

Research Contributions on Oral Cancer in India: An Analysis of Citation Count

Sadik Batcha M

Department of Library and Information Science, Annamalai University Annamalainagar, Tamil Nadu, South India -608 002, INDIA.

ABSTRACT

Oral cancer is any malignant neoplasm which is found on the lip, floor of the mouth, cheek lining, gingiva, palate or in the tongue. Oral cancer is among the top three types of cancers in India. The incidence of oral cancer is highest in India, south and South-east Asian countries. In India, 90 -95% of the oral cancers is squamous cell carcinoma. Based on oral cancer research data obtained from Web of Science database core collection, it is seen that with 2606 (6.92% global share) articles from India on oral cancer during 2010-2017, India ranks 4th in the world in terms of research paper output. About 75% of the Indian publications appeared during the period 2010-17. Tata Memorial Hospital, All India Institute of Medical Sciences Science and Annamalai University are the three institutions publishing the highest number of papers during the period. Chaturvedi and Nagini are the most productive authors in India contributing relatively higher number of publications in oral cancer. About 50% Indian publications are a result of international collaboration with 114 countries.

Keywords: Scientometrics, Oral cancer, Squamous cell carcinoma, India, Local citation Score, Global citation Score.

Correspondence

Sadik Batcha M

Associate Professor, Department of Library and Information Science, Annamalai University, Annamalainagar, Tamil Nadu, South India -608 002, INDIA.

E-mail: msbau@rediffmail.com

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INTRODUCTION

The World Health Organization's International Agency for Research on Cancer (IARC) (<http://www.iarc.fr/>) has identified more than 100 types of chemical, physical, and biological carcinogens that cause cancer. Cancer research is focused on discovering new carcinogens, explaining how they cause cancer and providing insights into ways to prevent cancer. Peyton Rous discovered cancer, and the virus causing cancer came to be known as Rous sarcoma virus. Peyton Rous was awarded the Nobel Prize in 1966 for his discovery.^[1] In addition to viruses, chemicals and radiations also cause cancer and sometimes cancer is found to run in families.^[2]

Oral cancer is any malignant neoplasm which is found on the lip, floor of the mouth, cheek lining, gingiva, palate or in the tongue. Oral cancer is among the top three types of cancers in India.^[3] Severe alcoholism, use of tobacco like cigarettes, smokeless tobacco, betel nut chewing and human papilloma virus (HPV) are the most common risk factors for oral cancer^[4-5] Oral cancer may also occur due to poor dental care

and poor diet.^[6] The incidence of oral cancer is highest in India, south and Southeast Asian countries. In India, 90 -95% of the oral cancers is squamous cell carcinoma.^[7] The international agency for research on cancer has predicted that India's incidence of cancer will increase from 1 million in 2012 to more than 1.7 million in 2035. This indicates that the death rate because of cancer will also increase from 680000 to 1- 2 million in the same period. A case control study from India demonstrates that oral cancer is interrelated with low income. Low social economic class is interrelated with factors like nutrition, health care, living condition and risk behaviors which contribute to the development of oral cancer.^[8] In many low-income and middle-income countries, including India, most of the population does not have access to a well organized and well regulated cancer care system. A diagnosis of cancer often leads to high personal health expenditures. Such expenditures can push entire families below the poverty line and may threaten social stability.^[9] No significant advancement in the treatment of oral cancer has been found in recent years, though the present treatments improve the quality of life of oral cancer patients but the overall survival rate of years has not improved in the past decades.

Cancer research is growing rapidly as evidenced by the increasing research publication output. Bibliometric analysis helps in studying the various facets of publication productivity in different research areas.^[10-11] Several bibliometric studies have

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reported analysis of cancer literature.^[12-14] There are bibliometric studies on cancer of specific organs such as cervical cancer,^[15-16] breast cancer^[17] and oral cancer,^[18] while other bibliometric studies are on cancer in specific countries^[19-21] including a study on global perspectives.^[22] Specific country based cancer studies include Arab countries,^[23] Brazil,^[24] France,^[25] Iran,^[26-27] Mexico^[28] and Nigeria.^[29] From the review of literature, it is seen that there are minimum number of bibliometric studies on oral cancer research from India so far. So, this paper attempts to fill this gap by presenting a Bibliometric report on oral cancer research in India.

Objectives of the study

- To analyze the contribution of India in oral cancer research
- To study the research performance of Indian institutions in oral cancer;
- To identify Indian oral cancer researchers;
- To find preferred journals in which Indian oral cancer researchers publish their works; and
- To examine the citations of journals from which oral cancer researchers acquire knowledge.

METHODOLOGY

The Web of Science (WOS) database was searched (25-12-2017) for records on oral cancer using the keywords oral cancer, Mouth Neoplasm, Neoplasm, Mouth Neoplasms, Oral Neoplasm, Oral Neoplasm, Oral Neoplasms, Neoplasms, Mouth, Cancer of Mouth, Mouth Cancers, Mouth Cancer, Cancer, Mouth, Cancers, Mouth Oral Cancer, Cancer, Oral, Cancers, Oral, Oral Cancers, Cancer of the Mouth available in title, abstract and keyword fields. The geographical location was kept as India. All these keywords used for tumors or cancer of the human oral and have been obtained from Medical Subject Heading (MeSH) for oral Cancer available at PubMed of National Center for Biotechnological Information (NCBI). The following search string was used to retrieve data from WOS.

TS=(Mouth Neoplasm OR Neoplasm, Mouth OR Neoplasms, Oral OR Neoplasm, Oral OR Oral Neoplasm OR Oral Neoplasms OR Neoplasms, Mouth OR Cancer of Mouth OR Mouth Cancers OR Mouth Cancer OR Cancer, Mouth OR Cancers, Mouth OR Oral Cancer OR Cancer, Oral OR Cancers, Oral OR Oral Cancers OR Cancer of the Mouth) AND CU=(India). The Period of study is from 2010 to 2017. Eight Years recent trend in the field is analyzed.

Data Analysis and Discussion

The data were analyzed for tabulating the characteristics of publications, types of publications, productive countries, and then further analyzed for Indian contribution in terms of performance by institutions, journals, authors and their citation impact and Hirsch Index (*h*-Index).^[30]

The research productivity on oral cancer by the global scientists is accounted to 37680. The publications on oral cancer increased with a slow space from 9.64% to 15.15 with the little fluctuations found during the study period 2010 to 2017. The Indian scientists' publications are 2606 in total which started with 147 from 2010 to 528 in 2016. The year 2017 shows a declining trend as 419. Table 1 explains the share of India in collaborating with the global level.

Table 2 explains the most productive countries and their publication share on oral cancer research. A total of 37,680 records were retrieved from WOS using the query discussed in the methodology. Table 1 gives the publication productivity of the top twenty-five countries on oral cancer research in recent years. It was found that the USA was the most productive country with 31.34% of global share of publications on oral cancer. India is ranked 4th in terms of total publications with 2606 papers which is 6.92% of global literature. In terms of global share of publications during 2010, it was 4.05% (147 articles of 37,680 globally) that increased further to 5.67% (222 articles) during 2011. Since then the research by the Indian authors is continuously increasing i.e., 6.09% (282 articles) in 2013 to 9.25% (528 articles) of global output during 2016. The data was downloaded up to 25-12-2017. So, it shows less in numbers i.e. 419 articles (7.76%) in 2017. India has been ranked at the top 5 place leaving other developed countries behind in the research productivity in the case of oral cancer.

Research performance of Indian institutions on Oral cancer

It was found that four institutes published more than hundred papers on oral cancer during 2010-2017. Table 3 provides publication output of top 25 Indian institutions and their citation impact. Unlike other Bibliometric measures, these 25 institutes have contributed 72.18% of the total Indian publications on oral cancer. The highest contribution came from Tata Memorial Hospital (351 papers), followed by All India Institute of Medical Sciences (213 papers) and Annamalai University, Annamalainagar (193 papers). In terms of citation count, Tata Memorial Hospital tops the list with 916 local citations and global citation score is 5446. All India Institute of Medical Sciences has TLCS of 490 and TGCS 3980. It is followed by Annamalai University with higher Local citation score than AIIMS i.e. 539 and it has TGCS as 2496. Yet the top most local citation and global citation is achieved by Regional Cancer centre 960 and 5171 respectively.

Table 1: Research Output of Oral Cancer by Global Scientists.

Year	Global Output	%	Cum Global Output	Cum %	Indian Output	%	Cum. Indian Output	Cum %	India's share In %
2010	3634	9.64	3634	9.64	147	5.64	147	5.64	4.05
2011	3915	10.39	7549	20.03	222	8.52	369	14.16	5.67
2012	4315	11.45	11864	31.48	240	9.21	609	23.37	5.56
2013	4632	12.3	16496	43.78	282	10.82	891	34.19	6.09
2014	4633	12.3	21129	56.08	294	11.28	1185	45.47	6.35
2015	5443	14.45	26572	70.53	474	18.19	1659	63.66	8.71
2016	5710	15.15	32282	85.68	528	20.26	2187	83.92	9.25
2017	5398	14.32	37680	100.00	419	16.08	2606	100.00	7.76
Total	37680	100.00			2606	100.00			6.92

Table 2: Most Productive countries and their publication share on Oral cancer research.

Country	Number of Publications of Countries year wise									Share of Publications of Countries' Percentage year wise								
	2010	2011	2012	2013	2014	2015	2016	2017	Total	2010	2011	2012	2013	2014	2015	2016	2017	Total
USA	1139	1213	1261	1450	1366	1543	1542	1448	10962	31.34	30.98	29.22	31.30	29.48	28.35	27.01	26.82	29.09
China	207	286	388	483	617	768	813	894	4456	5.70	7.31	8.99	10.43	13.32	14.11	14.24	16.56	11.83
Japan	349	356	449	415	416	489	479	490	3443	9.60	9.09	10.41	8.96	8.98	8.98	8.39	9.08	9.14
India	147	222	240	282	294	474	528	419	2606	4.05	5.67	5.56	6.09	6.35	8.71	9.25	7.76	6.92
England	297	299	313	326	283	342	338	331	2529	8.17	7.64	7.25	7.04	6.11	6.28	5.92	6.13	6.71
Italy	245	238	275	264	271	345	347	309	2294	6.74	6.08	6.37	5.70	5.85	6.34	6.08	5.72	6.09
Germany	221	251	276	264	271	285	318	297	2183	6.08	6.41	6.40	5.70	5.85	5.24	5.57	5.50	5.79
Thaiwan	171	228	232	253	256	249	232	267	1888	4.71	5.82	5.38	5.46	5.53	4.57	4.06	4.95	5.01
France	162	166	181	209	195	230	211	251	1605	4.46	4.24	4.19	4.51	4.21	4.23	3.70	4.65	4.26
Canada	180	166	170	212	204	213	226	209	1580	4.95	4.24	3.94	4.58	4.40	3.91	3.96	3.87	4.19
Brazil	161	155	186	197	178	216	229	212	1534	4.43	3.96	4.31	4.25	3.84	3.97	4.01	3.93	4.07
South Korea	132	156	154	172	178	220	211	219	1442	3.63	3.98	3.57	3.71	3.84	4.04	3.70	4.06	3.83
Spain	154	126	173	165	155	173	166	171	1283	4.24	3.22	4.01	3.56	3.35	3.18	2.91	3.17	3.40
Australia	95	118	124	178	157	146	196	184	1198	2.61	3.01	2.87	3.84	3.39	2.68	3.43	3.41	3.18
Netherlands	118	122	121	153	121	168	180	145	1128	3.25	3.12	2.80	3.30	2.61	3.09	3.15	2.69	2.99
Switzerland	82	73	88	82	91	80	97	89	682	2.26	1.86	2.04	1.77	1.96	1.47	1.70	1.65	1.81
Sweden	55	64	71	71	63	80	96	71	571	1.51	1.63	1.65	1.53	1.36	1.47	1.68	1.32	1.52
Turkey	45	40	70	79	65	105	82	70	556	1.24	1.02	1.62	1.71	1.40	1.93	1.44	1.30	1.48
Poland	46	37	48	71	62	68	95	68	495	1.27	0.95	1.11	1.53	1.34	1.25	1.66	1.26	1.31
Belgium	35	52	55	71	61	75	80	61	490	0.96	1.33	1.27	1.53	1.32	1.38	1.40	1.13	1.30
Denmark	45	45	50	46	60	60	78	75	459	1.24	1.15	1.16	0.99	1.30	1.10	1.37	1.39	1.22
Iran	34	26	42	54	46	58	75	100	435	0.94	0.66	0.97	1.17	0.99	1.07	1.31	1.85	1.15
Greece	52	49	74	47	52	50	43	33	400	1.43	1.25	1.71	1.01	1.12	0.92	0.75	0.61	1.06
Scotland	45	56	43	46	32	42	44	40	348	1.24	1.43	1.00	0.99	0.69	0.77	0.77	0.74	0.92
Israel	49	35	34	57	36	47	47	35	340	1.35	0.89	0.79	1.23	0.78	0.86	0.82	0.65	0.90

Table 3: Most productive institutions in India working on Oral cancer (2010-2017).

Rank	Institution	Publcn	%	TLCs	TGCs	Rank	Institution	Publcn	%	TLCs	TGCs
1	Tata Memorial Hospital, Mumbai	351	9.5	916	5446	14	CSIR, India	43	1.2	38	1545
2	All India Institute of Medical Sciences, New Delhi	213	5.8	490	3989	15	Panjab University, Chandigarh	40	1.1	12	442
3	Annamalai University, Annamalainagar, TN	193	5.2	539	2496	16	King Georges Med University, Lucknow	36	1.0	37	220
4	Regional Cancer Centre, Trivandrum	173	4.7	960	5171	17	Govt. Dental College, Tamil Nadu	32	0.9	55	385
5	Manipal University, Karnataka	90	2.4	59	562	18	Indian Stat Inst, India	32	0.9	105	512
6	University of Madras, TN	78	2.1	136	1406	19	Jamia Hamdard, New Delhi	30	0.8	22	563
7	Chittaranjan National Cancer Inst. Kolkata	75	2.0	150	1009	20	Postgrad Inst. of Med Educn and Res, Haryana	29	0.8	24	322
8	Gujarat Canc Res Inst, Ahmadabad	68	1.8	198	1034	21	Univ Delhi, New Delhi	29	0.8	43	513
9	Int Agcy Res Cancer, Lyon France	58	1.6	598	3887	22	Cent Drug Res Inst, Lucknow	28	0.8	21	251
10	Kidwai Memorial Institute of Oncology, Bangalore	54	1.5	160	2776	23	Jawaharlal Nehru Univ, New Delhi	28	0.8	15	395
11	Indian Inst Technology, India	50	1.4	41	449	24	NIPER, India	28	0.8	97	906
12	Indian Inst Chemical Biology, Kolkata	49	1.3	122	1070	25	Govt. Dental College and Hosp, India	26	0.7	53	218
13	Banaras Hindu University, Varanasi	47	1.3	24	650						
	Total	1499					(1499+381=1880)	381	72.14		

Research output of Indian authors on oral cancer

Table 4 illustrates output and impact of India’s most productive authors on breast cancer research. There are 20 Indian authors who have published thirty-five or more papers during 2010-2017. It was found that these 20 authors belong to 14 institutions of India. These 20 authors contributed 1016 papers, which accounts for 38.99% of the total Indian publications output. Four authors have published more number of papers than the group average (28.14% papers), of which the most productive author is Chaturvedi.P, from Tata Hospital, Mumbai who has published the highest number of 90 publications followed Nagini.S from Annamalai University with 71 papers, Nair MK with 63 papers and Ralhan.R has published 62 papers. The Next five authors have published 50 and more Publications in which an author belongs to Annamalai University reveals that this institution stands to be the one of the most productive institution on oral cancer. The total local citation (TLC) score represents the total number of times a paper has been cited by other papers from the retrieved sample. Second, the total global citation (TGC) score is the total number of times a paper has been cited based on the full ISI Web of Knowledge count.

Going by citation count, the highest number of global citations (TGC- 2133) were received by R. Sankaranarayan’s papers who had an average citation per paper (TLCP) of 33.13, followed by Ralhan.R with 1920 citations (TLCP=20.92) and Nagini.S of Annamalai University, Annamalainagar with 1248 citations (TLCP=22.78). Considering *h*-index as a factor of qualitative measure, it was found that Ralhan.R has highest *h*- Index with a value of 28, followed by Sankaranarayan (*h*-Index=27)^[31] and Kaur.J (*h*- Index=21). Both the authors Nagini S and Nair Mk have *h*-index 20 each.

Journal productivity in terms of Indian contribution

The Indian papers on oral cancer research were published in 934 national and international journals. Table 5 presents the list of journals in which 19 or more papers on oral cancer were published. The publication share of these 25 journals was 44.51% of total Indian research output. Many Indian authors preferred *ORAL ONCOLOGY* for publishing oral cancer research (193 papers). It has Impact Factor (IF) of 4.794 for the year 2017 JCR.

Other journals were *Asian Pacific Journal of Cancer Prevention* (98 papers; IF=2.39), *Journal of Cancer Research and Therapeutics* (98 articles; IF=0.750) and *Indian Journal of Cancer* (98 articles; IF=0.497). As far as the Impact Factor (IF) is concerned, the Indian authors have published 27 papers in *Journal of Clinical Oncology* which has IF 24.008 as the topmost IF in JCR 2017, followed by *Cancer* (19 papers) with IF of 5.997 and *Journal Of Experimental and Clinical Cancer Research* (20 papers) with IF of 5.189 (Table 5). The total local citation (TLC) score

Table 4: Most Productive Authors in India working on Oral cancer (2010-2017).

Rank	Author	PubIn	Percent	TLC	TLCP	TLCxS	TGC	TGCP	TLCR	TLC-B	TLC-E	h-index	h-ind Rank
1	Chaturvedi P, Tata Hosp. Mumbai	90	2.4	180	25.02	95	941	140.05	232	37	14	18	7
2	Nagini S, Annamalai University	71	1.9	294	22.78	92	1248	109.09	249	106	21	20	4
3	Nair MK, Reg.Can. Cent; Trivandrum	63	1.7	248	11.34	144	1235	57.21	78	38	32	20	5
4	Ralhan R, Mt Sinai Hosp.	62	1.7	306	20.92	116	1920	144.35	300	88	17	28	1
5	Kumar A, Mol Oncol Lab, Hyderabad	57	1.5	38	5.63	25	683	91.94	64	13	-	16	9
6	Kumar S, CSIR, Lucknow	56	1.5	60	8.84	35	549	89.26	88	9	-	14	12
7	Kannan S, ACTREC, Mumbai	53	1.4	171	15.08	109	784	67.99	153	37	14	15	11
8	Manoharan S, Annamalai University	50	1.4	237	21.6	65	795	79.24	231	84	27	17	8
9	Sankaranarayanan R, JBL, Bangalore	50	1.4	533	33.13	379	2133	144.25	160	48	90	27	2
10	D'Cruz AK, FHNO, Mumbai	48	1.3	105	12.41	57	613	86.93	89	17	20	13	13
11	Gupta S, ISM, Jharkhand	48	1.3	60	5.39	40	474	75.34	50	10	-	11	17
12	Shukla NK, AIIMS, Newdelhi	48	1.3	123	9.57	39	1019	82.25	154	39	1	20	6
13	Kaur J, Panjab Univ	45	1.2	158	10.03	70	1081	82.24	203	42	4	21	3
14	Prabhash K, Tata Hosp. Mumbai	44	1.2	67	13.38	18	205	39.29	100	20	-	10	19
15	Singh M, PCDSR, Bhopal	41	1.1	70	8.04	36	554	64.81	68	22	-	13	14
16	Joshi A, TMH, Mumbai	40	1.1	40	7.95	10	121	24.86	71	9	-	6	20
17	Kuriakose MA, AIIMS, Kerala	39	1.1	43	6.39	34	293	41.39	51	3	-	11	18
18	Das SN, AIIMS, New Delhi	38	1	86	10.93	32	410	52.5	63	26	8	13	15
19	Panda CK, CNCI, Kolkata	38	1	92	7.71	37	577	54.99	133	26	15	16	10
20	Agarwal JP, Tata Hosp. Mumbai	35	1	56	8.67	28	490	79.62	31	9	1	13	16
		1016	38.99										

TLC- Total Local Citation, TLCP- Total Local Citation per Year, TLCxS- Total Local Citation excluding Self citation, TGC- Total Global Citation, TGCP- Total Global Citation Per Year, TLCR - Total Local Citation Reference, TLC-B= Total Local Citation @ beginning, TLC-E= Total Local Citation @ End

Table 5: Top journals preferred for publishing Indian Oral cancer research.

Journal	Publn	%	IF	TLC	TLCP	TGC	TGCP	TCR
ORAL ONCOLOGY	193	5.2	4.794	579	54.02	2999	272.06	445
ASIAN PACIFIC JOURNAL OF CANCER PREVENTION	98	2.7	2.39*	207	28.20	955	126.61	260
JOURNAL OF CANCER RESEARCH AND THERAPEUTICS	98	2.7	0.750	107	14.69	488	74.75	165
INDIAN JOURNAL OF CANCER	76	2.1	0.497	78	13.36	316	50.36	156
JOURNAL OF CLINICAL AND DIAGNOSTIC RESEARCH	75	2.0	--	4	1.17	43	12.75	63
INTERNATIONAL JOURNAL OF CANCER	70	1.9	6.513	549	32.35	2707	170.69	182
JOURNAL OF ORAL PATHOLOGY and MEDICINE	63	1.7	2.043	177	14.96	909	77.48	179
HEAD AND NECK-JOURNAL FOR THE SCIENCES AND SPECIALTIES OF THE HEAD AND NECK	42	1.1	3.376	134	13.59	738	73.33	77
PLOS ONE	42	1.1	2.806	0	0.00	619	107.75	133
TUMOR BIOLOGY	41	1.1	3.650	29	6.88	153	34.67	118
JOURNAL OF EVOLUTION OF MEDICAL AND DENTAL SCIENCES-JEMDS	36	1.0	--	0	0.00	1	0.25	19
CLINICAL CANCER INVESTIGATION JOURNAL	31	0.8	--	0	0.00	1	0.25	29
RESEARCH JOURNAL OF PHARMACEUTICAL BIOLOGICAL AND CHEMICAL SCIENCES	31	0.8	0.35*	0	0.00	0	0.00	28
CANCER LETTERS	29	0.8	6.375	75	4.44	510	36.78	44
JOURNAL OF CLINICAL ONCOLOGY	27	0.7	24.008	5	0.51	1615	116.60	2
ORAL DISEASES	27	0.7	2.011	74	8.34	367	39.01	90
INDIAN JOURNAL OF OTOLARYNGOLOGY AND HEAD and NECK SURGERY	22	0.6	0.054*	6	0.99	34	4.82	21
MOLECULAR AND CELLULAR BIOCHEMISTRY	21	0.6	2.669	30	3.00	425	44.64	19
JOURNAL OF EXPERIMENTAL and CLINICAL CANCER RESEARCH	20	0.5	5.189	25	1.24	218	12.76	20
JOURNAL OF ORAL AND MAXILLOFACIAL SURGERY	20	0.5	1.916	7	0.74	75	9.69	15
JOURNAL OF SURGICAL ONCOLOGY	20	0.5	2.993	45	3.23	276	20.67	38
RSC ADVANCES	20	0.5	3.108	22	4.97	94	22.48	34
SOUTH ASIAN JOURNAL OF CANCER	20	0.5	--	4	1.00	20	5.67	69
CANCER	19	0.5	5.997	173	9.31	745	45.54	19
JOURNAL OF BIOMEDICAL OPTICS	19	0.5	2.530	0	0.00	345	37.62	78
Total	1160	44.51						

TLC- Total Local Citation, TLCP- Total Local Citation Per year, TGC - Total Global Citation, TGCP- Total Global Citation Per year, TCR – Total Cited Reference.

Table 6: Spearman's Rank Correlation Coefficient between TLC and TGC.

Journal	IF	TLC	Rank of TLC	TLCP	TGC	Rank TGC	TGCP	TCR	d	d^2
Oral Oncology	4.794	579	25	54.02	2999	25	37.62	78	0	0
Asian Pacific Journal of Cancer Prevention	2.39*	207	23	28.2	955	22	22.48	34	1	1
Journal of Cancer Research and Therapeutics	0.75	107	19	14.69	488	16	39.01	90	3	9
Indian Journal of Cancer	0.497	78	18	13.36	316	12	0.25	29	6	36
Journal of Clinical and Diagnostic Research	--	4	6.5	1.17	43	6	170.69	182	0.5	0.25
International Journal of Cancer	6.513	549	24	32.35	2707	24	45.54	19	0	0
Journal of Oral Pathology and Medicine	2.043	177	22	14.96	909	21	20.67	38	1	1
Head And Neck- Journal For The Sciences And Specialties of The Head And Neck	3.376	134	20	13.59	738	19	12.76	20	1	1
Plos One	2.806	0	3	0	619	18	44.64	19	-15	225
Tumor Biology	3.65	29	13	6.88	153	9	107.75	133	4	16
Journal of Evolution Of Medical And Dental Sciences- Jemds	--	0	3	0	1	2.5	126.61	260	0.5	0.25
Clinical Cancer Investigation Journal	--	0	3	0	1	2.5	74.75	165	0.5	0.25
Research Journal of Pharmaceutical Biological And Chemical Sciences	0.35*	0	3	0	0	1	272.06	445	2	4
Cancer Letters	6.375	75	17	4.44	510	17	4.82	21	0	0
Journal of Clinical Oncology	24.008	5	8	0.51	1615	23	5.67	69	-15	225
Oral Diseases	2.011	74	16	8.34	367	14	36.78	44	2	4
Indian Journal of Otolaryngology and Head and Neck Surgery	0.054*	6	9	0.99	34	5	12.75	63	4	16
Molecular and Cellular Biochemistry	2.669	30	14	3	425	15	116.6	2	-1	1
Journal of Experimental and Clinical Cancer Research	5.189	25	12	1.24	218	10	34.67	118	2	4
Journal of Oral and Maxillofacial Surgery	1.916	7	10	0.74	75	7	77.48	179	3	9
Journal of Surgical Oncology	2.993	45	15	3.23	276	11	0.25	19	4	16
RSC Advances	3.108	22	11	4.97	94	8	73.33	77	3	9
South Asian Journal of Cancer	--	4	6.5	1	20	4	50.36	156	2.5	6.25
Cancer	5.997	173	21	9.31	745	20	9.69	15	1	1
Journal of Biomedical Optics	2.53	0	3	0	345	13	0	28	-10	100
Total										685

Calculation Square: n= 25, Sum (d²) = 685, Spearman's r value rs= 0.7365.

Table 7: Top cited Oral cancer journals of Indian research Scientists.

Name of the Journal	2010	2011	2012	2013	2014	2015	2016	2017	Total	IF
Colloids and surfaces b-bio interfaces	21	67	96	127	179	224	230	236	1180	3.887
Journal of clinical oncology	105	107	119	114	102	90	82	62	781	24.008
Lancet	40	51	53	75	110	86	79	62	556	47.831
JAMA oncology	0	0	0	0	0	9	134	335	478	16.559
Journal of the national cancer institute	65	53	68	63	60	70	43	49	471	12.589
Journal of controlled release	35	48	29	49	53	73	78	53	418	7.786
British journal of cancer	36	49	32	41	41	33	35	33	300	6.176
Journal of pharmacy and pharmaceutical sciences	36	41	38	40	18	37	34	25	269	1.811
Lancet oncology	26	25	30	25	36	25	32	25	224	33.90
Addiction biology	12	23	25	17	26	19	21	21	164	4.603
Theranostics	0	0	0	0	11	42	63	46	162	8.712
Nanotechnology	3	21	22	23	22	24	14	18	147	3.44
Respirology	12	16	20	21	25	17	22	12	145	3.256
International journal of cancer	12	24	15	20	27	17	15	10	140	6.513
Journal of coordination chemistry	0	1	14	27	23	26	26	23	140	1.795
Carbohydrate polymers	0	4	21	19	21	14	31	28	138	4.811
Journal of pharmacy and pharmaceutical sciences	10	12	12	15	17	21	21	20	128	1.811
Expert opinion on investigational drugs	0	6	17	25	18	14	26	20	126	4.03
Clinical cancer research	15	13	25	25	19	11	10	5	123	9.619
Annals academy of medicine singapore	7	11	16	20	22	16	12	16	120	0.617

represents the total number of times a paper has been cited by other papers from the retrieved sample. Second, the total global citation (TGC) score is the total number of times a paper has been cited based on the full ISI Web of Knowledge count.

Spearman's Rank Correlation coefficient between Total Local Citation and Total Global Citation proves that the rs value found in the Table 6 is 0.7365 and it is clear there is no strong correlation between the TLC and TGC.

$$\text{Formula SRC} = r_s = \frac{6\sum d^2}{n(n^2 - 1)}$$

Table 7 presents the list of journals that the Indian authors cited for their publication purpose during the study period 2010 to 2017. There have been 20 top cited journals are listed in the table. Among them the top cited journal by the oral cancer authors is *Colloids and Surfaces B-Biointerfaces* which has got 1180 citations in total and it was increasingly cited year to year. It has IF 3.887. The next highly cited journal is *Journal of Clinical Oncology* with 781 citations followed by *Lancet* 556 citations and *Jama Oncology* with 478 citations. The other Journals have received less than 450 citations. As far as Impact Factor is concerned, the top most IF journal that has cited 556 times is *Lancet* (47.831-JCR 2017). The second top IF journal is *Lancet Oncology* (IF 33.90) followed by *Journal of Clinical Oncology* with IF 24.008 and *Jama Oncology* with IF 16.559.

The Journal of the National Cancer Institute has recorded IF 12.589. The other Journals have IF less than 10.

CONCLUSION

Cancer has become one of the deadliest and life-threatening diseases for the global population. Majority of research in the area of cancer is focused on discovering new carcinogens, causes, and discovery of drugs. The lifetime risk for mortality from cancer in India for both males and females is 61%. According to statistics, the number of deaths in 2012 due to oral cancer is 36463 in males and 15361 in females.^[7] The present study presents a recent year's perspective of Indian oral cancer research. The study reveals that the Indian oral cancer research is continuously increasing. Initially the research trend was low but the largest number (75%) of publications appeared during the last three years of the study. This is one of the few studies that may have found that a hospital (Tata Memorial Hospital) and a university (Annamalai University) have very active research activities as compared to other specialized research institutes.

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SUMMARY

The study focuses on the pattern of literature growth, global publication share and ranking, authorship pattern, collaborative coefficient, productivity and impact of most productive institutions and authors, sources and highly cited articles based on data obtained on oral cancer research from Web of Science. The study lights on the citation score gained by the Indian Scientists in terms of their publication and h-index. It is supported by the spearman's correlation coefficient ranking analysis. The study will motivate the researchers in the area of Oral cancer and policy makers to understand the pit falls and take measures to overcome the pit falls.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

ABBREVIATIONS USED

TLC: Total Local Citation; TLCP: Total Local Citation Per year; TGC: Total Global Citation; TGCP: Total Global Citation Per year; TCR: Total Cited Reference.

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