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Journal of Family and Community Medicine: A scientometric analysis 1994–2020

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Abstract:

The Journal of Family and Community Medicine (JFCM) is a peer-reviewed open access journal published by the Saudi Society of Family and Community Medicine. This review is aimed to analyze the scientometric attributes of manuscripts published over 27 years from 1994 to 2020 using scientometric technique. The bibliographic records of manuscripts published from 1994 to 2020 were retrieved from the Web of Science and Medline-PubMed databases. The data were analyzed by using VOSviewer, CiteSpace, and Biblioshiny software. A total of 648 manuscripts were included; these were written by 1442 authors, with an average of 2.22 authors per manuscript and 24 manuscripts per year. All manuscripts gained 2,693 citations with a mean ratio of 4.15 citations per manuscript. All the top-20 contributing authors belonged to Saudi Arabia, and 48% of the manuscripts were in the single-author pattern; the multiauthored manuscripts received a higher ratio of citations. The review highlighted the most contributing institutions and countries. Bibliographic coupling of countries, institutions, keywords co-occurrence, and co-citation of journals were also presented. The JFCM is an important journal of Saudi Arabia that has provided a platform to family medicine researchers to share their scholarly and scientific communication for the past 27 years. Over the years, the frequency and number of publications in the journal have improved. Although the journal has received manuscripts from all over the world, most contributions were from Saudi Arabia.

Keywords:

Citation analysis, databases, Journal of Family and Community Medicine, journals, publications, scientometrics

Introduction

The dissemination of research findings is one of the vital facets of research. Journals are considered a primary source for the publication of scholarly and scientific communication. The literature published in journals provides contemporary up-to-date information.^[1] Further, through publication, the results of experiments are shared with the rest of the world. This motivates younger scientists to do research and validates findings, and enhances authors' status as

well as that of the affiliated institution and the country, and elevates the image of the profession.^[2]

Research in the health sciences is necessary for the welfare of individuals and the improvement of the quality of life of the community. A healthy population plays a significant role in a nation's and the world's development.^[3,4] Moreover, published medical research contributes to the effective promotion and development of all medical specialties. It is estimated that about 30% of scholarly literature is on biomedical sciences, with nearly a 3.5% annual increase in scholarly

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communication.^[5] As research productivity increases, the demand for the evaluation of research characteristics gains recognition. This evaluation of literature is done on both quantitative and qualitative scales.^[6]

The earliest example of assessing the features of publications was done in 1917 when Cole and Eales examined the literature on comparative anatomy published between 1543 and 1860.^[7] Two more studies were performed on the history of science and on the literature of chemical society in 1923 and 1927, respectively.^[8,9] This method known as statistical bibliography was renamed by Alan Prichard as bibliometric in 1969. The bibliometric method has been employed in the analysis and measurement of the state and progress of scientific and scholarly disciplines.^[10] Bibliometric analysis is often used to assess the impact of an individual researcher, research groups, institutions, countries, or journals. The outcomes of these studies help to understand the strengths and weaknesses of knowledge, publication growth, collaborative style, authorship pattern, and citation impact.^[11,12] The related term scientometric was coined by two Russian authors, Nalimov and Mulchenko, in the same year, 1969.^[10] It is a quantitative technique of evaluating an individual researcher's scientific productivity and research publications in explicit knowledge, research group, organization, country, and the world.^[13] It seems that the definitions of bibliometric and scientometric overlap. However, bibliometric studies deals with the literature of science and scholarship, while the scientometric analysis primarily focuses on the literature of science and technology.^[10]

Saudi Arabia, the largest country in the Arabian Peninsula, is blessed with natural resources. The Saudi Government has recognized the importance of education for economic and social transformation. The past two decades have seen an extraordinary growth of degree-awarding institutions and research and funds for development. These initiatives have changed the image of Saudi Arabia in the academic world. The number of research publications and journals have also increased.^[14] A country-level bibliometric study on Saudi Arabia revealed the promising growth in research publications through these efforts.^[15] Some bibliometric studies have been conducted to assess the research productivity of Saudi Arabia in medical sciences.^[2,4,16-18] The bibliometric analysis of a specific journal is important as it provides insight far beyond the journal's scope.^[19] Few studies have examined the bibliometric characteristics of medical journals published in Saudi Arabia.^[1,19-21]

The Journal of Family and Community Medicine (JFCM), the official journal of the Saudi Society of Family and Community Medicine (<https://www.jfcmonline.com>),

deals with the important medical specialty, family medicine (FM), a comprehensive specialty devoted to providing inclusive healthcare for people of all ages. The scope of FM covers all ages, both genders, every organ system, and every disease entity.^[22] FM aims to provide personal, comprehensive, and continuing care for the individual, the family, and the community.^[23]

JFCM is a leading journal related to the distinct medical specialty of FM with a decent history of consecutive publications for 27 years and is indexed in all celebrated global databases. JFCM has scored a 0.9 Cite Score in the Scopus database. There are 42 journals indexed in the Family Practice category, and JFCM stands on 29th rank in the 3rd Quartile.^[24]

In the Clarivate Analytics, Web of Science database, JFCM, falls in the Emerging Source Citation Index. New field-normalized measurement scale, Journal Citation Indicator (JCI) has been introduced by Clarivate Analytics, Web of Science database. JFCM has improved its ranking in the JCI from 0.56 in 2019 to 0.65 in 2020.^[25]

The first issue of JFCM came out in 1994, and since then, the journal has been published regularly once every 6 months. From the year 2000, the frequency of the journal changed to every 4 months which means three issues in a year (January, May, and September). The open-access peer reviewed journal, with a vast readership, is indexed in all well-known global databases and is appreciated by primary care providers. The purpose of the JFCM is to promote excellence in family and community medicine and all closely related fields. The journal was established to promote the knowledge, attitude, and practice of all aspects of comprehensive healthcare including preventive, curative, and rehabilitative. The journal also aims at facilitating the development of community-based research, education, and health services. The publication of JFCM was initiated by King Faisal University Press, and Prof. Zohair Sebai served as its first editor from 1994 to 2001. However, from mid-2010s, the publishing rights were transferred to Medknow/Wolter Kluwer group. In the next year (2011), JFCM was indexed in the PubMed database. The submission of manuscripts increased from 36 in 1994 to 137 in 2011.^[26]

A study that discussed the designs and statistical methods of 229 articles published in JFCM from 1994 to 2010 showed that more than three-fourth ($n = 175$; 76.4%) of the articles followed the cross-sectional study designs, and the Chi-square test ($n = 111$) most frequently used.^[27]

A 2015 study provided the details of 28 health sciences journals published in Saudi Arabia.^[28] Alanazi, Baladi, and Haq conducted a survey covering the period of 5 years from 2013 to 2017 on the characteristics of

three medical journals published from Saudi Arabia: Saudi Journal of Medicine and Medical Sciences, Saudi Journal of Heart Diseases, and Journal of Infection and Public Health. A total of 827 documents were identified, and a four-author pattern was found to be the most preferred.^[21] The Tanveer *et al.*, study on the bibliometric indicators of 7700 documents of the Saudi Medical Journal from 1979 to 2019, published in 2020, showed that authors affiliated to 81 countries had contributed, with King Saud University emerging as the institution that contributed the most.^[1] In another study which explored the citation analysis of the Saudi Medical Journal, a total of 7483 documents published from 1979 to 2018 gained 37,988 citations with an average of 5.07 citations per document. Review papers received slightly more citations than original research articles.^[20] The bibliometric analysis of the Journal of Infection and Public Health in Saudi Arabia presented by Krauskopf indicated that international authors contributed 80% of the total of 586 documents published from 2008 to 2016, and King Saud bin Abdulaziz University for Health Sciences was the most productive institution.^[19] No bibliometric review was found on JFCM. This review was intended to fill this gap.

Research Questions

1. What are the publication and citation trends of JFCM?
2. Which are the most productive authors, most contributing institutions, countries, and top-cited documents?
3. What is the co-citation of journals in JFCM for its lifespan?
4. What is the bibliographic coupling of institutions publishing in JFCM for its lifespan?
5. What are the authorship and collaboration research patterns of JFCM publications?

Methodology

Scientometrics, which employ quantitative methods to evaluate and describe the published scientific literature was applied in this research.^[29] The data sources of this study were PubMed and Web of Science databases.^[30,31] Based on the retrieved bibliographic data from PubMed and Web of Science, a report of the journal was created. The sample of this study was the bibliographic records of JFCM manuscripts published between 1994 and 2020. Using scientometrics, an analysis can be performed on the authors, institutions, journals, and subject fields. Quantity, quality, and evolution of the journals and other publications sources can be evaluated in terms of the number of publications and citations.^[1,32,33]

A comprehensive search strategy was adopted to retrieve the data. A search query with the “Journal of Family and Community Medicine” was performed in the PubMed database.^[29] The retrieved results were then exported to MS Excel, plaintext, and Bibtext formats. Initially, the search query yielded 695 records. An inclusion and exclusion criteria were applied for maximum recall and precision. After limiting the results to the peer-reviewed document types, 47 nonpeer review documents were excluded. Finally, 648 records were assessed and finalized for analysis. The Web of Science data generated networked visualization using VOSviewer, Cite Space, Biblioshiny (RStudio), and BibExcel software. Microsoft Excel was used to create tables.

Results

Overview of results

The search query retrieved 695 records of manuscripts published in the JFCM from 1994 to 2020. After applying inclusion and exclusion criteria, 648 papers were selected for the final analysis [Figure 1]. These manuscripts had an average of 4.017 citations per document. One thousand and four hundred forty-two authors prepared these 648 publications with an average of 2.22 authors per publication and 0.449 papers per author. There were 179 single-authored documents and 1263 multiauthored documents of JFCM. Single authorship was the common trend as shown by single authors of the 237 studies.

Chronological growth and citation structure of JFCM manuscripts

Table 1 provides the citation structure of JFCM, while Figure 2 presents the annual growth of publications and citations. JFCM published 13 manuscripts in its inaugural year, 1994, and received 18 citations. The journal published the maximum number of manuscripts (37) in 2018, with the citations peaking ($n = 333$) in 2012. Out of 18 publications of JFCM, eight were cited 18 times, with an average of 1.38 citations per publication in the foundational year of the journal. The best average of citations per publication (11.48) was in 2012, followed by 2013 with 11.10 citations per publication. The JFCM manuscripts of 2013 listed the highest number of references ($n = 723$). In 2012 and 2014, the highest number of manuscripts^[28] were cited in any 1 year.

Most contributing authors in JFCM manuscripts

Table 2 lists the most prolific authors of JFCM. Al-Khaldi YM, affiliated to the General Directorate of Health Affairs, Saudi Arabia, had the highest number of publications ($n = 12$) in JFCM. Eleven of his publications were cited one or more times, with an average of 3.67 citations per publication. Al-Dawood KM, affiliated

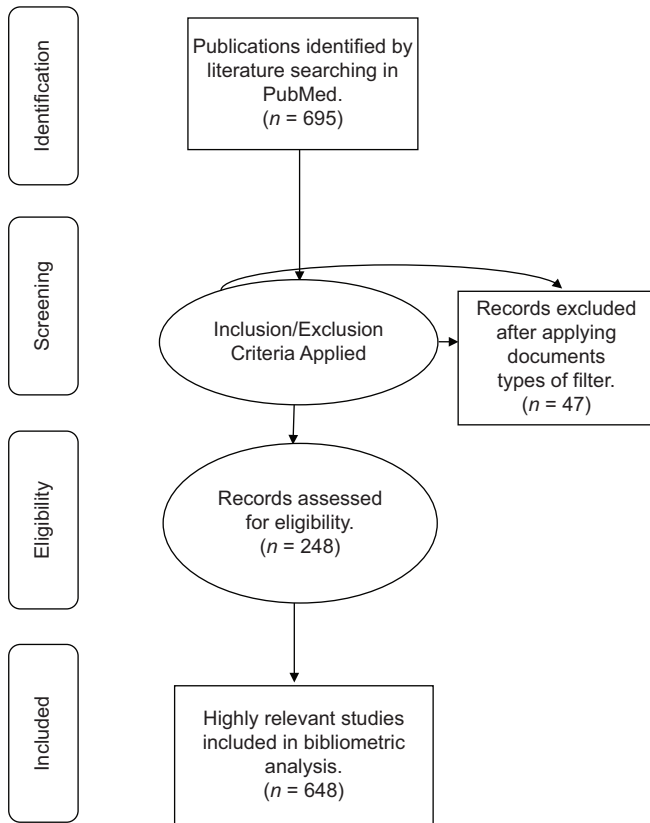


Figure 1: Four-phase flow diagram of data extraction and filtration process of Journal of Family and Community Medicine Literature

with Imam Abdulrahman Bin Faisal University, and Kurashi NY of King Faisal University were other prolific authors with ten publications each. The highest number of citations (101) was on the manuscripts by Al-Elq AH of Imam Abdulrahman Bin Faisal University. The author received the best average of 20.20 citations per publication and citations per cited publication. Most of the authors publishing in JFCM were affiliated to institutions geographically located in the Eastern region of Saudi Arabia.

Top institutions that have affiliation with the authors of JFCM manuscripts

Table 3 provides the details of the top institutions whose affiliated authors regularly publish in JFCM. All the leading contributing institutions are Saudi organizations, most of which are in the academic sector. Only two nonteaching organizations, the Ministry of Health and King Faisal Specialist Hospital and Research Center, have a place in the top contributing organizations. Authors affiliated with Imam Abdulrahman Bin Faisal University have the highest number of publications ($n = 205$) and citations ($n = 563$) in JFCM. King Saud University is the other institution that has contributed more than a hundred publications ($n = 110$) with 244 citations. Authors affiliated with Majmaah University have

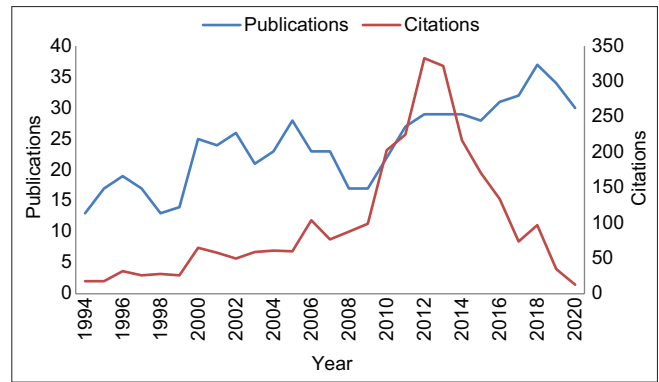


Figure 2: Evolution of Journal of Family and Community Medicine publications and citations

Table 1: Citation structure of the manuscripts appearing in Journal of Family and Community Medicine between 1994 and 2020

Year	TP	TCP	TC	TR	C/P	C/CP	C/R
1994	13	8	18	240	1.38	2.25	0.08
1995	17	7	18	208	1.06	2.57	0.09
1996	19	11	32	297	1.68	2.91	0.11
1997	17	13	26	350	1.53	2.00	0.07
1998	13	9	28	164	2.15	3.11	0.17
1999	14	9	26	158	1.86	2.89	0.16
2000	25	16	65	296	2.60	4.06	0.22
2001	24	17	58	336	2.42	3.41	0.17
2002	26	17	50	310	1.92	2.94	0.16
2003	21	14	59	262	2.81	4.21	0.23
2004	23	16	61	313	2.65	3.81	0.19
2005	28	17	60	350	2.14	3.53	0.17
2006	23	20	104	378	4.52	5.20	0.28
2007	23	19	77	356	3.35	4.05	0.22
2008	17	15	88	411	5.18	5.87	0.21
2009	17	15	99	344	5.82	6.60	0.29
2010	22	21	203	432	9.23	9.67	0.47
2011	27	23	225	545	8.33	9.78	0.41
2012	29	28	333	581	11.48	11.89	0.57
2013	29	26	322	723	11.10	12.38	0.45
2014	29	28	217	602	7.48	7.75	0.36
2015	28	25	171	602	6.11	6.84	0.28
2016	31	23	134	559	4.32	5.83	0.24
2017	32	21	74	440	2.31	3.52	0.17
2018	37	25	97	579	2.62	3.88	0.17
2019	34	19	35	680	1.03	1.84	0.05
2020	30	8	13	702	0.43	1.63	0.02

TP=The total number of JFCM publications, TCP=Total cited publications, TC=Total citations, TR=Total references, C/P=Average citations per publication, C/CP=Average citations per cited publication, C/R=Average citations per references, JFCM=Journal of Family and Community Medicine

published ten manuscripts in JFCM with one cited manuscript that received eight citations.

Top countries affiliated with the authors of JFCM manuscripts

Table 4 lists the affiliated countries of JFCM authors. Authors affiliated with the institutions of Saudi Arabia

Table 2: Top 20 productive authors of Journal of Family and Community Medicine

Author	Affiliation	Region	TP	TCP	TC	C/P	C/CP	h-index
Al-Khalidi YM	General Directorate of Health Affairs, KSA	Central region	12	11	44	3.67	4.00	4
Al-Dawood KM	Imam Abdulrahman Bin Faisal University	Eastern region	10	8	14	1.40	1.75	2
Kurashi NY	King Faisal University	Eastern region	10	6	9	0.90	1.50	3
Bahnassy AA	King Fahd Medical City	Central region	9	9	63	7.00	7.00	4
Al-Faris EA	King Saud University	Central region	8	6	29	3.63	4.83	3
Elzubier AG	King Faisal University	Eastern region	8	5	12	1.50	2.40	2
Milaat WA	King Abdulaziz University	Western region	8	4	18	2.25	4.50	2
Bella H	King Faisal University	Eastern region	7	3	7	1.00	2.33	2
Abumadani MS	Imam Abdulrahman Bin Faisal University	Eastern region	6	6	12	2.00	2.00	2
Al-Mulhim AA	King Faisal University	Eastern region	6	5	15	2.50	3.00	2
Al-Rubaish AM	Imam Abdulrahman Bin Faisal University	Eastern region	6	4	18	3.00	4.50	3
Al-Rukban MO	King Saud University	Central region	6	5	17	2.83	3.40	2
Bashawri LA	Imam Abdulrahman Bin Faisal University	Eastern region	6	6	23	3.83	3.83	3
Saeed AA	King Fahd Medical City	Central region	6	6	49	8.17	8.17	4
Sebai ZA	Al Sebai Institutes for Health Training	Eastern region	6	2	14	2.33	7.00	2
Al-Elq AH	Imam Abdulrahman Bin Faisal University	Eastern region	5	5	101	20.20	20.20	4
Al-Baghli NA	Directorate of Health Affairs, KSA	Western region	5	5	29	5.80	5.80	5
Abdelhadi MS	King Faisal University	Eastern region	5	3	20	4.00	6.67	3
Al-Shehri AM	Imam Abdulrahman Bin Faisal University	Eastern region	5	3	12	2.40	4.00	3
Alshammari SA	King Saud University	Central region	5	4	11	2.20	2.75	2
Darwish MA	Imam Abdulrahman Bin Faisal University	Eastern region	5	5	11	2.20	2.20	2
Wosornu L	Imam Abdulrahman Bin Faisal University	Eastern region	5	4	11	2.20	2.75	2

TP=The total number of JFCM publications by each author, TC=Total citations associated with these publications, C/P=Citations per publication, JFCM=Journal of Family and Community Medicine

Table 3: The top 10 institutions affiliated with the authors of manuscripts within the Journal of Family and Community Medicine between 1994 and 2020

Organization	TP	TCP	TC	TR	C/P	C/CP	C/R
Imam Abdulrahman Bin Faisal University	205	80	563	2205	2.75	7.04	0.26
King Saud University	110	55	244	1140	2.22	4.44	0.21
King Faisal University	86	59	170	1148	1.98	2.88	0.15
King Khalid University	48	27	127	592	2.65	4.70	0.21
King Abdulaziz University	37	16	60	332	1.62	3.75	0.18
King Saud Bin Abdulaziz University for Health Sciences	34	12	94	382	2.76	7.83	0.25
Ministry of Health	19	11	37	252	1.95	3.36	0.15
King Faisal Specialist Hospital and Research Center	13	8	71	148	5.46	8.88	0.48
Imam Mohammad Ibn Saud Islamic University	12	7	4	68	0.33	0.57	0.06
Majmaah University	10	1	8	18	0.80	8.00	0.44

TP=The total number of JFCM publications, TCP=Total cited publications, TC=Total citations, C/P=Average citations per publication, C/CP=Average citations per cited publication, C/R=Average citations per references, JFCM=Journal of Family and Community Medicine

have the highest number of publications ($n = 508$) and citations ($n = 2032$) in JFCM. India follows Saudi Arabia with 72 publications and 314 citations. The manuscripts of the affiliated Egyptian authors recorded the best average of 10.75 citations per publication. Manuscripts affiliated with Canadian authors had an average of 10 citations per publication.

Most frequently cited manuscripts of JFCM

Table 5 lists the JFCM manuscripts that have been frequently cited. The highest number of citations ($n = 63$) were of the manuscript titled "Simulation-Based Medical Teaching and Learning" (Al-Elq 2010), with an average of 5.25 citations per year. The manuscript

titled "Factors Contributing to Non-Compliance Among Diabetics Attending Primary Health Centers in the Al Hasa district of Saudi Arabia" (Khan 2012) had the second-highest number of citations ($n = 49$) with an annual average of 4.90 citations. The authors affiliated with Imam Abdulrahman Bin Faisal University have the highest number of publications in the list of 20 most cited manuscripts of JFCM between 1994 and 2020.

The top journals citing JFCM publications

Table 6 lists the journals that have cited the JFCM manuscripts the most. The manuscripts of JFCM received the highest number of citations ($n = 83$) from the manuscripts published in the Saudi Medical Journal.

New England Journal of Medicine is another journal that has frequently cited the JFCM manuscripts. The journal has the best impact factor of 74.7 of the top 15 citing journals and is ranked in the first Quartile of the Journal Citation Reports of clarivate analytics. With the exception of only one journal, all of the other journals in the list of top 15 citing journals are indexed in clarivate analytics. Medical education, published in the United Kingdom by the Wiley-Blackwell publisher, has cited the JFCM manuscripts 19 times, the lowest number of citations in a list of top citing journals.

Bibliographic coupling and co-citation analysis

A co-occurrences map of author keywords, bibliographic coupling of JFCM authors’ affiliated countries, co-citation of journals, and bibliographic coupling of JFCM authors’ affiliated institutions were created using the Gephi software. For Keyword analysis, we used the keywords that the authors assigned to the manuscripts in JFCM. Figure 3 explains that the keyword “Saudi Arabia” took center stage linking the topical keywords used in JFCM manuscripts. Different colors represented different clusters of keywords. The map was created with the criteria of selecting keywords that had at least occurred thirty times in JFCM manuscripts.

Bibliographic coupling of JFCM authors’ affiliated countries is presented in Figure 4. The size of the node and placement of Saudi Arabia indicated that most of the authors of manuscripts published in JFCM were associated with institutions in Saudi Arabia. The thickness of the link between Egypt and Saudi Arabia indicated the high level of collaboration between the two countries.

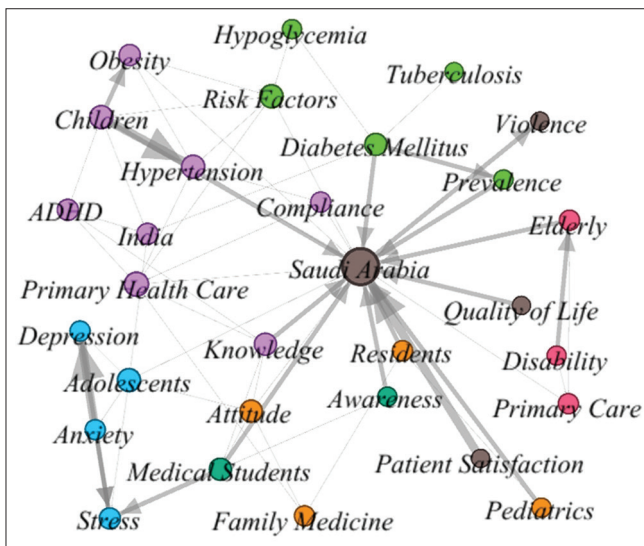


Figure 3: Keyword's co-occurrences of manuscripts published in the Journal of Family and Community Medicine with a threshold of 30 occurrences. Purple (cluster 1), green (cluster 2), blue (cluster 3), orange (cluster 4), and dark green (cluster 5)

Figure 5 presents the co-citation of journals with the citation threshold of 450 citations. Saudi Medical Journal and PLOS One present in cluster 1 form the strongest association based on the overall strength of the link. Cluster 1 comprising six journals was the most significant, followed by cluster 4 represented in orange.

Bibliographic coupling of JFCM’s author’s affiliated intuitions is presented in Figure 6. The node’s size shows relational bonds, while the thickness of the line represents the strength of the relationship. The figure revealed that the institutions working in the health-care sector have established strong connections.

Table 4: The top 15 countries affiliated with authors of manuscripts published within the Journal of Family and Community Medicine between 1994 and 2020

Rank	Country	Continent	TP	TC	C/P
1	Saudi Arabia	Asia	508	2032	4.00
2	India	Asia	72	314	4.36
3	Iran	Asia	6	56	9.33
4	Sudan	Africa	13	44	3.38
5	Egypt	Africa	4	43	10.75
6	Qatar	Asia	7	18	2.57
7	Kuwait	Asia	2	14	7.00
8	Iraq	Asia	2	11	5.50
9	Canada	North America	1	10	10.00
10	Nigeria	Africa	3	8	2.67
11	Malaysia	Asia	3	7	2.33
12	Spain	Europe	1	7	7.00
13	Turkey	Asia	1	7	7.00
14	Indonesia	Asia	1	6	6.00
15	Oman	Asia	5	5	1.00

TP=The total number of “JFCM” publications, TC=Total citations, C/P=Average citations per publication, JFCM=Journal of Family and Community Medicine

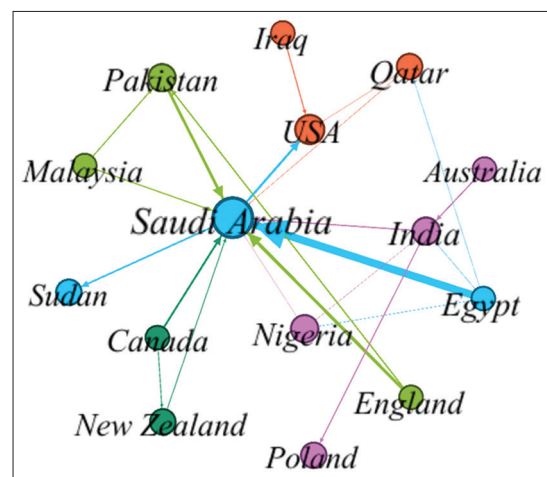


Figure 4: Bibliographic coupling of countries published in Journal of Family and Community Medicine. Purple (cluster 1), orange (cluster 2), green (cluster 3), blue (cluster 4)

Table 5: The 20 most frequently cited manuscripts in the Journal of Family and Community Medicine between 1994 and 2020

Title	Author	Affiliation	TC	PY	CPY	TR
Simulation-based medical teaching and learning	Al-Elq AH	Imam Abdulrahman Bin Faisal University	63	2010	5.25	37
Factors contributing to noncompliance of diabetics attending primary health centers in the Al Hasa district of Saudi Arabia	Khan AR	Al Omran Primary Health Care Center	49	2012	4.90	21
Economic costs of diabetes in Saudi Arabia	Alhawaish AK	Imam Abdulrahman Bin Faisal University	41	2013	4.56	29
Knowledge, attitude, and behavior among Saudis toward cancer preventive practice	Ravichandran K	King Faisal Specialist Hospital and Research Center	32	2011	2.91	33
Dynamics of doctor-patient relationship: A cross-sectional study on concordance, trust, and patient enablement	Banerjee A	D Y Patil Medical College, India	31	2012	3.10	17
Prevalence of low testosterone levels in men with type 2 diabetes mellitus: A cross-sectional study	Al Hayek AA	Jordan University of Science and Technology, Jordan	29	2013	3.22	54
The pattern of self-medication with analgesics among Iranian University Students in Central Iran	Sarahroodi S	Qom University of Medical Sciences	28	2012	2.80	19
The public health burden of physical inactivity in Saudi Arabia	Al-Hazaa HM	King Saud University	28	2004	1.56	30
Health and socioeconomic hazards associated with Khat consumption	Ageely HM	Jizan University	27	2008	1.93	27
Prevalence of oral mucosal lesions in dental patients with tobacco smoking, chewing, and mixed habits: A cross-sectional study in South India	Patil PB	Subharti University, India	26	2013	2.89	17
Metabolic syndrome and cardiovascular risk	Alshehri AM	Imam Abdulrahman Bin Faisal University	24	2010	2.00	40
The attitude of health care professionals towards accreditation: A systematic review of the literature	Alkhenizan A	King Faisal Specialist Hospital and Research Center	24	2012	2.40	18
The impact of Vitamin D deficiency on asthma, allergic rhinitis and wheezing in children: An emerging public health problem	Bener A	University of Manchester	24	2014	3.00	28
The pattern of Khat abuse and academic performance among secondary school and college students in Jizan Region, Kingdom of Saudi Arabia (KSA)	Al-Sanosy RM	King Fahad Central Hospital	23	2009	1.77	11
Metabolic syndrome: Risk factors among adults in kingdom of Saudi Arabia.	Aljohani NJ	King Saud Bin Abdulaziz University for Health Sciences	22	2014	2.75	35
The association between watching television and obesity in children of school-age in Saudi Arabia	Al-Ghamdi SH	King Abdulaziz Medical City	21	2013	2.33	18
Breastfeeding practices: Positioning, attachment (latch-on) and effective suckling - a hospital-based study in Libya	Goyal RC	Datta Meghe Institute of Medical Sciences	20	2011	1.82	22
Isolation and identification of microbes associated with mobile phones in dammam in eastern Saudi Arabia	Al-Abdalal AH	Imam Abdulrahman Bin Faisal University	20	2010	1.67	18
A pilot study of faith healers' views on evil eye, jinn possession, and magic in the kingdom of Saudi Arabia	Al-Habeeb TA	King Saud University	20	2003	1.05	14
Assessment of the nutritional status of the elderly and its correlates	Agarwalla R	Gauhati Medical College, India	20	2015	2.86	13

TC=Total citations, PY=Publication year, CPY=Average citations per year, TR=Total references

Authorship pattern of JFCM publications

Single authorship is the common trend in JFCM publications as the majority of the manuscripts ($n = 311$) were prepared by single authors, followed by the 98 studies for which two authors collaborated. The 64 studies are the result of the joint effort of three authors, while four authors produced 59 manuscripts collaboratively. Five authors collaborated in the conduct of 47 studies [Figure 7].

Discussion

JFCM is a leading journal related to the distinct medical specialty of FM. JFCM has a decent history of consecutive publications for 27 years and is indexed in all celebrated global databases. JFCM has scored a 0.9 Cite Score in the Scopus database. There are 42 journals indexed in

the Family Practice category, and JFCM is ranked 29th in the 3rd Quartile.^[24] In the Clarivate Analytics, Web of Science database, JFCM falls in the Emerging Source Citation Index.^[25]

One relevant study found on the manuscripts of JFCM was limited to the study designs and statistical methods of 229 articles published from 1994 to 2010. The study concluded that designs most frequently found were cross-sectional studies and Chi-square tests.^[27]

In the current scientometric review, 648 manuscripts published in 27 years in JFCM were selected for analysis. To analyze the growth of publications, the span of 27 years was divided into three equal periods of 9 years. A slightly more than a quarter ($n = 168$; 26%) of the documents were published during the first period

Table 6: The top 15 journals citing the Journal of Family and Community Medicine manuscripts the most between 1994 and 2020

Rank	Source	Publisher	Country	TC	IF	Q
1	Saudi Medical Journal	Saudi Arabian Armed Forces Hospital	Saudi Arabia	83	1.195	3
2	New England Journal of Medicine	Massachusetts Medical Society	United States	49	74.7	1
3	Diabetes Care	American Diabetes Association	United States	48	16.02	1
4	Lancet	Elsevier	United Kingdom	44	60.39	1
5	BMJ	BMJ	United Kingdom	43	30.31	1
6	Annals of Saudi Medicine	King Faisal Specialist Hospital and Research Centre	Saudi Arabia	38	0.917	4
7	Pediatrics	American Academy of Pediatrics	United States	36	5.359	1
8	Medical Teacher	Informa Healthcare	United Kingdom	35	2.654	2
9	PLoS ONE	Public Library of Science	United States	34	2.74	2
10	BMC Public Health	BioMed Central	United Kingdom	33	2.521	2
11	Academic Medicine	Lippincott Williams and Wilkins	United States	32	5.354	1
12	JFCM	Wolters Kluwer Medknow Publications	India	32	N/A	N/A
13	JAMA	American Medical Association	United States	27	45.54	1
14	Eastern Mediterranean Health Journal	World Health Organization	Switzerland	24	0.678	4
15	Medical Education	Wiley-Blackwell	United Kingdom	19	4.57	1

TC=Total citations, IF=Impact factor, Q=Quartile, JAMA=Journal of the American Medical Association, BMJ=British Medical Journal, JFCM=Journal of Family and Community Medicine, N/A= Not available

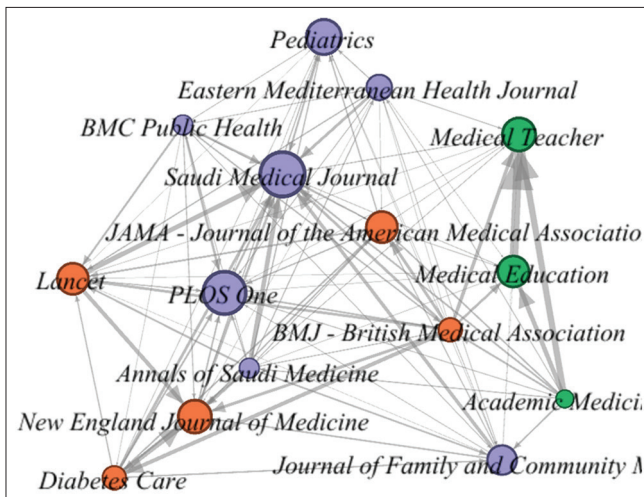


Figure 5: Co-citation of journals with a citation threshold of 450. Purple (cluster 1), green (cluster 2), blue (cluster 3), orange (cluster 4), dark green (cluster 5)

from 1994 to 2002, with an average of 18.66 papers per year. The next period from 2003 to 2011 saw a slight increase of documents ($n = 201$; 31%), while the highest number of manuscripts ($n = 279$; 43%) was published in the last stretch from 2012 to 2020 with an average of 31 documents per year. Overall, an average of 24 documents per year was published. The lowest number of recorded manuscripts ($n = 13$) was published in 1994 and 1998, and the highest number of documents ($n = 37$) was published in 2018.

In the current review, all selected documents received 2693 citations with a mean ratio of 4.15 citations per document. The documents published in the first period received 321 citations, with an average of 1.91 citations per document. In comparison, the documents published in the second interval received 976 citations

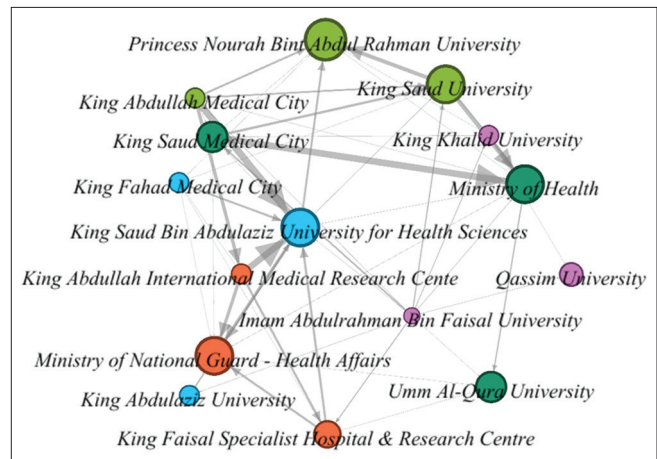


Figure 6: Bibliographic coupling of Journal of Family and Community Medicine's author's affiliated intuitions. Purple (cluster 1), dark green (cluster 2), blue (cluster 3), red (cluster 4), orange (cluster 5), and Green (cluster 6)

with an average of 4.85 citations. The highest number of citations ($n = 1396$) was gained by 279 documents published in the last phase (2012-2020), with an average of 5.60 citations per document. The citation analysis is considered one of the quality indicators of publications. The examination of citation by periods revealed that the quality of the manuscripts had improved over time. A similar study on the Saudi Medical Journal from 1979 to 2018 revealed that it gained a ratio of 5.07 citations per document.^[20] The citation analysis on dental research produced by Saudi Arabia from 2009 to 2018 showed that 1771 documents received 10,320 citations with an average of 5.83 citations per document.^[32] Another study on the Journal of Pakistan Medical Association's publications records from 1965 to 2018 showed that the journal gained 3.26 citations per document.^[34]

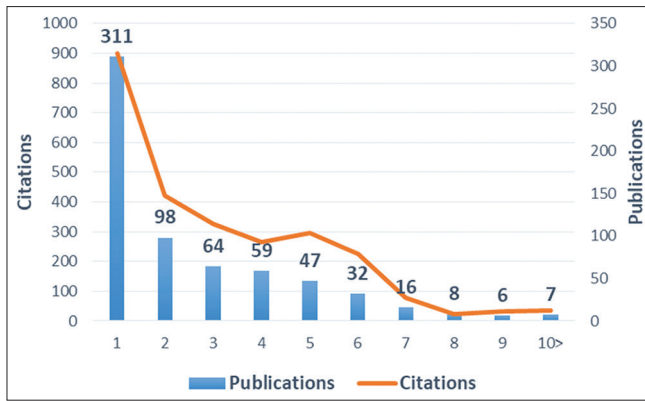


Figure 7: Authorship pattern of Journal of Family and Community Medicine publications explaining the single and multiple authorships

In the present review, most of the authors out of 20 most contributors were geographically located in the Eastern Region of Saudi Arabia, and eight were affiliated with Imam Abdulrahman Bin Faisal University. The author, Al-Khaldi YM, who contributed the most was affiliated to the General Directorate of Health Affairs, Saudi Arabia, and the most influential in terms of citation impact, Al-Elq AH, was affiliated to Imam Abdulrahman Bin Faisal University. A study on Neuroscience research in Saudi Arabia which provided the detail by regions showed that almost half of the research was produced by the Western region followed by the central region.^[12]

The authorship pattern in our review pointed out that slightly less than half of the documents ($n = 311$; 48%) were in the single-author pattern, 52% ($n = 337$) were the result of collaboration. The single-author documents gained 899 citations with an average of 2.71 citations per document, while the multi-author documents received 1794 citations with an average of 5.32 citations per document. The multiauthored documents gained more attention from the scholarly world than single-authored documents. The topic of the paper, research theme, and methodology other than the pattern of authorship also contributed in attracting the attention of scholars. The ratio of single-authored documents was very low in other studies compared to JFCM; 13% and 3% of the total documents were contributed by single authors in Pakistan Journal of Medical Association and Pakistan Journal of Medical Sciences, respectively.^[35,36] Another study on the bibliometric indicators of 12,866 papers published in four medical journals of Saudi Arabia from 2000 to 2019 revealed that about 5% ($n = 2337$) of the total documents were single authored.^[37] Collaborative research for the JFCM should be encouraged.

The top-20 most cited documents received 572 citations, with an average of 28.6 citations per document. More than one-fifth (21.2%) of the total citations were gained by the 20 most cited documents. These documents were

published between the years 2003 and 2015, and four documents each were published in 2012 and 2013. Of the top 15 journals that cited documents of JFCM, the Saudi Medical Journal, which cited 83 times was at the top, followed by New England Journal of Medicine and Diabetic Care. The analysis of affiliated countries of the authors revealed that the majority of documents ($n = 508$; 78.4%) were contributed by Saudi Arabia, followed by India ($n = 72$) and Sudan ($n = 13$). The contribution of other countries was in the single digits. Although the authors affiliated to Egypt contributed only four documents, their documents gained the highest citation impact. International authors contributed about 21% of the manuscripts in JFCM. In comparison, the ratio was 80% and 50%, respectively, in two medical journals of Saudi Arabia, Journal of Infection and Public Health and Saudi Medical Journal.^[19,20] The editorial team should invite more international authors to publish their research in JFCM.

The scrutiny of the authors' affiliated institutions revealed that all top 10 institutions belonged to Saudi Arabia. The authors from Imam Abdulrahman Bin Faisal University contributed the highest number of documents ($n = 205$; 31.6%), followed by King Saud University, King Faisal University, and King Khalid University with 110, 86, and 48 documents, respectively. Although King Faisal Specialist Hospital and Research Center contributed only 13 documents, these documents received 71 citations with an average of 5.46 citations per document. However, Imam Abdulrahman Bin Faisal University recorded 2.75 citations per document.

JFCM has been publishing quality research manuscripts on FM for the past 27 years and has achieved many milestones in the period. To further improve the stature of JFCM in the Scopus and Web of Science databases, it is suggested that collaborative research efforts should be encouraged as our findings showed that single-author manuscripts gained a low citation impact compared to multiauthored manuscripts. Similarly, foreign authors should be encouraged to publish their innovative research in JFCM. One of the possible reasons for low international contribution might be the lengthy manuscript processing time. Usually, researchers perceive that the processing of manuscripts in a journal published every 4 months took more time than the monthly or the quarterly journals to process. To overcome these problems, JFCM should increase the frequency of publications from three issues a year to at least quarterly and reduce the processing time of manuscripts. The editorial board can start student corners to motivate the young researchers.

Bibliographic coupling of JFCM's presented in the node's size shows relational bonds, while the thickness of the

lines represents the strength of the relationship.^[38] The cooccurrence of keywords showed that the keyword “Saudi Arabia” was quite frequent, and the cluster of seven keywords, obesity, children, hypertension, attention deficit/hyperactivity disorder, India, compliance, primary healthcare, and knowledge constituted the strongest network. The co-occurrence of countries’ networks highlighted the research collaboration with 14 countries in JFCM. Similarly, the cocitation network of journals demonstrated that JFCM had developed a strong cocitation cluster with six journals, the Saudi Medical Journal and PLOS One being at the top. The bibliographic coupling of authors’ affiliated institutions showed that all top 15 institutions were in Saudi Arabia, and that there was a strong connection with institutions in the healthcare sector.

The review has some limitations. The data was retrieved from the Web of Science and Medline-PubMed databases. However, it is possible that some manuscripts were missed or not indexed in these databases. The record of citations was taken from the Web of Science database.^[30] Future studies can perform the subject dispersion of manuscripts and analyze the citation impact of different subjects to point out the qualitative aspects of subject categories. The study of attributes of the 100 most cited manuscripts can also be done.

Conclusion

The scientometrics of a single journal helps to identify publication trends, citation impact, author productivity, and the pattern of collaboration. The JFCM is an important journal of Saudi Arabia which since 1994 has provided a platform for FM researchers to share their scientific and scholarly research with the rest of the world. Over the years, both the frequency of publications and the number of published manuscripts in the journal have greatly improved. Although the scope of the journal is international and manuscripts are received from all over the world, most contributions are from Saudi Arabia. This study has highlighted the various scientometric indicators of manuscripts published in JFCM, which have also helped to improve standards and raised the global ranking of JFCM.

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Conflicts of interest

There are no conflicts of interest.

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