

Bibliometric Analysis of Scientific Publication Performance of Medical Faculties in Türkiye: Recommendations and Strategies

Türkiye'deki Tıp Fakültelerinin Bilimsel Yayın Performansının Bibliyometrik Analizi: Öneriler ve Stratejiler

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Abstract

Education and research in medical schools are the basis for progress in the field of health. Türkiye is the country with the highest number of medical faculties in Europe. The aim of this study was to provide a bibliometric evaluation of scientific research in medical faculties in Türkiye. The study evaluated scientific publications from the Web of Science database between 2000 and 2024. In Türkiye, the number of medical faculties has increased threefold and the number of scientific publications has increased fivefold since 2000. Medical faculties in Türkiye produced 0.26% of the world's scientific publications and 17% of the publications in Türkiye. The majority of scientific publications, 74%, are articles. The leading research fields are general internal medicine, surgery, pediatrics, and clinical neurology. The most common keywords are "children", "oxidative stress", "rat", "COVID-19", "apoptosis". The USA (3.65%) and Germany (1.23%) are in first and second place for international collaboration. The top ten funding organisations funded 5% of scientific publications. International cooperation and financial support in publications were observed to be at a very low level. The quality of scientific publications is as important as their quantity. High-quality publications provide opportunities for increased collaboration and funding. It influences the quality of medical education and health care. This study proposes strategies for the sustainability of the research performance of medical schools and recommendations regarding medical schools in Türkiye. These strategies are expected to systematically increase the research performance of faculties.

Keywords: Bibliometrics, Quality Publication, Quality Education, Research Performance, Performance Strategy

Özet

Tıp fakültelerindeki eğitim ve araştırma, sağlık alanındaki ilerlemenin temelini oluşturmaktadır. Türkiye, Avrupa'da en fazla tıp fakültesine sahip ülkedir. Bu çalışmanın amacı, Türkiye'deki tıp fakültelerindeki bilimsel araştırmaların bibliyometrik bir değerlendirmesini sunmaktır. Çalışmada, 2000-2024 yılları arasında Web of Science veri tabanından alınan bilimsel yayınlar değerlendirilmiştir. Türkiye'de tıp fakültesi sayısı 2000 yılından bu yana yaklaşık üç kat, bilimsel yayın sayısı ise beş kat artmıştır. Türkiye'deki tıp fakülteleri, dünya bilimsel yayınlarının %0,26'sını, Türkiye'deki yayınların ise %17'sini üretmiştir. Bilimsel yayınların çoğunluğu (%74) makalelerden oluşmaktadır. Önde gelen araştırma alanları genel dahiliye, cerrahi, pediatri ve klinik nörolojidir. En sık kullanılan anahtar kelimeler "çocuk", "oksidatif stres", "sıçan", "COVID-19" ve "apoptoz"dur. Uluslararası iş birliği açısından ABD (%3,65) ve Almanya (%1,23) birinci ve ikinci sırada yer almaktadır. İlk on fon sağlayıcı kuruluş, bilimsel yayınların %5'ini finanse etmiştir. Yayınlar da uluslararası iş birliği ve finansal destek çok düşük düzeyde gözlemlenmiştir. Bilimsel yayınların niteliği, niceliği kadar önemlidir. Yüksek kaliteli yayınlar, iş birliği ve fonlamanın artırılması için fırsatlar sunar. Tıp eğitimi ve sağlık hizmetlerinin kalitesini etkiler. Bu çalışma, Türkiye'deki tıp fakültelerine ilişkin bulgular ve literatür önerileri doğrultusunda tıp fakültelerinin araştırma performansının sürdürülebilirliği için stratejiler önermektedir. Bu stratejilerin fakültelerin araştırma performansını sistematik olarak artıracığı düşünülmektedir.

Anahtar Kelimeler: Bibliyometri, Nitelikli Yayın, Kaliteli Eğitim, Araştırma Performansı, Performans Stratejisi

The advancement of health is contingent upon the development of robust educational and research programs within medical schools. Training of prospective physicians and the establishment of a robust

scientific foundation are essential components of this process. However, research is equally crucial, as it drives the evolution of medical sciences and enhances the quality of health services (Hakimi, 2023; Abad-Segura et al., 2020).

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Yükseköğretim Dergisi / TÜBA Higher Education Research/Review (TÜBA-HER), 15(3), 503-524. © 2025 TÜBA
Geliş tarihi / Received: Temmuz / July 16, 2024; Kabul tarihi / Accepted: Ocak / January 8, 2025

Bu makalenin atıf künyesi / How to cite this article: Ağlarıcı, A. V. (2025). Bibliometric analysis of scientific publication performance of medical faculties in Türkiye: Recommendations and strategies. *Yükseköğretim Dergisi*, 15(3), 503-524. <https://doi.org/10.53478/yuksekogretim.1516862>

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The research and scientific publications conducted in medical faculties facilitate an understanding of health problems, the development of new treatments, the prevention of diseases, and an increase in knowledge on these topics. The findings of these studies are utilized to enhance the quality of life for patients by directly informing clinical practice. Moreover, research conducted in medical faculties contributes to the scientific literature and helps countries to gain international recognition and enhance their academic reputation (Cárdenas et al., 2021; Medina et al., 2015; Campbell et al., 2001).

The research activities conducted within medical schools provide an invaluable opportunity for faculty members and students alike to cultivate their scientific thinking skills and enhance their problem-solving abilities. This guarantees that graduates possess not only clinical abilities but also a scientific outlook and a commitment to lifelong learning. Accordingly, the research and scientific publication performance of a medical school is of significant consequence (Herrera et al., 2017; Ynalvez et al., 2011). This is because scientific research has a direct impact on the quality of education (Ebrahimpour et al., 2021).

The objective of this study was to conduct a bibliometric assessment of the scientific publications produced by medical faculties in Türkiye. The number of medical faculties in Türkiye has increased markedly over the past two decades. In 2000, there were 47 medical faculties in the country; by 2023, this number had grown to 128. Of these faculties, 91 are affiliated with state universities. In some medical faculties, part or all of the training is conducted at another medical faculty. These medical faculties are not yet equipped with the necessary infrastructure, teaching staff, or opportunities to effectively engage in education and research. It has been documented that this dearth of personnel and infrastructure represents a significant impediment to the delivery of quality education and scientific inquiry. In comparison to other countries in Europe, Türkiye has the highest number of medical faculties. England and Ireland, countries with populations similar to that of Türkiye in Europe, have a total of 61 medical faculties. France has 54, Spain has 44, Italy has 47, and Germany, with a population approximately similar to Türkiye's, has only 43 (TMAEB, 2023; Odabaşı, 2023).

The objective of this study was to examine the scientific publication performance of Türkiye, which has the largest number of medical schools in Europe.

The publication performance of medical faculties in Türkiye serves as an indicator of the country's overall development and academic success within the health sector. Medical faculties engage in research across a range of interdisciplinary fields, disseminating the findings of this research at both national and international levels. The publication performance of medical schools contributes to their ability to gain international recognition and reputation. The publication

of high-quality scientific literature serves to enhance an institution's academic reputation, while also facilitating international collaboration and funding opportunities (Sebo et al., 2021). The publication performance of medical schools in Türkiye plays a role in influencing the formation of health policy and the enhancement of health services. In this context, the scientific publications produced by medical schools in Türkiye make a substantial contribution to the country's progress in the field of health.

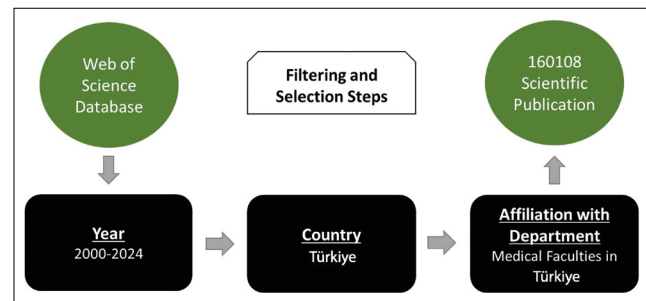
A review of the literature reveals that the scientific publications and academic productivity of countries have been evaluated at the national level, within medical faculties, and across different health fields (Ebrahimpour, 2021; Lee et al., 2018; Noruzi et al., 2014; Khan et al., 2014; Muller et al., 2023; Gallagher et al., 2023; González et al., 2022). Some of these studies have sought to identify various strategies for fostering research development in medical schools (Cardenas, 2021; Kang et al., 2009). Some studies have examined the impediments to health research (Hakimi, 2023; Alenezi et al., 2020). Some studies have examined factors related to academic productivity, including those by Zhang et al. (2017) and MacMaster et al. (2017).

This study examined the scientific publications, research trends, collaborations, and productivity performance of medical schools in Türkiye, which have increased in number over the years. The article goes on to present strategies and recommendations for improving and sustaining research performance. It is anticipated that the findings will assist in the identification of research gaps and priorities for future studies in this field. In this regard, it constitutes a valuable resource.

Method

The data utilized in the study were sourced from the Web of Science database. First, the researcher inputs the temporal range in the database's search section. The period under consideration was 2000–2024. Subsequently, the country of Türkiye was subjected to a filtering process. The medical faculties in Türkiye were selected using the “Affiliation with Department” option. The data were collected on March 26, 2024. The methodology employed for the selection of data is illustrated in ■ Figure 1.

■ **Figure 1**
Filtering and Selection Steps





From 2000 to 2024, a total of 60,825,513 scientific publications were produced globally. Of these, 936,962 (1.54%) were generated in Türkiye, with an additional 160,108 (0.26%) originating from medical faculties within the country. Seventeen percent of the publications produced in Türkiye originated from medical faculties. When considering only articles, it is notable that 38,454,215 articles were published worldwide between 2000 and 2024. Of these, 732,671 (1.9%) were produced in Türkiye and 118,970 (0.31%) in Turkish medical faculties. A total of 16.24% of the articles produced in Türkiye were derived from medical faculties. In order to evaluate the publications, both frequency analysis and bibliometric analysis were employed. The research entailed an evaluation of 160,108 scientific publications obtained from the database. Bibliometrics is a quantitative research evaluation tool that can be used to assess academic outputs, teams, and even individuals in the field of scientific research. A bibliometric analysis allows for the numerical analysis of publications produced by individuals or institutions within a specific field or over a defined period, as well as the examination of the relationships between these publications. It is employed to illustrate the distribution and trends of literature in accordance with publication topics. Furthermore, it enables the visualization of common collaborative networks within publications (Tyrrell et al., 2017; Sillet, 2013; Pritchard, 1969). A bibliometric analysis is comprised of two distinct components. Descriptive bibliometrics and evaluative bibliometrics are two distinct approaches to bibliometric analysis. Descriptive bibliometrics is employed to illustrate the distribution and trends of literature according to various parameters, including countries of origin, authorship, publication years, subject matter, and languages. The objective of evaluative bibliometrics is to analyse the relationships between authors, publications and even the countries in which the publications are published. Two distinct types of bibliometric analysis were employed in the study.

The study examined the distribution of publications according to their respective fields, years of publication, and subtopics. A keyword analysis was conducted. The study also evaluated collaborations between countries, institutions, and authors. Moreover, the publications were examined in light of the Sustainable Development Goals.

The bibliometric analysis of the publications was conducted using the “Analyze Results” menu in the Web of Science database and the VOSviewer v1.6.20 software.

Results

In this study, which evaluated the scientific publications of medical faculties in Türkiye since 2000, a total of 160,108 scientific publications were examined. Of the total number of publications, 118,970 (74%) were articles, 21,007 (13%) were meeting abstracts, 9,065 (5.66%) were letters, and 5,721 (3.57%) were review articles. An evaluation of the scientific publications according to the Web of Science database index

revealed that 85.13% were included in the SCI-EXP, 13.87% in the ESCI, 3.78% in the SSCI, and 0.04% in the A&HCI index. The majority of articles (83.25%) were included in the SCI-EXP, while 15.78% were included in the ESCI, 4.09% in the SSCI, and 0.05% in the A&HCI index. The overwhelming majority of scientific publications, 98.06%, were published in English, while 0.18% were in Turkish, 0.06% in Spanish, 0.05% in Portuguese, and 0.02% in German. The vast majority of articles, 97.82%, were published in English, with 2.02% in Turkish, 0.06% in Portuguese, 0.05% in Spanish, and 0.02% in German. Some of the scientific publications were supported by funding organisations. Looking at the funding organisations, 1.83% (2,931) of the scientific publications and 2.20% (2,616) of the articles were supported by “TURKIYE SCIENTIFIC AND TECHNOLOGICAL RESEARCH COUNCIL TUBITAK”. The distribution of the top ten funding institutions according to the number of supported scientific publications is as follows: “ISTANBUL UNIVERSITY” (%0.83), “UNITED STATES DEPARTMENT OF HEALTH HUMAN SERVICES” (%0.63), “NATIONAL INSTITUTES OF HEALTH NIH USA” (%0.62), “EGE UNIVERSITY” (0.32%), “MARMARA UNIVERSITY” (0.30%), “GAZI UNIVERSITY” (0.27%), “ERCIYES UNIVERSITY” (0.26%), “BASKENT UNIVERSITY” (0.21%), “CUKUROVA UNIVERSITY” (0.20%). The distribution of the top ten funding organisations by number of articles funded is as follows: “ISTANBUL UNIVERSITY” (1.09%), “UNITED STATES DEPARTMENT OF HEALTH HUMAN SERVICES” (0.74%), “NATIONAL INSTITUTES OF HEALTH NIH USA” (0.73%), “EGE UNIVERSITY” (0.42%), “MARMARA UNIVERSITY” (0.38%), “GAZI UNIVERSITY” (0.35%), “ERCIYES UNIVERSITY” (0.34%), “BASKENT UNIVERSITY” (0.28%), “CUKUROVA UNIVERSITY” (0.27%).

This section presents a summary of the results of the frequency analysis according to the various registration options available in the Web of Science database.

The initial step involved an examination of the distribution of publications across subject areas and fields. ■ Table 1 illustrates the distribution according to the Web of Science categories with the highest number of publications and articles. The category with the highest number of publications is Medicine, General Internal. A total of 10.84% of all publications and 12.81% of the articles were categorised within this field. This was followed by ‘Surgery’ (9.39%), ‘Pediatrics’ (7.43%) and ‘Clinical Neurology’ (6.69%). These four fields were the most published, both in terms of total publications and articles. However, when considering only articles, there are some changes in the order of the categories.

■ Table 2 illustrates the distribution of research activity across different fields. The ranking of the five most researched fields is identical for both all publications and articles. The most frequently published fields from Turkish medical faculties are “General Internal Medicine”

(11.55%), “Surgery” (9.39%), “Neurosciences Neurology” (8.88%), “Pediatrics” (7.43%), and “Cardiovascular System Cardiology” (6.43%). When analyzed by article, the rates are 13.41%, 10.27%, 8.52%, 7.26%, and 5.51%, respectively. Despite minor fluctuations in the number of articles in subsequent rankings, the priority areas remain largely consistent.

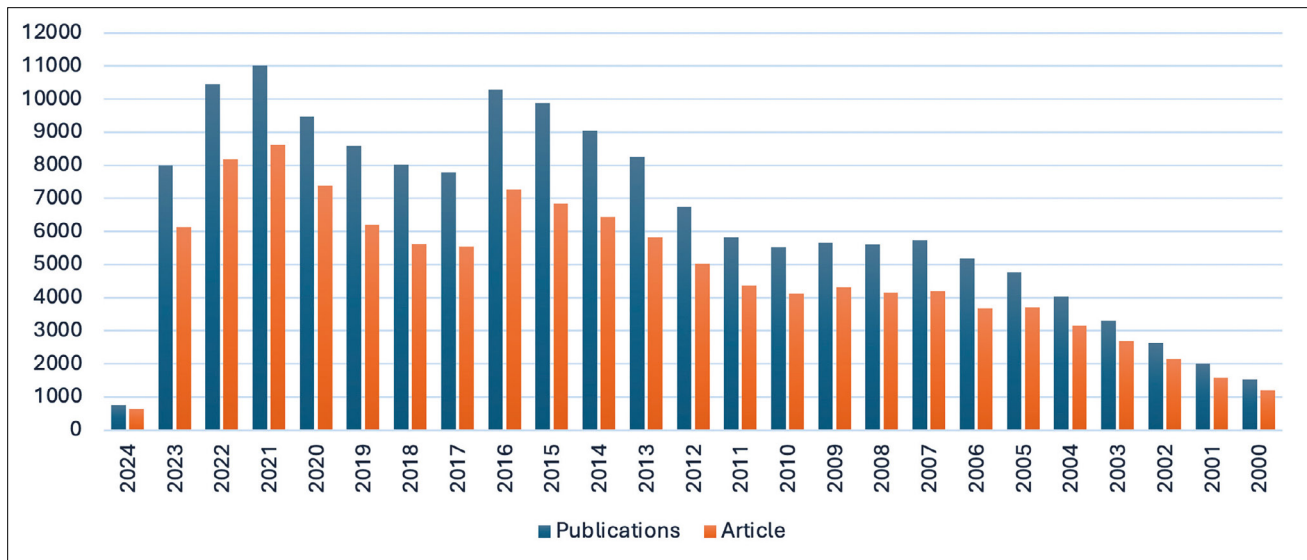
In addition, the scientific publications were examined according to more specific sub-themes. The evaluations were conducted at the meso and micro levels, where the research fields were discussed in greater detail. The micro level represents a more detailed and specific dimension than the meso level. The distribution analysis at the meso level is presented in Table 3. It is evident that the subfields of “Orthopedics”, “Antibiotics & Antimicrobials”, and “Cardiology” have the highest number of publications and articles. A total of 1.87% of scientific publications and 2.25% of articles were classified within the field of “Orthopedics”. A total of 1.80% of scientific publications and 2.09% of articles were related to the field of “Antibiotics & Antimicrobials”. The evaluation in terms of topic micro, which represents a more specific dimension in which scientific publications are examined according to their topics, is presented in Table 4. At the micro level, the category with the highest number of scientific publications in Turkish medical faculties was “Coronavirus.” The 2019 pandemic appears to have influenced the distribution of scientific publications according to their topics. A total of 0.97% of scientific publications and 0.96% of articles were found to be related to the topic of “Coronavirus”. This finding provides evidence of the scientific efforts of medical faculties in Türkiye to combat the pandemic. The second most researched topic was “Behçet’s disease”. The distribution of publications and articles on other topics is shown in Table 4.

The number of medical faculties in Türkiye has increased markedly in recent years, from 47 in 2000 to nearly three times that number today. Table 5 and Figure 2 illustrate the shift in the number of scientific publications by medical faculties since 2000. Table 5 additionally illustrates the number of articles published per year, as well as the proportion of articles within the total volume of scientific publications. The number of scientific publications increased fivefold, from 1,530 in 2000 to 8,008 in 2023. Although there have been fluctuations in the number of articles published by medical faculties over a period of approximately 25 years, there is a discernible upward trend. Although there was a decline in the number of publications in 2017, it reached its zenith in 2021. It is hypothesized that this increase in 2021 is attributable to the pandemic. As a consequence of the scientific contribution of medical faculties in Türkiye to the literature on COVID 19, the number of scientific publications reached its zenith in 2021. Following the peak observed in 2021, a decline in the number of publications was subsequently noted. The data from the end of 2024 will provide insight into the trajectory of this trend. The year-end actual data will indicate whether the decrease will persist or reverse.

Table 6 presents a comparison of the scientific publication performance of medical faculties with that of universities from 2000 onward. In both the number of publications and the number of articles, Istanbul University and Ankara University were the institutions with the highest output. The Faculty of Medicine of Istanbul University was responsible for 11.91% of the scientific publications produced by medical faculties in Türkiye since 2000, while the Faculty of Medicine of Ankara University accounted for 8.8%. Nevertheless, it would be erroneous to evaluate performance based solely on the number of publications. This is due to the fact that the founding year of each faculty

Figure 2

Distribution of the Number of Scientific Publications by Years





is different. ■ Table 7 presents a chronological overview of the establishment of medical faculties in Türkiye, as documented by Yoloğlu et al. (1998) and Odabaşı (2023). For example, despite the fact that the Faculty of Medicine at Başkent University was only established in 1994, it ranked highly in terms of both publications and articles. Approximately 6% of the scientific publications were produced by Başkent University. It has been observed that the Faculty of Medicine at Koç University, which was established in 2009, has become competitive with the medical faculties established in the 1980s in terms of the number of scientific publications. Additionally, the Gazi University and Marmara University Faculty of Medicine, which were established in 1982-83, were also identified as having the highest number of scientific publications. The number of scientific publications produced by medical faculties established in similar years can be compared using ■ Tables 6 and 7.

■ Table 8 illustrates the journals in which the majority of scientific publications produced by medical faculties in Türkiye are published. A total of 1.19% of all publications and 1.52% of the articles were published in the journal titled “TURKISH JOURNAL OF MEDICAL SCIENCES”. This journal is classified as Q3. An analysis of the top five most published journals in terms of Q category reveals the presence of two Q1 categories, one Q2, one Q3, and one Q4. A review of the data reveals that four of the top five journals with the highest number of articles are in the Q4 category, while the remaining one is in the Q3 category. A review of the 25 journals with the highest number of scientific publications reveals that 52% of them are classified as Q1 and Q2 journals (6 Q1, 7 Q2, 2 Q3, 8 Q4, and 2 ESCI). An examination of the 25 journals with the highest number of articles reveals that 56% of these were Q4 category journals (5 Q2, 1 Q3, 14 Q4, 5 ESCI).

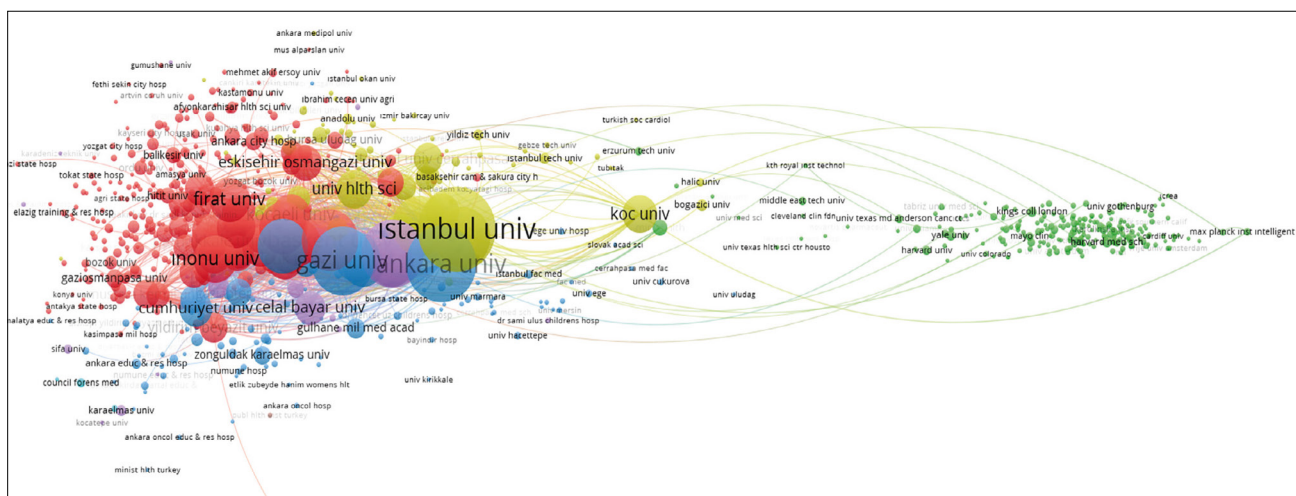
As you are aware, the Sustainable Development Goals were formally adopted by world leaders at the United Nations General Assembly in September 2015. The United Nations Sustainable Development Goals concentrate on the resolution of social, cultural, and environmental concerns. In this study, the relationship between publications produced in Turkish medical schools and the Sustainable Development Goals was also evaluated. The extent to which they contribute to these goals was evaluated through a scientific methodology. The primary objectives of scientific publications were subjected to examination. ■ Table 9 illustrates the number and distribution of scientific publications according to the sustainable development goals. The majority of scientific publications, specifically 79.21%, were found to be related to “health and well-being”, while 7.46% were associated with “gender equality” and 1% focused on “zero hunger”. A total of 90.11% of the articles were found to pertain to the domain of “health and well-being”, 8.83% to the domain of “gender equality” and 1.18% to the domain of “zero hunger”.

Bibliometric Network Analysis

This section presents the results of the bibliometric analysis, which was conducted to identify the publication collaborations of medical faculties in Türkiye. The results are presented using network visualization. Association networks were constructed based on the institutions, countries, and keywords in question. The bibliometric network analysis was conducted using only articles. A total of 118,970 articles were examined to gain insight into the nature of collaboration networks.

Since the year 2000, a total of 118,970 scientific articles have been produced through the individual or joint efforts of 28,356 national and international institutions. The results of the bibliometric network analysis, which was conducted on 745 institutions with the strongest connections, are presented in ■ Figure 3.

■ Figure 3
Inter-institutional Collaboration Network



The size of the nodes obtained through bibliometric network analysis serves to indicate the frequency of occurrence. The curves between nodes represent the co-occurrence of the phenomena in question. The shorter the distance between two nodes, the greater the frequency of co-occurrence of the two phenomena (things evaluated) in question.

The results of the bibliometric analysis indicate that the medical faculties that produced the greatest number of articles were those of Istanbul, Ankara, and Gazi Universities. As illustrated in ■ Figure 3, the node representing Istanbul University Faculty of Medicine, which produced the greatest number of articles, is the largest. Subsequently, the nodes of the Ankara and Gazi University Faculties of Medicine were identified. The faculties of medicine with the highest number of citations were those of Istanbul, Ankara, and Aegean Universities. The faculties of medicine with the greatest number of connections were those of Istanbul, Ankara, and Hacettepe universities. ■ Figure 3 illustrates that the Faculty of Medicine of Koç University acts as a conduit between international institutions and those in Türkiye.

The network visual, which examines medical school collaborations on a country-by-country basis, is presented in ■ Figure 4. A bibliometric analysis was conducted on 126 countries with the most robust interconnectivity. The majority of articles published by medical faculties were from the USA (3.65%), Germany (1.23%), England (1.16%), Italy (1%),

and Spain (0.6%). As illustrated in ■ Figure 4, the United States represents the largest node, followed by Germany and England. The most frequently cited joint articles were those conducted in collaboration with the United States, Germany, England, Italy, and Canada. Of the 118,970 articles published by medical faculties, the countries with the most links with Türkiye were the USA, Italy, and England, respectively.

The most frequently occurring keywords in the articles produced by medical faculties were subjected to a bibliometric analysis. The network image generated from 6,851 keywords with strong connections is presented in ■ Figure 5. The nodes representing words with high frequency in the graph were observed to be of a larger size. The most frequent keywords are “children”, “oxidative stress”, “rat”, “COVID-19”, “apoptosis”, “Türkiye”, “prognosis”, “depression”, “quality of life”, “pregnancy”, “magnetic resonance imaging”, “breast cancer”, “obesity”, “mortality” and “treatment”. The keywords with the highest number of links are “oxidative stress”, “rat”, “children”, “apoptosis”, “COVID-19”, “depression”, “obesity”, “quality of life”, “nitric oxide”, “anxiety”, “Türkiye”, “inflammation”, “mortality”, “prognosis” and “lipid peroxidation”. It can be observed that the words utilized in conjunction are classified into clusters, which are represented by distinct colors. ■ Figure 6 also presents a visual representation of keyword density. In this graph, highly repetitive keywords are represented by larger letters and darker colors. The proximity of two keywords indicates the frequency with which they are used in conjunction with one another.

■ **Figure 4**
Cross-country Collaboration Network

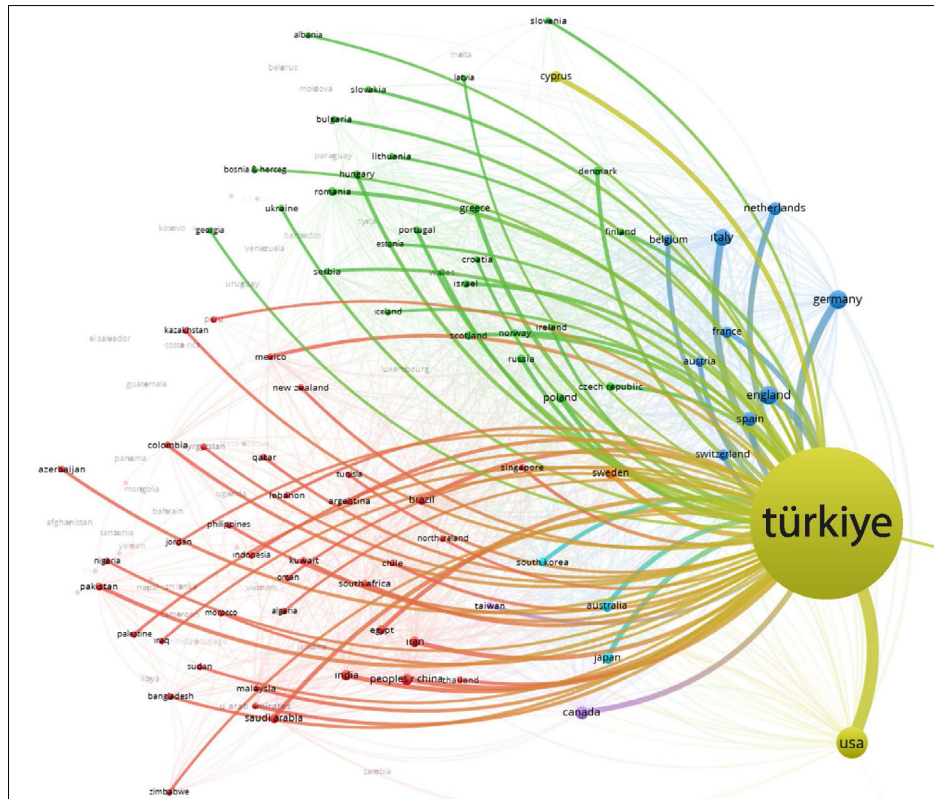




Figure 5
Common Network Analysis of Keywords

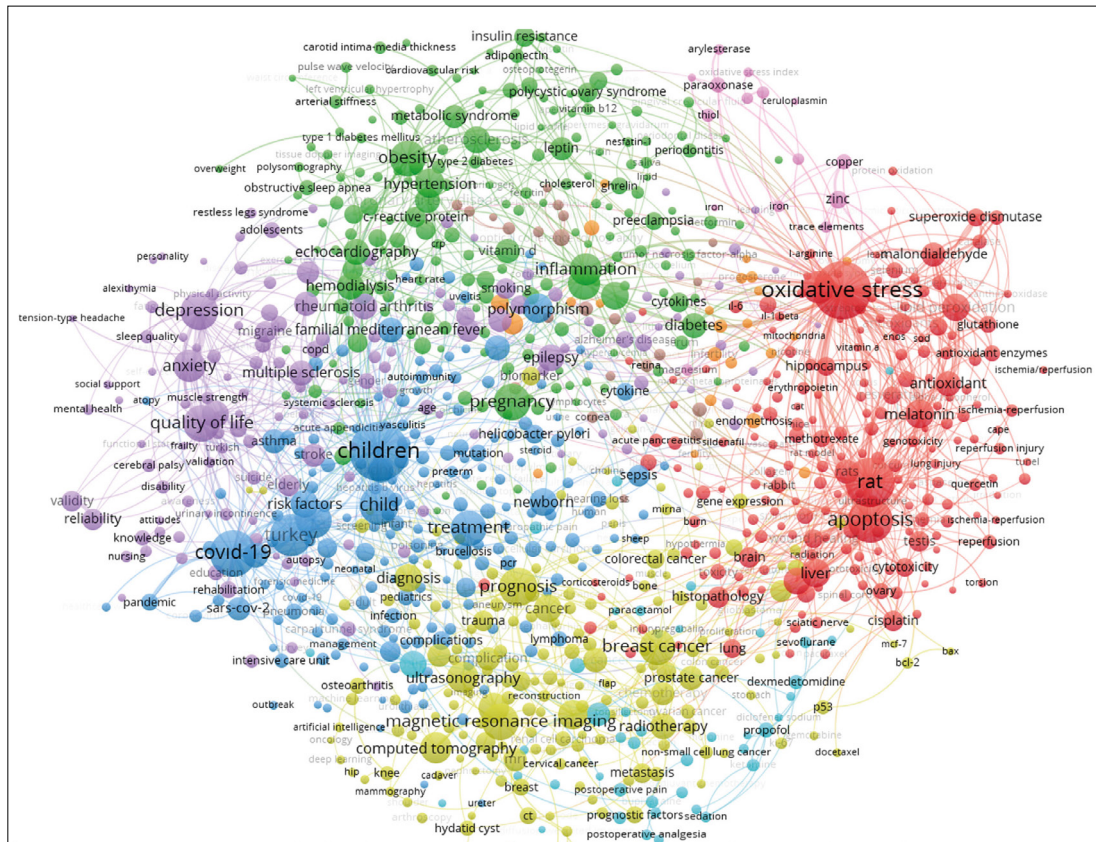


Figure 6
Density Visualization in Terms of Keywords



Discussion and Conclusion

In order to evaluate the extent of research activity, it is essential to consider the volume of scientific publications generated by institutions and countries. The number of publications is regarded as an indicator of scientific output (Noruzi et al., 2014). The level of research activity in medical schools is a significant determinant of the quality of education and healthcare. In recent years, the evaluation and ranking of countries and institutions around the world according to research indicators has become a significant aspect of national and international assessment.

In this study, the scientific publication performance of medical faculties in Türkiye between 2000 and 2024 was evaluated using bibliometric analysis. The analysis encompassed an examination of scientific publications in terms of research trends and collaborations. The bibliometric analysis is a method used to identify emerging research areas, evaluate the research performance of universities and countries, and examine publication relationships between institutions (Kim et al., 2020).

The evaluations were examined separately from all scientific publications and articles. Since the year 2000, approximately three per thousand of the global scientific publications and 17% of the scientific publications produced in Türkiye have been produced in medical faculties in Türkiye (160,108 publications). The majority of scientific publications, comprising 74% of the total, are in the form of articles. Furthermore, 98% of these publications are written in English. The majority of scientific publications were funded by TUBITAK. Nevertheless, they represent only approximately two percent of all publications. The ten most prominent funding organizations were responsible for supporting 5% of all scientific publications, while 25 institutions collectively funded 7%. In light of these figures, it is evident that the level of support is relatively limited. It appears that further research support is required in this area. The majority of funders are domestic. It would be prudent to pursue research that would benefit from the support of international funders. The opportunity for cooperation in funding arises from the publication of high-quality scientific works (Sebo et al., 2021). It is recommended that collaboration in this respect be increased.

A review of the distribution by Web of Science subject categories and research fields (Tables 1 and 2) revealed that over 10% of the publications were related to the field of “Medicine General Internal.” This was the field of study that was the subject of the greatest number of research projects undertaken by students at Turkish medical faculties. The next most researched fields in Türkiye were surgery, pediatrics, and clinical neurology. Following the four most researched fields, minor alterations were noted in the topic ranking of all publications and articles. Given that articles represent 74% of all scientific publications, it is recommended that they be accorded greater weight in the determination of the most researched topics.

A quantitative analysis of scientific publications produced in German medical faculties between 2009 and 2020 revealed that the field of “Neurosciences” ranked first in terms of the highest number of publications. Subsequently, the rankings were topped by “Oncology”, “Surgery”, “Clinical Neurology” and “Psychiatry” (Aman and Besselaar, 2024). The fields of “Surgery” and “Clinical Neurology” were among the five most prolific in Turkish medical faculties, mirroring the results observed in German medical faculties. However, the field of “Medicine General Internal”, which is the most prolific in Türkiye in terms of publications, ranks 15th in the research fields of German medical faculties. The field of “Pediatrics”, which ranks third in Türkiye, is not among the top fifteen fields of study of German medical faculties. Conversely, “Oncology” is among the top ten research areas of medical faculties in Türkiye.

The Web of Science and research field categorization provide a more general classification of research fields. At the more specific level, the most researched fields are represented by the subject categories “topic meso” and “topic micro”. At the meso level, the research fields with the highest number of scientific publications were orthopedics, antibiotics and antimicrobials, and cardiology. At the micro level, the most researched topics were coronavirus and Behcet’s disease. These represent the most prominent research topics in medical faculties in Türkiye.

Over time, the number of scientific publications produced by medical schools has increased. The highest number of publications was recorded in 2007, 2016, and 2021. Although there has been a subsequent decline, the overall trend has been one of growth (■ Figure 2). It is hypothesized that the maximum number of publications in 2021 can be attributed to the impact of the pandemic. The topic of greatest micro-level research was the novel coronavirus. This outcome substantiates the scientific endeavors of medical faculties in Türkiye in response to the pandemic. In 2000, there were 47 medical faculties and 6,592 faculty members in Türkiye. By 2023, this number had grown to 128 medical faculties and 18,160 faculty members (TMAEB, 2023; Odabaşı, 2023). A comparison of the publication data from 2023 with previous years reveals a threefold increase in the number of medical faculties and faculty members, accompanied by a fivefold increase in the number of scientific publications. It has been observed that the medical faculties with the highest number of publications are those of Istanbul, Ankara, Ege, and Gazi Universities. The year in which the faculties were established is also a significant factor. To illustrate, despite the fact that Başkent University’s Faculty of Medicine was established in 1994 (■ Table 7), it is among the five institutions that publish the greatest number of articles. The Gazi University Faculty of Medicine, established in 1982, is among the top three institutions with the highest number of publications. The Koç University Faculty of Medicine, established in 2009, is among the top 25 institutions with the highest number of scientific publications.



In addition to the increase in the number of scientific publications, the most crucial issue is the number of publications that meet the requisite standards for quality (Güllüoğlu et al., 2000). The Web of Science database offers a Q classification for qualified publication categories. A review of the literature revealed that the journal with the highest number of articles published by the Faculty of Medicine in Türkiye is the Q3 category, “TURKISH JOURNAL OF MEDICAL SCIENCES.” Of the 25 journals with the highest number of articles, 20% are classified as Q2, 56% are classified as Q4, 20% are classified as ESCI, and the majority are Turkish journals. It is notable that no journals in the Q1 category are represented among the top 25. It would be beneficial for medical faculties to establish objectives for the quality of their publications. It is also noteworthy that the fees associated with open access (OA) journals have a detrimental impact on Turkish scientists. This is because it is not feasible for a researcher affiliated with a medical faculty in Türkiye to bear the costs of open access (OA) journal fees without securing external funding.

The scientific literature was evaluated in relation to the Sustainable Development Goals (SDGs) set forth by the United Nations for achievement by the year 2030. Given that the publications originate from medical faculties, they tend to prioritize health-related objectives. The results indicated that 79% of the publications and 90% of the articles aligned with the objective of “good health and well-being”. With regard to the remaining objectives, it was determined that 9% of the articles addressed the “gender equality” objective and 1% addressed the “zero hunger” objective (■ Table 9). Articles that contribute to the advancement of the “quality education” and other goals represent less than one percent of the total number of articles evaluated. From this perspective, further research on other goals can be developed and increased. For instance, quality education should be a primary focus of medical faculties. The recently established medical faculties in Türkiye are lacking in physical, technical, and other resources. It has been documented that deficiencies exist in these areas. It has been reported that this dearth of human resources and infrastructural deficiencies constitute a significant impediment to the delivery of quality education and scientific research (TMAEB, 2023).

The results of the bibliometric analysis, conducted to ascertain the nature of the collaborations evident in the articles under review, are presented below: The medical schools with the greatest number of institutional collaborations are those of Istanbul, Ankara, and Hacettepe Universities. The medical faculties with the highest number of citations are those of Istanbul, Ankara, and Ege Universities. The Faculty of Medicine at Koç University has facilitated the establishment of collaborative relationships between international institutions and those in Türkiye (■ Figure 3). At the country level, the highest number of article

collaborations were with the USA, followed by Germany and England (■ Figure 4). A total of 3.65% of all articles were co-authored with authors in the USA. This rate suggests a relatively low level of international collaboration among medical schools.

A comprehensive analysis of health research in Iran between 2000 and 2014 was conducted using the Scopus database. Over the course of the 15-year period, 81,867 articles were published, representing 34.53% of all publications. The countries with the highest rates of collaboration in article production were the United States (4.75%), the United Kingdom (2.77%), and Canada (1.93%). It was asserted that greater efforts are required to promote collaborative outputs (Djalalinia et al., 2017). In a separate study, the 2015 data from the Scopus database were analyzed to examine the publications of Iranian universities of medical sciences. A total of 18,023 articles were produced in the relevant year. It was reported that 15% of these articles were published through international collaboration (Eftekhar et al., 2017). In the study, which evaluated international collaboration in medical research in Latin American countries, the scientific publications listed in the Scopus database between 2003 and 2007 were used as the basis for analysis. In this study, countries such as Brazil, Mexico, Argentina, Chile, Venezuela, Colombia, and Cuba are reported to have international cooperation in scientific publications representing at least 30% of their total output. Those countries with a 30-50% international collaboration rate include Mexico, Argentina, Chile, Venezuela, Colombia, Jamaica, and Trinidad and Tobago. Those countries with a 50-70% rate of international collaboration in scientific publications include Cuba, Puerto Rico, Uruguay, Ecuador, Panama, and Guadeloupe. Ultimately, Peru, Costa Rica, Bolivia, Guatemala, Nicaragua, and Honduras have been identified as countries in which over two-thirds of their medical research outputs are the result of international collaboration (Chinchilla-Rodríguez et al., 2012). Another study assessed the extent of international collaboration among South American countries in the field of clinical medicine. It was reported that 36% of the 40,069 articles on clinical medicine published between 2000 and 2009 were conducted in international collaboration (Huamaní et al., 2012).

The most salient keywords in the studies were “children”, “oxidative stress”, “rat”, “covid-19” and “apoptosis”. The terms with the highest number of links (indicating the most frequent usage) are “oxidative stress”, “rat”, “children”, “apoptosis” and “covid-19” (■ Figure 5). The keyword analysis also revealed the extent of the scientific contribution of medical faculties in Türkiye to the literature on covid-19.

Based on these findings and other studies in the literature, some suggestions and strategies are presented to improve and maintain the research performance of medical faculties in Türkiye:

Cardenas et al. (2021) advised the formulation of a strategic plan for the advancement of research activities within medical faculties. Similarly, Kang et al. (2009) asserted the necessity of strategic plans for the effective management of human resources in order to facilitate scientific publications in medical faculties with constrained resources. It was proposed that the research strategy should be planned in consideration of the resources available to the medical faculty. In this regard, it would be prudent for medical faculties in our country to establish three- or five-year strategic research objectives. At the conclusion of each fiscal year, the faculty administration is responsible for monitoring and reporting on the level of achievement of the established goals. It is the responsibility of the faculty administration to address unachieved goals and to monitor progress on an ongoing basis.

The H-index is a method of measuring the impact of an individual faculty member on the scientific literature. In other words, it can be referred to as a measure of citation performance. Zang et al. (2017) discovered that departments and faculties with greater numbers of members tend to exhibit a higher h-index. The addition of personnel to the department has been demonstrated to enhance the department's h-index (Tyrell et al., 2017). In this regard, the Council of Higher Education (YK) in Trkiye should consider the fact that newly established medical faculties are subject to annual personnel limits in terms of faculty members.

As Tyrell et al. (2017) have observed, it is crucial to promote effective research among faculty members if the institution is to enhance its faculty h-index. The results indicated a negative correlation between academic rank and the h-index productivity (h-index/number of articles) of faculty members. Similarly, Acar and Bektař (2021) discovered a correlation between an increase in age and a decline in productivity among researchers. It has been proposed that senior faculty members should be encouraged to invest their academic time in activities that will enhance their h-index and minimise the prevalence of low-impact articles (Tyrell, 2017). It is recommended that faculty management establish publication and h-index targets for individuals occupying senior academic positions, which should be included among the institution's strategic indicators. This will also markedly enhance the caliber of research and instruction produced.

Acar and Bektař (2021), Benton and Benton (2019), Ruan et al. (2018), and Zacca-González et al. (2014) highlight the significance of collaboration between authors and institutions, as well as between industry and resources at the national and international levels. It has been demonstrated that enhanced collaboration leads to an increase in the number and quality of publications. The provision of industry support in the field of healthcare has been identified as a significant factor influencing academic

productivity. The allocation of research-specific funding and the availability of higher levels of funding were found to be associated with higher h-indices and higher academic rankings. Even relatively modest levels of funding were found to have a positive effect on academic performance. Additionally, our study revealed that the number of funded articles is relatively low. Additionally, the number of international collaborative articles was found to be relatively low. In light of these findings, it would be prudent to prioritize the expansion of collaborative efforts and the diversification of resource support as strategic objectives.

In their study, Gllođlu et al. (2000) underscored the significance of article quality in addition to the quantity of articles. He asserted that the proportion of meritorious publications among the total number of publications is a significant indicator. Similarly, Acar and Bektař (2021) underscored the significance of publication quality, noting that merely increasing the number of publications is insufficient to secure a reputable position within the scientific community. In light of these considerations, it would be prudent for medical schools to integrate the Q1 and Q2 publication rate among their strategic objectives, alongside the total number of publications.

Osaigbovo (2019) notes that evidence derived from theses is frequently disregarded in medical schools. He underscores the significance of transforming theses into publications and disseminating them through scientific communication. He asserted that these studies should be included in the existing literature. The publication of thesis results in a peer-reviewed, indexed journal serves to validate the research and increases the likelihood of it being read, cited, and included in systematic reviews, he stated. In accordance with the World Medical Association's Declaration of Helsinki, it is the ethical obligation of researchers to publish the findings of studies involving human subjects. It was observed that junior medical practitioners should be encouraged to engage with this under-researched area and to disseminate their findings. In light of the aforementioned considerations, it is recommended that both specialist and doctoral theses conducted within the context of medical schools should be published, integrated into strategic objectives, and regarded as a graduation requirement.

In their 2017 study, Herrera-Añazco and colleagues emphasized the importance of process managers in medical schools. He posited that effective leadership facilitates the production of research and enhances an institution's reputation. He examined the quality of research conducted in medical schools by those responsible for its oversight. It is similarly recommended that process leaders demonstrate high research performance, that research policies be effectively managed, and that these factors be taken into account when selecting managers. It is recommended that administrators and academic staff alike adopt research performance as a goal.



In a recent study, Hakami (2023) discovered that faculty members encounter significant challenges when attempting to engage in scientific research and subsequently publish their findings. The primary obstacles were identified as difficulties in adhering to APA standards, a dearth of expertise in scientific research writing, challenges in articulating ideas in English, and difficulties in complying with journal guidelines. Some individuals are disinclined to publish without external pressure. It is imperative that faculty members be provided with the necessary support, resources, and training to overcome these barriers and enhance their research productivity. It is recommended that medical faculties develop and implement an annual educational program addressing the identified challenges, with the involvement of experts.

Acar and Bektaş (2021) asserted that Türkiye has made the most significant contributions to global literature in the field of clinical medicine. Türkiye has not yet achieved a significant presence in the field of basic medical sciences. Furthermore, they asserted the necessity for the publication of additional high-quality research in the field of basic medical sciences. Tyrrell et al. (2017) posited that enhanced communication between the basic and clinical sciences is essential for the advancement of health research. He stated that the advancement of research is contingent upon the integration of clinical and basic sciences, and that enhanced communication and collaboration are essential. Strategic indicators may be employed to establish objectives for interdisciplinary initiatives and publications.

Consequently, the present study thus sought to evaluate the scientific publication performance of medical faculties in Türkiye over the approximately 25-year period commencing in 2000. The research subject trends in faculties, the number of publications by year, the nature of institutional collaborations at the national and international levels, and the relationship between publications and the sustainable development goals were evaluated using bibliometric analysis. In light of the findings of the present study and those of other studies in the literature, recommendations have been put forth with a view to enhancing research performance. It has been recommended that medical schools should establish three- or five-year strategic objectives and conduct an annual assessment of the extent to which these objectives have been met. It is recommended that the establishment of goals and the monitoring and evaluation of their attainment become standard practice within medical faculties. The establishment of strategic objectives will facilitate sustainability by enhancing research performance in terms of quality and quantity. Moreover, an improvement in research performance will ensure continuous enhancement, thereby elevating the quality of both education and health services.

Limitations of the Study

It should be noted that this study is not without limitations. The study presents a comprehensive analysis of the scientific publication performance and research trends of medical faculties in Türkiye over a 25-year period. The strategies are presented in the context of sustainable quality publications. Nevertheless, the objective of this study is not to rank medical faculties according to the number of publications. It should be noted that the establishment of some medical faculties in Türkiye was followed by a division of the institution, with the faculty continuing its work within another university. Some medical faculties were initially established as part of larger universities and subsequently became part of newly established universities. For example, Istanbul University Faculty of Medicine, which was established in 1827, was split into two in 1967 and a new faculty called Cerrahpaşa Faculty of Medicine was formed. Until 2018, these two medical faculties were part of Istanbul University, but since then they have been operating under the roof of two separate universities. Similarly, the Selçuklu Faculty of Medicine, founded in 2001, was the second medical faculty within Selçuk University. However, Meram Faculty of Medicine, which was established within Selçuk University in 1982, was separated in 2011 and became part of Necmettin Erbakan University. On the other hand, the University of Health Sciences, which was established in 2015, now includes several medical faculties. From this perspective, it is not entirely accurate to establish a definitive ranking among universities based on the number of publications. This is regarded as a limitation of the study.

Acknowledgments: "None."

Funding/Support: "None."

Other disclosures: "None."

Ethical approval: "Not applicable."

Disclaimers: "None."

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Table 1
Distribution by Web of Science Categories

All Publications			Articles		
Web of Science Categories	n	%	Web of Science Categories	n	%
Medicine General Internal	17357	10.84	Medicine General Internal	15237	12.81
Surgery	15033	9.39	Surgery	12217	10.27
Pediatrics	11894	7.43	Pediatrics	8641	7.26
Clinical Neurology	10708	6.69	Clinical Neurology	7238	6.08
Oncology	9195	5.74	Pharmacology Pharmacy	5507	4.63
Cardiac Cardiovascular Systems	8293	5.18	Oncology	5434	4.57
Urology Nephrology	7558	4.72	Cardiac Cardiovascular Systems	5218	4.39
Pharmacology Pharmacy	7069	4.42	Obstetrics Gynecology	5044	4.24
Neurosciences	6752	4.22	Urology Nephrology	5010	4.21
Obstetrics Gynecology	6296	3.93	Radiology Nuclear Medicine Medical Imaging	4489	3.77
Radiology Nuclear Medicine Medical Imaging	6241	3.9	Neurosciences	4467	3.75
Endocrinology Metabolism	5744	3.59	Medicine Research Experimental	4343	3.65
Biochemistry Molecular Biology	5103	3.19	Endocrinology Metabolism	4211	3.54
Medicine Research Experimental	4934	3.08	Ophthalmology	3711	3.12
Hematology	4874	3.04	Biochemistry Molecular Biology	3404	2.86
Rheumatology	4692	2.93	Otorhinolaryngology	2870	2.41
Immunology	4532	2.83	Psychiatry	2830	2.38
Gastroenterology Hepatology	4341	2.71	Orthopedics	2765	2.32
Ophthalmology	4278	2.67	Immunology	2682	2.25
Psychiatry	4187	2.62	Gastroenterology Hepatology	2570	2.16
Respiratory System	3755	2.35	Hematology	2379	2.00
Dermatology	3341	2.09	Dermatology	2322	1.95
Orthopedics	3174	1.98	Rheumatology	2234	1.88
Otorhinolaryngology	3149	1.97	Emergency Medicine	2223	1.87
Transplantation	3087	1.93	Respiratory System	2211	1.86



Table 2
Distribution by Research Area

All Publications			Articles		
Research Area	n	%	Research Area	n	%
General Internal Medicine	18490	11.55	General Internal Medicine	15951	13.41
Surgery	15033	9.39	Surgery	12217	10.27
Neurosciences Neurology	14217	8.88	Neurosciences Neurology	10141	8.52
Pediatrics	11894	7.43	Pediatrics	8641	7.26
Cardiovascular System Cardiology	10301	6.43	Cardiovascular System Cardiology	6560	5.51
Oncology	9195	5.74	Pharmacology Pharmacy	5839	4.91
Urology Nephrology	7558	4.72	Oncology	5434	4.57
Pharmacology Pharmacy	7422	4.64	Obstetrics Gynecology	5044	4.24
Obstetrics Gynecology	6296	3.93	Urology Nephrology	5010	4.21
Radiology Nuclear Medicine Medical Imaging	6241	3.90	Endocrinology Metabolism	4596	3.86
Endocrinology Metabolism	6164	3.85	Radiology Nuclear Medicine Medical Imaging	4489	3.77
Biochemistry Molecular Biology	5326	3.33	Research Experimental Medicine	4343	3.65
Research Experimental Medicine	4934	3.08	Ophthalmology	3711	3.12
Hematology	4874	3.04	Biochemistry Molecular Biology	3561	2.99
Rheumatology	4692	2.93	Otorhinolaryngology	2870	2.41
Immunology	4532	2.83	Psychiatry	2830	2.38
Gastroenterology Hepatology	4341	2.71	Orthopedics	2765	2.32
Ophthalmology	4278	2.67	Immunology	2682	2.25
Psychiatry	4187	2.62	Gastroenterology Hepatology	2570	2.16
Respiratory System	3755	2.35	Hematology	2379	2.00
Dermatology	3341	2.09	Dermatology	2322	1.95
Orthopedics	3174	1.98	Rheumatology	2234	1.88
Otorhinolaryngology	3149	1.97	Emergency Medicine	2223	1.87
Transplantation	3087	1.93	Respiratory System	2211	1.86
Emergency Medicine	2586	1.62	Cell Biology	1961	1.65

Table 3

Distribution in terms of Citation Topic Meso

All Publications			Articles		
Topic Meso	n	%	Topic Meso	n	%
1.34 Orthopedics	2989	1.87	1.34 Orthopedics	2678	2.25
1.23 Antibiotics & Antimicrobials	2887	1.80	1.23 Antibiotics & Antimicrobials	2492	2.09
1.37 Cardiology - General	2674	1.67	1.71 Cardiology - Circulation	2205	1.85
1.71 Cardiology - Circulation	2659	1.66	1.37 Cardiology - General	2113	1.78
1.118 Soft Tissue. Bone & Nerve Cancers	2531	1.58	1.26 Diabetes	2049	1.72
1.43 Anesthesiology	2446	1.53	1.43 Anesthesiology	2031	1.71
1.26 Diabetes	2327	1.45	1.55 Urology & Nephrology - General	1986	1.67
1.173 Cosmetic Surgery	2272	1.42	1.173 Cosmetic Surgery	1958	1.65
1.55 Urology & Nephrology - General	2267	1.42	1.118 Soft Tissue. Bone & Nerve Cancers	1956	1.64
1.104 Virology - General	2261	1.41	1.128 Fertility. Endometriosis & Hysterectomy	1864	1.57
1.106 Rheumatology	2197	1.37	1.72 Obstetrics & Gynecology	1846	1.55
1.128 Fertility. Endometriosis & Hysterectomy	2156	1.35	1.80 Bone Diseases	1809	1.52
1.21 Psychiatry	2078	1.30	1.142 Urology	1791	1.51
1.142 Urology	2061	1.29	1.104 Virology - General	1734	1.46
1.65 Allergy	2056	1.28	1.65 Allergy	1709	1.44
1.72 Obstetrics & Gynecology	2037	1.27	1.106 Rheumatology	1698	1.43
1.80 Bone Diseases	2034	1.27	1.81 Reproductive Biology	1686	1.42
1.81 Reproductive Biology	1983	1.24	1.21 Psychiatry	1662	1.40
1.216 Abdominal Surgery	1915	1.20	3.16 Phytochemicals	1609	1.35
1.125 Hepatitis	1735	1.08	1.216 Abdominal Surgery	1577	1.33
3.16 Phytochemicals	1725	1.08	1.129 Back Pain	1476	1.24
1.129 Back Pain	1703	1.06	1.137 Sleep Science & Circadian Systems	1435	1.21
1.75 Blood Clotting	1624	1.01	1.213 Thyroid Disorders	1405	1.18
1.137 Sleep Science & Circadian Systems	1614	1.01	1.49 Dentistry & Oral Medicine	1381	1.16

■ **Table 4**

Distribution in terms of Citation Topic Micro

All Publications			Articles		
Topic Micro	n	%	Topic Micro	n	%
1.104.1353 Coronavirus	1561	0.97	1.104.1353 Coronavirus	1141	0.96
1.36.1207 Behcet's Disease	1268	0.79	1.36.1207 Behcet's Disease	899	0.76
1.43.202 Bupivacaine	1047	0.65	1.71.2048 Mean Platelet Volume	795	0.67
1.71.2048 Mean Platelet Volume	987	0.62	1.23.146 Antibiotic Resistance	788	0.66
1.243.519 Urolithiasis	888	0.55	1.43.202 Bupivacaine	787	0.66
1.23.146 Antibiotic Resistance	884	0.55	1.243.519 Urolithiasis	767	0.64
1.281.1992 Familial Mediterranean Fever	808	0.50	1.213.319 Thyroid Cancer	704	0.59
1.142.165 Urinary Incontinence	789	0.49	1.142.165 Urinary Incontinence	699	0.59
1.213.319 Thyroid Cancer	777	0.49	1.81.510 Polycystic Ovary Syndrome	684	0.57
1.81.510 Polycystic Ovary Syndrome	777	0.49	1.148.94 Candida Albicans	655	0.55
1.163.1106 Hydatid Cyst	749	0.47	1.137.382 Obstructive Sleep Apnea	634	0.53
1.148.94 Candida Albicans	743	0.46	1.213.168 Hypothyroidism	632	0.53
1.137.382 Obstructive Sleep Apnea	711	0.44	1.281.1992 Familial Mediterranean Fever	609	0.51
1.173.369 Flap	692	0.43	1.80.279 Vitamin D	590	0.50
1.213.168 Hypothyroidism	689	0.43	1.129.175 Intervertebral Disc	589	0.50
1.222.143 Epilepsy	682	0.43	1.173.369 Flap	585	0.49
1.80.279 Vitamin D	656	0.41	1.163.1106 Hydatid Cyst	578	0.49
1.247.461 Migraine	648	0.40	1.222.143 Epilepsy	574	0.48
1.129.175 Intervertebral Disc	646	0.40	1.142.484 Erectile Dysfunction	555	0.47
1.125.275 Hbv	643	0.40	1.247.461 Migraine	554	0.47
1.128.390 Ovarian Cancer	632	0.39	1.26.107 Adiponectin	550	0.46
1.142.484 Erectile Dysfunction	628	0.39	1.36.141 Keratoconus	546	0.46
1.26.107 Adiponectin	614	0.38	1.128.390 Ovarian Cancer	543	0.46
1.36.141 Keratoconus	596	0.37	1.26.337 Leptin	541	0.45
1.26.337 Leptin	590	0.37	1.36.226 Glaucoma	537	0.45

Table 5
Number of Scientific Publications by Years

All Publications			Articles			Article in Publication
Years	n	%	Years	n	%	%
2024	759	0.47	2024	633	0.53	83.40
2023	8008	5.00	2023	6135	5.16	76.61
2022	10446	6.52	2022	8169	6.87	78.20
2021	11015	6.88	2021	8621	7.25	78.27
2020	9478	5.92	2020	7376	6.20	77.82
2019	8573	5.35	2019	6208	5.22	72.41
2018	8017	5.01	2018	5614	4.72	70.03
2017	7786	4.86	2017	5549	4.66	71.27
2016	10286	6.42	2016	7265	6.11	70.63
2015	9880	6.17	2015	6848	5.76	69.31
2014	9048	5.65	2014	6444	5.42	71.22
2013	8250	5.15	2013	5825	4.90	70.61
2012	6742	4.21	2012	5027	4.23	74.56
2011	5811	3.63	2011	4362	3.67	75.06
2010	5532	3.46	2010	4116	3.46	74.40
2009	5671	3.54	2009	4313	3.63	76.05
2008	5600	3.50	2008	4159	3.5	74.27
2007	5739	3.58	2007	4192	3.52	73.04
2006	5171	3.23	2006	3671	3.09	70.99
2005	4770	0.3	2005	3704	3.11	77.65
2004	4044	2.53	2004	3148	2.65	77.84
2003	3312	2.07	2003	2678	2.25	80.86
2002	2621	1.64	2002	2137	1.8	81.53
2001	2019	1.26	2001	1583	1.33	78.41
2000	1530	0.96	2000	1193	1.00	77.97



■ Table 6

Distribution of Scientific Publications by Universities

All Publications			Articles		
University	n	%	University	n	%
ISTANBUL UNIVERSITY	19074	11.91	ISTANBUL UNIVERSITY	12980	10.91
ANKARA UNIVERSITY	14085	8.80	ANKARA UNIVERSITY	9901	8.32
EGE UNIVERSITY	11208	7.00	GAZI UNIVERSITY	8133	6.84
GAZI UNIVERSITY	10974	6.85	EGE UNIVERSITY	8024	6.74
MARMARA UNIVERSITY	9017	5.63	BASKENT UNIVERSITY	6580	5.53
BASKENT UNIVERSITY	8898	5.56	MARMARA UNIVERSITY	6264	5.27
ISTANBUL UNIVERSITY CERRAHPASA	8788	5.49	DOKUZ EYLUL UNIVERSITY	6237	5.24
DOKUZ EYLUL UNIVERSITY	8755	5.47	ISTANBUL UNIVERSITY CERRAHPASA	5823	4.89
ERCIYES UNIVERSITY	6848	4.28	ERCIYES UNIVERSITY	5146	4.33
ATATURK UNIVERSITY	6292	3.93	CUKUROVA UNIVERSITY	4710	3.96
CUKUROVA UNIVERSITY	6150	3.84	ATATURK UNIVERSITY	4701	3.95
HACETTEPE UNIVERSITY	5601	3.50	HACETTEPE UNIVERSITY	4109	3.45
ULUDAG UNIVERSITY	5252	3.28	ONDOKUZ MAYIS UNIVERSITY	4097	3.44
ONDOKUZ MAYIS UNIVERSITY	5249	3.28	INONU UNIVERSITY	4066	3.42
INONU UNIVERSITY	5108	3.19	ULUDAG UNIVERSITY	3964	3.33
SELCUK UNIVERSITY	4727	2.95	SELCUK UNIVERSITY	3691	3.10
KOCAELI UNIVERSITY	4176	2.61	UNIVERSITY OF HEALTH SCIENCES TÜRKİYE	3517	2.96
UNIVERSITY OF HEALTH SCIENCES TÜRKİYE	4156	2.60	FIRAT UNIVERSITY	3269	2.75
ESKİSEHIR OSMANGAZI UNIVERSITY	4046	2.53	ESKİSEHIR OSMANGAZI UNIVERSITY	3116	2.62
FIRAT UNIVERSITY	3966	2.48	KOCAELI UNIVERSITY	3096	2.60
TRAKYA UNIVERSITY	3951	2.47	KARADENİZ TECHNICAL UNIVERSITY	3091	2.60
KOC UNIVERSITY	3922	2.45	BEZMIALEM VAKIF UNIVERSITY	3090	2.60
BEZMIALEM VAKIF UNIVERSITY	3906	2.44	YUZUNCU YIL UNIVERSITY	2959	2.49
KARADENİZ TECHNICAL UNIVERSITY	3872	2.42	MERSİN UNIVERSITY	2927	2.46
MERSİN UNIVERSITY	3643	2.28	TRAKYA UNIVERSITY	2829	2.38

Table 7

Establishment Years of Medical Faculties

University	Year	University	Year
ISTANBUL UNIVERSITY	1827	INONU UNIVERSITY	1987
ANKARA UNIVERSITY	1945	SELCUK UNIVERSITY	1982
EGE UNIVERSITY	1955	KOCAELI UNIVERSITY	1992
GAZI UNIVERSITY	1982	UNIVERSITY OF HEALTH SCIENCES TÜRKİYE	2015
MARMARA UNIVERSITY	1983	ESKİSEHIR OSMANGAZI UNIVERSITY	1993
BASKENT UNIVERSITY	1994	FIRAT UNIVERSITY	1983
ISTANBUL UNIVERSITY CERRAHPASA	1967	TRAKYA UNIVERSITY	1982
DOKUZ EYLUL UNIVERSITY	1982	KOC UNIVERSITY	2009
ERCIYES UNIVERSITY	1982	BEZMIALEM VAKIF UNIVERSITY	2010
ATATURK UNIVERSITY	1966	KARADENİZ TECHNICAL UNIVERSITY	1973
CUKUROVA UNIVERSITY	1972	MERSIN UNIVERSITY	1992
HACETTEPE UNIVERSITY	1963	YUZUNCU YIL UNIVERSITY	1992
ULUDAG UNIVERSITY	1974	ONDOKUZ MAYIS UNIVERSITY	1975



■ Table 8

Journals with the Most Scientific Publications in Medical Faculties

All Publications			Articles		
Journal	n	%	Journal	n	%
TURKISH JOURNAL OF MEDICAL SCIENCES (Q3)	1908	1.19	TURKISH JOURNAL OF MEDICAL SCIENCES (Q3)	1803	1.52
ACTA PHYSIOLOGICA (Q1)	1266	0.79	TURKISH JOURNAL OF PEDIATRICS (Q4)	1122	0.94
TURKISH JOURNAL OF PEDIATRICS (Q4)	1189	0.74	TRANSPLANTATION PROCEEDINGS (Q4)	807	0.68
ANNALS OF THE RHEUMATIC DISEASES (Q1)	1033	0.65	ULUSAL TRAVMA VE ACIL CERRAHI DERGISI TURKISH JOURNAL OF TRAUMA EMERGENCY SURGERY (Q4)	792	0.67
PEDIATRIC NEPHROLOGY (Q2)	942	0.59	JOURNAL OF CRANIOFACIAL SURGERY (Q4)	725	0.61
TURKISH JOURNAL OF GASTROENTEROLOGY (Q4)	923	0.58	TURKISH NEUROSURGERY (Q4)	701	0.59
ANATOLIAN JOURNAL OF CARDIOLOGY (Q4)	853	0.53	TURKISH JOURNAL OF GASTROENTEROLOGY (Q4)	614	0.52
TRANSPLANTATION PROCEEDINGS (Q4)	817	0.51	ANATOLIAN JOURNAL OF CARDIOLOGY (Q4)	564	0.47
ULUSAL TRAVMA VE ACIL CERRAHI DERGISI TURKISH JOURNAL OF TRAUMA EMERGENCY SURGERY (Q4)	810	0.51	EUROPEAN REVIEW FOR MEDICAL AND PHARMACOLOGICAL SCIENCES (Q2)	555	0.47
JOURNAL OF CRANIOFACIAL SURGERY (Q4)	773	0.48	CUKUROVA MEDICAL JOURNAL (ESCI)	544	0.46
TURKISH NEUROSURGERY (Q4)	745	0.47	MIKROBIYOLOJİ BULTENİ (Q4)	508	0.43
FEBS JOURNAL (Q2)	719	0.45	RHEUMATOLOGY INTERNATIONAL (Q2)	499	0.42
TURK KARDIYOLOJİ DERNEĞİ ARSIVI ARCHIVES OF THE TURKISH SOCIETY OF CARDIOLOGY (ESCI)	697	0.44	TURK KARDIYOLOJİ DERNEĞİ ARSIVI ARCHIVES OF THE TURKISH SOCIETY OF CARDIOLOGY (Q4)	494	0.42
EUROPEAN JOURNAL OF NUCLEAR MEDICINE AND MOLECULAR IMAGING (Q1)	686	0.43	PEDIATRICS INTERNATIONAL (Q4)	489	0.41
ALLERGY (Q1)	673	0.42	TURKIYE KLİNİKLERİ TIP BİLİMLERİ DERGISİ (Q4)	469	0.39
BALKAN MEDICAL JOURNAL (Q2)	647	0.40	RENAL FAILURE (Q2)	462	0.39
CUKUROVA MEDICAL JOURNAL (ESCI)	613	0.38	TURK GÖĞÜS KALP DAMAR CERRAHİSİ DERGISİ TURKISH JOURNAL OF THORACIC AND CARDIOVASCULAR SURGERY (Q4)	435	0.37
RHEUMATOLOGY INTERNATIONAL (Q2)	604	0.38	EUROPEAN ARCHIVES OF OTO RHINO LARYNGOLOGY (Q2)	431	0.36
INTERNATIONAL JOURNAL OF CARDIOLOGY (Q2)	598	0.37	ERCIYES MEDICAL JOURNAL (ESCI)	420	0.35
NEPHROLOGY DIALYSIS TRANSPLANTATION (Q1)	597	0.37	GAZİ MEDICAL JOURNAL (ESCI)	416	0.35
EUROPEAN REVIEW FOR MEDICAL AND PHARMACOLOGICAL SCIENCES (Q2)	582	0.36	JOURNAL OF PEDIATRIC ENDOCRINOLOGY METABOLISM (Q4)	411	0.35
VIRCHOWS ARCHIV (Q2)	551	0.34	ACTA ORTHOPAEDICA ET TRAUMATOLOGICA TURCICA (Q4)	408	0.34
MIKROBIYOLOJİ BULTENİ (Q4)	529	0.33	BALKAN MEDICAL JOURNAL (Q2)	404	0.34
JOURNAL OF CLINICAL ONCOLOGY (Q1)	526	0.33	JOURNAL OF CLINICAL AND ANALYTICAL MEDICINE (ESCI)	404	0.34
TURKISH JOURNAL OF HEMATOLOGY (Q3)	522	0.33	TURK OFTALMOLOJİ DERGISİ TURKISH JOURNAL OF OPHTHALMOLOGY (ESCI)	402	0.34

Table 9

Distribution of Scientific Publications According to Sustainable Development Goals

Sustainable Development Goals	All Publications		Articles	
	n	%	n	%
03 Good Health And Well Being	126816	79.21	107205	90.11
05 Gender Equality	11940	7.46	10510	8.83
02 Zero Hunger	1581	0.99	1400	1.18
04 Quality Education	680	0.42	552	0.46
15 Life On Land	232	0.14	212	0.18
11 Sustainable Cities And Communities	227	0.14	194	0.16
13 Climate Action	213	0.13	185	0.16
06 Clean Water And Sanitation	201	0.13	177	0.15
16 Peace And Justice Strong Institutions	88	0.05	81	0.07
01 No Poverty	79	0.05	66	0.06
14 Life Below Water	49	0.03	43	0.04
12 Responsible Consumption And Production	44	0.03	36	0.03
08 Decent Work And Economic Growth	39	0.02	32	0.03
07 Affordable And Clean Energy	35	0.02	30	0.03
09 Industry Innovation And Infrastructure	31	0.02	24	0.02
10 Reduced Inequality	22	0.01	15	0.01

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