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INVITED REVIEW

Bibliometric analysis of articles published in Cukurova Medical Journal between 2011 and 2022

Cukurova Medical Journal'da 2011-2022 yılları arasında yayınlanan makalelerin bibliyometrik analizi

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Abstract

Purpose: This study aimed to perform a bibliometric analysis of the abstracts and keywords in articles published in the Cukurova Medical Journal from 2011 to 2022.

Materials and Methods: We compiled and analyzed all articles published in the Cukurova Medical Journal between 2011 and 2022, totaling 1734 articles, using VOSviewer software (version 1.6.19). This analysis focused on the terms in the abstracts and the keywords of these articles.

Results: The study identified 27,409 unique terms and 4,040 unique keywords in the abstracts of the 1734 articles. The most common terms were 'surgery' (333 occurrences), 'pain' (263), 'infection' (201), 'measurement' (192), 'rat' (185), 'tumor' (177), 'covid' (157), 'pregnancy' (148), 'questionnaire' (144), and 'drug' (142). The top keywords were 'children' (43 occurrences), 'quality of life' (37), 'covid-19' (34), 'nursing' (32), 'pregnancy' (28), 'depression' (27), 'mortality' (26), 'anxiety' (24), 'child' (22), and 'obesity' (17).

Conclusion: This is the first bibliometric analysis of keywords and terms used in the Cukurova Medical Journal, offering insights into the evolving topics of interest in the journal's publications. It also provides valuable information for researchers looking to submit articles to the journal, highlighting prevalent themes and content areas.

Keywords: Bibliometric analysis, keyword, term, Cukurova Medical Journal

Öz

Amaç: Bu çalışmanın amacı Cukurova Medical Journal'da 2011-2022 yılları arasında yayınlanan makalelerin özet kısmında yer alan terim ve anahtar kelimelerin bibliyometrik olarak değerlendirilmesidir.

Gereç ve Yöntem: Cukurova Medical Journal'da 2011-2022 yılları arasında yayınlanan makalelerin her biri belirlenerek listelendi. Belirlenen 1734 makalenin tamamı VOSviewer (versiyon 1.6.19) programına aktarıldı. Makalelerin özet bölümünde yer alan terimler ve anahtar kelimeler VOSviewer yazılım programı aracılığıyla değerlendirildi.

Bulgular: Çalışma, 1734 makalenin özetlerinde 27,409 benzersiz terim ve 4,040 benzersiz anahtar kelime tespit etti. En yaygın terimler 'cerrahi' (333 kez), 'ağrı' (263), 'enfeksiyon' (201), 'ölçüm' (192), 'sıçan' (185), 'tümör' (177), 'covid' (157), 'gebelik' (148), 'anket' (144) ve 'ilaç' (142) idi. En çok kullanılan anahtar kelimeler ise 'çocuklar' (43 kez), 'yaşam kalitesi' (37), 'covid-19' (34), 'hemşirelik' (32), 'gebelik' (28), 'depresyon' (27), 'ölüm oranı' (26), 'anksiyete' (24), 'çocuk' (22) ve 'obezite' (17) idi..

Sonuç: Sunulan bu çalışma Cukurova Medical Journal'a ait ilk bibliyometrik anahtar kelime ve terim analizidir ve Cukurova Medical Journal'da geçmişten günümüze yayınlanan makalelerin zamanla değişen eğilimleri hakkında bilgi sahibi olmamıza olanak sağlamaktadır. Ayrıca, çalışmamız dergiye makale göndermek isteyen araştırmacıların derginin içeriği hakkında bilgi sahibi olmalarını sağlayacaktır.

Anahtar kelimeler: Bibliyometrik analiz, anahtar kelime, terim, Cukurova Medical Journal

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INTRODUCTION

Bibliometric analysis is a statistical method that performs quantitative analysis on a subject using mathematical-statistical methods[1]. The origin of the word (bibliometric) is of Greek origin and means "book-measurement" (*Βιβλιο:* Book, *μέτρηση:* Measurement)[2]. The roots of bibliometric analysis, which is used in many fields today, date back to the 1950s [3,4]. This analysis can explore knowledge structure patterns in a given field, reveal current disciplinary foundations, and identify emerging themes and trends. This analysis can also uncover current problems and challenges in a particular field and ultimately contribute to the advancement of the field[5].

Cukurova Medical Journal is a peer-reviewed, open-access journal focused on general medicine and is published quarterly online. It is an international platform dedicated to disseminating a wide range of clinical medicine research. The journal publishes articles in English and is included in the Emerging Sources Citation Index within the Web of Science (WoS) database[6]. Established in the 1960s, the WoS is a widely-used database today, known for its comprehensive quality metrics in scientific production. A key indicator of a study's quality or a researcher's international impact is its inclusion in this database and the frequency of its citations. Journals listed in the WoS must fulfill specific criteria to be considered for inclusion[7-9].

Vosviewer is a freely available software tool designed to create and visualize bibliometric maps[8]. Developed to support researchers, Vosviewer processes data using scientific databases like the Web of Science and Elsevier's Scopus for bibliometric analyses. This tool is particularly beneficial for both researchers and clinicians, offering an objective, systematic approach to bibliometric analysis[5].

The terms and keywords found in the abstract section of articles provide researchers with valuable insights into various fields of study. Creating scientific maps based on these keywords is a key objective, as it helps researchers understand the focus areas of the journal. Consequently, this study aimed to conduct a bibliometric analysis of articles published in the Cukurova Medical Journal from 2011 to 2022, specifically examining the usage of keywords and terms to reveal the journal's thematic trends and research directions.

MATERIALS AND METHODS

On July 20, 2023, for the purpose of conducting a bibliometric analysis, the Web of Science (WoS) Core Collection database was utilized. In the advanced search of the WoS Core Collection, a specific search was conducted using the ISSN number (IS=2602-3032) of the Cukurova Medical Journal to gather precise data. This search resulted in the identification and listing of all articles published in the journal, revealing that the publications spanned from 2011 to 2022. The data pertinent to this analysis was downloaded in a Tab-delimited format (Windows) using the 'Export Records to File' feature.

Subsequently, the extracted data from the WoS was imported into the VOSviewer (version 1.6.19), a software dedicated to visualizing scientific landscapes, for detailed analysis. Through VOSviewer, both the terms in the abstracts and the keywords used in the articles were evaluated. This analysis led to the creation of a map highlighting the most frequently used terms and keywords. The top 10 of these terms and keywords were recorded, and significant trends and shifts over the years were identified. These research processes and their outcomes are illustrated in Figure 1.

Moreover, statistical data from the WoS Core Collection database was also incorporated into the study. The authors declared that due to the nature of this study's methodology, obtaining approval from an ethics committee was not necessary.

RESULTS

Our analysis revealed that the Cukurova Medical Journal published 1,734 articles from 2011 to 2022, as recorded in the Web of Science (WoS) Core Collection database. Utilizing VOSviewer software, we identified 27,409 unique terms within the abstracts of these articles. After filtering out terms unrelated to the content, the ten most common terms were identified as surgery (333 instances), pain (263), infection (201), measurement (192), rat (185), tumor (177), covid (157), pregnancy (148), questionnaire (144), and drug (142). A total of 124 terms appeared at least 50 times, with 16 content-related terms highlighted in Figure 2. Our network analysis divided these terms into five distinct clusters, each represented by different colors, with the size of each circle correlating to the term's frequency of use.

In terms of temporal analysis, a density mapping showed a notable shift in term usage between 2018 and 2020, as illustrated in Figure 3. The lines on the map indicate connections between terms, with line density and color indicating the strength of these connections. The shift towards yellow on the density map suggests recent research focus in these areas. Figure 1 displays the detailed methodological workflow of our study. Regarding keywords, the VOSviewer software identified 4,040 distinct keywords used in the journal's articles. The most frequently occurring keywords were children (43 occurrences), quality of life (37), covid-19 (34), nursing (32), pregnancy (28), depression (27), mortality (26), anxiety (24), child (22), and obesity (17). Out of these, 35 keywords were used at least 10 times, as shown in Figure 4. Similar to the term analysis, keywords were categorized into eight clusters, represented by various colors on the bibliometric map, with circle sizes corresponding to keyword frequency.

For keywords, density mapping also revealed a significant change between 2018 and 2020, depicted in Figure 5. The color-coded lines on this map signify relationships between keywords, with the density and color of the lines indicating the strength of these connections.

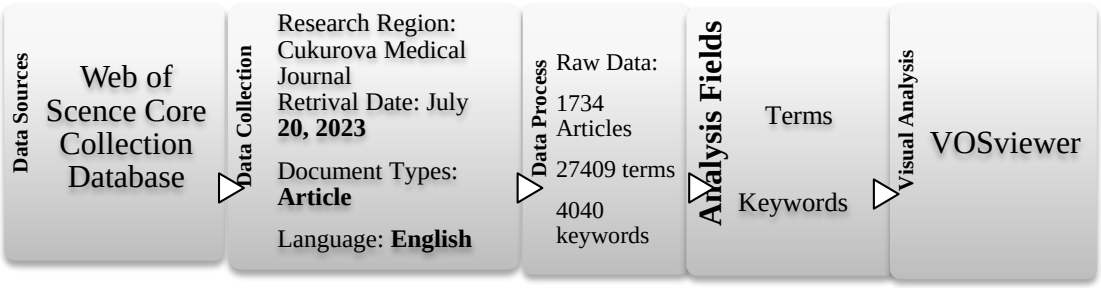

Figure 1. Detailed methodologic workflow

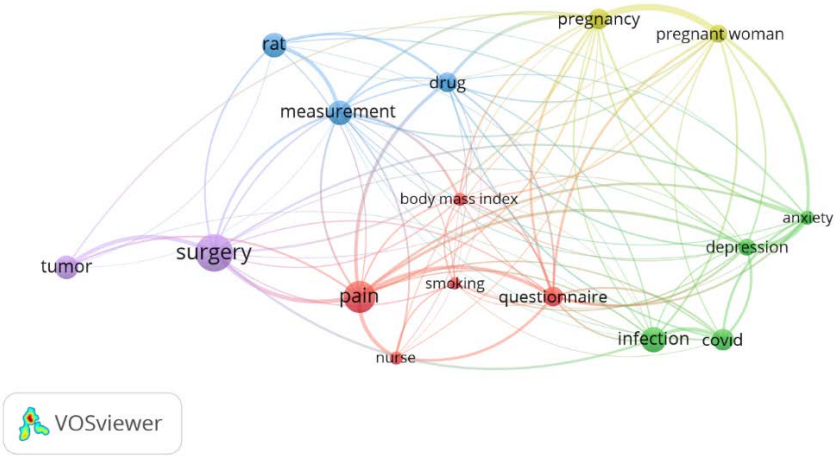

Figure 2. Viewing of the most frequently used terms

Note: The size of the circles is proportional to the frequency of use of the term and color represented clusters.

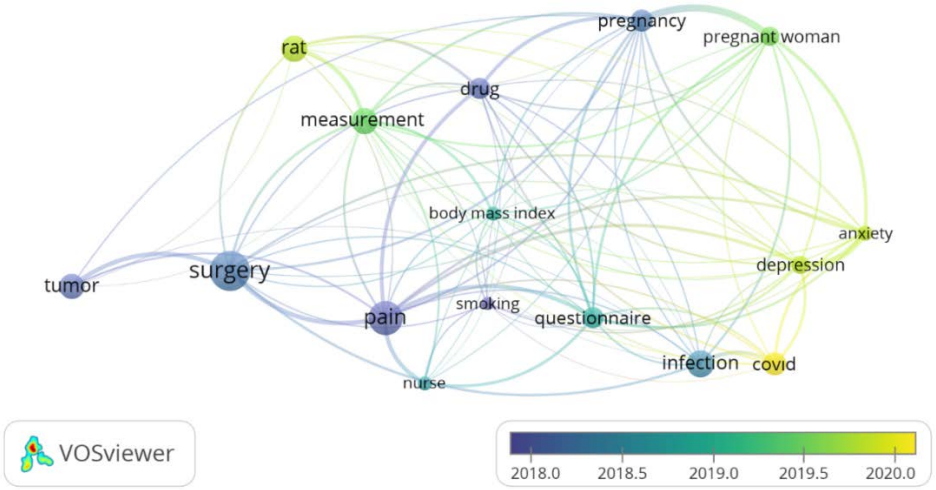

Figure 3. Viewing of the overlay visualization of the most frequently used terms

Note: The size of the circles is proportional to the frequency of use of the keyword.

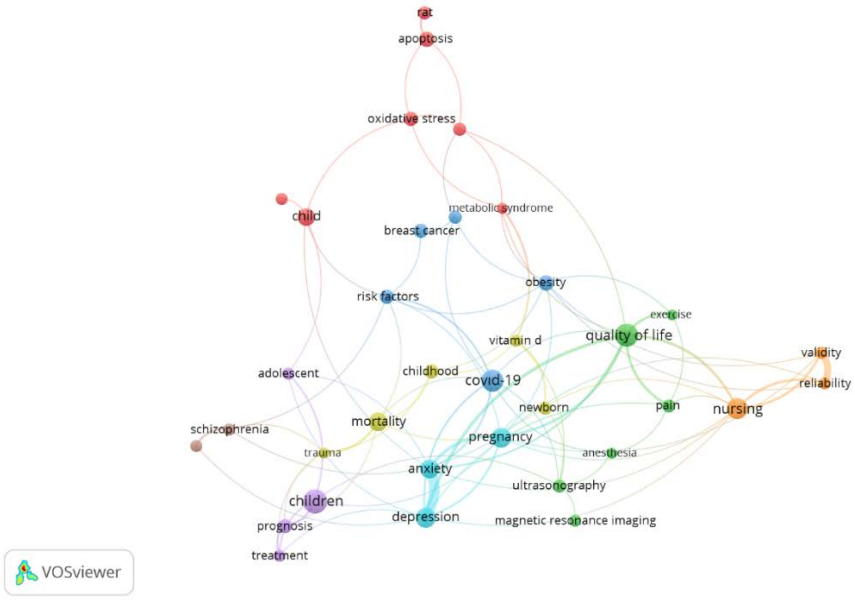

Figure 4. Viewing of the most frequently used keywords

Note: The size of the circles is proportional to the frequency of use of the keyword.

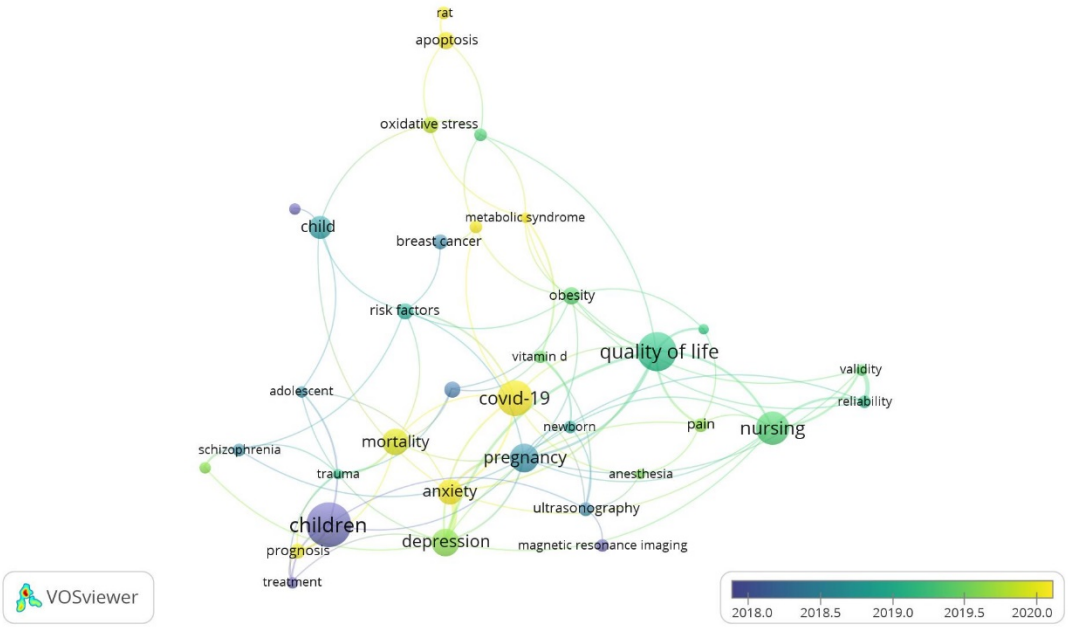

Figure 5. Viewing of the overlay visualization of the most frequently used keywords

Note: The size of the circles is proportional to the frequency of use of the keyword.

DISCUSSION

The Cukurova Medical Journal, established in 1976, has been featured in the Web of Science since 2011. Originally named "Çukurova Üniversitesi Tıp Fakültesi Dergisi" (ISSN:0250-5150), it was later renamed to its current title (ISSN:2602-3032, eISSN:2602-3040). This change means that our analysis could only include publications from 2011 onwards. The journal's mission is to advance science through the publication of significant scientific and clinical works. Prioritizing clinical and experimental research in basic and clinical medical sciences, it employs a double-blind peer review process. As a free, open-access journal, it publishes quarterly in an online-print format and accepts contributions from researchers worldwide. The journal is indexed in several databases, including the Emerging Sources Citation Index (ESCI), TR Index, Cabell's Journalytics, Academic Search Premier (EBSCO), Directory of Open Access Journals (DOAJ), Ideal Online, and Turkey Citation Index[6].

This study aims to provide valuable insights to researchers and journal editors by examining the journal through keywords, assessing its alignment with stated objectives. Bibliometric analyses and maps are used to create a content map of the journal..

The VOSviewer software program was founded by Nees Jan van Eck and Ludo Waltman in 2009 with the support of Leiden University to visualize the scientific landscape[10]. Information visualization tools, which offer us scientific mapping analysis, can thus analyze fields of knowledge and picture where topics in a given field are going and how they form structural relationships[11]. For scientists working on medical informatics, bibliometric analysis is important not only to learn about the changing trends from the past to the present, but also to show the most interesting and popular studies and the level and structure of the relationship between them[12]. The Bibliometric mapping methods combined with clustering techniques that enable the evaluation of the structure and behavior of the scientific field are one of the basic elements of bibliometric analysis[10]. In bibliometric analysis, much attention is given to the analysis of networks, for example, documents, keywords, authors, or journals. The main purpose of these mapping and clustering techniques is to provide

information about the structure of a network[13]. It is shown that the goal of keyword analysis is to determine the way of the research field and common trends. Important terms and keywords represent key points in the research areas[14].

Scientific maps created by VOSviewer software allow us to interpret the connections between selected topics[10]. When we look at the second map (Figure 2), which examines the connections between the terms, we see that 5 different clusters are formed. A close examination of the figure reveals that the depicted clusters, each representing a distinct branch of science or study field, are interconnected. These clusters are categorized as a) clinical studies, b) surgical studies, c) experimental studies, d) nursing studies, and e) epidemiological studies, as per the term map. The Cukurova Medical Journal encompasses a broad spectrum of topics, including nursing, pregnancy, experimental, and contemporary COVID studies, among others. Notably, the scientific maps for both keywords and terms demonstrate a lack of focus on any single subject area.

A holistic view of the scientific maps provided by the software indicates that the keywords and terms generally converge in similar areas of study, suggesting a positive correlation between them. Exploring deeper into the keyword maps, it's apparent that the journal features a diverse range of publications covering various aspects of basic medical sciences. Keywords like "rat", "anesthesia", and "treatment" indicate the inclusion of experimental studies in the journal's content. These keywords are mirrored in the term map as well. Furthermore, the prominent size of the term "surgery" in comparison to others on the map signifies a substantial number of studies related to this area.

Our bibliometric analysis indicates that the coronavirus pandemic has markedly influenced research trends. "Coronavirus" or "COVID-19" emerged as one of the most frequently used keywords, signifying a notable shift in research focus following the pandemic. Seyhan and Öztürk's 2021 bibliometric study on COVID-19 highlighted Turkey's significant contribution, ranking it 13th globally in terms of COVID-19 related publications [15]. This study also found that most COVID-19 research was published in general internal medicine journals. Additionally, the analysis identified "obesity" as another frequently used keyword, reflecting its status as a global health issue. According to the World Health Organization (WHO), the prevalence of obesity among individuals aged 5-19 years increased more than fourfold from 1975 to 2016[16]. The Cukurova Medical Journal's alignment with these current trends is evident.

These findings are valuable for the journal's editorial board, providing comprehensive insights into the journal's current scope and potential. This information can guide the board in steering the journal's future direction. Furthermore, these insights will assist researchers in making informed decisions when considering submitting articles to the journal, as they can align their work with the journal's recent studies, trends, and focus areas.

Despite the journal's establishment well before 2011, the inclusion of only post-2011 articles in the Web of Science presents a limitation in capturing the full spectrum of the journal's evolution in research topics. Additionally, the journal's transition to publishing in English introduces another constraint in our analysis. While the Vosviewer program was instrumental in data processing, incorporating other software tools could enhance the robustness and depth of the study's analysis.

CONCLUSION

In conclusion, this study represents the inaugural bibliometric analysis of keywords and terms in the Cukurova Medical Journal. It provides a comprehensive overview, highlighting that areas such as pediatrics, nursing, COVID-19, psychiatry, surgery, obstetrics, and obesity are notably prevalent topics within the journal. Furthermore, our findings align with the journal's stated aims, as the scientific maps vividly illustrate a concentration of keywords related to both clinical and basic medical sciences.

This analysis offers a unique and valuable perspective on the journal's thematic evolution. By mapping out the keywords and terms, we have been able to trace the historical trajectory of topics, shedding light on the journal's past and present focuses. Moreover, this study provides insights into potential future trends, guiding both current and prospective contributors on the subjects that are gaining traction. It also enhances the visibility and understanding of the journal's content, allowing researchers and readers alike to grasp the breadth and depth of the topics covered in the Cukurova Medical Journal. This comprehensive approach to analyzing the journal's content not only

underscores its commitment to diverse medical fields but also serves as a beacon for future research directions and trends in the ever-evolving landscape of medical science..

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