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Bibliometric analysis of COVID-19 research publications in pharmacy practice journals

Waleed M. Sweileh[*], iD

Department of Physiology, Pharmacology/Toxicology, Division of Biomedical Sciences, College of Medicine and Health Sciences, An-Najah National University, Nablus, Palestine

[*]Correspondence: Department of Physiology, Pharmacology/Toxicology, Division of Biomedical Sciences, College of Medicine and Health Sciences, An-Najah National University, P.O. Box 7, Nablus, Palestine. Tel: + 970 599 225906; E-mail: waleedsweileh@yahoo.com

Abstract

Objectives Pharmacy practice journals are considered the main player in promoting pharmacy practice research and the pharmacy profession globally. The current study aimed to explore and analyze literature on the COVID-19 pandemic published in pharmacy practice journals.

Methods COVID-19 research articles were extracted from 32 pharmacy practice journals indexed in Scopus for the study period from 01 January 2020, up until 31 December 2021

Key findings A total of 581 documents were found with an average of 4.5 authors per article and 4.8 citations per document. The retrieved documents were published in 28 pharmacy practice-related journals with the *Research in Social and Administrative Pharmacy* and the *American Journal of Health System Pharmacy* journals being the leaders in this field. The major findings of the analysis indicated (1) a limited number of contributing countries with limited author-author interactions and cross country collaboration; (2) specific topics were encountered, mainly hospital pharmacy services, survey studies on knowledge, and pharmacy education; (3) several contributing countries in the Middle East, mainly Saudi Arabia; Egypt, and Jordan contributed to the retrieved documents, and (4) the highly-cited documents discussed issues related to pharmacy services and role of the community pharmacists during the pandemic.

Conclusion Research activity on COVID-19 in pharmacy practice journals represents the commitment of researchers and professionals to transform and promote the profession of pharmacy. Research on pharmacy practice and pharmacists in low- and middle-income countries during pandemics needs to be prioritized by scholars and journal editors.

Keywords: COVID-19; pharmacy practice; bibliometric analysis

Background

In late 2019, several cases of coronavirus infection in Wuhan city were identified, and soon the disease became a worldwide threat.[1] The novel coronavirus infection was unique in terms of high pathogenicity and that is why the World Health Organization (WHO) declared the outbreak a global public health emergency and named the disease 'COVID-19', which is a short form of 'coronavirus disease 2019'.[2] The world has witnessed two previous outbreaks caused by coronaviruses different from COVID-19. These outbreaks included Severe Acute Respiratory Syndrome coronavirus (SARS-CoV) and the Middle East Respiratory Syndrome coronavirus (MERS-CoV) which had case fatality rates of 10% and 37% for SARS-CoV2 and MERS-CoV, respectively.[3, 4] At the time of writing this manuscript, approximately 187 million cases of COVID-19 were reported in more than 200 different countries/territories, with four million deaths.[5] Since the beginning of the outbreak, researchers and health professionals worldwide were fully engaged in developing better diagnostics, safe and effective vaccines, and evidence-based therapeutics for this novel coronavirus.[6] Based on the current flow of data and information, it might take several years of scientific efforts and financial support before humanity gains full control over the COVID-19 pandemic and the new emerging strains.[7–9] That

is why thousands of publications on COVID-19 have flooded scientific journals in different subject areas.

Pharmacists at their professional sites can help in the fight against the pandemic.[10–12] A recent scoping review on the role of pharmacists during COVID-19 found 11 publications that described the core services provided by the pharmacist during the COVID-19 pandemic.[13] The authors of the study summarized the roles of pharmacists in disease prevention and infection control, adequate storage, and drug supply, patient care, and support for healthcare professionals. In certain developing countries, community pharmacists played a crucial role in vaccination to achieve full national coverage.[14, 15] There are at least four million pharmacists worldwide, and most of them practice the profession as community or clinical, or hospital pharmacists. It is believed that COVID-19 represents an excellent opportunity for better recognition of the pharmacy profession and pharmacists at times of the public health crisis.[16]

The dissemination of knowledge through scientific publications in peer-reviewed journals is a credible source for developing evidence-based treatment guidelines and evidence-based practice for the pharmacy profession. Peer-reviewed journals in the field of pharmacy practice are considered the voice of practicing pharmacists worldwide and

bear the responsibility of educating pharmacists, promoting the pharmacy profession, disseminating evidence, and increasing communications among pharmacists in different parts of the world to gain recognition for pharmacists by governments and health policymakers in the healthcare industry. Gaining knowledge about the current literature available on COVID-19 published in pharmacy practice journals across the globe is of high value since it sheds light on the contribution of pharmacy practice to the global public health crisis.

Assessing scientific publications on COVID-19 within pharmacy practice is important for shaping the pharmacy profession and developing an evidence-based future curriculum that focuses on combating human crises such as the COVID-19 pandemic. Bibliometric analysis is a field in which several parameters and techniques are used to assess the volume, scientific impact, and trend of research on a particular topic.[17] Bibliometric analysis and data visualization have been widely used to measure and evaluate scientific research quantitatively and qualitatively.[18, 19] At least 50 bibliometric studies on COVID-19 have been published in the past several months of the epidemics. The majority of these bibliometric studies focused on COVID-19 literature,[20, 1] while certain others focused on COVID-19 literature within the context of a specific field such as nursing.[21, 22] The bibliometric analysis provides information about the research volume and activity of different faculties of pharmacy and pharmaceutical associations in different countries. The objective of the current study was to conduct a bibliometric analysis of COVID-19 research published in pharmacy practice journals.

Methods

The current study was a retrospective descriptive bibliometric analysis of COVID-19 research published in pharmacy practice journals.

Pharmacy practice journals

Several scientific databases, including Web of Science, Scopus, PubMed, and Google Scholar could be used to achieve the objective of the study. Scopus database owned by Elsevier is 100% inclusive of PubMed and included twice the number of journals indexed in the Web of Science.[23] Therefore, the Scopus database was used in the current study to perform and present the bibliometric indicators on a selected list of pharmacy practice journals.

The list of pharmacy practice journals was obtained from Mendes et al.'s study.[22] That study objectively classified the 285 pharmacy journals into six clusters. The cluster of "pharmacy practice" journals included 67 journals. The 67 journals were sorted based on their strength of relatedness to pharmacy practice discipline and the top 33 journals were used in the current study and designated as leading pharmacy practice journals. The reason for selecting the top 33 journals and not all journals was to minimize retrieving research articles with minimum relevancy to pharmacy practice due to overlapping of the pharmacy practice journals with clinical pharmacology journals since these two classes belonged to one group based on the analysis made by Mendes et al. Therefore, journals with a lower strength of association with pharmacy practice discipline exist at the boundaries of clinical pharmacology/pharmacotherapy class. The list of journals used in the current bibliometric

study was shown in Appendix 1. Of the 33 journals, one journal is not indexed in Scopus and therefore the retrieved articles were extracted from 32 journals indexed in Scopus and had the highest association strength with the pharmacy practice field. In addition to the list of pharmacy practice journals obtained from Mendes et al.'s study,[22] any peer-reviewed journal with "pharmac* practice" or "pharmac* service*" terms in the name of the journal was included in the search query.

COVID-19 keywords

Keywords used for COVID-19 included 'COVID-19', 'novel coronavirus', '2019 novel coronavirus', 'coronavirus 2019', 'coronavirus disease 2019', '2019-novel CoV', '2019 ncov', 'COVID 2019', 'COVID19', 'corona virus 2019', 'nCoV-2019', 'nCoV2019', 'nCoV 2019', 'ncov', 'COVID-19', 'Severe acute respiratory syndrome coronavirus 2', and 'SARS-CoV-2'. These keywords were separated by the Boolean operator 'OR'. COVID-19 keywords were searched in the title only to minimize false-positive results. Keywords related to COVID-19 were obtained from previously published bibliometric papers on COVID-19.[24, 25] The list of keywords related to COVID-19 was combined with the list of journal names using the 'AND' Boolean operator. The asterisk and quotation marks were used in the search strategy to facilitate and increase the accuracy of the research strategy. On 15 February 2022, the metadata of all the articles published in these journals were extracted from Scopus.

Inclusion and exclusion criteria

The retrieved articles were not limited to any type of publication. No language restrictions were used. The study period was from 01 January 2020 to 31 December 2022.

Data extraction and analysis

The search strategy was implemented on 17 July, 2021 and all data extraction and analysis were carried out on the same day to avoid any change in the number of citations. The retrieved data were exported from Scopus as a 'csv' file to the Microsoft Excel® program. The exported information included the following information about each article: author(s) and their affiliations, title and abstract, year of publication, journal name, number of citations, the language of the article, and author keywords. VOSviewer software version 1.6.14 (Leiden University, Leiden, Netherlands)[26] was used to create maps for the most frequent author keywords and the most frequent terms in the titles/abstracts of the retrieved articles.

Results

General characteristics of the retrieved articles

The search strategy retrieved 581 documents. Research articles constituted approximately 58.0% (n = 334) of the retrieved documents. Table 1 shows the various types of retrieved documents. The bulk of the retrieved documents was published as open access (n = 489, 84.2%). The vast majority of the retrieved documents (n = 553, 95.2%) were published in English while the remaining documents were bilingual. At the time of writing the current manuscript, the retrieved articles received 2794 citations, an average of 4.8 citations per document. The bulk of the retrieved documents was not funded. Of the limited research publications that

were funded, the *National Institutes of Health* was the main funder.

The annual number of publications

The 581 retrieved documents were published in 2020 (n = 211, 36.3%) and 2021 (n = 370, 63.7%).

Table 1 Types of documents published on pharmacy practice journals on COVID-19

Document type	Frequency	% (N = 581)
Article	334	57.5
Note	90	15.5
Letter	68	11.7
Review	52	9.0
Editorial	30	5.2
Short survey	5	0.9
Conference paper	2	0.3

Journals publishing the retrieved articles

In total, 28 pharmacy-practice-related journals participated in publishing the retrieved documents (Table 2). The *Research in Social and Administrative Pharmacy* journal (n = 77, 13.3%), followed by the *American Journal of Health System Pharmacy* journal (n = 70, 12.0%) followed by the *Journal of the Pharmaceutical Policy and Practice* (n = 45, 7.7%).

Countries contributing to the published articles

In total, researchers from 68 different countries participated in publishing the retrieved articles. Table 3 shows countries with a minimum contribution of three documents. Therefore researchers from one-third of affected countries worldwide participated in publishing the retrieved documents. Authors from the US participated in 206 (35.5%), followed by the UK (n = 57; 9.8%), and Canada (n = 34; 32 5.5%). Researchers from the three above-mentioned countries contributed to 292 (50.3%) of the retrieved documents. Six Arab countries and four countries in the African region were present in the list of countries.

Table 2 Pharmacy practice-related journals that published the retrieved documents on COVID-19.

Journal	Frequency	% N = 581
Research in Social and Administrative Pharmacy	77	13.3
American Journal of Health System Pharmacy	70	12.0
Journal of Pharmaceutical Policy and Practice	45	7.7
Journal of the American Pharmacists Association	42	7.2
American Journal of Health System Pharmacy AJHP Official Journal of the American Society of Health System Pharmacists	38	6.5
European Journal of Hospital Pharmacy	35	6.0
Journal of Pharmacy Practice	35	6.0
Journal of Oncology Pharmacy Practice	28	4.8
Journal of Clinical Pharmacy and Therapeutics	26	4.5
Actualites Pharmaceutiques	24	4.1
American Journal of Pharmaceutical Education	20	3.4
Hospital Pharmacy	17	2.9
International Journal of Clinical Pharmacy	16	2.8
Canadian Pharmacists Journal	14	2.4
Chinese Pharmaceutical Journal	13	2.2
Pharmacy Education	13	2.2
International Journal of Pharmacy Practice	10	1.7
Journal of Pharmacy Practice and Research	10	1.7
Canadian Journal of Hospital Pharmacy	9	1.5
SA Pharmaceutical Journal	9	1.5
Journal of Advanced Pharmacy Education and Research	8	1.4
Currents in Pharmacy Teaching and Learning	7	1.2
Pharmacy Practice	6	1.0
Journal of Pharmaceutical Health Services Research	3	0.5
Egyptian Pharmaceutical Journal	2	0.3
International Journal of Pharmaceutical and Healthcare Marketing	2	0.3
Journal of Oncology Pharmacy Practice Official Publication of The International Society of Oncology Pharmacy Practitioners	1	0.2
Journal of Pain and Palliative Care Pharmacotherapy	1	0.2
TOTAL	**581**	**100%**

Table 3 List of countries contributing at least three publications on COVID-19 in pharmacy practice-related journals

Country	Frequency	% (N = 581)	Country	Frequency	% (N = 581)
United States	206	35.5	Nigeria	7	1.2
United Kingdom	57	9.8	South Africa	6	1.0
Canada	34	5.9	Brazil	5	0.9
Australia	32	5.5	Indonesia	5	0.9
China	32	5.5	Japan	5	0.9
France	31	5.3	Switzerland	5	0.9
Saudi Arabia	22	3.8	Germany	4	0.7
Turkey	18	3.1	Iraq	4	0.7
Malaysia	16	2.8	Lebanon	4	0.7
Pakistan	15	2.6	Serbia	4	0.7
United Arab Emirates	15	2.6	Colombia	3	0.5
Italy	13	2.2	Croatia	3	0.5
Spain	12	2.1	Czech Republic	3	0.5
Egypt	11	1.9	Ethiopia	3	0.5
Jordan	11	1.9	Greece	3	0.5
Netherlands	11	1.9	Kenya	3	0.5
India	9	1.5	New Zealand	3	0.5
Portugal	8	1.4	Philippines	3	0.5
Belgium	7	1.2	Thailand	3	0.5
Ireland	7	1.2	Viet Nam	3	0.5

Authorship analysis

In total, 2603 authors participated in publishing the retrieved documents, giving an average of 4.5 authors per document. One hundred and four (17.9%) documents were single-authored, 73 (12.6%) were double-authored, 96 (16.5%) were three-authored, and 78 (13.4%) were four-authored articles. The remaining documents (n = 230, 39.6%) were multi-authored (≥ 5 authors).

The most impactful documents

The top 10 cited documents[15, 27–35] are listed in Table 4. The list included eight documents published in *Research in Social and Administrative Pharmacy*. The documents that received the highest number of citations (n = 95) discussed the role of pharmacists during the public health crisis of COVID-19.[15]

Research themes (mapping frequent terms in titles/abstracts)

Visualization of terms with a minimum frequency of occurrences of 10 in titles/abstracts of the retrieved documents yielded 149 terms distributed into three different clusters, each representing a research theme (Figure 1). The largest cluster was the red cluster (66 terms) which focused on pharmacy service/challenge/education/response during the pandemic. The second-largest cluster (green) included 61 terms and focused on the drug treatment/therapy/outcome of COVID-19. The third cluster (blue) included 22 terms. The cluster focused on survey studies on perception and knowledge about COVID-19.

Important topics (mapping the most frequent author keywords)

Figure 2 is a network visualization map of author keywords with a minimum occurrence of 10 times. The map included

eight clusters. Each cluster represented keywords on a specific important topic. The red cluster represented keywords related to hospital pharmacy services during COVID-19. The green cluster represented keywords related to studies on chloroquine. The purple cluster represented keywords related to pharmacy education and medication safety during the pandemic. The yellow cluster included keywords related to community and clinical pharmacy services during the pandemic. The remaining clusters included ones related to the vaccine, anti-coagulation, and emergency preparedness.

Mapping international research collaboration

Research collaboration among countries with a minimum contribution of five (n = 26) is mapped in Figure 3. The map showed the US and the UK in the center of the map with connecting lines with most countries on the map. Based on the node size, the UK had the highest percentage of documents with international authors. The map included six clusters. Each cluster represented countries with common research interests. The geographic proximity of collaborating countries was present in certain research networks such as the cluster of Arab countries and the cluster of certain European countries.

Mapping networks of author collaboration

Figure 4 shows networking among scholars with a minimum contribution of four documents. The map included 11 scholars with minimum interaction among the scholars. Traynor, K has the largest node size indicating high research activity in the field.

Discussion

In the current study, bibliometric information about 581 COVID-19 documents published in pharmacy practice

Table 4 Top 10 cited research articles on COVID-19 published in pharmacy practice-related journals

| Rank	Title	Year	Source title	Cited by	Document Type
1	On the frontline against COVID-19: community pharmacists' contribution during a public health crisis[15]	2021	*Research in Social and Administrative Pharmacy*	95	Article
2	Recommendations and guidance for providing pharmaceutical care services during COVID-19 pandemic: a China perspective[36]	2021	*Research in Social and Administrative Pharmacy*	90	Review
3	Community pharmacist in public health emergencies: quick to action against the coronavirus 2019-nCoV outbreak[35]	2020	*Research in Social and Administrative Pharmacy*	89	Note
4	Medication management and adherence during the COVID-19 pandemic: perspectives and experiences from low-and middle-income countries[32]	2021	*Research in Social and Administrative Pharmacy*	66	Article
5	Providing pharmacy services during the coronavirus pandemic [34]	2020	*International Journal of Clinical Pharmacy*	65	Note
6	When fear and misinformation go viral: pharmacists' role in deterring medication misinformation during the 'infodemic' surrounding COVID-19[30]	2021	*Research in Social and Administrative Pharmacy*	64	Note
7	Community pharmacists and communication in the time of COVID-19: Applying the health belief model [29]	2021	*Research in Social and Administrative Pharmacy*	62	Note
8	Media's effect on shaping knowledge, awareness risk perceptions and communication practices of pandemic COVID-19 among pharmacists [31]	2021	*Research in Social and Administrative Pharmacy*	61	Article
9	Pharmacists at the frontline beating the COVID-19 pandemic [28]	2020	*Journal of Pharmaceutical Policy and Practice*	60	Review
10	Fighting against COVID-19: Innovative strategies for clinical pharmacists[33]	2021	*Research in Social and Administrative Pharmacy*	55	Review
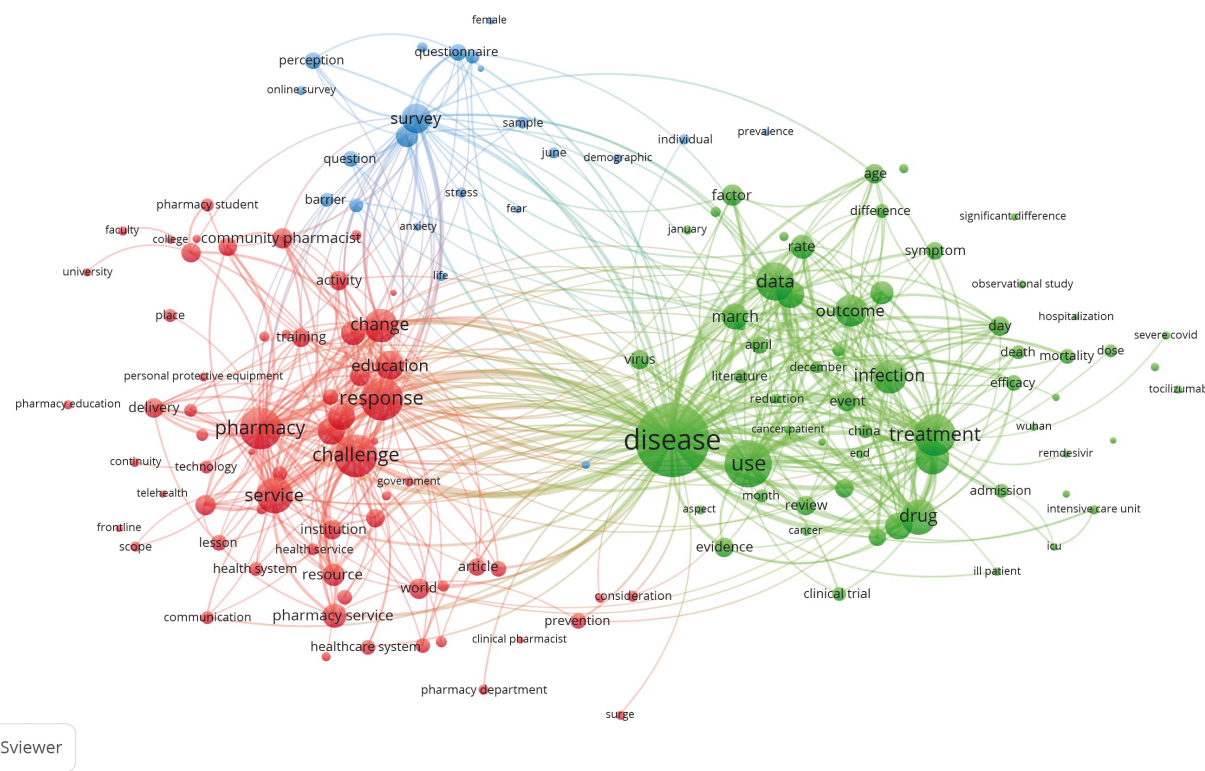
Figure 1 Research themes obtained by mapping frequent terms in the titles/abstracts of the retrieved articles. Of the 9486 terms, 248 terms have occurred at least 10 times. For each of the 248 terms, a relevance score was determined and used to select the 60% most relevant terms. The size of the circles in the map represents the number of occurrences of the term in the title/abstract of the retrieved documents. The largest set of connected terms consists of 149 terms in three clusters: red cluster = 66 terms, green cluster (61 terms), and blue cluster (22 terms).

journals was presented. There were five major findings in the current study. First, within the past two years, a relatively large number of documents were published indicating a quick response of those in the field of pharmacy practice to COVID-19 research. Second, researchers from a limited number of countries did participate in the publication. This suggests that pharmacy practice research in many countries was inadequate and poor in the context of COVID-19. A few countries
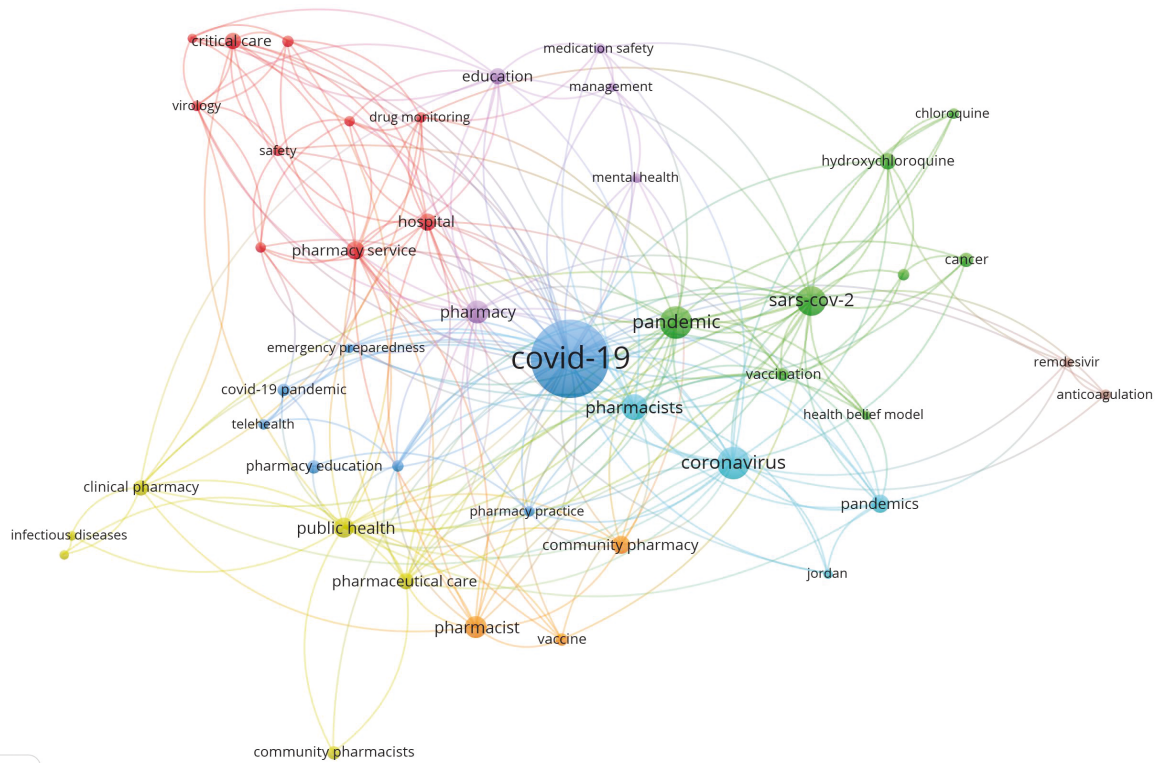
Figure 2 Most frequent author keywords mapped using co-occurrence analysis. Of the 999 author keywords present in the retrieved documents, 45 keywords with a minimum occurrence of 10 times were mapped. The size of the circle in the map is proportional to the number of occurrences in the retrieved articles.
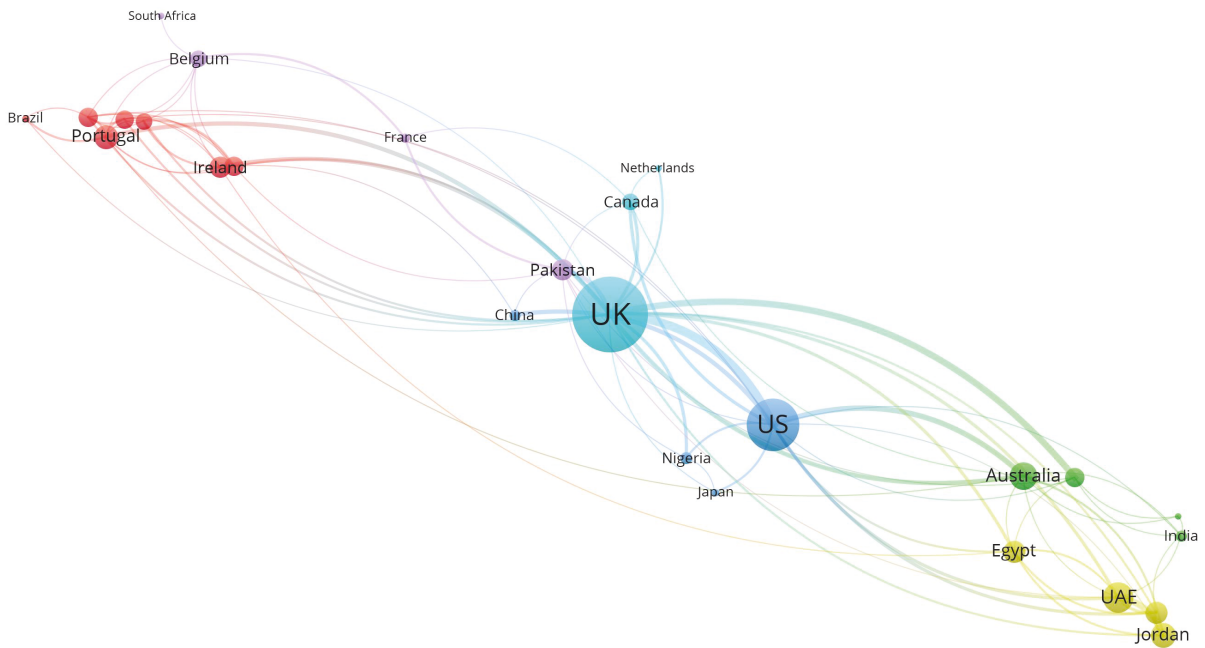

Figure 3 Mapping research collaboration for countries with a minimum contribution of five documents. Twenty-six countries appeared on the map distributed into six clusters. The thickness of the connecting lines is a measure of the strength of collaboration between any two countries. The node size is proportional to the percentage of documents with international authors.

dominated research in this field. Of the investigated pharmacy practice-related journals, three journals dominated the field indicating the presence of a limited number of peer-reviewed

journals leading the pharmacy practice field. Third, the *Research in Social and Administrative Pharmacy* journal had a leading role in this field, and documents published in this
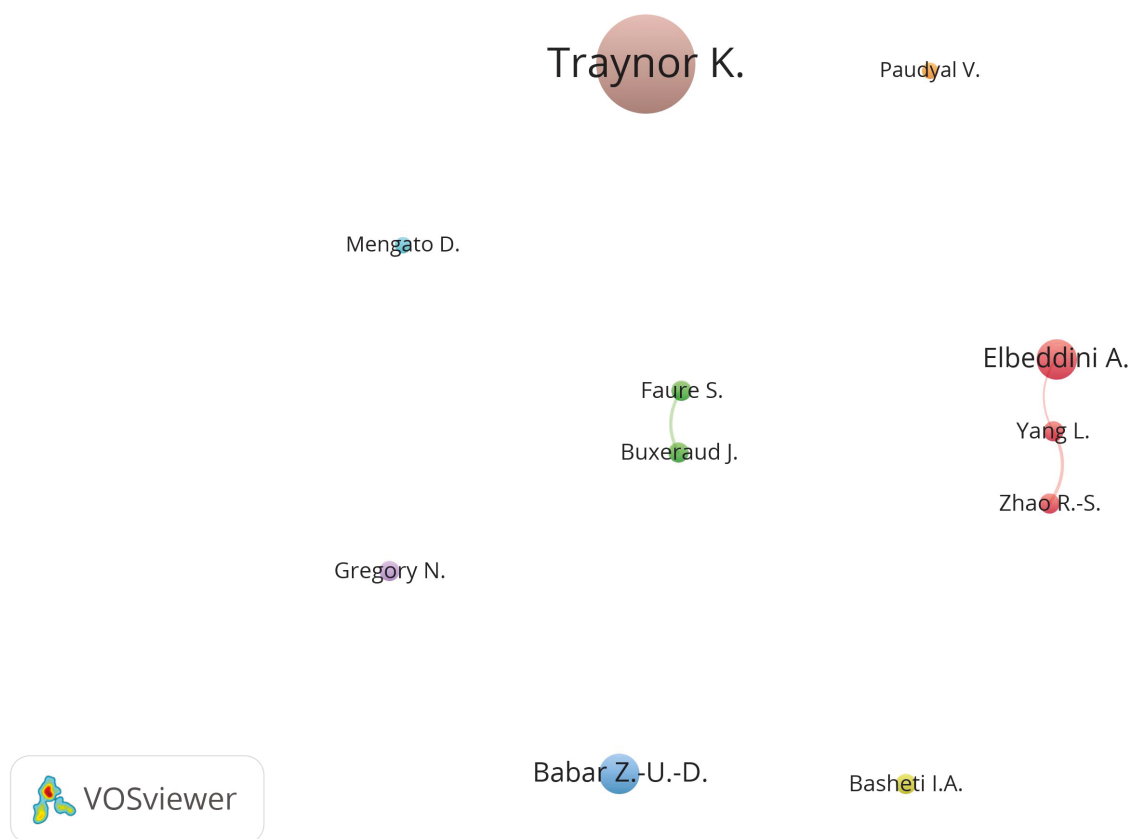
Figure 4 Network visualization map of co-authorship for researchers with a minimum of five publications. The map included nine scholars distributed into six clusters.

journal received the highest number of citations. This journal had a relatively high impact factor (IF = 2.844) relative to other pharmacy practice journals. The journal is an international journal, based in Europe, indexed in Scopus and Web of Science, and within the Elsevier platform. Fourth, despite the relatively high number of authors per document, there was limited interaction across researchers and countries. A recent bibliometric study indicated low rates of international collaboration in pharmacy practice research articles.[36] One important potential reason for this relatively weak research collaboration is the vast difference in the pharmacy profession and pharmacy practice among different countries. Fifth, the retrieved documents discussed a wide range of topics but hospital and community pharmacy services during the crisis were major topics discussed.

The current study has three important limitations. First, there are many pharmacy-related research documents on COVID-19 published in public health or health services journals that were not included in the analysis because our focus was on pharmacy practice-related journals. Therefore, the retrieved documents do not represent the global research on COVID-19 in the context of pharmacy practice. The current study represented documents published in pharmacy practice journals assuming that these leading journals should represent and reflect the intellectual output in the field of pharmacy practice from researchers in the field worldwide. The second point of limitation is the use of Scopus which does not represent all local or regional journals in the field of pharmacy. There are several pharmacy-related journals in the Middle East and other parts of the world that are not indexed

in Scopus. Therefore research documents published in these unindexed journals were missed. Despite these limitations, the current snapshot analysis represented a general overview of research published by leading researchers in leading pharmacy practice journals. The analysis should benefit associations and groups interested in promoting pharmacy research and the pharmacy profession by directing future efforts and building research priorities for researchers in pharmacy practice in different parts of the world. Furthermore, the current analysis should trigger better interaction and research collaboration in the field of pharmacy practice research and education. A panel of leading journal editors was convened by the International Pharmaceutical Federation Pharmacy Practice Research Special Interest Group recommended that pharmacy practice researchers should focus on assessing the clinical and cost-effectiveness of COVID-19 therapies and vaccines and evaluate different models of pharmaceutical services and education delivery.[37] The third and final limitation is the use of Mendes et al paper to extract the list of pharmacy practice journals. The paper included 285 journals in the analysis and was based on specific terms such as pharmacy, pharmacology, pharmacists, and others. It must be emphasized that this methodology might have missed some journals with non-English names especially those from Latin America, China, and other world regions. For example, the 'Hospital Pharmacy' journal based in the US was included in the analysis but the 'Farmacia Hospitalaria' based in Spain was not included in the analysis despite that both journals have the same equivalent meaning. This suggests that a more comprehensive research strategy needs to be developed and

validated that depends on more than just a list of pharmacy journals as we did in the current study.

The current study indicated that the US ranked first. Previously published bibliometric studies on COVID-19 alone indicated that China ranked first, followed by the US. For example, El-Mohadab et al. carried out a bibliometric analysis of COVID-19 publications for a period of six months using the Scopus database found that China ranked first, followed by the US, India, Germany, the UK, Italy, and Japan.[38] A study by Chahrour et al. also found that China ranked first in the volume of publications on COVID-19.[24] A bibliometric analysis on pharmacy education publications using the Scopus database for the study period from 2000 to 2016 found that the US had the highest number of publications in pharmacy education followed by the UK and India.[19] The top ten active countries in pharmacy education publications did not include China. Another bibliometric study about global publications on medication adherence found that the US ranked first in the number of publications. In contrast, China did not rank among the top active 10 countries.[39] In the current study, Saudi Arabia and Jordan ranked in the active list indicating that these countries two countries have a substantial contribution to pharmacy practice-related publications.[40] The second potential reason is the fact that community pharmacists in the Middle East are very accessible and the general public tends to approach community pharmacists seeking help for their health problems rather than attending primary healthcare providers.[10, 41]

The current study indicated that pharmacies, pharmacists, and services were frequently encountered author keywords. Community pharmacies are suitable places to get protective masks and hand hygiene products and medications for chronic diseases at a time of crisis. Community pharmacists are also an essential and first-line source of COVID-19 concerning prevention, diagnosis, and treatment.[42, 43] During the COVID-19 pandemic, community pharmacies became a potential place for the spread of the virus due to the increased influx of customers seeking to purchase protective devices or medications for chronic use. Community pharmacies have changed their space design to minimize contact between pharmacy staff and customers. Furthermore, community pharmacies have posted strict regulations for customers regarding wearing masks and keeping physical distance to prevent the virus's potential spread.[44, 45] In certain developed countries, a 'drive-thru pharmacy service' was implemented to minimize the risk of spreading the infection during the pandemic.[46] Community pharmacies are an essential sector in fighting the pandemic through increasing education, awareness and providing advice regarding potential diagnosis. However, it seems that this sector is not given attention by governmental and non-governmental agencies involved in fighting COVID-19.[47] The role of community pharmacies during COVID-19 emphasizes the role of pharmacists as an essential member of public health in general and as a member in preparing for public health emergencies.[48] These changes in the role of community pharmacies in public health crises need to be included in pharmacy practice and pharmacy training to reflect a positive difference in community pharmacy practice.[49] The community pharmacy services during the COVID-19 pandemic have witnessed an increase in tele-pharmacy and home delivery of medications. This change was imposed on community pharmacies since many customers were either afraid of going out due to the lockdown or were unable to go to the pharmacy due to their illness. This kind of service represents a shift in pharmacy practice, especially in developing countries.[50, 51] Regardless of the work settings, pharmacists remain an important source of information for the public and the patients regarding effective therapeutic strategies. Pharmacists are also important in the task force needed to fight fake information and false treatment approaches written in social media. During public health crises such as COVID-19, pharmacists can play a crucial role in determining the list of essential medications to invest in and store in large quantities. Pharmacists in clinical settings and hospitals also play an important role in clinical trials designed to test certain drugs against COVID-19.[52] Furthermore, clinical pharmacists are involved in developing therapeutic protocols to treat patients with COVID-19.[53]

Conclusion

The current study showed that pharmacy practice experts and researchers were quick in their response to COVID-19 and published approximately 240 articles within the past 19 months, an average of 14 articles per month or one article every other day. The retrieved articles emphasized the role of community, hospital, and clinical pharmacists during a public health crisis such as the COVID-19 pandemic. The pharmacy practice research during such a crisis needs to focus on preparedness and the role of pharmacists in increasing public awareness, managing pharmaceutical services, medication supply, and education. Pharmacy practice research is important for all countries to promote the pharmacy profession and to learn from success stories of pharmacy practice experiences in other countries. The final point is that academics and researchers in pharmacy practice need to strengthen their research network as one potential mechanism of promoting research, improving patient services, and upgrading the pharmacy profession to meet the current and future challenges.

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Authors' Contributions

W.S initiated the idea, did the writing and analysis, and submitted the manuscript. W.S started the idea, designed the methodology; did the data analysis, graphics, and data interpretation; wrote and submitted the manuscript.

Author's Information

Professor Sweileh is a researcher at the College of Medicine and Health Sciences (An-Najah National University). Professor Sweileh is interested in Global Public Health issues with a special interest in antimicrobial resistance.

Ethics Approval and Consent to Participate

Not applicable

IRB at An-Najah National University, Palestine requires no approval for bibliometric studies

Consent for publication

Not applicable

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Conflict of Interests

The authors declare that they have no competing interests.

Data Availability

All data presented in this manuscript are available on the Scopus database using the search query listed in the methodology section.

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