



Review Article

Scientific Publications on the Human Papillomavirus: A Worldwide and Indian Bibliometric Analysis of Research Published from 1990 to April 2023

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A B S T R A C T

Introduction: Human papillomavirus (HPV)-related sexually transmitted illnesses are common in both men and women worldwide. The study's objective was to examine the HPV research output globally and in India using the Web of Science (WoS) database.

Methods: The term "Human Papillomavirus" was used in the title field of the WoS database to search the global and Indian research publications.

Results: There were 21,544 HPV papers available worldwide between 1990 and April 2023. There were 251 publications on HPV in 1990, 1082 in 2016, and 946 in 2022. There were 390 articles from India during the period 1990 to April 2023. The major focal field of HPV research was oncology. Authors often used words such as human, Papillomavirus, and cancer. The leading author in the world was from Sweden, and the leading author in India was from Delhi University. The Research Libraries UK (RLUK) was the world's leading HPV research institute, whereas, in India, it was the Indian Council of Medical Research.

Conclusion: Our analysis showed that there was a significant increase in HPV research articles both globally and in India. The metrics offered would provide researchers with additional information as they work to advance HPV vaccination, treatment, and prevention.

Keywords: Bibliometric Analysis, Human Papillomavirus, HPV, Global, India, Web of Science



Introduction

A German virologist, Harald Zur Hausen, initially identified the association between human papillomavirus (HPV) and cervical uterine cancer in the 1970s.^{1,2} Many disorders are associated with HPV infection. “High-grade squamous intraepithelial lesions”, “low-grade squamous intraepithelial lesions”, benign cutaneous warts, and juvenile respiratory papillomatosis are all called HPV.³ In addition to carcinomas of the oropharynx, vagina, penis, anus, and vulva, cervical cancer is also connected to HPV.^{4,5} Warts (papillomas), other benign tumours, and malignancies of the genital tract, especially of the uterine cervix in females, are brought about by a sub-group of infections from the family Papovaviridae that infect individuals. Over 100 varieties of HPVs are small polygonal viruses with circular double-stranded DNA (deoxyribonucleic acid).⁶

HPV causes sexually transmitted diseases that can significantly affect a patient’s well-being. The vast majority are low-risk HPVs that can cause benign genital warts. Normal cells can develop into malignant ones when exposed to high-risk HPV. Although most individuals who engage in sexual activity are in danger of HPV, it is difficult to predict who will get the disease. According to research,⁷ women with risk factors like multiple partners and smoking are more likely to develop cervical cancer⁸. There has been a significant advancement in cervical cancer screening and prevention over the past ten years.⁹ According to projections for 2020, 604,127 new cases of cervical cancer are found worldwide every year, 123,907 of which occur in India.

It is beneficial to learn about the available research on HPV worldwide. Many databases (such as Web of Science, Scopus, Google Scholar, and others) can reveal metrics for published scientific research. Our goal was to draw attention to the manually maintained Web of Science (WoS) database, which cites more sources.¹⁰ The study’s goal was to examine the research matrices of HPV publications that were published in the WoS database between January 1990 and April 2023.

Methods

All research published between January 1990 and April 2023 was taken from the Thomas Reuters WoS data source, Science Citation Index Expanded, limiting the search under the title “Human Papillomavirus” on April 30, 2023.

Descriptive analysis was carried out for India and the world based on the HPV research output scope. The following headings were used to group the results of the research output on HPV:

1. Quantification of human papillomavirus publication by year

2. Distribution of publications’ types
3. Research areas on human papillomavirus, WOS, 1990–April 2023
4. Publication of human papillomavirus research article by language
5. Geographical distribution and production of publications on human papillomavirus
6. Commonly used keywords
7. Leading researchers in HPV with a high number of publications
8. Leading publications for the human papillomavirus and their impact factor
9. The top five papers on the human papillomavirus, with the number of citations and the average number of citations per year
10. Productive institute for the publication of studies on the human papillomavirus
11. Most productive publishers of the HPV research

Microsoft Office, Word Cloud Generator-13, Vos Viewer, and Arc GIS 10.1 tools were used to analyse the data.

Results

Quantification of Human Papillomavirus Publication by Year

Between 1990 and April 2023, 21,544 records on HPV research were obtained globally using WoS databases. Globally, 251 articles were published on HPV in 1990, 1082 in 2016, and 946 in 2022.

The HPV research output, when confined to India, contained 390 research articles. It increased from one article in 1991 to 18 in 2012 and 30 in 2022. The findings (Figures 1 and 2) from 1990 to 2022 (ignoring incomplete data from 2023) show that there has been an upsurge in the publication of research on HPV globally and in India, over the last three decades.

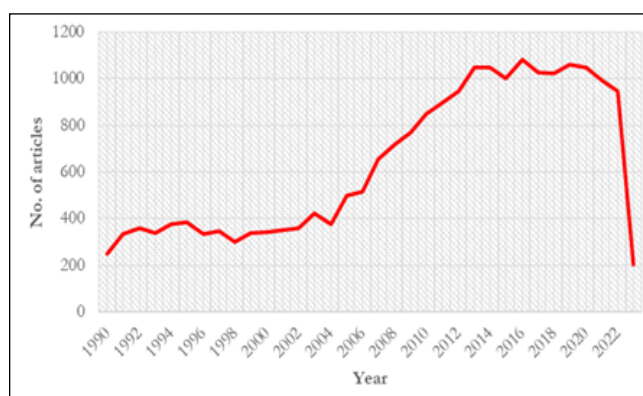


Figure 1. Year-wise Distribution of Research Publications Globally on Human Papillomavirus from 1990 to April 2023

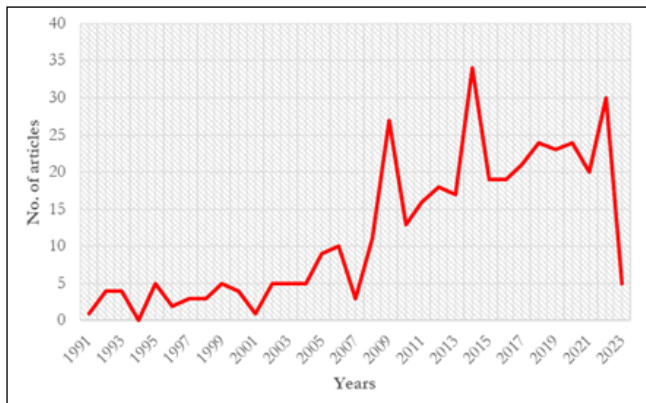


Figure 2. Year-wise Distribution of Research Publications on Human Papillomavirus in India (1991–2023)

Distribution of Publications' Types

Original research articles ($n = 15,495$, 71.9%) accounted for the majority of global HPV research outputs, followed by meeting abstracts ($n = 2,636$, 12.2%), review articles ($n = 1,379$, 6.4%), letters ($n = 896$, 4.2%), editorial material ($n = 635$, 2.9%), proceeding paper ($n = 410$, 1.9%), and other miscellaneous documents ($n = 93$, 0.4%).

When narrowed to India, the publications of original research articles made up 77.2% ($n = 301$) of the total research outputs, followed by review articles ($n = 35$, 9.0%), meeting abstracts ($n = 25$, 6.4%), letters ($n = 20$, 5.1%), editorial materials ($n = 6$, 1.5%), and other miscellaneous publications like early access, note, proceeding paper etc. ($n = 3$, 0.8%).

Research Areas on Human Papillomavirus (WOS, 1990–April 2023)

Globally, the leading focused subject areas were primarily in the field of oncology ($n = 5,249$, 24.4%), followed by virology ($n = 2,458$, 11.4%), immunology ($n = 2,246$, 10.4%), obstetrics and gynaecology ($n = 2,219$, 10.3%), infectious diseases ($n = 2,070$, 9.6%), pathology ($n = 1,901$, 8.8%), public environmental and occupational health ($n = 1,718$, 7.97%), medicine research experimental ($n = 1,405$, 6.5%), microbiology ($n = 1,371$, 6.4%), and others ($n = 907$, 4.2%).

The most focused areas in the Indian research were in the field of oncology ($n = 137$, 35.1%), followed by immunology ($n = 63$, 16.2%), obstetrics and gynaecology ($n = 43$, 11.0%), medicine research experimental ($n = 39$, 10.0%), infectious diseases ($n = 28$, 7.2%), virology ($n = 28$, 7.2%), medicine general internal ($n = 26$, 6.66%), pathology ($n = 22$, 5.6%), biochemistry molecular biology ($n = 20$, 5.2%), and others ($n = 47$, 12.0%).

Languages of Publications of Research Articles on Human Papillomavirus

Globally, the WoS database showed that most of the research publications were in English ($n = 21,279$, 98.8%) during the study period, followed by publications in Spanish ($n = 93$, 0.43%), French ($n = 76$, 0.35%), German ($n = 56$, 0.26%), and the least in the Polish language (40, 0.19%).¹ India's research papers were in English ($n = 360$, 100.00%).

Geographical Distribution and Production of Publications on Human Papillomavirus

Globally, in the field of HPV research, the United States of America and China accounted for the majority of publications from 1990 to 2023. The map (Figure 3) depicts the global geographical distribution of a number of published articles on HPV. The information was exported to Excel, and the map was created with the ArcGIS 10.1 software. The areas devoid of colour indicate that the WoS database was not used for any research output.

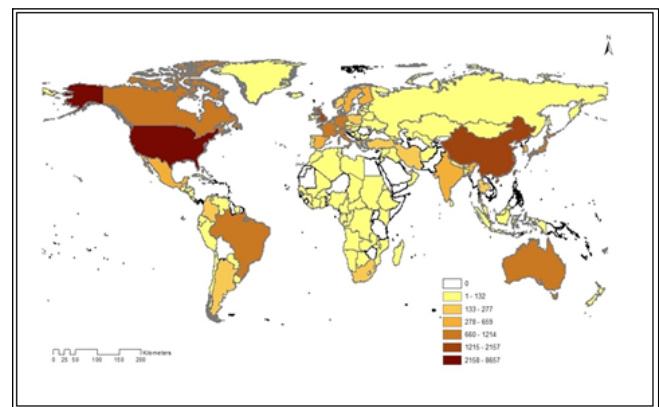


Figure 3. Geographical Distribution of HPV Research Publications across Different Countries from 1990 to April 2023 using the WoS Database

The USA ranked first in scientific production ($n = 8,657$, 40.2%). The second leading country was China ($n = 1,765$, 8.2%), the third was England ($n = 1,405$, 6.5%), and the fourth was Germany ($n = 1,214$, 5.6%). With 390 (1.8%) publications, India achieved twentieth place in scientific productivity.

Research Output Keywords at the Global Level and at the Indian Level

Keywords were taken from highly cited scientific articles and entered into the Word Cloud Generator, and the results are shown in Figure 4. Keywords "Papillomavirus", "human", "HPV", "cervical", and "cancer" appeared more prominent in size than other keywords globally, as well as for India.

Figure 4 shows bibliometric analyses of keywords for global and Indian papillomavirus papers published, using VOSviewer. Based on keyword analysis, the maps (Figures 4a1 and 4b1) illustrate the clusters. The size of the circle represents the frequency of occurrences of the terms, and the varied colours represent the diversity of clusters. The keywords “Papillomavirus”, “human”, “HPV”, “cervical”, and “cancer” were more prominent in size than other keywords globally and in India (Figures 4a2 and 4b2).

Researchers in HPV with a High Number of Publications

According to the WoS database, the leading researcher globally from 1990 to April 2023 was author Dillner J from Sweden, who had published 232 (1.07%) HPV articles, and the second topper was Schiffman M from the USA, who had published 225 (1.04%) articles. The third topper was

Meijer CJLM from the Netherlands, who had published 216 (1.00%) articles; the fourth topper was Franco EI from Canada, who had published 199 (0.92%) articles, and the fifth topper, Castle PE, was from the USA and had published 190 (0.88%) articles (Table 1).

In India, the author, Das BC, a researcher from the University of Delhi, Delhi, had published the highest number (n = 46, 11.79%) of publications of HPV articles; the second leading researcher was Basu P from France, who collaborated with Indian authors and published 26 (6.66%) articles on HPV; followed by Bhatia N from the United Kingdom who collaborated with Indian authors and published 25 (6.41%) articles on HPV. The fourth author, Pillai MR from Toronto, possibly collaborated with Indian authors and published 23 (5.89%) articles on HPV. The fifth author was from Delhi University and had published 22 (5.64%) articles on HPV (Table 2).

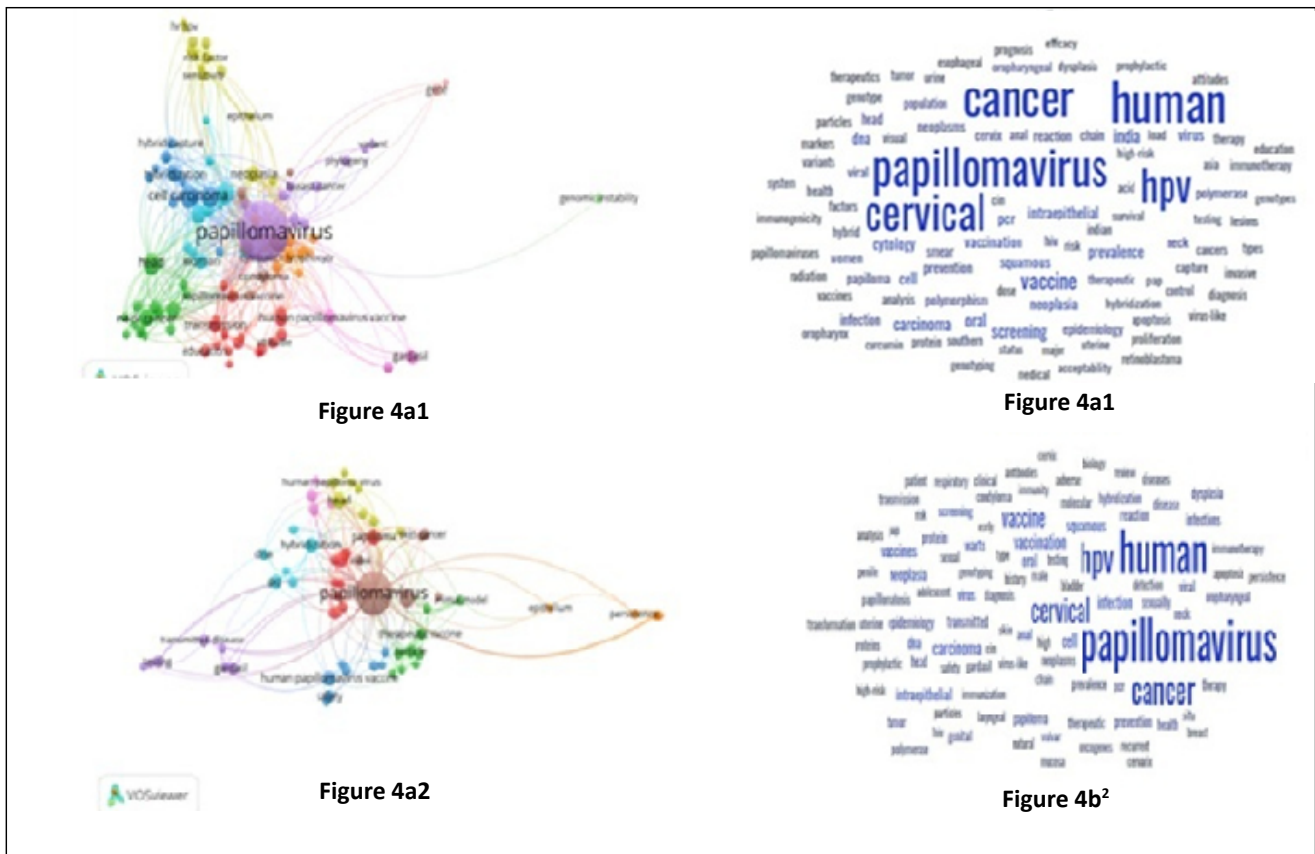


Figure 4. Human Papillomavirus Research Output Keywords using WoS Database (a). Globally (1990–2023) and (b). India (1991–2023)

Table I. Top Five Researchers Globally using WoS Database (1990–April 2023)

S. No.	Primary Author	Institution	Country	Percentage	No. of Articles
1	Dillner J	Karolinska Institute Hospital	Sweden	1.07	232

2	Schiffman M	Division of Cancer Epidemiology and Genetics, - National Cancer Institute, National Institutes of Health, Department of Health and Human Services	USA	1.04	225
3	Meijer CJLM	Department of Pathology, VU University Medical Center	Netherlands	1.00	216
4	Franco EL	Department of Oncology, McGill University, Montreal, QC	Canada	0.92	199
5	Castle PE	American Society for Clinical Pathology Institute, Washington	USA	0.88	190

Table 2. Top Five Researchers in India, with h-index using WoS Database (1990–2023)

S. No.	Primary Author	Institute	No. of Articles	Percentage
1	Das BC	University of Delhi	46	11.79
2	Basu P	Early Detection, Prevention, and Infections Branch; International Agency for Research on Cancer, Lyon, France	26	6.66
3	Bhatia N	University of Edinburgh, UK	25	6.41
4	Pillai MR	Department of Medicine, University of Toronto, Toronto	23	5.89
5	Bharti AC	University of Delhi	22	5.64

Leading Publications for the Human Papillomavirus and their Impact Factor

The top 10 leading journals at the global level, according to the WoS database, are shown in Table 3. Most of the published articles were in the Journal of Virology, with 686 articles and an impact factor of 6.5, followed by the International Journal of Cancer with 493 articles and an impact factor of 7.3, Vaccines with 457 articles and an impact factor of 4.9, and so on. The result showed that the Journal of Medical Virology had the highest impact

factor of 20.69, and the other journals had an impact factor ranging between 3.5 and 7.8.

The leading journals with HPV publications from India are shown in Table 4. The journal 'Vaccine' with 16 articles and an impact factor of 4.9, had the maximum number of articles; the International Journal of Cancer was next with 15 articles and an impact factor of 7.3, followed by the Indian Journal of Medical Research, which had 14 publications and an impact factor of 5.3, and so on. Other journals had an impact factor in the range of 1.3 to 20.7.

Table 3. Ten Global Leading Journals with HPV Publications along with their Publishers and Impact Factors (Thomas Reuters) using WoS Database (1990–April 2023)

S. No.	Journal	Articles Published	Impact Factor 2022	Percentage	Publisher
1.	Journal of Virology	686	6.5	3.18	American Society for Microbiology
2.	International Journal of Cancer	493	7.3	2.28	John Wiley
3.	Vaccines	457	4.9	2.12	Elsevier
4.	Journal of Infectious Diseases	446	7.8		Oxford University Press
5.	Journal of Medical Virology	358	20.69	2.07	Wiley-Blackwell
6.	PLoS One	339	3.8	1.57	Public Library of Science

7.	Gynecologic Oncology	315	5.3	1.46	Elsevier
8.	Virology	312	3.5	1.44	Elsevier
9.	International Journal of Gynecological Cancer	300	4.7	1.39	British Medical College
10.	Cancer Epidemiology Biomarkers Prevention	287	4.1	1.33	American Association for Cancer Research, Inc.

Table 4. Ten Leading Indian Journals with HPV Publications along with their Publishers and Impact Factors (Thomas Reuters) using WoS Database (1991–April 2023)

S. No.	Journal	Articles Published	Impact Factor	Percentage	Publisher
2022	Publisher	686	6.5	3.18	American Society for Microbiology
1.	Vaccine	16	4.9	Elsevier	John Wiley
2.	International Journal of Cancer	15	7.3	John Wiley	Elsevier
3.	Indian Journal of Medical Research	14	5.3	Medknow Publications (Wolters Kluwer Health)	Oxford University Press
4.	International Journal of Gynecological Cancer	13	4.6	International Gynecologic Cancer Society and the European Society of Gynaecological Oncology	Wiley-Blackwell
5.	PLoS One	10	3.8	Public Library of Science	Public Library of Science
6.	Journal of Medical Virology	9	20.7	Wiley - Blackwell	
7.	Journal of Cancer Prevention	8	-		Lippincott Williams & Wilkins
8.	Gynecologic Oncology	7	5.3	Elsevier	
9.	Indian Journal of Medical Microbiology	7	1.3	Medknow Publications	
10.	Cancer	6	-	Wiley	

Top Five Papers on the Human Papillomavirus, with the Number of Citations and the Average Number of Citations per Year

The citation analysis with the h-index of five highly cited papers is shown in Table 5. The highest cited article globally

was published in 2013 (739 citations), with an average citation per year of 67.18. At the Indian level, the most cited article was published in 2010. Its number of citations was 1719, with an average citation per year of 122.79. The details of the next four highly cited articles are shown in Table 6.

Table 5. Top Five Global Human Papillomavirus Publications with Their Numbers of Citations and the Average Numbers of Citations per Year (WoS, 1990–April 2023)

S. No.	Details	Total Citations	Average Citation per Year
1.	Jemal A et al. Annual Report to the Nation on the Status of Cancer, 1975-2009, featuring the burden and trends in Human Papillomavirus (HPV) – associated cancers and HPV vaccination coverage levels. <i>Journal of National Cancer Inst.</i> 2013 Feb 6; 105(3):175-201.	739	67.18
2	Markowitz LE et al. Centers for Disease Control and Prevention (CDC). "Human papillomavirus vaccination: recommendations of the Advisory Committee on Immunization Practices (ACIP)". <i>MMWR Recomm Rep.</i> 2014 August 29;63:1-30.	697	69.7
3	Gillison ML et al. Epidemiology of Human Papillomavirus-Positive Head and Neck Squamous Cell Carcinoma. <i>Journal of Clinical Oncology.</i> 2015 Oct 10; 33(29):3235-42.	690	76.67
4	Gillison ML et al. Radiotherapy plus cetuximab or cisplatin in human papillomavirus-positive oropharyngeal cancer (NRG Oncology RTOG 1016): a randomised, multicentre, non-inferiority trial. <i>Lancet.</i> 2019 Jan 5;393(10166):40-50.	673	134.6
5	Holman DM et al. Barriers to human papillomavirus vaccination among US adolescents: a systematic review of the literature. <i>JAMA Pediatr.</i> 2014 Jan;168(1):76-82.	600	60

Table 6. Top Five Indian Human Papillomavirus Publications with Their Numbers of Citations and Average Citations per Year (WOS, 1991–April 2023)

S. No.	Details	Total No. of Citations	Average Citation per Year	Accepted Date
1	De Sanjose S et al. Retrospective International Survey and HPV Time Trends Study Group. Human papillomavirus genotype attribution in invasive cervical cancer: a retrospective cross-sectional worldwide study. <i>Lancet Oncology.</i> 2010 Nov;11(11):1048-56.	1719	122.79	Oct 18, 2010
2	Herrero R et al. IARC Multicenter Oral Cancer Study Group. Human papillomavirus and oral cancer: the International Agency for Research on Cancer multicenter study. <i>Journal of National Cancer Inst.</i> 2003 Dec 3;95(23):1772-83.	885	42.14	Sep 29, 2003
3	Clifford GM et al. IARC HPV Prevalence Surveys Study Group. Worldwide distribution of human papillomavirus types in cytologically normal women in the International Agency for Research on Cancer HPV prevalence surveys: a pooled analysis. <i>Lancet.</i> 2005 Sep 17-23;366(9490):991-8.	779	41	Aug 16, 2005

4	Franceschi S et al. Variations in the age-specific curves of human papillomavirus prevalence in women worldwide. <i>International journal of cancer.</i> 2006 Dec 1;119(11):2677-84.	304	16.89	Jun 22, 2006
5	Ho Let al. The genetic drift of human papillomavirus type 16 is a means of reconstructing prehistoric viral spread and the movement of ancient human populations. <i>Journal of Virology.</i> 1993 Nov;67(11):6413-23.	262	8.45	Aug 5, 1993

The top five most-cited research papers (R1–R5) were examined for their citation patterns. The most-cited articles were only cited from the year 2013, and the paper R4 published in the year 2006 had a maximum of 212 citations in the year 2022 (Figure 5).

Institutes Leading in the Publication of Studies on Human Papillomavirus

The ten most productive institutes at the global level in HPV research from 1990 to April 2023 are listed in Table

7. Among them, Research Libraries UK (RLUK) with 1264 (5.86%) publications stands first, followed by the National Institutes of Health (NIH) USA with 863 (4.00%) publications and NIH National Cancer Institute (NCI) with 746 (3.46%) publications.

In India, the Indian Council of Medical Research had 81 publications, followed by the National Institute of Cancer Prevention Research (NICPR) ICMR (n = 64), and All India Institute of Medical Sciences (AIIMS), New Delhi with 43 publications. More details are shown in Table 8.

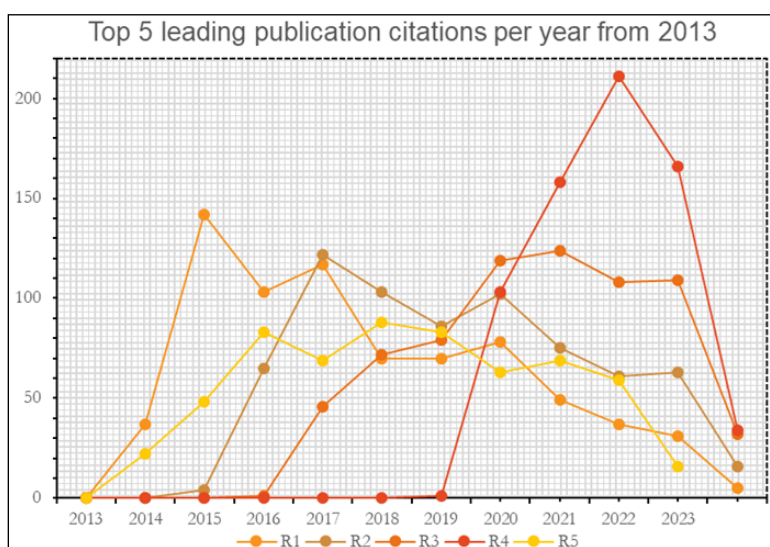


Figure 5. Top Five Leading Publication Citations on Human Papillomavirus Research from 2013

Table 7. Ten Most Productive Institutes at the Global Level in the Field of HPV Research (1990–April 2023)

S. No.	Institutes	No. of Articles Published	Percentages (N = 21,544)
1	Research Libraries UK (RLUK)	1264	5.867
2	National Institutes of Health (NIH) USA	863	4.006
3	NIH National Cancer Institute (NCI)	746	3.463
4	University of California System	712	3.305
5	Johns Hopkins University	702	3.258
6	University of Texas System	569	2.641

7	Harvard University	563	2.613
8	University of London	539	2.502
9	Helmholtz Association	493	2.288
10	World Health Organization	488	2.265

Table 8. Ten Most Productive Institutes in India in HPV Research (1991–April 2023)

S. No.	Institutes	No. of Articles Published
1	Indian Council of Medical Research	81
2	National Institute of Cancer Prevention Research (NICPR) (ICMR)	64
3	All India Institute of Medical Sciences, AIIMS, New Delhi	43
4	World Health Organization	41
5	International Agency for Research on Cancer (IARC)	38
6	University of Delhi	34
7	Tata Memorial Centre (TMC)	32
8	Chittaranjan National Cancer Institute	26
9	Department of Biotechnology (DBT) India	24
10	Regional Cancer Centre	22

Most Productive Publishers of the HPV Research

The first three most productive publishers in the field of HPV research globally and in India are Elsevier, Wiley, and Springer Nature. The details of the top ten publishers globally and in India have been provided in Tables 9 and 10, respectively. Elsevier publishers were more productive in publishing HPV research worldwide ($n = 4,536$, 21.06%) and in India ($n = 106$, 27.2%). Wiley publishers took the second lead in publishing HPV articles globally ($n = 3,208$, 14.9%) and in India ($n = 64$, 16.4%). Springer Nature took the third lead by publishing 2192 (10.175%) articles globally and 39 (10.0%) articles in India.

Table 9. Ten Most Productive Publishers at the Global Level in the Field of HPV Research (1990–April 2023)

S. No.	Publishers	No. of Articles Published	Percentages (N = 21,544)
1	Elsevier	4536	21.055
2	Wiley	3208	14.890
3	Springer Nature	2192	10.175
4	Lippincott Williams and Wilkins	1578	7.325
5	American Society of Microbiology	1106	5.134
6	Oxford University Press	1018	4.725

7	American Association of Cancer Research	699	3.245
8	BMJ Publishing Group	527	2.446
9	Taylor and Francis	469	2.177
10	Sage	381	1.768

Table 10. Ten Most Productive Publishers at the Indian Level in the Field of HPV Research (1991–April 2023)

S. No.	Publishers	No. of Articles Published	Percentages (N = 390)
1	Elsevier	106	27.18
2	Wiley	64	16.41
3	Springer Nature	39	10.00
4	Wolters Kluwer Med Know	24	6.15
5	Lippincott Williams and Wilkins	19	4.87
6	BMJ Publishing Group	15	3.85
7	Oxford University Press	12	3.08

8	Public Library Science	10	2.56
9	Sage	8	2.05
10	Asian Pacific Organization Cancer Prevention	7	1.79

Discussion

In this study, we employed a bibliometric approach on April 31, 2023, to analyse the research trends of HPV at the global level (1990–April 2023) and in India (1991–April 2023) using the WoS database with the search term “Human Papillomavirus” in the title field. Globally, there were 21,544 articles and in India, there were 390 research publications. The publications on HPV presented a growth with an increasing number of articles from 251 publications (in 1990) globally, whereas it was one publication (in 1991) in India. Original research articles accounted for the majority of HPV research outputs globally (71.9%) and in India (77.2%). The leading subject area of HPV was oncology, globally (29.4%) and in India (35.1%). The language of publication of HPV research articles was mainly English, both globally (98.8%) and in India (100%).

This bibliometric analysis has demonstrated the leading role that the USA (40.1%) played in the number of scientific publications, followed by China (8.2%). India (1.8%) ranked twentieth in HPV research. “Human”, “wart virus”, “papillomavirus infections”, and “HPV” were the authors’ main keywords. The leading author in the world, Dillner J from Sweden, published 232 articles, whereas Das BC, the leading author in India, published 46 articles. The leading journal globally was the ‘Journal of Virology’ with 686 publications and an impact factor of 6.5, whereas, in India, it was the journal ‘Vaccine’ with 16 publications and an impact factor of 4.9. The most cited article globally was by Jemal et al., with 739 citations and an average citation per year of 67.18. The most cited article in India was by Sanjose et al., with 1719 citations and an average citation per year of 122.79.

The leading global institute was Research Libraries UK (RLUK) with 1264 articles, whereas in India, it was the Indian Council of Medical Research, which along with NICPR-ICMR, had 145 articles. The most productive publisher, globally and in India, was Elsevier, with 4536 and 106 articles, respectively.

A bibliometric study¹¹ using the WoS database, conducted between 1900 and 2009, found 29,330 publications using the search term “HPV”. The United States topped the list with 12,270 publications, accounting for 96.3% of the

HPV-specific items with publications in English. The HPV research articles were mainly cited by the US and Germany, followed by the UK with more than 50,000 citations. The category “oncology” had the most publications on HPV (7098). Pathology, with its 3661 HPV-related publications, came next.

In another study,¹² a title search using the term “cervical cancer” from 1900 to 2015, was conducted to examine the global scientific productivity of this field. Globally, 22,185 unique papers on cervical cancer were published, 20,717 (93%) of which were in English and 634 (3%) were in German. At the start of the 1980s, global research efforts saw a noticeable increase. This growth gradually increased by more than 1000 publications per year, peaking in 2015.

A joint distribution of HPV immunisation and cervical malignant growth was envisioned by a bibliometric study¹³ utilising the WoS database with the keywords “cervical cancer”, “human papillomavirus”, and “HPV”. According to the findings, 2021 saw the most (n = 94) publications on the HPV vaccine and cervical cancer. More articles were from the USA, with 281 articles trailed by the UK and Australia. The journals “Vaccine” and “PLoS One” contributed around 11% of the articles.

African authors¹⁴ published a total of 2,587 SCOPUS-indexed articles on HPV between the year of commencement (1974) and July 16, 2022, with an average annual production rate of 50.5 publications. 1.2% of the papers were in the field of social sciences. 95.1% of the publications were in English. “Human papillomavirus” was used as the keyword during a search using the WoS from 1993 to 2008.¹⁵ The results revealed a sharp upward rise since 2004, and the USA ranked first using five publication indicators: total publications, single country, international, first, and corresponding author publications.

Even though the investigations mentioned above were conducted throughout various periods, under different search titles, and using various databases, it was clear that the research output is rising, with English being the most commonly used language.

Conclusion

Our investigation found that the growth trend of HPV research publications was rising globally, reaching a peak in 2016 with 1082 articles, and when limited to India, it showed 34 papers. Most of the publications, both globally and in India, were original articles, with oncology as the primary focus of HPV research. English was the most predominant language of publication. Regarding HPV research, the United States ranked first, followed by China, while India was placed twentieth. The terms “human”, “wart virus”, “papillomavirus infections”, and “HPV” were most commonly used by authors. Globally speaking, the

leading author was from Sweden, and in India, the leading author was from Delhi University. Considering the volume of articles, the leading journal was the “Journal of Virology”, whereas “Vaccine” was the leading journal in India. Jemal et al.’s article had the most citations internationally, whereas Sanjose et al.’s article had the most citations in India. The globally leading HPV research institute was Research Libraries UK (RLUK), whereas it was the Indian Council of Medical Research in India. Elsevier was the most productive publisher, both globally and in India. The metrics described above would offer researchers more information as they work to enhance HPV prevention, treatment, and immunisation.

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Conflict of Interest: None

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