified healthcare providers.

“I thought it was a common women’s issue, so I tried home treatment first.”

Financial and Logistical Barriers

Travel costs, accommodation expenses, and the need to arrange funds delayed access to specialised cancer services.

“Going to Raipur is very expensive when you consider travel, stay, and food.”

Theme 3: Treatment Delay

Delayed Diagnosis and Referral

Several women reported receiving treatment for infections before undergoing appropriate investigations, resulting in delayed diagnosis.

“Treatment continued everywhere, but no investigations were done. Later, reports confirmed cancer.”

Fragmented referral pathways further prolonged access to definitive care.

“One hospital referred us to another, then to another. There was neither proper investigation nor treatment anywhere.”

Provider and System-Level Barriers

Repeated symptomatic treatment, delayed investigations, long waiting times, and multiple referrals contributed to treatment delay.

“I was treated for infection in a private clinic for two months, and no investigations were advised.”

“Investigations and reports take a long time. The whole day goes by just waiting in queues.”

DISCUSSION

The present study explored the sociodemographic profile, healthcare-seeking behaviour, risk factors, and delays across the cervical cancer care continuum among women diagnosed with cervical cancer. The findings demonstrate that cervical cancer remains predominantly a disease affecting socioeconomically disadvantaged, rural, and less-educated women, with substantial delays occurring at multiple stages from symptom recognition to treatment initiation.

The mean age of participants in the present study was 52.9 ± 9.8 years, with nearly two-thirds of women belonging to the 41–60 years age group. Similar age distributions have been reported in previous studies from India and other low- and middle-income countries, where cervical cancer incidence peaks during the fifth and sixth decades of life 1,2. The

predominance of rural residents (71.2%) observed in the present study is also consistent with national data indicating a higher burden of cervical cancer among rural women due to limited access to screening services, poor awareness, and delayed healthcare utilization 3,4. The social and educational profile of the participants highlights the strong association between cervical cancer and socioeconomic disadvantage. More than half of the women were illiterate, and the majority belonged to unskilled occupational groups. Similar findings have been reported by Sankaranarayanan et al. and Arrossi et al., who demonstrated that lower educational status significantly influences awareness, preventive practices, and healthcare-seeking behaviour among women at risk of cervical cancer. 5,6. Illiteracy may contribute to delayed symptom recognition and reduced participation in screening programmes. A notable finding of the study was the poor healthcare-seeking behaviour among participants. Nearly two-thirds of women initially ignored symptoms, while only one-third sought medical consultation after symptom recognition. Lack of awareness and the perception that symptoms were normal age-related changes were the most common reasons for delay. These findings are comparable to previous qualitative and quantitative studies which identified poor symptom awareness, social stigma, fear, and normalization of symptoms as major barriers to timely healthcare seeking among women with cervical cancer 7,8.

Several established cervical cancer risk factors were highly prevalent in the study population. Tobacco use was reported by more than half of the participants, while poor genital hygiene and the use of cloth menstrual absorbents were also common. Previous studies have demonstrated that tobacco exposure increases the risk of cervical carcinogenesis through immunological and molecular mechanisms that facilitate persistent HPV infection 9. Poor menstrual hygiene and inadequate genital hygiene have similarly been associated with increased cervical pathology and infection risk in resource-limited settings 10. The reproductive and sexual characteristics observed in the present study further support existing evidence regarding cervical cancer risk. Early marriage, early age at first pregnancy, and sexual exposure before 18 years were highly prevalent among participants. Early initiation of sexual activity increases the duration of exposure to human papillomavirus (HPV), the primary etiological factor for cervical cancer 11. Similar findings have been reported in studies conducted across India and South Asia, where early marriage and high parity remain important contributors to cervical cancer burden 12.

One of the most alarming findings was the complete absence of HPV vaccination and cervical cancer screening among study participants. This finding reflects the substantial gap in preventive healthcare services in the study population. Similar observations have been reported in several Indian studies where awareness and utilization of cervical cancer screening services remain extremely low, particularly in rural and tribal populations 13,14. The lack of screening opportunities contributes to late-stage presentation and poor outcomes. The study identified substantial delays across the cervical cancer care pathway. Median appraisal, illness, diagnostic, and treatment delays were 52, 60, 45, and 30 days, respectively. These findings are comparable to previous studies that have documented prolonged delays in diagnosis and treatment among women with cervical cancer in low-resource settings 15,16. Diagnostic delays exceeding 60 days and treatment delays beyond 30 days were common, suggesting significant barriers at both patient and healthcare system levels.

Awareness emerged as one of the strongest determinants of delay. Women who were aware of cervical cancer symptoms experienced significantly lower appraisal, illness, scheduling, diagnostic, and total delays. Similar associations have been demonstrated in previous studies showing that symptom awareness facilitates earlier recognition and timely healthcare utilization 17,18. The findings highlight the critical importance of community-based awareness programmes and health education interventions. Perception of symptoms also significantly influenced illness, scheduling, diagnostic, and total delays. Women who perceived their symptoms as serious sought care earlier than those who considered them benign or age-related. Similar findings have been reported by the Model of Pathways to Treatment, which emphasizes the role of symptom appraisal and illness perception in determining healthcare-seeking behaviour 19.

Interestingly, direct referral pathways did not demonstrate a statistically significant association with delays in the present study. This may reflect persistent healthcare system challenges such as inadequate diagnostic facilities, multiple referrals, and long waiting times, irrespective of the initial healthcare pathway. Similar observations have been reported from cancer care systems in developing countries where referral inefficiencies contribute substantially to treatment delays. 20 The qualitative findings provided valuable insights into the reasons underlying delayed presentation and treatment. Symptom normalization, lack of awareness, embarrassment, and fear emerged as important contributors to presentation delay. Family responsibilities and financial dependence further complicated healthcare-seeking decisions. Similar psychosocial barriers have been consistently reported in qualitative studies exploring cervical cancer experiences among women in India, Africa, and Latin America. 21,22 Healthcare-seeking delays were additionally influenced by reliance on home remedies and informal healthcare providers. Women frequently attempted self-management before seeking professional care. Such behaviour has been documented in several low-resource settings and often results in advanced disease at diagnosis. 23 Treatment delays were largely attributed to delayed diagnosis, fragmented referral systems, repeated symptomatic treatment, and prolonged waiting periods for investigations. The qualitative narratives revealed instances where women received treatment for presumed infections for several months before appropriate diagnostic evaluation was undertaken.

Similar provider-level and system-level barriers have been identified in previous studies evaluating cancer care pathways in low- and middle-income countries. 24,25 Overall, the findings suggest that cervical cancer care delays are multifactorial and involve patient-related, provider-related, and health system-related determinants. Strengthening awareness programmes, expanding HPV vaccination and screening services, improving referral pathways, and reducing diagnostic waiting times are essential strategies for promoting early diagnosis and improving outcomes among women with cervical cancer. The integration of community-based education, primary healthcare strengthening, and timely referral mechanisms may substantially reduce delays and contribute to achieving the goals of cervical cancer elimination proposed by the World Health Organization 26.

Strengths and Limitations

Strengths

- Focused assessment of healthcare-seeking behavior and delays.
- Inclusion of multiple dimensions of the cancer care pathway.
- Representation of women from rural and underserved populations.

Limitations

- Single-center design limits generalizability.
- Mix-method nature precludes causal inference.
- Stage-specific and survival data were unavailable.
- Potential recall bias regarding delay intervals.

CONCLUSION

The present study highlights substantial delays in symptom recognition, diagnosis, and treatment among women with cervical cancer. Rural residence, low literacy, unskilled occupations, and poor awareness emerged as major contributors to delayed healthcare-seeking behavior.

Strengthening community awareness, screening programs, referral systems, and patient navigation services may facilitate earlier diagnosis and improve cervical cancer outcomes.

Acknowledgements

The authors acknowledge all study participants and healthcare professionals who contributed to the study.

Funding Statement

No external funding was received for this study.

Conflict of Interest

The authors declare no conflict of interest.

Ethical Approval

Ethical approval was obtained from the Institutional Ethics Committee (No. /MC/Ethics/2024/69) prior to commencement of the study. Written informed consent was obtained from all participants.

Author Contributions

All authors contributed to study conception, data collection, analysis, manuscript preparation, and final approval of the manuscript.

Data Availability Statement

Data supporting the findings of this study are available from the corresponding author upon reasonable request.

REFERENCES

1. Bray F, Laversanne M, Sung H, Ferlay J, Siegel RL, Soerjomataram I, et al. Global cancer statistics 2024: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin.* 2024;74(3):229-263.
2. National Centre for Disease Informatics and Research (NCDIR). National Cancer Registry Programme Report 2023. Bengaluru: Indian Council of Medical Research; 2023.
3. Arbyn M, Weiderpass E, Bruni L, de Sanjosé S, Saraiya M, Ferlay J, et al. Estimates of incidence and mortality of cervical cancer in 2018: A worldwide analysis. *Lancet Glob Health.* 2020;8(2):e191-e203.
4. Neal RD, Tharmanathan P, France B, Din NU, Cotton S, Fallon-Ferguson J, et al. Is increased time to diagnosis and treatment in symptomatic cancer associated with poorer outcomes? Systematic review. *Br J Cancer.* 2015;112(Suppl 1):S92-S107.

5. Unger-Saldaña K. Challenges to the early diagnosis and treatment of cancer in developing countries. *Cancer Control*. 2014;21(2):109-118.
6. Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, Jemal A, 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(3):209-249.
7. Thulaseedharan JV, Malila N, Hakama M, Esmy PO, Cheriyan M, Swaminathan R. Socio-demographic and reproductive risk factors for cervical cancer in India: A case-control study. *BMC Public Health*. 2019;19:743.
8. Ghosh S, Muwonge R, Budukh A, et al. Association of socio-demographic factors and delays in cervical cancer diagnosis in India. *Asian Pac J Cancer Prev*. 2013;14(6):3441-3445.
9. Shapley M, Jordan J, Croft PR. An epidemiological survey of symptoms of cervical cancer in UK women. *Br J Gen Pract*. 2006;56(527):880-885.
10. Moodley J, Cairncross L, Naiker T, Constant D. From symptom onset to treatment initiation: Cervical cancer care pathways in low- and middle-income countries. *Gynecol Oncol*. 2018;148(2):394-404.
11. Vaccarella S, Lortet-Tieulent J, Plummer M, Franceschi S, Bray F. Worldwide trends in cervical cancer incidence: Impact of screening against changes in disease risk factors. *Lancet Glob Health*. 2021;9(2):e191-e203.
12. Sankaranarayanan R, Nene BM, Shastri SS, Jayant K, Muwonge R, Budukh AM, et al. HPV screening for cervical cancer in rural India. *N Engl J Med*. 2009;360(14):1385-1394.
13. Basu P, Meheus F, Chami Y, Hariprasad R, Levin C. Management algorithms for cervical cancer screening and treatment in low-resource settings. *Int J Cancer*. 2018;143(7):1573-1580.
14. Lim JNW, Ojo AA. Barriers to utilisation of cervical cancer screening in sub-Saharan Africa: A systematic review. *PLoS One*. 2017;12(8):e0180801.
15. Marlow LAV, Waller J, Wardle J. Barriers to cervical cancer screening among ethnic minority women: A qualitative study. *J Med Screen*. 2015;22(1):26-33.
16. Moss EL, Taniou C, Dixon M, et al. The impact of delayed diagnosis on cervical cancer outcomes. *BJOG*. 2019;126(1):11-18.
17. Ncube B, Bey A, Knight J, Bessler P, Jolly PE. Factors associated with cervical cancer screening among women in low-income settings. *BMC Womens Health*. 2015;15:60.
18. Scott SE, Grunfeld EA, McGurk M. Patient delay for symptoms of oral cancer: A systematic review. *Br J Cancer*. 2006;95(7):825-831.
19. Peters DH, Garg A, Bloom G, Walker DG, Brieger WR, Hafizur Rahman M. Poverty and access to health care in developing countries. *Health Policy Plan*. 2008;23(3):161-168.
20. Ambroggi M, Biasini C, Del Giovane C, Fornari F, Cavanna L. Distance as a barrier to cancer diagnosis and treatment: A systematic review. *Patient Educ Couns*. 2015;98(8):938-945.
21. Prinja S, Bahuguna P, Gupta I, Chowdhury S, Trivedi M. Role of publicly financed health insurance schemes in financial protection against cancer expenditure in India. *Lancet Reg Health Southeast Asia*. 2023;13:100188.
22. National Health Authority. Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (AB-PMJAY): Annual Report 2024. New Delhi: National Health Authority; 2024.
23. Patel K, Kanu M, Liu J, Bond B, Brown E, Williams E, et al. Factors influencing delays in seeking care among women with symptoms suggestive of cervical cancer in low- and middle-income countries: a systematic review. *BMC Womens Health*. 2022;22(1):210.
24. Moodley J, Cairncross L, Naiker T, Constant D. From symptom discovery to treatment - women's pathways to diagnosis and care for cervical cancer in South Africa. *BMC Cancer*. 2018;18(1):289.
25. Tapera O, Dreyer G, Kadzatsa W, Nyakabau AM, Stray-Pedersen B, Hendricks SJH. Patient and health system delays in the diagnosis and treatment of cervical cancer in Zimbabwe: a mixed-methods study. *PLoS One*. 2019;14(7):e0219144.
26. World Health Organization. Global strategy to accelerate the elimination of cervical cancer as a public health problem. Geneva: World Health Organization; 2020.