Contributions from Türkiye to the international emergency medicine literature during the COVID-19 pandemic: A bibliometric analysis

COVID-19 pandemisi sırasında Türkiye'den Uluslararası acil tıp literatürüne katkılar: Bibliyometrik bir analiz

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ABSTRACT

Aim: The present study aimed to evaluate the bibliometric contributions made from Türkiye to the international scientific literature in the field of Emergency Medicine during the 2020-2021 period, which covered the COVID-19 pandemic period.

Materials and Methods: The present study included a total of 872 studies in Emergency Medicine WoS Indexes between 2020-2021. The study data were retrieved from the Web of Science (WoS) database of Thomson Reuters – Clarivate Analytics, and the review included publications in the "Emergency Medicine" category from Türkiye that spanned the pandemic period between the years 2019-2020.

Results: 78.1% of the aforementioned studies were included in the Science Citation Index Expanded and 88.2% were original research papers. A total of 2930 researchers were involved in the 872 publications in the scope of the study. The average number of co-authors per publication was 5.2, where the average number of publications per author was 0.3. As regards the scope of the publications, the main topic was "SARS-Cov-2 and pandemic". The aforementioned main theme was associated with general emergency medicine practices, COVID-19 pneumonia, and high-mortality emergency cases.

Conclusion: To the best of our knowledge, the present study is the first that investigated the studies from Türkiye that contributed to the international literature in the field of emergency medicine during the pandemic period and provided valuable data reflecting the scientific productivity of the researchers, who continued their research in the field of emergency medicine, during the pandemic period.

Keywords: COVID-19, emergency medicine, publications, bibliometric analysis, Türkiye.

ÖZ

Amaç: Bu çalışma, COVID-19 pandemi dönemini kapsayan 2020-2021 döneminde Acil Tıp alanında uluslararası bilimsel literatüre Türkiye'den yapılan bibliyometrik katkıların değerlendirilmesini amaçlamıştır.

Gereç ve Yöntem: Bu çalışmaya 2020-2021 yılları arasında Acil Tıp WoS İndekslerinde toplam 872 çalışma dahil edildi.Çalışma verileri Thomson Reuters – Clarivate Analytics'in Web of Science (WoS) veri tabanından elde edilmiştir ve 2019-2020 yılları arasında pandemi dönemini kapsayan Türkiye'den "Acil Tıp" kategorisindeki yayınları içermektedir.

Bulgular: Bahsedilen çalışmaların %78,1'i Science Citation Index Expanded'a dahil edilmiş ve %88,2'si orijinal araştırma makaleleridir. Çalışma kapsamındaki 872 yayına toplam 2930 araştırmacı katılmıştır. Yayın başına ortalama ortak yazar sayısı 5,2, yazar başına ortalama yayın sayısı ise 0,3'dür. Yayınların kapsamına bakıldığında ise ana konu "SARS-Cov-2 ve pandemi"dir. Yukarıda bahsedilen ana tema, genel acil tıp uygulamaları, COVID-19 pnömonisi ve yüksek ölümlü acil vakalar ile ilişkilendirilmiştir.

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Sonuç: Bilindiği kadarıyla bu çalışma, pandemi döneminde acil tıp alanında Türkiye'den yapılan ve uluslararası literature katkı sağlayan çalışmaların araştırıldığı ilk çalışmadır. Bu veriler pandemi döneminde Acil Tıp alanında çalışmalarını yürüten araştırmacıların bilimsel üretkenliğini yansıtan değerli bilgiler içermektedir.

Anahtar Sözcükler: COVID-19, acil tıp, yayınlar, bibliyometrik analiz, Türkiye.

INTRODUCTION

One of the biggest health crises of the current century emerged at the end of 2019 upon the SARS-CoV-2 outbreak, a new type of coronavirus first reported in Wuhan, Hubei Province, China, and spread throughout the world in a rather short period of time, and the disease, namely COVID-19, which was declared a pandemic by the World Health Organization (WHO) in March 2020, affected every aspect of daily life than ever before (1). Naturally, these effects were also manifest in the field of academic studies, followed by a very rapid and high-volume publication flow to the literature. In 2020, it was reported that 4% of all the research results published worldwide were on COVID-19, but there was also a sharp increase in all the other topics, which might be associated with the fact that thanks to the stay-at-home restrictions, the scholars could have found more time to write and publish the results of their academic research (2).

Bibliometric analyses enabled studying and analyzing large volumes of scientific publications in the literature and quantitatively evaluating the changes that occur over time based on the foci of interest in a particular field (3, 4). Especially during the pandemic period, there was only a limited number of published bibliometric analyses in the field of emergency medicine, although bibliometric analyses on scientific research in different branches were published (5). There was no bibliometric study, which evaluated the contributions made from Türkiye to the international literature during the pandemic period. Accordingly, the present study aimed to investigate the contributions made by Turkish scientists to the emergency medicine literature during the COVID-19 pandemic.

MATERIALS and METHODS

The present study reviewed the scientific research between 2019 and 2020 during the pandemic period by the scholars in Türkiye (primary author/corresponding author or co-author from Türkiye), which were published in international journals and indexed by the Web of Science (WoS) database of Thomson Reuters' Clarivate Analytics, one of the main international science indexes (primary author MC conducted the literature review). Since this study was conducted on the electronic bibliometric data from the WoS database and did not included any patient data, no ethical committee or institutional review board approval was needed.

Statistical Analyses

The descriptive statistics of the publications in the scope of the study were expressed in frequency and percentage distribution of the index, publication types, WoS categories, analysis of author numbers, and journals in which the publications were published. Keyword and dendrogram analyses were made and subject sets and inter-cluster connections were examined in the assessment of the general scope and research fields of the publications, and findings were presented in frequency tables, word cloud, and dendrogram cluster chart. The Bibliometrix package of R statistical software was used in the Bibliometric analyses in the study.

RESULTS

A total of 872 Turkish studies out of 17,256 studies published during the pandemic period between 2020 and 2021 were reviewed amongst a total of 141,653 publications in the "Emergency Medicine" category of the WoS index. A review of the distribution of journals by the indexes indicated that 682 publications (78.1%) were published in the Science Citation Index Expanded (SCI-E), 191 publications (21.9%) in the Emerging Sources Citation Index (ESCI), 13 publications (1.5%) in Social Sciences Citation Index (SSCI), and 4 publications (0.5%) in Conference Proceedings Citation Index – Science (CPCI-S). A review of the publication types showed that 769 (88.2%) were original research articles, followed by 60 (6.9%) short communications (letter to the editor, etc.). All the publications were in the Emergency Medicine category, nevertheless, an investigation of the other subcategories suggested that they were also listed in the pediatric and surgical subcategories (the number of publications in both

subcategories was 38 (4.4%). A total of 2930 researchers were involved in the 872 publications in the scope of the study. The average number of co-authors per publication was 5.2, where the average number of publications per author was 0.3. The descriptive statistics of the publications reviewed for the purposes of the study are presented in (Table-1).

A review of the institutional information reported in the publications in the scope of the study indicated that 181 (20.8%) articles were originated from the University of Health Sciences, followed by Ankara City Hospital with 33 publications (3.8%). A review of the distributions of the publications by journals showed that 241 (27.6%) were published in the Turkish Journal of Trauma and Emergency Surgery, an international journal published in Türkiye, and 170 (19.5%) were published in the American Journal of Emergency Medicine (Table-2).
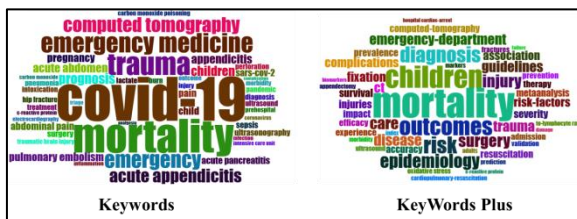
Table-1. General characteristics of the publications reviewed in the study.

	n (%)
All publications	872 (100)
Publication's Index	
Science Citation Index Expanded (SCI-E)	682 (78.1%)
Emerging Sources Citation Index (ESCI)	191 (21.9%)
Social Sciences Citation Index (SSCI)	13 (1.5%)
Conference Proceedings Citation Index – Science (CPCI-S)	4 (0.5%)
Publication type	
Original research paper	769 (88.2%)
Short communication (letter to editor, etc.)	60 (6.9%)
Early access article	27 (3.1%)
Compilation	24 (2.8%)
Editorial material	15 (1.7%)
Correction	3 (0.3%)
Conference proceedings - Full-text paper	3 (0.3%)
Conference proceedings - Abstract paper	1 (0.1%)
WoS categories	
Emergency medicine	872 (100)
Pediatrics	38 (4.4%)
Surgery	38 (4.4%)
Critical care medicine	32 (3.7%)
Orthopedics	30 (3.4%)
Cardiac / Cardiovascular system	12 (1.4%)
Nursing	9 (1)
Authors	
Total number of authors in publications	2930
Number of researchers, who published an article as a single author	37
Co-authoring	
Number of single-author publications	38
Average number of publications per author	0.298
Average number of authors per publication	3.36
Average number of co-authors in publications	5.18

Table-2. Institutions of the authors and international journals, which published the articles.

	n (%)
Author's institution	
University of Health Sciences	181 (20.8%)
Ankara City Hospital	33 (3.8%)
Necmettin Erbakan University	30 (3.4%)
Ataturk University	28 (3.2%)
Eskisehir Osmangazi University	27 (3.1%)
Akdeniz University	26 (3.0%)
Selçuk University	26 (3.0%)
Ankara Training and Research Hospital	25 (2.9%)
Istanbul University	25 (2.9%)
Antalya Training and Research Hospital	24 (2.8%)
Journal	
Turkish Journal of Trauma and Emergency Surgery	241 (27.6%)
American Journal of Emergency Medicine	170 (19.5%)
Eurasian Journal of Emergency Medicine	69 (7.9%)
Signa Vitae	53 (6.1%)
Journal of Emergency Medicine Case Reports	51 (5.8%)
Pediatric Emergency Care	38 (4.4%)
Turkish Journal of Emergency Medicine	32 (3.7%)
Injury International Journal of the Care of the Injured	30 (3.4%)
Hong Kong Journal of Emergency Medicine	29 (3.3%)
European Journal of Trauma and Emergency Surgery	28 (3.2%)

Upon the keyword analyses based on the assumption that keywords reflected the overall scope and purposes of the scientific publications, the most frequently used keywords were "emergency", "emergency department", "emergency medicine", and "emergency service" indicative of the field of Emergency Medicine. This were followed by "COVID-19" and "mortality" keywords. Other major keywords consisted of terms referring to the most prevalent reasons for presentation, including "acute appendicitis", "trauma", "cardiopulmonary resuscitation", and "acute abdomen", referring to imaging methods, including "computed tomography", and referring to patient outcomes, including "prognosis" (Figure-1). The KeyWords Plus analysis suggested that terms especially related to patient management and outcomes, including "management", "mortality", "outcomes", "risk", "diagnosis", and "epidemiology" were used as the keywords (Table-3).
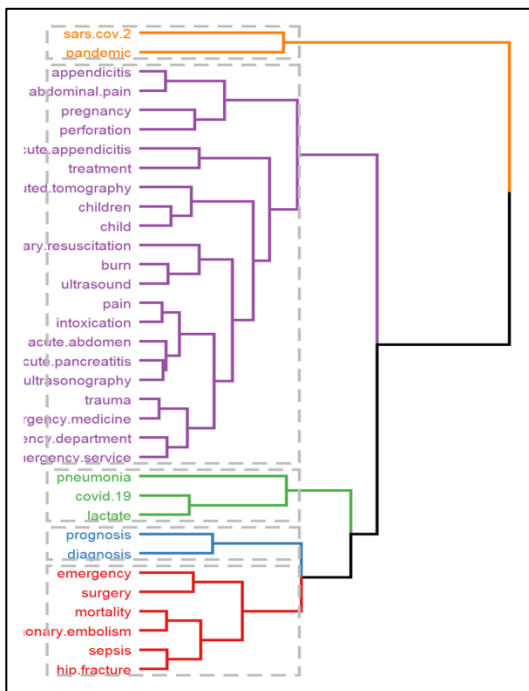

Figure-1. Keywords and KeyWords Plus word cloud.

A review of the subject matter dendrogram, which investigated the scope and research field of the publications, the "SARS-Cov-2 and pandemic" cluster was the first important cluster, and the cluster, which included the general emergency medicine procedures, including "appendicitis, abdominal pain, resuscitation, burns, pain, pregnancy, intoxication, trauma" was the first large cluster associated with the former, while the second large cluster was the one that included "pneumonia, COVID-19, lactate", "prognosis, diagnosis" and "surgery, mortality, coronary embolism, sepsis, hip fracture" (Figure-2).

Table-3. Keyword and KeyWords Plus analysis.

Keywords	n
emergency / emergency department / emergency medicine / emergency service	131
COVID-19	61
mortality	47
acute appendicitis	32
trauma	31
child - children	25
computed tomography	21
cardiopulmonary resuscitation	17
prognosis	15
acute abdomen	13
pregnancy	12
pulmonary embolism	12
abdominal pain	11
pain	11
acute pancreatitis	10
Keyword Plus	
management	98
mortality	51
children	38
outcomes	31
risk	29
diagnosis	27
epidemiology	24
injury	22
surgery	22
care	21
disease	20
emergency-department	19
guidelines	19
trauma	19
ct	18

Figure-2. Keyword-based study area dendrogram.

DISCUSSION

The COVID-19 pandemic has resulted in significant limitations in the provision of health services and access to available services similar to all the other aspects of life. Emergency medical services, like all the other disciplines, have been significantly affected by the associated controversies. The World Health Organization (WHO) reported that ambulance services were interrupted in 36% of the world's countries, where 24-hour emergency services were disrupted in 32% and emergency surgeries in 23% of the countries (6). During these interruptions in the provision of healthcare, services, the scientific production has gained an increasing pace contrary to above, especially with regard to the COVID-19 related publications, and the number of researches published in all scientific fields has significantly increased compared to the times prior to the pandemic, and early access publications associated with COVID-19 have dramatically increased with an aim to spread information quickly (2). Albeit not

as impressive as the number of publications in the field of Emergency Medicine, the number of publications in other scientific research areas listed in WoS Indexes also increased to 443 and 429 in 2020 and 2021, respectively, which was higher compared to 286, 318, and 359 in 2017, 2018, 2019, respectively, during the pre-pandemic period (7). The present study investigated the general bibliometric characteristics of the Turkish publications in the field of Emergency Medicine during the pandemic period and reviewed their contribution to the international literature.

Approximately 90% of the publications reviewed in the scope of the present study were original research papers. Although 50% of the publications were originated from the University of Health Sciences, different healthcare centers affiliated with this academic institution were not separately taken into assessment. A review of other academic institutions that followed the University of Health Sciences indicated that university hospitals had higher numbers of publications compared to the training and research hospitals. Upon a review of the distribution of publications by journals showed that approximately one-third were published in the Turkish Journal of Trauma and Emergency Surgery and 3% in the Turkish Journal of Emergency Medicine. This is suggestive of the fact that publications had a chance of faster publication in Turkish journals were listed in international indexes.

Keyword analyses were made to investigate the general scope and purposes of the publications in the scope of the present study. Accordingly, "COVID-19" and "mortality" were the most frequently used keywords indicative of the period, in which the respective studies were conducted, followed by "the most frequent reasons for presentation to emergency medicine services", and further, "pediatric emergency cases" and "emergency computed tomography (CT) imaging" were among the most frequently used keywords. Previous studies, which investigated the keywords and scopes of publications, also reported that "pediatric emergency cases" and "imaging methods" were the popular search areas (8).

The clustering characteristics of the research themes were also reviewed along with the keywords, and dendrogram analyses showed that the "SARS-CoV-2 and Pandemic" cluster

was a stand-alone cluster associated with all the other topics. The other clusters were collected under 4 topics, including reasons for presentation to emergency room, child emergency cases, and emergency imaging methods in the first group. The second cluster was composed of "pneumonia, COVID-19, lactate" group, where "diagnosis and prognosis" group was the third cluster, and the "emergency and surgical, mortality and coronary embolism, sepsis and hip fracture" group was the last cluster. Upon review, it was found that although the research themes generally remained the same in the field of emergency medicine during the pandemic period, the said themes were associated with the pandemic and that the number of publications were higher compared to the previous years. Although, a literature review indicated that there was no study, which investigated the publications in the field of emergency medicine by the distribution of research topics, it was reported in a study prior to the pandemic that traumas, cardiological emergencies, pain, sepsis, and infectious diseases were the most common topics (9). Another study reported that randomized studies in the field of emergency medicine most commonly investigated pain management, orthopedic emergencies, cardiovascular diseases, pre-hospital emergency medicine, and children (10). Although there may be proportional differences between the research topics by the research periods and types of academic institutions, the research topics in the emergency medicine literature are generally similar and the results of our study were generally consistent with above.

Study Limitations

To the best of our knowledge, the present study was the first study, which reviewed the studies from Türkiye that contributed to the international literature in the field of emergency medicine during the pandemic period. Nevertheless, certain limitations should be taken into consideration in the assessment of our results. First of all, the present study reviewed only the publications that were listed in primary citation indexes widely accepted across the world and included in the WoS database and other indexes were not included in the research. Secondly, although the literature review period included the years 2020 and 2021 so as to cover the pandemic period, especially some of the publications from 2020 may be based on 2019

research, which completed the peer review processes and qualified for publication in 2020.

Finally, the researcher profiles were not evaluated in the bibliometric analyses of choice and inter-researcher and inter-institution interaction and network analyses were not performed based on the assumption that multicenter research volume would be lower due to the nature of the pandemic period.

CONCLUSION

Nevertheless, despite the aforementioned limitations, the present study offers valuable data that reflects the scientific productivity of the researchers, who continued their research in the field of emergency medicine during the pandemic period.

Conflict of interest: There is no conflict of interest between the authors.

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