A Scientometric Analysis of scientific communications on "Gastritis"

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Abstract

This research endeavor is aimed to explore the quantitative analysis of global productivity on "Gastritis". Data for this quantitative analysis is extracted from Web of Science indexing database using proper methodology. This research highlights the research productivity trend for the period of 2011 to 2021 and research performanceof research institutions, nations and authors. The research also finds out the most preferred journals, document types and preferred language for publication of the research outputs. The citation trend is also studied and tabulated accordingly. A total of 7083 publications appeared during the period of 2011-2021. Research findings suggest USA as one of the most contributing nations followed by People's Republic of China and Japan. Malfertheiner P and "Helicobacter" are the most prolific author and journal respectively. Highest number of publications appeared in the form of articles contributing to 70.5% of the total publication and English is the most preferred language in which 97.5% publications appeared.

Keywords: Gastritis, hypertrophic gastritis, atrophic gastritis, gastric ulcer, Web of Science

Introduction:

Scientometric studies are used to quantify the research performance of any entity involved in research. We use a number of statistical and bibliometric methods to measure the research on quantitative basis. The present study based on analysis of scientific communications on Gastritis using scientometric tools and techniques. This study is an endeavor to analyze the publication productivity on gastritis visa vis the prolific nations, authors, journals and institutions. Chronological output, document type, citation analysis, language preferences etc have been studied also.

Review of literature:

(Yuan, Cai, Liu, & Tang, 2020) studied the 100 topmost cited papers in gastric disease and found that out of the total 100 most cited papers 41 was from USA. The authors revealed that the 100 top cited papers are distributed among 32 journals and out of the 32 journals Lancet or the New England Journal of Medicine carried on third of the total top cited articles. The authors concludes that the journal impact factor has played a big role as both the journals have an impact factor >40 in 2017-18. **(Amanullah & Seethai, 2018)** analysed the availability of e-books on library and information science in EBSCO e-book collection. The study reveals that ALA edition of American Library Association has published highest number of eBooks on library and information science followed by ALA editions and facet publishing. The authors also analysed the downloading facility of e books and found that 98.50% of e books are downloadable. **(Klingelhöfer, Id, Schöffel, Id, & Id, 2021)**has done a scientometric study of gastric cancer and found that up to 2017 there were as many as 34195 articles. In the most prolific authors Larren from Finland ranked first with 3836 citations seconded by Parsonnet et al from USA with 3040 citations. They also analysed productivity country wise and found that china tops the nations list with 8931 publications followed by Japan (8454), USA (4051) and South Korea (3424). **(Amanullah & Khiste, 2019)**studied the availability of open access eBooks on chemical technology in the Directory Of Open Access Books. The authors studied the licensing pattern of the books on chemical technology and found that 63.64 percentages of the eBooks are licensed under BY-NC-ND licence type followed by 27.27% under BY-NC type of licensing, and 9.09% under CC-By type of licensing. The study reveals that MDPI Multidisciplinary Digital Publishing Institute published most of the eBooks followed by EDP Sciences and Springer. The authors found that 86.36% of books used only ISBN as standard number while as 13.64% books used both ISSN and ISBN.**(Powell, Hughes, Wheat, & Lewis, 2016)** on the basis of citation and impact factor studied the influential paper on gastric cancer. The study revealed that the most frequently referenced topics belonged to pathology followed by Aetiology/Pathophysiology and science. Institution wise 4 papers each appeared in the top hundred list for Technische Universitat München and National Cancer Institute Bethesda

followed by University of Porto and Osaka University. The top most hundred influential papers appeared in as many as 36 journals where Cancer Research rank first in the journal list with 13 papers of the 100 influential papers followed by Cancer with 9 manuscripts and New England Journal of Medicine with 8 manuscripts. **(Bansal, 2019)** studied the publication trend on Buruli Ulcer and found that the highest number of papers were published in the year 2014 during the study period of 2000-2017. It shows that most of the publication appeared as journal articles (85.83) and in English language (71.85). The authors found PLoS Neglected Tropical Diseases as the rank 1 journal with 159 papers followed by American Journal of Tropical Medicine and Hygiene and Emerging Infectious Diseases. Portaels F from Institute of Tropical Medicine, Belgium ranks 1st in the prolific authors with 107 publications followed by Pluschke G from Functional Genomics Centre, Zurich, Switzerland with 77 publications. The authors found that of the Control Of Neglected Tropical Diseases authored by Hotez P.J., et. Al is the highest cited paper with 874 citations seconded by Genetic Dissection of Immunity to Mycobacteria: The Human Model authored by Casanova J.-L., Abel L with 695 citations. **(Bang, Lee, & Baik, 2019)** carried out a study on Helicobacter pylori research and found that of the 100 most cited articles in WOSCC database11 articles are form the journal "Gut" followed by Gastroenterology with 9 and Helicobacter with 8 articles in the top 100 cited article list. The authors analysed the top 10 cited articles in Google scholar and found that Unidentified curved bacilli in the stomach of patients with gastritis and peptic ulceration published by Marshall B J in the journal Lancet got highest number of citations in PubMed Central followed by the article Helicobacter pylori infection and the risk of gastric carcinoma published in N Engl J Med by Parsonnet J. **(Ahmad & Batcha, 2020)** studied the scientometric of publications on Alopecia Areata Disease. Their research revealed that of the Institutions with most of the publications included Columbia University, University of Manchester and University of Miami ranked 1st, 2nd and 3rd with 127, 61 and 55 publications each. The research was carried out for the period of 2010 to 2019.the authors found that Christiano AM, Clynes R and Paus R are the top three authors that contributed to the research on Alopecia Ariata Disease, and they have contributed 84, 60 and 53 articles respectively. They also studied the authorship pattern and found that as many as 16.46% articles are authored jointly by four persons followed by 16.27% articles jointly authored by three persons and 14.86% articles jointly authored by two persons .**Wani, Z.A., Kharadi, A.H. & Ganaie, M. (2017)** analysed the publication productivity on Hepatitis-E literature. The study revealed that USA, India and Peoples Republic of China are the top three prolific nations with 233, 161 and 151 publications during the period of 1999-2-11. The study also revealed that most of the articles are produced in the years of 2011, 2009 and 2010 with 154, 147 and 119 articles respectively. Journal of Medical Virology, Journal of General Virology and journal of Clinical Microbiology captured the top three ranks with 84, 49 and 42 publications.**(Gupta & Bala, 2013)** studied bone marrow research for the period of 2003-2012 in India. They found that during the period of study the highest number of publications are produced by USA with a percentage share of 32.74% followed by China with a share of 8.59% and Japan ranks 3rd with 8.30% of total global publications. The authors studied the publication trend subject wise and found that majority of the publications are published in the subject area of medicines with of share of 76.58% followed by biochemistry, genetics and microbiology with a share of 13.74%. of the prolific authors they found that N Verma ranks first with total citation of 82 and H Index 6 followed by M Mahapatra with total citation of 44 and H Index of 5. **(Sachithanantham & Raja, 2015)** in a study for the period of 1950-2014 analyzed the rabies research literature of India. The study revealed a constant growth in the literature related to rabies research with the highest no of single year output occurring in the 5 year period of 2010-2014. The study revealed that India has produced 495 publications against the world output of 12977 which accounts to 3.81%. National Institute of Mental Health and Neurosciences, (NIMHANS), Kempegowda Institute of Medical Sciences and Indian Veterinary Research Institute, Izatnagar are the top three institutions which contributed 91, 58 and 49 publications respectively. They also analyzed the regional output and found that Karnataka is ranking 1st followed by Delhi and Uttar Pradesh. **(Ramakrishnan & Thavamani, 2015)** made a bibliometric study of leptospirosis and found that a total of 714 publications were produced by India from 2006 to 2013 and the highest number of publications came in the year 2006. The analysis found that 67.65% of publications appeared as articles followed by 16.67% as letters and 9.80% as reviews. They also analyzed the relative growth rate and doubling time and found that there is a decreasing trend in growth rate and increasing trend in doubling time. **(Meena & Nagarajan, 2013)** made a study on research out put on Malaria and analyzed data in order to find out the publication productivity year wise, top institutions, document type and language used. They found that from 1974 to 2013 a total of 2924 publications were produced with highest number counting to 229 in the year of 2012. They also analyzed the type of publications and found that most of the research output appeared as articles (76.33%) followed by review (8.38%) and letters (5.13%). The analyses found that English is the favorable language chosen by the authors with 97.09 percent publications appearing in the said language and is followed by French, German and Russian languages.

Aims & Objectives: this research was carried out with the following aims and objectives
a)   To analyze the chronological global productivity.

b)   To analyze the Nation wise research performance.
c)   To analyze the Authorship pattern
d)   To analyze the language preferences for publication.
e)   To analyze the institution performance.
f)   To analyze the preference of publication by document type.
g)   To analyze the citation trend.
h)   To analyze the journal preferences for publication.
i)   To analyze the application of "Bradford's Law of journal productivity".

Methodology: The research is an endeavor towards quantitative analysis of global publication productivity on "Gastritis". For this research data was extracted from the popular indexing database "Web of Science" core collection using advanced search by filtering the search for the period of 2011-2021. Search term "Gastritis" was used in the search box and data was extracted on 10-08-2021. Data retrieved in plain text (.txt) was analyzed and tabulated by using different tools. HistCite, Bibexcel, MS Excel and MS word are used in order to obtain accurate results and visuals.

Analysis & Discussion:

The data is analyzed using different tools to evaluate the results within the outline of the aims of research.

1.1. *Analysis of Global publication productivity by year of publication*: A total of 7083 records were generated on gastritis research during the period of study (2011-2021). The research trend shows an uneven growth in gastritis literature. The highest number of research contributions came in the year 2020 and is followed by 2013 and 2019. Highest global citation score is generated by the articles published in the year 2013 followed by 2012 and 2014 with 12948, 12583 and 12361citations respectively.

Table-1 (Analysis of Global publication productivity by year of publication)

S.No	Year of Publication	Publications	TGCS
1	2011	626	12097
2	2012	651	12583
3	2013	738	12948
4	2014	689	12361
5	2015	674	9868
6	2016	675	8987
7	2017	716	7197
8	2018	680	6176
9	2019	719	4220
10	2020	840	1672
11	2021	66	60
13	Total	7083	88169

1.2. *Analysis of Global publication productivity by author*: as much as 26935 authors contributed for research on gastritis. Malfertheiner P is the most prolific author with 89 publications and 2848 total global citation score. He

is followed by Rugge M and Geneta RM with 83 and 70 publications on gastritis. The 20 top ranking prolific authors are shown in the **Table-2**. The data suggest that most of the publications are authored by multiple authors.

Table-2 Top 20 prolific authors

S. No	Author	Publications	TGCS
1	Malfertheiner P	89	2848
2	Rugge M	83	1327
3	Genta RM	70	1331
4	Kim JH	65	1202
5	Yamaoka Y	58	949
6	Yuan Y	57	774
7	Annibale B	54	903
8	Cho JY	53	1185
9	Di Mario F	52	335
10	Lahner E	44	574
11	Lenti MV	44	297
12	Zhang Y	44	655
13	Zhang L	42	632
14	Kim N	41	986
15	Leja M	40	958
16	Miceli E	39	203
17	Suzuki H	39	1253
18	Xu Q	39	593
19	Graham DY	38	1869
20	Li Y	38	397

*1.3. Analysis of Global publication productivity by journal preference***:** The publications on gastritis for the study period are published in as many as 1490 Journals. Data in **Table-3** shows the 20 most preferred journals. The journal helicobacter is the most preferred one where 323 publications on gastritis appeared followed by World Journal Of Gastroenterology with 217 publications and American Journal Of Gastroenterology with 190 publications. World Journal of Gastroenterology has got the highest citation score followed by Helicobacter and Plos One.

Table-3 Top 20 most prolific journals

S. No	Journal title	Publications	TGCS
1	HELICOBACTER	323	3388
2	WORLD JOURNAL OF GASTROENTEROLOGY	217	4725

3	AMERICAN JOURNAL OF GASTROENTEROLOGY	190	779
4	GASTROENTEROLOGY	189	2386
5	JOURNAL OF GASTROENTEROLOGY AND HEPATOLOGY	171	1024
6	PLOS ONE	154	2682
7	DIGESTIVE AND LIVER DISEASE	124	377
8	DIGESTIVE DISEASES AND SCIENCES	99	1228
9	JOURNAL OF ETHNOPHARMACOLOGY	78	1544
10	MEDICINE	71	328
11	SCANDINAVIAN JOURNAL OF GASTROENTEROLOGY	68	783
12	SCIENTIFIC REPORTS	64	1054
13	MODERN PATHOLOGY	59	210
14	BMC GASTROENTEROLOGY	57	762
15	ALIMENTARY PHARMACOLOGY & THERAPEUTICS	56	1147
16	LABORATORY INVESTIGATION	56	77
17	DIGESTION	50	469
18	GASTROENTEROLOGY RESEARCH AND PRACTICE	49	329
19	GASTROINTESTINAL ENDOSCOPY	49	590
20	VIRCHOWS ARCHIV	49	283

1.4. Analysis of Global publication productivity by Document type: The publications on gastritis have appeared in as many as 12 document types. Data in **Tabl-4** suggest that highest number of publications, around 70% appeared in the form of journal articles with 4991 records followed by Meeting Abstracts (943) and reviews (745).

Table-4 Document types

S. No	Document Type	Publications	Percentage	TGCS
1	Article	4991	70.5	69463
2	Meeting Abstract	943	13.3	62
3	Review	745	10.5	16369
4	Editorial Material	165	2.3	932
5	Letter	135	1.9	302
6	Article; Proceedings Paper	48	0.7	777
7	Correction	20	0.3	15
8	Article; Book Chapter	14	0.2	94

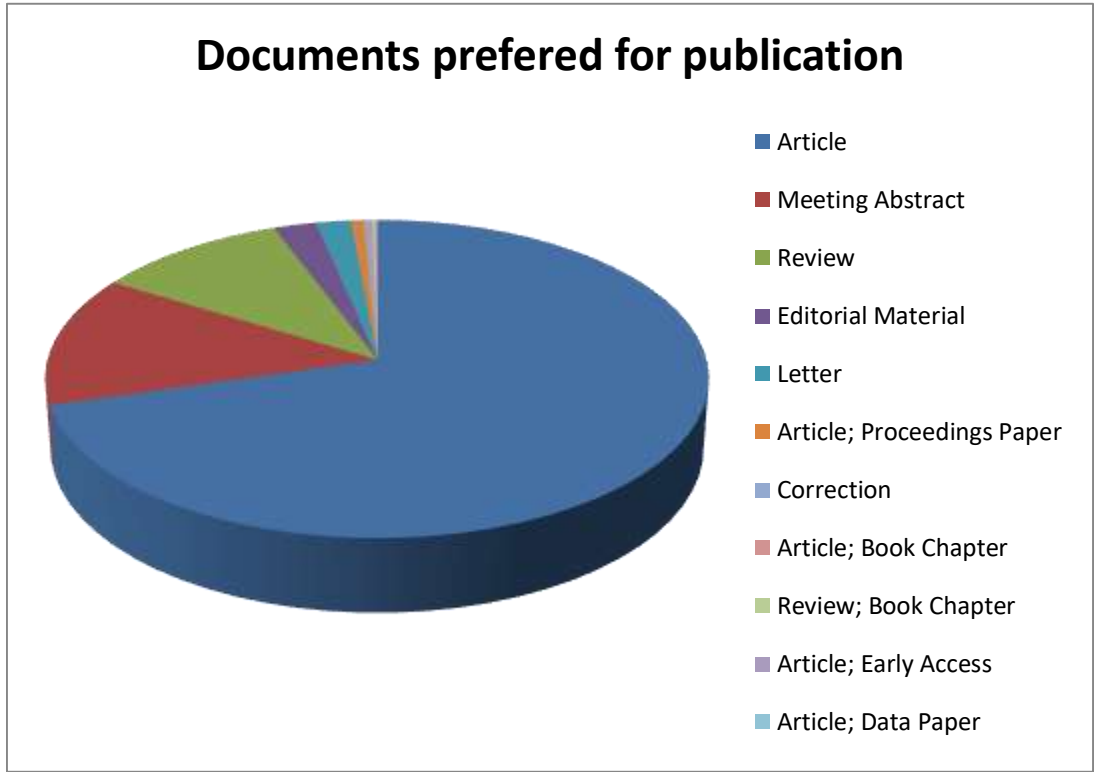| 9	Review; Book Chapter	11	0.2	155
10	Article; Early Access	9	0.1	7
11	Article; Data Paper	1	0.01	0
12	News Item	1	0.01	0
13	**Total**	**7083**	**100**	**88176**

Figure-1

1.5. Analysis of Global publication productivity by Language preference: ***Figure-2*** shows that the highest number of publications appeared in English language counting to 97.5% of total publication and is followed by Spanish, German and Russian. Data suggest that publications on gastritis appeared in 15 different languages. As per expectation the highest global citation score for publications in English language is highest followed by Spanish, French and German.
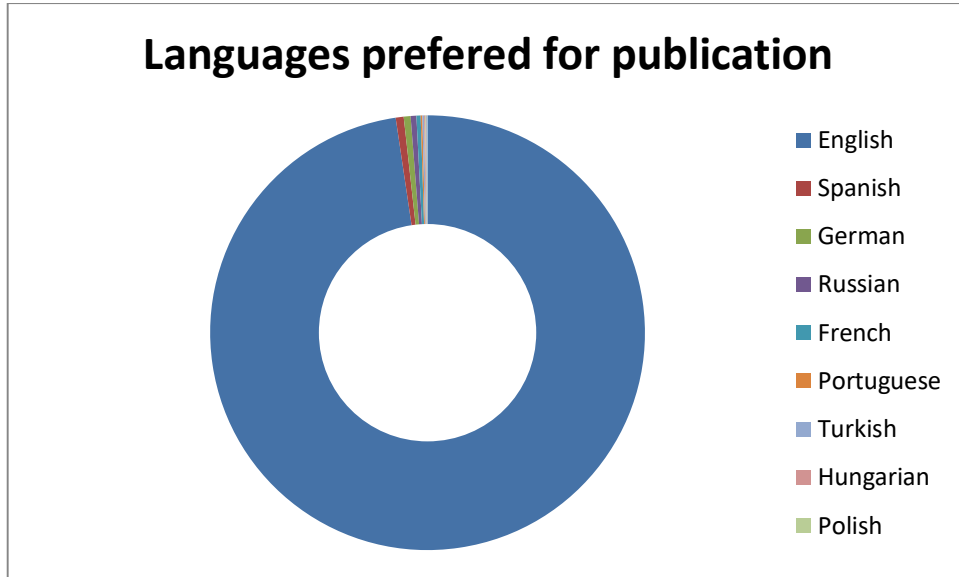
Figure-2

1.6. Analysis of Global publication productivity by nation: The data suggests that as many as 124 countries contributed in publication of scholarly literature on gastritis. USA ranks first among nations by producing 1448 publications followed by 1171 publications by Peoples Republic of China, Japan (813) and Italy (538). India ranks 14th among the 124 nations.

Table-5 publications by nation wise

S. No	Country	Publications	TGCS
1	USA	1448	25075
2	Peoples Republic China	1171	14419
3	Japan	813	13818
4	Italy	538	8457
5	South Korea	501	6560
6	Germany	354	8755
7	Turkey	266	2002
8	Iran	223	2383
10	Brazil	217	2414
11	UK	200	5688
12	Australia	188	3618
13	France	156	3238
14	India	152	1517
15	Taiwan	122	1716
16	Spain	120	2482
17	Canada	115	1678

18	Poland	100	1088
19	Sweden	96	2846
20	Portugal	92	2965

1.7. Analysis of Global publication productivity by Organization: As many as 6548 institutions/Organizations have contributed in gastritis research. Baylor College of Medicine ranks first among the prolific institutions and is followed by Vanderbil University, Seoul National University, University of Padua and China Medical University. Vanderbilt University tops in global citation scorerank followed by Baylor College of Medicine and Seoul National University.

Table-6 Institution wise analysis

S. No	Institution	Publications	TGCS
2	Baylor College of Medicine	113	2888
3	Vanderbilt University	102	3330
4	Seoul National University	98	1891
5	University of Padua	89	1863
6	China Medical University	85	1493
7	University of Tokyo	81	1751
8	Sungkyunkwan University	73	1469
9	Oita University	69	1213
10	Tehran university of Medical Science	66	1074
11	Peking University	63	884
12	Shanghai Jiao Tong University	63	859
13	National Cancer Center	59	1035
14	Otto von Guericke University	58	1306
15	University of Porto	57	1828
16	Michael E DeBakey VA Medical Center	53	1386
17	Shandong University	48	537
18	Yonsei University	48	665
19	University of Milan	45	398
20	University of Parma	45	575

1.8. Analysis of Global publication productivity by Citation Trend: The data in **Table-7** suggests that the highest number of publications fall under the range of 1-10 citations. As the citation range increases the publications count is decreasing hereby showing a reverse proportionality trend. One among the 7083 publications got as many as 551 citations followed by 465 and 434 citations by another two publications.

Table-7 Citation Trend

Range of Citation	Count of Publications

Zero	1587
1 to 10	3090
11 to 20	1164
21 to 30	510
31 to 40	783
41 to 50	150
51 to 60	96
61 to 70	70
71 to 80	44
81 to 90	27
91 to 100	20
101 to 110	16
111 to 120	7
121 to 130	8
131 to 140	3
141 to150	6
151 to 160	1
161 to 170	4
171 to 180	2
181 to 190	4
191 to 200	0
201 to 210	1
211 to 220	1
221 to 230	1
231 to 240	0
241 to 250	0
251 to 260	1
261 to 270	1
271 to 280	0
281 to 290	1
291 to 300	2
more than 300	5

1.9. Applicability of Bradford's law: the law states that ordering the journals in descending order of productivity for a given research topic can be categorized in three zones. Zone first, second and third containing equal number of articles but different number of journals producing these articles in the fashion of $1:n:n^2$. The present study show that first 2370 articles were produced by 24 journals (Zone-1), next 2385 articles were produced by 195 journals (Zone-2) and next 2340 articles were produced by 1271 journals (Zone-3). It fulfills that application of "Bradford's Law of journal productivity" in gastritis research.

Conclusion: The present study suggests that research on gastritis from 2011 to 2021 has shown an uneven trend. USA, Peoples Republic of China and Japan has contributed considerably towards gastritis research. This study shows that as many as 1490 different journals are being preferred for publication. The application of Bradford law was not found applicable as the first 24 journals contributes 1/3rd of the total publications and later it doesn't show the 1: n: n2proportion. The highest number of publications appeared in the form of articles contributing 75.5% followed by

meeting abstracts and reviews. Highest number of publications appeared in English language followed by Spanish and German. Citation trend was studied by making range of citations and number of publications falling in the ranges. It's found that 5 publications are such which received more than 300 citations. Citation analysis suggests that 64 publications have received more than 100 citations.

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