AUDIT ARTICLE

Bibliometric analysis of the Journal of Pakistan Medical Association during the period from 1965 to 2018

Aamir Raoof Memon

Abstract

Objective: To conduct a bibliometric analysis of the citable documents published in the Journal of Pakistan Medical Association from 1965 to 2018.

Methods: This bibliometric study of the Journal of Pakistan Medical Association was conducted using Scopus and included citable documents (original articles and review articles). The outcome parameters were number of publications, citations, top countries, authors, institutions, and citation analysis and impact factor. In addition, most frequent author keywords were presented as visualization map, using VOS viewer. The data was imported from Scopus as Microsoft Excel files and analyzed.

Results: The total number of documents identified was 8,521 and 7,245 (85.03%) were included in the analysis. Articles were the most common category of the documents articles published in the journal were articles (n=6,721; 78.88%). The highest number of publications (n=441) was recorded for 2016 and citations (n=3,060) for 2017. The highest number of documents came from Pakistan (57.83%) and Aga Khan University (26%). There was a steep increase in impact factor from 0.409 to 0.718 from 2013 to 2017. The most common author keywords on the visualization map were 'Pakistan', 'diabetes', 'medical students', 'diabetes mellitus', 'prevalence'.

Conclusion: There is a continuous increase in the number of publications, citations, and impact factor of the Journal of Pakistan Medical Association. In addition, the journal appears to attract wider audience, which is reflected by the analysis of its two-thousand highly cited papers.

Keywords: Bibliometric indicators, Citation analysis, Databases, Journals, Publications. (JPMA 69: 1150; 2019)

Introduction

Scientific journals serve as the main channels of knowledge dissemination and propagation of science, which makes 'assessment of scientific journals' an important aspect of demonstrating the reliability of the material being published in them.[1] Traditionally, 'peer review' has been the major method to determine the quality of scientific work, but since the 1990s, quantitative assessment measures, such as bibliometrics, have gained increasing importance.[2] There are several definitions of the term 'bibliometrics' but it may be comprehensively defined as "to shed light on the processes of written communication and of the nature and course of development of a discipline (in so far as this is displayed through written communication), by means of counting and analysing the various facets of written communication … the application of mathematics and statistical methods to books and other media of communication ...".[3,4] Currently, the use of bibliometrics has become a key component of assessment of research quality and has been changing the practice of research, because of their capability to yeild quick results and easy accessibility of various bibligraphic databases (such as Scopus, Web of Science etc.).[2] Through bibliometrics, we can gain information about several parameters of research output such as i) the number of authors, their country of origin and affiliations; ii) sources of funding; iii) research design, topic, and focus of the research; and iv) citation indexes to quantify the uptake of the research.[5] Thus, bibliometric methods may be used for mapping the scientific productivity of journals, authors, institutions, countries, authorship pattern, research collaboration, and overall scientific growth in any discipline.[3] Because of these remarkable features, the use of bibliometric techniques is increasing rapidly across all the fields and in different parts of the world. The use of bibliometric analysis indicators (i.e. the number of publications, citation index, document types and the impact factor etc.) is becoming increasingly common to examine the objective performance and development of several fields, such as neuroscience, bariatric surgery, as well as various journals.[5-9] In several fields, some authors have attempted to measure the impact and performance of several journals while others have focused on a specific journal.[5,9-14] In Pakistan, journal-specific bibliometric for Pakistan Journal of Medical Sciences, Journal of Pakistan

Institute of Physiotherapy and Rehabilitation Sciences, Peoples University of Medical and Health Sciences for Women, Nawabshah, Sindh, Pakistan.
Correspondence: Email: dpt.aamir@gmail.com

Medical Association, Journal of the College of Physicians and Surgeons Pakistan, Journal of Ayub Medical College, and Rawal Medical Journal have been conducted.[15-19] Therefore, bibliometric studies at regular intervals are required for assessing the standard and standing of a journal, as it helps in assessment of progress and provides future directions.

The Journal of Pakistan Medical Association (JPMA or J Pak Med Assoc; ISSN: 0030-9982), is an international, peer-reviewed, biomedical journal of the Pakistan Medical Association published quarterly since 1953, and converted into a monthly journal in 1957. The JPMA (http://www.jpma.org.pk/) is recognized by the Higher Education Commission of Pakistan and Pakistan Medical and Dental Council (PMDC). It is abstracted by MEDLINE/PubMed and indexed in the Index Medicus (1975), Embase/ExcerptaMedcia Netherlands, Scopus (1966, from 1972 to Present), and the Science Citation Index Expanded (SCIE). In addition, JPMA is the member of the International Committee of Medical Journal Editors (ICMJE; 2009) and the Committee on Publication Ethics (COPE; 2010). The website of the journal was created in 2003, and all the articles from January 1978 are available online free of cost. Recently, a bibliometric analysis of the Journal of Pakistan Medical Association (JPMA) was conducted but it did not involve the information retrieval from any scientific database and covered a limited period.[16] Therefore, the purpose of this study was to analyze, using Scopus database, different bibliometric parameters of the publications in the Journal of Pakistan Medical Association (from 1965 to 2018).

Methods

This study is a bibliometric analysis of research published in the Journal of Pakistan Medical Association. Although several electronic databases may be used to perform bibliometric analyses, Scopus was used to retrieve the required data for the current study. The search strategy used for the current study is illustrated in Figure-1. First, the source title "Journal of the Pakistan Medical Association" was searched using the simple search query, it yielded 8,521 documents. Second, the time duration was restricted to 1965 and 2018 (n=8,521 documents). Finally, the 'document type' was limited to the citable documents (Original Articles and Review Articles), this step found 7,245 documents. All other document types such as Conference papers, Errata, Notes, Letters, Editorials, Short surveys were classified as non-citable documents and, were subsequently, excluded from the analysis. All the data were retrieved and analysis on 15 November 2018 in order to avoid the dynamics of citations from 1 day to another.

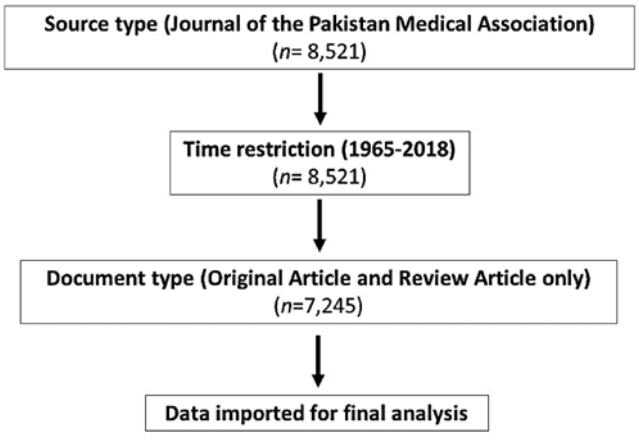

Figure-1: Search strategy used to retrieve data from Scopus (on 15 November 2018).

The bibliometric indicators sought and presented in this study included: 1) types of documents encountered in the retrieved literature; (2) total number of documents published during the study period (annual growth pattern); (3) total number of papers cited during the study period; (4) ten most active authors; (5) ten most active institutions; (6) ten most active countries; and (7) top 10 most cited papers. In addition, the top 10 countries, subject areas, institutions, authors, and sources for the 2,000 highly cited papers (27.6%) of the publications were also presented. Since the Scopus allows maximum 2,000 records to be imported, data of only 2,000 highly cited papers could be retrieved. The data were imported from Scopus as the Microsoft Excel 2016 (Microsoft Corp., USA) and analyzed thereafter.

Moreover, the most frequently encountered author keywords were presented as visualization map for: a) the 2,000 highly cited papers and b) the recently published 2,000 papers. As mentioned earlier, Scopus allows a maximum of 2,000 to be imported; thus, data for only 2,000 highly cited and recently published papers were imported. VOS viewer software, a free programme available from Leiden University to construct and visualize bibliometric networks to understand citation relationships, was used for mapping purposes.[20] In, VOS viewer information can be presented as density visualizations or network visualizations maps. The current study used the density visualizations maps to analyze co-occurrence of keywords. The density of each point or term is represented by a color. The color of a point in a map depends on: 1) the number of items in the neighborhood of the point, and 2) the relatedness of the neighbouring items. Any separation between the colours is indicative of lack of relatedness between two points. The density maps are useful to get an overview of the general structure of a map and to draw

attention to the most important areas in a map.

Since it is also difficult to directly measure or assess the quality of the publications, the total number of citations received, average number of citation received per document, percentage of highly cited papers, Hirsch-index (h-index), impact factor (IF) and Scimago Journal & Country Rank (SJR) were used as an alternative measures of the publication impact or quality. The h-index was introduced by JE Hirsch in 2005 to assess productivity and citation impact of researchers.[21] However, h-index has now been widely used and accepted as a measure of the productivity and citation impact of a researcher, journal, institution or country. In this study, h-index values for researchers, institutions and countries were obtained directly from Scopus database. The IF data was obtained from the editor of the Journal of the Pakistan Medical Association while the SJR data was obtained from the Scimago Journal & Country Rank website (https://www.scimagojr.com/journalsearch.php?q=16479&tip=sid).

This is a bibliometric analysis and does not require an approval from the ethical review committee of the institute.

Results

Out of the total 8,521 documents identified, 7,245 (85.03%) were included in the analysis. Overall, most of

Table-1: Disposal of JPMA documents (1965-2018) identified on Scopus search on Nov 15, 2018.

Documents	Frequency	Percentage
Total documents identified	8521	100.0
Documents excluded	1276	14.97
Editorial	462	5.42
Note	149	1.75
Erratum	69	0.81
Short Survey	42	0.49
Letter	543	6.37
Conference paper	11	0.13
Documents included	7245	85.03
Original Article	6721	78.88
Review Article	524	6.15

Table-2: Top 10 countries for the documents published in the JPMA (1965-2018).

Country	Documents	% of the total documents	Citations	Citations per document	h-index
Pakistan	4190	57.83	18292	4.36	36
Turkey	443	6.12	996	2.25	11
India	198	2.73	442	2.23	9
Iran	196	2.70	867	4.42	13
Saudi Arabia	195	2.69	571	2.93	10
United States	149	2.06	739	4.96	15
United Kingdom	128	1.77	476	3.72	11
Canada	68	0.94	263	3.87	8
China	37	0.51	42	1.14	4
United Arab Emirates	30	0.41	137	4.57	9

Table-3: Top 10 prolific authors publishing in the JPMA (1965-2018).

Author	Documents published (n=7245)	% of the total documents	Citations	Citations per document	h-index	Affiliation (Institution, Country)
Zuberi, S.J.	155	2.14	325	2.10	10	Pakistan Medical Research Council, Islamabad, Pakistan
Kalra, S.	108	1.49	193	1.79	7	Bharti Hospital and B.R.I.D.E., Department of Endocrinology, Karnal, India
Qureshi, H.	87	1.20	424	4.87	10	Pakistan Health Research Council, Islamabad, Pakistan
Khurshid, M.	61	0.84	389	6.38	11	The Aga Khan University Hospital, Department of Oncology, Karachi, Pakistan
Jafarey, N.A.	54	0.74	207	3.83	8	Ziauddin Medical University, Karachi, Pakistan
Kayani, N.	50	0.69	459	9.18	11	The Aga Khan University Hospital, Department of Pathology, Karachi, Pakistan
Alam, S.E.	49	0.68	230	4.69	8	Jinnah Postgraduate Medical Centre, PMRC Research Centre, Karachi, Pakistan
Pervez, S.	47	0.65	423	9.00	11	The Aga Khan University Hospital, Department of Pathology, Karachi, Pakistan
Abbas, Z.	44	0.61	221	5.02	9	University of the Punjab, Lahore, Department of Microbiology and Molecular Genetics, Lahore, Pakistan
Kamal, A.K.	42	0.58	61	1.45	4	The Aga Khan University Hospital, Karachi, Pakistan

Table-4: Top 10 institutions publishing in the JPMA (1965-2018).

Institution/Affiliation[a]	Documents published (n=7245)	% of the total documents	Citations	Citations per document	h-index[b]
The Aga Khan University, Karachi	1884	26.00	9559	5.07	-
Jinnah Postgraduate Medical Centre, Karachi	431	5.95	1953	4.53	19
Dow University of Health Sciences Karachi	412	5.69	1800	4.37	-
Liaquat National HospitalKarachi	267	3.68	1254	4.70	16
Ziauddin Medical UniversityKarachi	124	1.71	765	6.17	14
PMRC Research Centre	107	1.48	333	3.11	9
Sindh Institute of Urology and Transplantation Karachi#	97	1.34	519	5.35	12
Shifa International Hospital Islamabad#	97	1.34	322	3.32	10
Pakistan Institute of Medical Sciences, Islamabad	90	1.24	344	3.82	10
Army Medical College, Rawalpindi	82	1.13	397	4.84	11
University of Karachi	78	1.08	270	3.46	9

[a]The Aga Khan University and Aga Khan University Hospital were considered one entity. Similarly, Dow University of Health Sciences and Dow Medical College were considered single entity.
[B]h-index was not calculated.
#Sindh Institute of Urology and Transplantation and Shifa International Hospital were considered 7th top affiliation because of equal number of documents published.

Table-5: Top 10 Most Frequently Cited Papers That Have Been Published in the JPMA (1965-2018).

Author(s)	Title of the paper	Year	Document type	Citations
Khattak MF et al	Seroprevalence of hepatitis B, C and HIV in blood donors in northern Pakistan.	2002	Original Article	104
Gilani AH et al	Bronchodilator, spasmolytic and calcium antagonist activities of Nigella sativa seeds (Kalonji): A traditional herbal product with multiple medicinal uses	2001	Original Article	97
Wadood A et al	Effects of Acacia arabica and caralluma edulis on blood glucose levels of normal and alloxan diabetic rabbits	1989	Original Article	93
Zafar SN et al	Self-medication amongst university students of Karachi: Prevalence, knowledge and attitudes	2008	Original Article	92
Hamid S et al	PSG Consensus Statement on management of Hepatitis C Virus Infection - 2003	2004	Review Article	85
Shera AS et al	Pakistan national diabetes survey prevalence of glucose intolerance and associated factors in north west frontier province (NWFP) of Pakistan	1999	Original Article	83
Inam SN et al	Prevalence of anxiety and depression among medical students of private university.	2003	Original Article	78
Bhurgri Y et al	Pakistan - Country profile of cancer and cancer control 1995-2004	2006	Review Article	77
Akhtar MS et al	Field trial of Saussurealappa roots against nematodes and Nigella sativa seeds against cestodes in children	1991	Original Article	75
Akhtar MS et al	Study of anti diabetic effect of a compound medicinal plant prescription in normal and diabetic rabbits	1984	Original Article	74

Table-6A: Citations to the papers of JPMA (2,000 highly cited): Top 10 countries.

Country	Citations (n=27800)	% of the total citations
Top 10 countries	15693	56.45
1. Pakistan	5487	19.78
2. United States	2633	9.47
3. India	1979	7.12
4. United Kingdom	1219	4.38
5. Iran	1198	4.31
6. China	898	3.23
7. Turkey	719	2.59
8. Saudi Arabia	570	2.05
9. Canada	516	1.86
10. Germany	474	1.70

Table-6B: Citations to the papers of JPMA (2,000 highly cited): Top 10 subject areas.

Subject area	Citations (n=27800)	% of the total citations
Top 10 subject areas	23440	84.32
1. Medicine	15708	56.50
2. Biochemistry, Genetics and Molecular Biology	2415	8.69
3. Pharmacology, Toxicology and Pharmaceutics	1298	4.67
4. Immunology and Microbiology	890	3.20
5. Nursing	830	2.99
6. Agricultural and Biological Sciences	799	2.87
7. Social Sciences	549	1.98
8. Neuroscience	407	1.46
9. Environmental Science	297	1.07
10. Health Professions	247	0.89

the papers published in the journal were original articles (n=6,721; 78.88%) while the least were the conference papers (11; 0.13%). The summary of documents included in and excluded from the analysis is presented in Table-1.

On average, 150.94 documents were published each year, with a range from 1 to 441. The lowest number of documents was recorded for 1966 (n=1) while the highest was for 2016 (n=441). The peak number of publications

Table-6C: Citations to the papers of JPMA (2,000 highly cited): Top 10 institutions.

Institution/Affiliation	Citations (n=27800)	% of the total citations
Top 10 institutions	3387	12.18
The Aga Khan University	1519	5.46
Dow University of Health Sciences Pakistan	466	1.68
Tehran University of Medical Sciences	260	0.94
Liaquat National Hospital, Karachi	223	0.80
Liaquat University of Medical and Health Sciences, Jamshoro	170	0.61
Jinnah Postgraduate Medical Centre, Karachi	168	0.60
Khyber Medical College	155	0.56
University of the Punjab, Lahore	144	0.52
King Saud University	142	0.51
Shahid Beheshti University of Medical Sciences	140	0.50

Table-6D: Citations to the papers of JPMA (2,000 highly cited): Top 10 authors.

Author	Citations (n=27800)	% of the total citations
Top 10 authors	411	1.48
Bhutta, Z.A.	51	0.18
Rehman, R.	50	0.18
Kalra, S.	48	0.17
Jafri, W.	43	0.16
Pervez, S.	41	0.15
Fatmi, Z.	39	0.14
Qureshi, H.	37	0.13
Hamid, S.	35	0.13
Abbas, Z.	34	0.12
Hasan, R.	33	0.12

Table-6E: Citations to the papers of JPMA (2,000 highly cited): Top 10 sources.

Source	Citations (n=27800)	% of the total citations
Top 10 sources	3552	12.78
Journal of the Pakistan Medical Association	998	3.59
Journal of the College of Physicians and Surgeons Pakistan	601	2.16
Pakistan Journal of Medical and Health Sciences	409	1.47
Medical Forum Monthly	401	1.44
Pakistan Journal of Medical Sciences	308	1.11
Asian Pacific Journal of Cancer Prevention	202	0.73
Plos One	197	0.71
Rawal Medical Journal	161	0.58
Journal of Clinical and Diagnostic Research	154	0.55
Journal of Postgraduate Medical Institute	121	0.44

was observed at 5 occasions, where 93 documents were published in 1975, 139 in 1998, 199 in 2004, 376 in 2012, and 441 in 2016. There was a rapid steady surge in the number of publications from 2007 to 2012, starting from 168 to 376. The division of time in four clusters revealed that the number of publications during 1966-1982 (1966 and 1972-1982) was 631, 1,124 during 1983-1994, 1,663 during 1995-2006, and 3,827 during 2007-2018 (Figure-2).

The total number of citations received by the documents included in the analysis was 27,800, with average 3.84 citations per document (Figure-3). The first and only citation was recorded in 1978, followed by a consistent increase in the number of citations during 1995 (n=50) and 2017 (n=3,060). The highest number of citations was recorded during 2017 (n=3,060), with an average 7.57 citations per document (Figure-3).

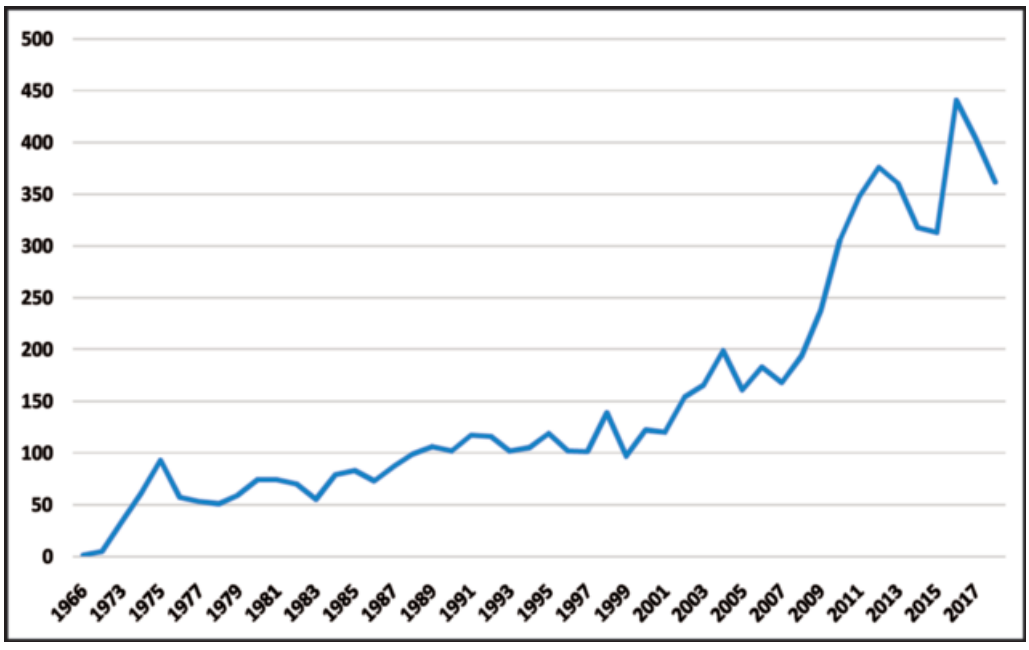

Figure-2: The total number documents published in the JPMA per year (1965-2018).

Of the top 10 countries, the most contributions came from Pakistan (n=4,190; 57.83% of the total documents) while the least number of documents amongst the top ten countries were from United Arab Emirates (n=30; 0.41% of the total documents). The documents published by the top 10 countries

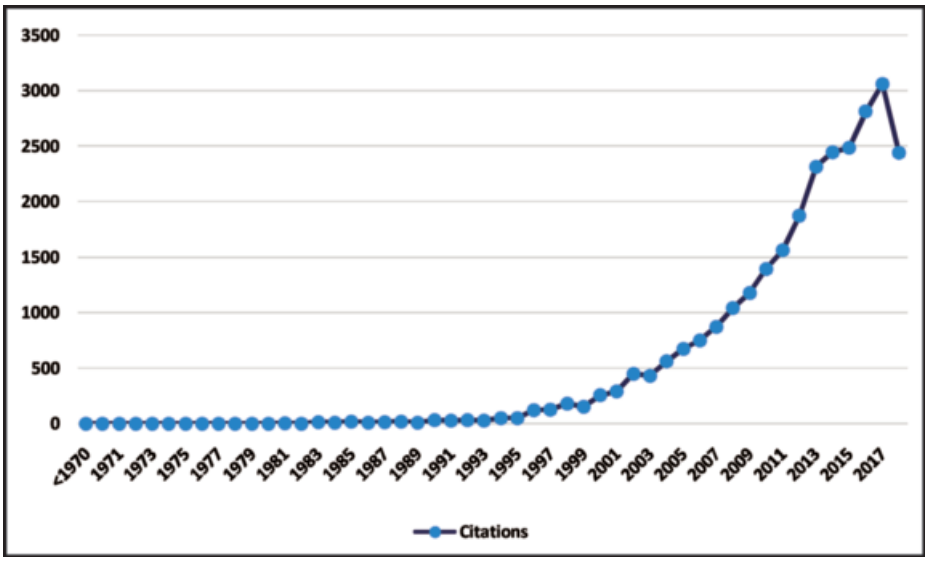

Figure-3: Distribution of citations to the documents published in the JPMA by year (1965-2018).

top ten countries, was for China (n=42; 1.14 per document). The detailed contribution from the top 10 countries is presented in Table-2.

The top 10 prolific authors in the Journal of the Pakistan Medical Association are shown in Table-3. The documents published by the top 10 authors contributed to only 9.62% of the titles included in the study. The highest number of publications by an author was 155 and the lowest number of documents amongst the top ten authors was 42. Amongst the top ten highly active authors, nine were from Pakistan and only one from India (Table-3).

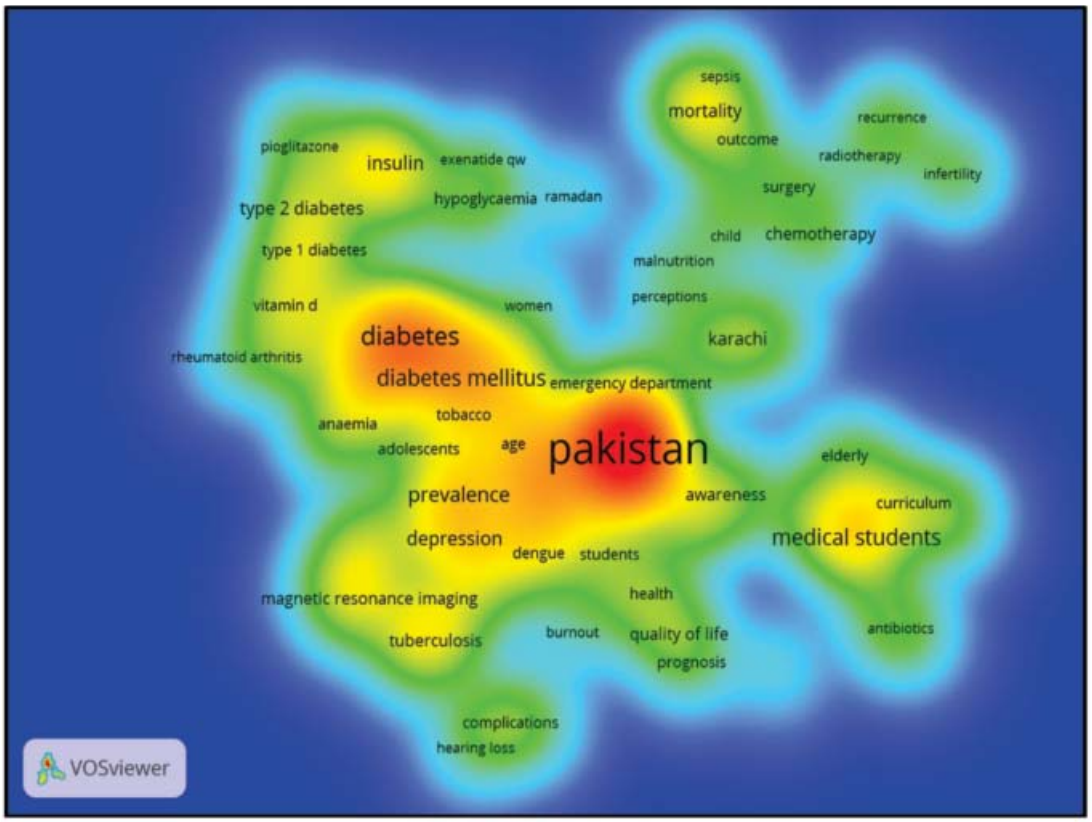

Figure-4: Density visualization map of co-occurrence of author keywords in 2000 recently published documents (with a minimum occurrence of 5).

In terms of affiliations, the top 10 institutions published 3,669 (50.64%) documents. The highest number of documents published had affiliation from the Aga Khan University (n=1,884; 26.00%), with the highest number of citations (n=9,559; 5.07 per document). The detailed contribution from the top 10 institutions is illustrated in Table-4.

The top 10 highly cited documents are shown in Table-5. The paper titled "Seroprevalence of hepatitis B, C and HIV in blood donors in northern Pakistan", received the highest number of citations (n = 104). The paper titled "Study of anti diabetic

constituted 77.76% of the titles included in the study. The highest number of citations was 18,292 (4.36 per document) for Pakistan whereas the lowest, amongst the

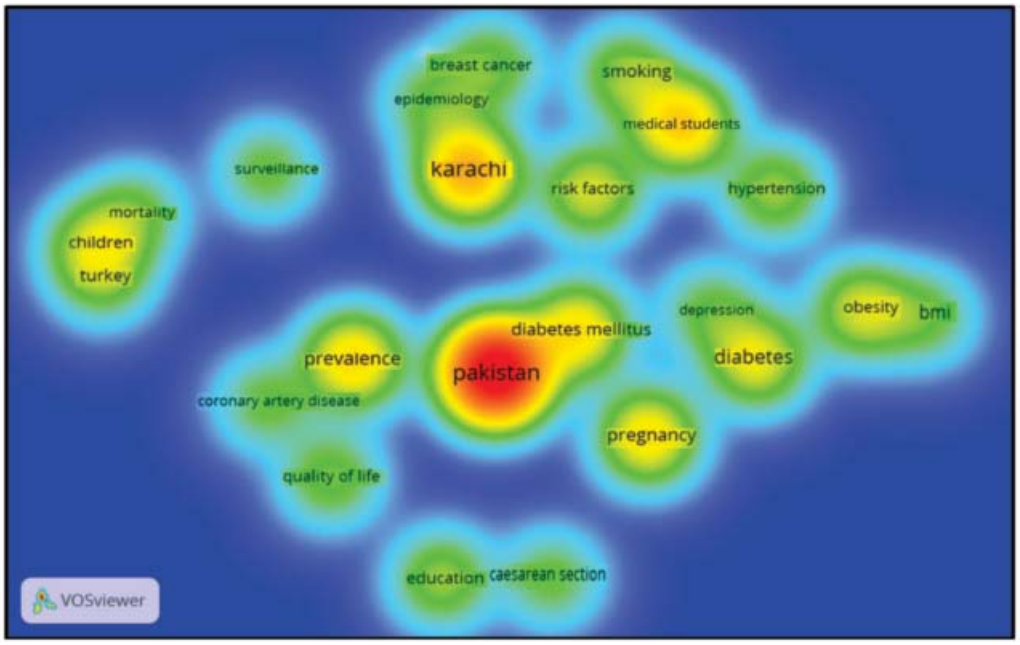

Figure-5: Density visualization map of co-occurrence of author keywords in 2000 highly cited documents (with a minimum occurrence of 5).

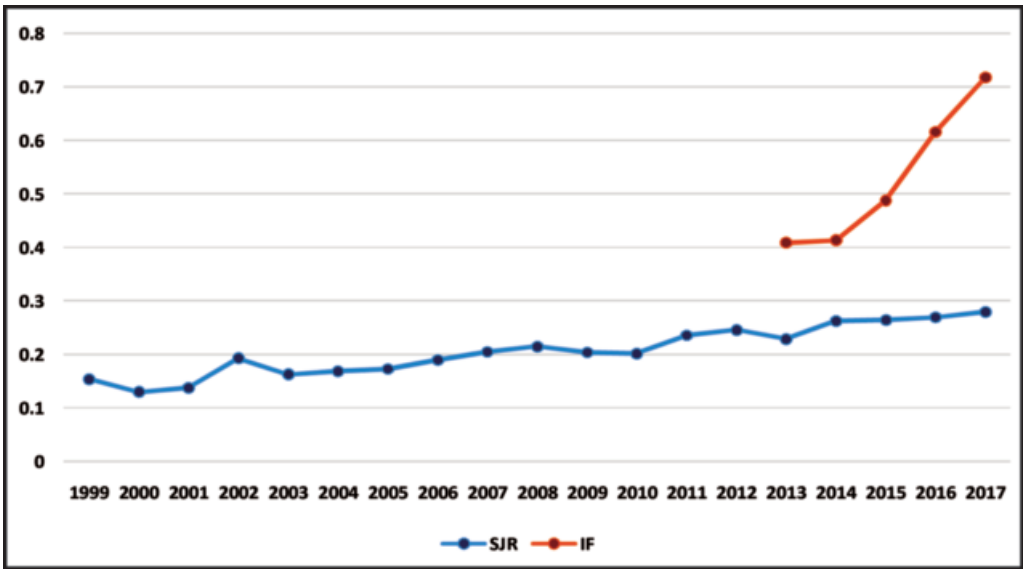

Figure-6: Impact factor (IF) and Scientific Journal Rankings (SJR) of JPMA from 1999 to 2018.

effect of a compound medicinal plant prescription in normal and diabetic rabbits", received, amongst the top ten highly cited documents, the lowest number of citations (n=74). Of the top 10 highly cited papers, eight were original articles and two were review articles (Table-5). Six studies published after 2,000 were amongst the top 10 highly cited papers. On the other hand, two studies of the top 10 highly cited documents were animal studies.

Out of the total 27,800 citations that all the documents included in the study received, 22,507 (80.96% of the total) citations were recorded for the 2,000 highly cited papers. The top 10 countries contributed to 15,693 (56.45%) citations to the 2,000 highly cited papers published in the JPMA, with highest contribution from Pakistan (n=5,487; 19.78%). In terms of subject areas, most of the citations (n=15,708; 56.50%), to the 2,000 highly cited papers, came from 'Medicine'. The Aga Khan University was the top institution with 1,519 (5.46%), and the Journal of the Pakistan Medical Association was the most prominent journal (n=998; 3.59%), which cited the 2,000 highly cited papers of the JPMA. The detailed findings for top 10 countries, subject areas, institutions, authors, and sources, which cited the 2,000 highly cited papers of the JPMA, are illustrated in Table-6 A-E.

The density visualization map of co-occurrence of author keywords in 2,000 recently published documents included 11 clusters of 99 relevant keywords with a total link strength of 1:100 (Figure-4). In this map, the main keywords were 'Pakistan', 'diabetes', 'medical students', 'diabetes mellitus', 'prevalence', etc. It indicates that the research on non-communicable disease and medical students is focused whereas research on infectious diseases appears to be less represented.

The density visualization map of co-occurrence of author keywords in 2000 highly cited documents included 7 clusters of 23 relevant keywords with a total link strength of 1:32 (Figure-5). The main keywords were 'Pakistan', 'diabetes', 'medical students', 'diabetes mellitus', 'pregnancy', 'prevalence', etc.

The Scientific Journal Rankings (SJR) of the JPMA has increased over the period of around 20 years on a moderate pace, starting from 0.154 in 1999 to 0.28 in 2017. Similarly, the impact factor of the journal has risen from 0.409 in 2013 to 0.718 in 2017. Unlike the SJR, impact factor of the journal has seen a steep inclination throughout the 4 years (Figure-6).

Discussion

This study was a comprehensive bibliometric analysis of published papers in JPMA over the period of more than 50 years, using Scopus database. Additionally, interpretation of the findings of the current study potentially provides an indirect indication as to the impact and performance of the JPMA. Overall, the number of papers in the JPMA has significantly increased in the recent years. The total number of papers, included in the study, published during the study period was 7,245 including 6,721 original articles and 524 review articles. The findings suggest that the JPMA has wider national and international research community coverage in terms of publications and citations.

In the current study, 'original articles' accounted for more than half of the scientific production, which corresponds to the findings of previous bibliometric analyses.[1,14,22] Similarly, most of the published papers came from Pakistan, accounting for almost 58% of the papers published during the study period. This finding coincides with previous studies that the maximum number of papers published in a journal are from the authors of the same country.[1,16,23] It was also noticed that most of the Pakistani authors publishing in the JPMA had affiliation from Karachi, and Rawalpindi-Islamabad, similar to the findings of the previous studies from Pakistan.[15-17] However, there is a potential weakness in Scopus that the author affiliations are not correctly represented. For example, some publications did not have the name of the author's city; thus, the names of the city may be underrepresented. In context to the citation analysis, the highest contributing countries, institutional affiliations and journals that cited the publications of the JPMA belonged to Pakistan. However, the journal had a coverage of many countries across the globe. Another important finding was that the journal no longer publishes studies conducted on animals. Additionally, it has recently published some interesting papers about the publication ethics and research education. This reflects the interest of the journal in increasing the awareness about publishing standards in its readership. In terms of the most common author keywords (with a minimum occurrence of 5) on the density visualization map, the terms included 'Pakistan', 'diabetes', 'medical students', 'diabetes mellitus', 'prevalence'. This may be partly because the journal has special section of papers on diabetes in every issue. This pattern also explains the focus of authors mostly publishing in these areas.

Recently, there has been a rise in the use of bibliometric studies undertaken to present the research output and growth of a journal. For example, the title search in Scopus for the combined terms "bibliometric" and "journal" retrieves 545 documents. However, only 3 journal-specific bibliometric studies, out of total 6 records from Pakistan, were found when the search for "bibliometric analysis" and "Pakistan" was conducted. This may partly be attributed to the fact that bibliometric studies are relatively new phenomenon and the search results may be limited to the literature indexed in the Scopus database. Studies suggest that journals from developing countries, such as Pakistan, suffer the problem of indexing in bibliographic databases such as PubMed, Scopus, and Web of Science.[24,25] Another important reason for the lack of systematic reviews and bibliometric analyses in Pakistan, is the inability of authors to access subscription-based, specialized databases, such as Scopus and Web of Science. At the same time, a recent report in the journal Nature suggests that Pakistan is at the top of the list of countries with biggest rises in publication output.[26]

This study has some limitations, which should be addressed. First, no bibliometric study is 100% accurate and perfect; bibliometric studies only provide a snapshot of the current situation based on certain keywords used in the database used. Secondly, electronic database have their own limitations. For example, different spelling of the name of the author, different institutional affiliations, system updates, and missing data are some common problems of electronic databases commonly used in bibliometric studies.[27] Scopus was used to retrieve the required data for the current study because: i) is larger than Web of Science and 100% inclusive of Medline; ii) it has multidisciplinary and multi-lingual coverage, which may be useful for the citation analysis; and iii) it is unique in facilitating robust bibliometric analysis of the retrieved literature.[28-31] However, Scopus is limited in its coverage of publications before 1996; this limits the utility of Scopus for the citation analysis. In addition, the data was

retrieved on 15 November 2018, which might represent truncated results for the year 2018. Therefore, the findings of the study warrant caution. Finally, the study was limited to one journal from the country and used Scopus database. There may be different findings if other databases, such as the Web of Science, were used. In addition, future studies exploring the evolution of indexed medical journals from Pakistan (or journal with impact factor) are needed.

Conclusion

The JPMA has gained a worldwide recognition and is increasingly growing to become a promising journal of the country. There is a visible growth in terms of publications per year, number of citations, and impact factor of the journal. It is expected that these features of the journal will grow further in the future. The keyword analysis suggests that the journal publishes the full spectrum of medical research (including medical education) but a major proportion of the recent papers is published on non-communicable diseases.

Disclaimer: None to declare.

Conflict of Interest: The author of the current paper serves as the editorial board member of the JPMA but the manuscript does not, in any way represent the view of the JPMA. Nor does the author's affiliation with the JPMA have any influence on the decision about the manuscript.

Funding Sources: None to declare.

References

1. Corrales IE, Reyes JJ, Fornaris Y. Bibliometric analysis of the Journal of Oral Research: Period 2012-2015. J Oral Res. 2016; 5:188-93.
2. Bornmann L, Leydesdorff L. Scientometrics in a changing research landscape: bibliometrics has become an integral part of research quality evaluation and has been changing the practice of research. EMBO Rep. 2014; 15:1228-32.
3. Hood W, Wilson C. The literature of bibliometrics, scientometrics, and informetrics. Scientometrics. 2001; 52:291-314.
4. Karanatsiou D, Misirlis N, Vlachopoulou M. Bibliometrics and altmetrics literature review: Performance indicators and comparison analysis. Perform Measur Metrics. 2017; 18:16-27.
5. Wiles L, Matricciani L, Williams M, Olds T. Sixty-five years of Physical Therapy: bibliometric analysis of research publications from 1945 through 2010. Phys Ther. 2012; 92:493-506.
6. Youngblood M, Lahti D. A bibliometric analysis of the interdisciplinary field of cultural evolution. Palgrave Communications. 2018; 4:120.
7. Yeung AW, Goto TK, Leung WK. The changing landscape of neuroscience research, 2006-2015: a bibliometric study. Front Neurosci. 2017; 11:120.
8. Dabi Y, Darrigues L, Katsahian S, Azoulay D, De Antonio M, Lazzati A. Publication trends in bariatric surgery: a bibliometric study. Obes Surg. 2016; 26:2691-9.
9. Železnik D, Blažun Vošner H, Kokol P. A bibliometric analysis of the Journal of Advanced Nursing, 1976-2015. J Adv Nurs. 2017; 73:2407-19.
10. 10.Jehangir S, Barnes EH, McDowell D, Holland AJ. Publishing trends in Journal of Paediatric Surgery, Pediatric Surgery International and European Journal of Pediatric Surgery over the past three decades. Pediatr Surg Int. 2019; 35:413-8.
11. Merigó JM, Núñez A. Influential journals in health research: a bibliometric study. Global Health. 2016; 12:46.
12. Bhutani G, Kaushal J, Godara S. Bibliometric analysis of Indian journal of endocrinology and metabolism. Indian J Endocrinol Metab. 2013; 17:871-5.
13. Grant C, Williams B, Driscoll T. Historical trends in publications in the International Journal of Epidemiology. Int J Epidemiol. 2018; 47:938-41.
14. Huh S. Journal Metrics of Infection & Chemotherapy and Current Scholarly Journal Publication Issues. Infect Chemother. 2018; 50:219-27.
15. Baladi ZH, Umedani LV. Pakistan Journal of Medical Sciences: A bibliometric assessment 2001-2010. Pak J Med Sci. 2017; 33:714-9.
16. Ibrahim M, Saeed UJ. Bibliometric analysis of the Journal of Pakistan Medical Association form 2009 to 2013. J Pak Med Assoc. 2015; 65:978-83.
17. Ullah S, Jan SU, Jan T, Ahmad HN, Jan MY, Rauf MA. Journal of the College of Physicians and Surgeons of Pakistan: Five Years Bibliometric Analysis. J Coll Physicians Surg Pak. 2016; 26:920-3.
18. Ullah M, Butt IF, Haroon M. The Journal of Ayub Medical College: a 10?year bibliometric study. Health Info Libr J. 2008; 25:116-24.
19. Javed M, Shah SS. Rawal Medical Journal-An analysis of citation pattern. RMJ. 2008; 33:254-7.
20. van Eck N, Waltman L. Software survey: VOSviewer, a computer program for bibliometric mapping. Scientometrics. 2010; 84:523-38.
21. Bucur O, Almasan A, Zubarev R, Friedman M, Nicolson GL, Sumazin P, et al. An updated h-index measures both the primary and total scientific output of a researcher. Discoveries (Craiova). 2015; 3: e50.
22. Chatterjee S, Mohanty P, Sahoo N, Gowd S, Srinivas B, Gojja S. Bibliometric study of three journals of orthodontics: A comparative analysis of 10 years. J Indian Orthod Soc. 2018; 52:174-8.
23. Jain S, Basavaraj P, Singla A, Singh K, Kundu H, Vashishtha V, et al. Bibliometric analysis of journal of clinical and diagnostic research (dentistry section; 2007-2014). J Clin Diagn Res. 2015; 9:ZC47-51.
24. Memon AR. Research publications and education in Pakistani medical universities: Avoiding predatory journals and improving the quality of research. J Pak Med Assoc. 2017; 67:830-3.
25. Memon AR. Revisiting the term predatory open access publishing. J Korean Med Sci. 2019; 34:e99.
26. Makri A. Egypt and Pakistan had highest rise in research output in. [Online] 2018 [Cited 2019 Mar 06]. Available from: URL: https://www.nature.com/articles/d41586-018-07841-9.
27. Sweileh WM, AbuTaha AS, Sawalha AF, Al-Khalil S, Al-Jabi SW, Sa'ed HZ. Bibliometric analysis of worldwide publications on multi-, extensively, and totally drug-resistant tuberculosis (2006-2015). Multi discip Respir Med. 2016; 11:45.
28. Falagas ME, Pitsouni EI, Malietzis GA, Pappas G. Comparison of PubMed, Scopus, web of science, and Google scholar: strengths and weaknesses. FASEB J. 2008; 22:338-42.
29. Kulkarni AV, Aziz B, Shams I, Busse JW. Comparisons of citations in Web of Science, Scopus, and Google Scholar for articles published in general medical journals. JAMA. 2009; 302:1092-6.
30. Meho LI, Yang K. Impact of data sources on citation counts and rankings of LIS faculty: Web of Science versus Scopus and Google Scholar. J Am Soc Inf Sci Technol. 2007; 58:2105-25.
31. Sharma N, Bairwa M, Gowthamghosh B, Gupta S, Mangal D. A bibliometric analysis of the published road traffic injuries research in India, post-1990. Health Res Policy Syst. 2018; 16:18.