Original Article

Bibliometric analysis of the literature on COVID-19 published in the Web of Science database from Türkiye

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ABSTRACT

Objectives: The aim of this study is to present the bibliometric analysis of the literature on coronavirus disease 2019 (COVID-19) in the Web of Science (WoS) database from Türkiye and to examine the scientific contributions of our country.

Materials and methods: WoS database was used to obtain the data. The literature published in our country until 20 December 2022 was searched with the keywords "COVID-19" or "SARS-COV-2" in the "Title". Document type was limited to "Article".

Results: A total of 153.397 articles were identified in the WoS database, of which 6,335 were published from Türkiye. Türkiye was in the ninth place in terms of article publication on COVID-19. The number of articles was also low in 2020. More than 95% of them were in English. Articles were published in 1997 different journals and eight journals among the 25 most frequently published journals were from Türkiye. 62.178% of the articles were published in journals in the Science Citation Index Expanded category. It has been published mostly in medicine. Twenty-two of the 25 most frequently broadcasting institutions are universities.

Conclusion: Türkiye has followed an increasing trend over the years in articles on COVID-19 and has made significant contributions to the literature. Our study will guide researchers in the design of their future studies.

Keywords: Bibliometric analysis, COVID-19, Türkiye.

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is a novel coronavirus that entered our lives in 2019, and the disease it causes is named coronavirus disease 2019 (COVID-19).[1] The rapidly spreading pattern of this disease was declared a pandemic by the World Health Organization (WHO) in March 2020.[2] According to WHO data, as of January 9, 2023, SARS-CoV-2 has caused more than 659 million confirmed cases and over 6.5 million deaths. Since December 21, 2022, more than 13 billion vaccine doses have been administered.[3]

In our country, the initial efforts related to COVID-19 began on January 10, 2020, under the auspices of the Republic of Türkiye Ministry of Health. On January 22, 2020, the first meeting of the Scientific Advisory Board of the Ministry of Health was held. The first case of COVID-19 in our country was reported on March 11, 2020.[4] As of November 27, 2022, SARS-CoV-2 infection in our country has resulted in more than 17 million confirmed cases and approximately 101,500 deaths.[5]

Since the beginning of the pandemic, there has been a rapid increase in the number of cases and deaths, necessitating a continuous flow and sharing of information on aspects such as the transmission, course, complications, or management of the disease. To adapt to this extraordinary situation, scientific publications and recommendations have been rapidly introduced into the literature worldwide in an unprecedented manner. Subsequently, with the initiation of vaccine studies and the emergence of the non-health impacts of the pandemic, these sharing activities have expanded and continued.

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Bibliometrics is a research method first applied by Pritchard, which can quantitatively and statistically reveal the research characteristics of a specific field.[6] The bibliometric method has been applied in various medical fields and is considered valuable for providing a comprehensive perspective on scientific contributions to the subject.[7-13] Although there are studies evaluating publications on COVID-19 through bibliometric analysis, a similar study examining the current literature in our country could not be found.[14-18]

The aim of this study is to present a bibliometric analysis of the COVID-19 literature published in the Web of Science (WoS) database from Türkiye and to analyze the scientific contributions of our country in this field. In doing so, the global position of Türkiye in COVID-19 research will be reviewed, and an assessment will be made on general publication trends, scientific fields, most influential institutions, and journals in COVID-19 research by researchers in our country.

MATERIALS AND METHODS

In this bibliometric study, the WoS database (Clarivate Analytics, Philadelphia, PA, USA) was utilized to obtain data. Literature published from our country up to December 20, 2022, was searched using the search engine with the keywords 'COVID-19' or 'SARS-CoV-2' in the title section. Subsequently, the document type was narrowed down to 'article.' The publication date range selected was from 2019 to 2022.

The data obtained from the search were downloaded as a Microsoft Excel document. Microsoft Office Excel program was used to manage the downloaded findings, remove duplicate information, and create visualizations.

The obtained data were analyzed to determine the top 10 countries with the highest number of article publications and the position of Türkiye among these countries. The most frequently used publication languages in COVID-19 articles from Türkiye, the distribution of articles by years, the top journals with the highest number of publications and their WoS categories, the top five scientific disciplines in which COVID-19 articles were published, and the 25 most frequently published scientific fields were discussed. Additionally, the discussion covered the top 25 institutions with the highest publication frequency.

Statistical analysis

In the analysis of the collected data, frequency and percentage values were calculated using the Microsoft Office Excel 2019 (Microsoft Company, Seattle, USA).

RESULTS

Evaluation of publications on COVID-19 and their distribution by countries: The number of research studies on COVID-19 worldwide in the WoS database is 258.609 of which 153.397 are articles. The country with the highest number of

Table 1. Distribution of articles published on COVID-19 by countries

Countries	Number of publications	%
United States	39,731	25,900
China	16,717	10,897
United Kingdom	13,723	8,946
Italy	11,069	7,216
India	9,919	6,466
Spain	7,432	4,845
Canada	6,902	4,499
Germany	6,818	4,445
Türkiye	6,335	4,130
Australia	6,268	4,086

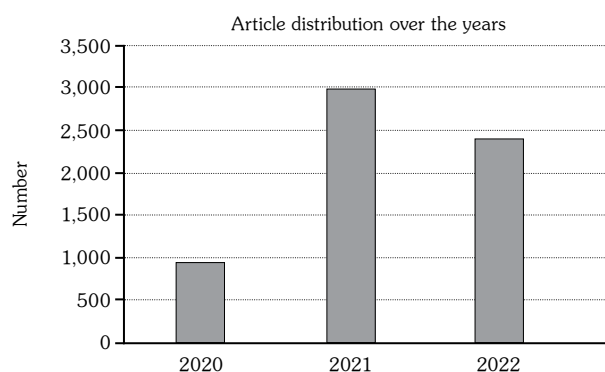COVID-19: Coronavirus disease 2019.

Figure 1. Distribution of COVID-19 articles published from Türkiye over the years.

COVID-19: Coronavirus disease 2019.

Table 2. Distribution of languages in articles on COVID-19 from Türkiye

Languages of publications	Number of publications	%
English	6,128	96.732
Turkish	201	3.173
German	2	0.032
Spanish	2	0.032
French	1	0.016
Russian	1	0.016

COVID-19: Coronavirus disease 2019.

articles is the United States, followed by China in second place. Türkiye is identified as the ninth country with the most article publications on

COVID-19, totaling 6.335 articles. The evaluation of articles on COVID-19 by countries is presented in Table 1.

The distribution of COVID-19 articles published from our country by years: Since the beginning of the COVID-19 pandemic, 6,335 articles have been published from Türkiye. Among these, 950 (14,996%) were published in 2020, 2,988 (47,167%) in 2021, and 2,397 (37,837%) in 2022, as shown in Figure 1.

The language of the COVID-19 articles published from Türkiye: In articles written on COVID-19 from Türkiye, the predominant language used is English, accounting for over 95%. Following this, publications in Turkish constitute around 3%. Although rare, articles

Table 3. Journals in which articles on COVID-19 from Türkiye are published

List of Journals	Number of publications	%
International Journal of Clinical Practice	123	1.942
Annals of Clinical and Analytical Medicine	86	1.358
Journal of Medical Virology	75	1.184
Turkish Journal of Medical Sciences	70	1.105
European Review for Medical and Pharmacological Sciences	58	0.916
Acta Medica Mediterranea	55	0.868
Revista da Associacao Medica Brasileira	54	0.852
Perspectives in Psychiatric Care	48	0.758
Current Psychology	44	0.695
FLORA The Journal of Infectious Diseases and Clinical Microbiology	40	0.631
Sustainability	40	0.631
Cureus Journal of Medical Science	38	0.600
Irish Journal of Medical Science	37	0.584
American Journal of Emergency Medicine	36	0.568
International Journal of Environmental Research and Public Health	36	0.568
Cukurova Medical Journal	35	0.552
Bratislava Medical Journal	34	0.537
Psychiatria Danubina	34	0.537
Clinical Laboratory	29	0.458
Turkish Thoracic Journal	28	0.442
Journal of Basic and Clinical Health Sciences	27	0.426
Journal of Infection in Developing Countries	27	0.426
Turkish Journal of Trauma Emergency Surgery	27	0.426
Erciyes Medical Journal	26	0.410
Results in Physics	26	0.410

COVID-19: Coronavirus disease 2019.

Table 4. Web of Science category of articles on COVID-19 published from Türkiye

Web of Science Categories	Number of publications	%
Science Citation Index Expanded (SCIE)	3,939	62.178
Emerging Sources Citation Index (ESCI)	1,755	27.703
Social Sciences Citation Index (SSCI)	1,375	21.705
Arts and Humanities Citation Index (AHCI)	43	0.679
Book Citation Index-Social Sciences and Humanities (BKCI-SSH)	15	0.237
Conference Proceedings Citation Index-Science (CPCI-S)	2	0.032
Book Citation Index-Science (BKCI-S)	1	0.016

COVID-19: Coronavirus disease 2019.

have also been published in languages such as German, Spanish, French, and Russian, as shown in Table 2.

The journals and WoS categories in which articles on COVID-19 from our country are published: Articles on COVID-19 from Türkiye have been published in 1,997 different journals. When examining these journals, the top-ranked journal is 'The International Journal of Clinical Practice,' with 123 articles (1.94%) published in this journal out of a total of 6,335 articles. It was determined that eight of the top 25 journals publishing articles on COVID-19 from our country are international journals. One of these journals is the 'FLORA The Journal Of Infectious Diseases and Clinical Microbiology.' Within these top 25 journals, only two journals ('Sustainability' and 'Results in Physics') are

related to non-medical fields, while the remaining 23 are related to the medical field, as shown in Table 3.

Of the articles on COVID-19 published from Türkiye and included in the WoS database, 62.178% are in the Science Citation Index Expanded (SCIE) category. Following this, 27.703% are published in the Emerging Sources Citation Index (ESCI), and 21.705% are in the Social Science Citation Index (SSCI) categories, as shown in Table 4.

A total of 54,960 citations have been made for the 6,335 articles, with an average citation per item of 8.68. The average H index per item is found to be 85.

Publication areas and institutions publishing COVID-19 articles in our country: Türkiye has
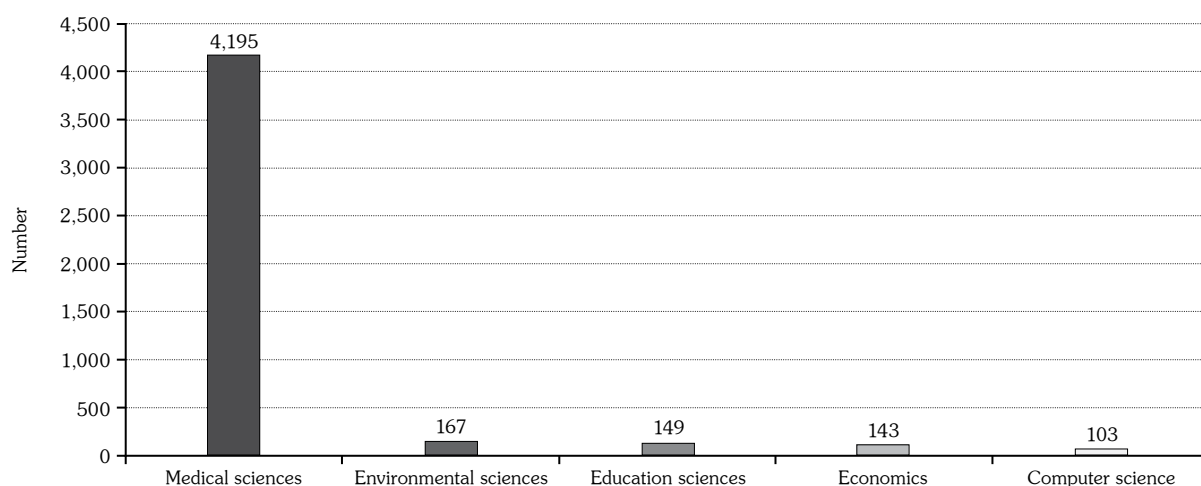

Figure 2. The top five disciplines for COVID-19 articles published from Türkiye and the number of publications.
COVID-19: Coronavirus disease 2019.

Table 5. Scientific fields of articles on COVID-19 published from Türkiye

List of Journals	Number of publications	%
Internal Medicine	1,067	16.843
Public, Environmental, and Occupational Health	347	5.478
Psychiatry	323	5.099
Pharmacology	283	4.467
Pediatrics	237	3.741
Nursing	236	3.725
Environmental Sciences	167	2.636
Infectious Diseases	165	2.605
Multidisciplinary Psychology	165	2.605
Clinical Neurology	159	2.510
Experimental Medical Research	153	2.415
Educational Research	149	2.352
Surgery	146	2.305
Economics	143	2.257
Immunology	141	2.226
Cardiac and Cardiovascular Systems	140	2.210
Respiratory System	126	1.989
Emergency Medicine	116	1.831
Radiology, Nuclear Medicine, Medical Imaging	112	1.768
Obstetrics and Gynecology	111	1.752
Microbiology	110	1.736
Urology, Nephrology	108	1.705
Computer Science, Artificial Intelligence	103	1.626
Oncology	103	1.626

COVID-19: Coronavirus disease 2019.

published articles on COVID-19 in 205 different scientific fields. The majority of these articles were published in the field of medical sciences. Following this, environmental sciences, educational sciences, economic sciences, and computer sciences were also identified as the most frequently published scientific disciplines, as shown in Figure 2. When the publication areas were further examined, it was determined that 16.84% of the publications were in the field of general internal medicine, as shown in (Table 5).

In Türkiye, 7,298 authors from different institutions have contributed to this literature. The majority of the publishing institutions are universities, with only three non-university institutions (Ankara City Hospital, Antalya Training and Research Hospital, Republic of Türkiye Ministry of Health) among the top 25 institutions with the highest frequency of publications, as shown in Table 6.

DISCUSSION

This study aims to evaluate the characteristics of publications from our country regarding the globally impactful COVID-19 pandemic and to analyze articles related to COVID-19 published in our country from a bibliometric perspective. Considering the global impact of the COVID-19 pandemic, especially in the field of health, providing a detailed overview of the research conducted in our country on this topic will not only motivate local researchers for new studies but also demonstrate our scientific contributions on a global scale.

Table 6. Institutions publishing articles on COVID-19 from Türkiye

Institution Names	Number of publications	%
Health Sciences University	820	12.944
Hacettepe University	332	5.241
Istanbul University	318	5.020
Istanbul University (Cerrahpaşa)	259	4.088
Ankara City Hospital	234	3.694
Ankara University	204	3.220
Marmara University	183	2.889
Sakarya University	176	2.778
Ankara Yıldırım Beyazıt University	173	2.731
Gazi University	167	2.636
Dokuz Eylül University	153	2.415
Istanbul Medeniyet University	152	2.399
İnönü University	148	2.336
Ondokuz Mayıs University	148	2.336
Antalya Training and Research Hospital	144	2.273
Republic of Türkiye Ministry of Health	139	2.194
Selçuk University	138	2.178
Ege University	136	2.147
Atatürk University	135	2.131
Koç University	127	2.005
Necmettin Erbakan University	125	1.973
Erciyes University	121	1.910
Fırat University	116	1.831
Akdeniz University	113	1.784
Kocaeli University	111	1.752

COVID-19: Coronavirus disease 2019.

When examining publications on COVID-19, it is observed that China had the highest number of publications in the early stages of the pandemic, followed by the United States. In the third place is the United Kingdom.[17] However, approximately a year later, the distribution of publications based on countries changed around the middle of the pandemic, with the United States rising to the position of the country with the highest number of publications with a rate of 25.4%. The second and third positions were taken by the United Kingdom and China.[18] The fact that the initial epicenter of the pandemic was in China and the highest number of cases were observed there in the early stages led to a concentration of COVID-19 publications in China during the initial period. Additionally, in the early stages, doctors worldwide kept track of Chinese publications to gain insights into the disease. However, the later prominence of the United States is not interpreted as a surprising result, considering the perception that advanced countries can allocate more budget to scientific research in the later stages of the pandemic.

Upon reviewing Türkiye's position in the COVID-19 literature, unfortunately, our country did not manage to rank among the top 20 countries in terms of publications on COVID-19 during the early stages of the pandemic.[16] However, around the middle of the pandemic, Türkiye has secured its place in the tables as the 13th country with the highest frequency

of publications.[18] In our study, a spotlight has been shed on publications until the end of 2022, and ultimately, it has been determined that our country has risen to the ninth position among the countries with publications on COVID-19. We believe that these data demonstrate the uninterrupted pace of scientific publications in our country, despite the intensity and fatigue of the pandemic, emphasizing the importance given to scientific research. Additionally, considering that approximately 15% of the articles from our country were published in 2020, and the respective percentages of 47% and 38% in 2021 and 2022, the rise in our ranking among countries becomes even more understandable.

Of the COVID-19 articles published from Türkiye, 96.7% are in English, while a small portion, 3.2%, is written in Turkish. This result is not surprising given the global status of English as a language and the fact that many articles are published in international journals. Additionally, we believe that researchers prefer to publish more in English, anticipating that it would increase the readability of their articles.

When looking at the journals with the most frequent publications on COVID-19 from our country, it has been observed that eight out of the top 25 journals are international journals where researchers from our country publish. This result is considered to highlight the contribution of journals from our country to the scientific field. Additionally, it has been determined that only two journals among the top 25 are related to non-medical fields. Considering that COVID-19 publications are predominantly in the field of medicine, this is an expected outcome.

Approximately 62.2% of the COVID-19 articles published from our country and entered into the WoS database are in the SCIE category, followed by articles in the ESCI and SSCI categories with over 20%. Considering that journals in these categories feature valuable and specialized articles from a scientific standpoint, it can be concluded that publications from our country are scientifically valuable. Additionally, we find it noteworthy that more than half of the publications (62.2%) from our country in the WoS database are in journals classified under the SCIE category.

Indeed, the COVID-19 pandemic has affected everyone and become a research subject in all scientific disciplines. Publications on COVID-19 have found their place in the literature, not only in medicine but also in fields such as economics, sociology, and computer technologies. Analyses in the literature indicate that the most frequently published field is medical sciences. However, research has also been conducted in various other disciplines such as socioeconomics, society, education, technology, and economics.[14,15] Similarly, in our country, a significantly high percentage, around 68.64%, of publications have been in the field of medicine, followed by publications in areas such as environment, education, economics, and computer sciences. Overall, the top three most frequently published fields are general internal medicine, public health, environmental and occupational health, and psychiatry. In publications from different countries, it is observed that the most commonly researched topics include pandemic preparedness measures, direct and indirect health impacts, and issues related to transmission.[15]

Research related to COVID-19 is generally conducted in university hospitals. Similar findings are reported in publications from various countries, highlighting that universities are the primary centers for publications on COVID-19.[15,17] In our country, among the top 25 centers publishing articles on COVID-19, only three centers are non-university institutions. It is expected that universities take a leading role in COVID-19 research due to their larger scale, the ability to conduct complex patient follow-ups and academic support.

The main limitation of this study includes data from a single database and therefore does not reflect the entire literature on this topic.

In conclusion, this study is the first bibliometric analysis evaluating articles on COVID-19 published from Türkiye. According to the results of our study, Türkiye has made significant contributions to the global literature on COVID-19. Even in the final stages of the pandemic, researchers have continued to investigate this topic, addressing the gaps in the literature. Articles from Türkiye have been published in prestigious categories in the WoS

database, and some have been published in journals managed by researchers from Türkiye. Türkiye has followed a rising trend in articles written on COVID-19 over the years, making important contributions to the scientific field. Our study will serve as a guide for researchers conducting future studies in designing their research endeavors in this field.

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