

Bibliometric analysis of the most cited one hundred anatomy articles in the 100th year of the Turkish Republic

Hanife Ertürk , Kenan Öztürk , İhsan Hız , Yadigar Kastamoni 

Department of Anatomy, Faculty of Medicine, Süleyman Demirel University, Isparta, Türkiye

Abstract

Objectives: Bibliometric studies are the analysis of publications in the literature using statistical methods. In order to show the trending topics in the field of anatomy, the 100 most cited articles in the field of anatomy written by researchers from Turkey were analyzed using data obtained from Web of Science (WoS).

Methods: The data included in the study were collected by typing the word “anatomy” in the “all fields” category in the Web of Science database. Articles written by researchers from Turkey between 1980 and September 10, 2023 were included in the study. The data were transferred to the VOSviewer 1.6.19 program for detailed analysis and analyzes were performed.

Results: Of the 100 most cited articles, 33 were cadaveric studies, 25 were radiologic studies, 13 were clinical studies, 6 were animal experiments, 6 were morphometry studies, 4 were dry bone, 3 were fetal cadavers, 2 were editorial comments and 2 were anatomy education. Six articles were related to veterinary anatomy. Keyword analysis, author citation analysis, co-authorship analysis, country citation analysis, and institution citation analysis were also performed.

Conclusion: The bibliographic analysis of the 100 articles in our study will help anatomists to understand which topics they should study in their future anatomy studies.

Keywords: anatomy; attribution; bibliometric analysis; VOSviewer; Web of Science (WOS)

Anatomy 2024;18(1):19–24 ©2024 Turkish Society of Anatomy and Clinical Anatomy (TSACA)

Introduction

Anatomy has been a fundamental and indispensable component of medical science throughout history. The first written sources on anatomy date back to the Egyptian Papyrus (3000–2500 BC). Anatomy developed with the contributions of researchers such as Hippocrates, Andreas Vesalius, and Leonardo Da Vinci and is still developing with cadaver dissections, radiological methods, animal experiments, and clinical practices.^[1]

Bibliometric analysis is a method employed to understand the current status and study areas of a research field. This method is applied by analyzing the numerical data of scientific publications with visualization software. Unlike the systematic literature review, bibliometric analysis does not provide a comprehensive and in-depth review of the research area. Instead, it provides a perspective on the

overall state of the research area. Bibliometrics, which can also be used as a preliminary stage of a systematic literature review, can also create a framework for a systematic literature review. It provides quantitative findings on country, author, university, and journal productivity, weak and strong research areas, literature gaps, collaboration networks, potential opportunities, and widespread effects of the outputs in an area. Bibliometric analysis compares research areas and enables the determination of research trends. Therefore, bibliometric analysis is becoming an increasingly important tool for understanding and interpreting knowledge in the research area.^[2–5]

Materials and Methods

The Web of Science (WoS) database is one of the most comprehensive resources for bibliometric analysis. It provides its users with access to a range of resources, including

This study was presented as a poster at the 23rd National Anatomy Congress, September 11–15, 2023, Ankara, Türkiye.

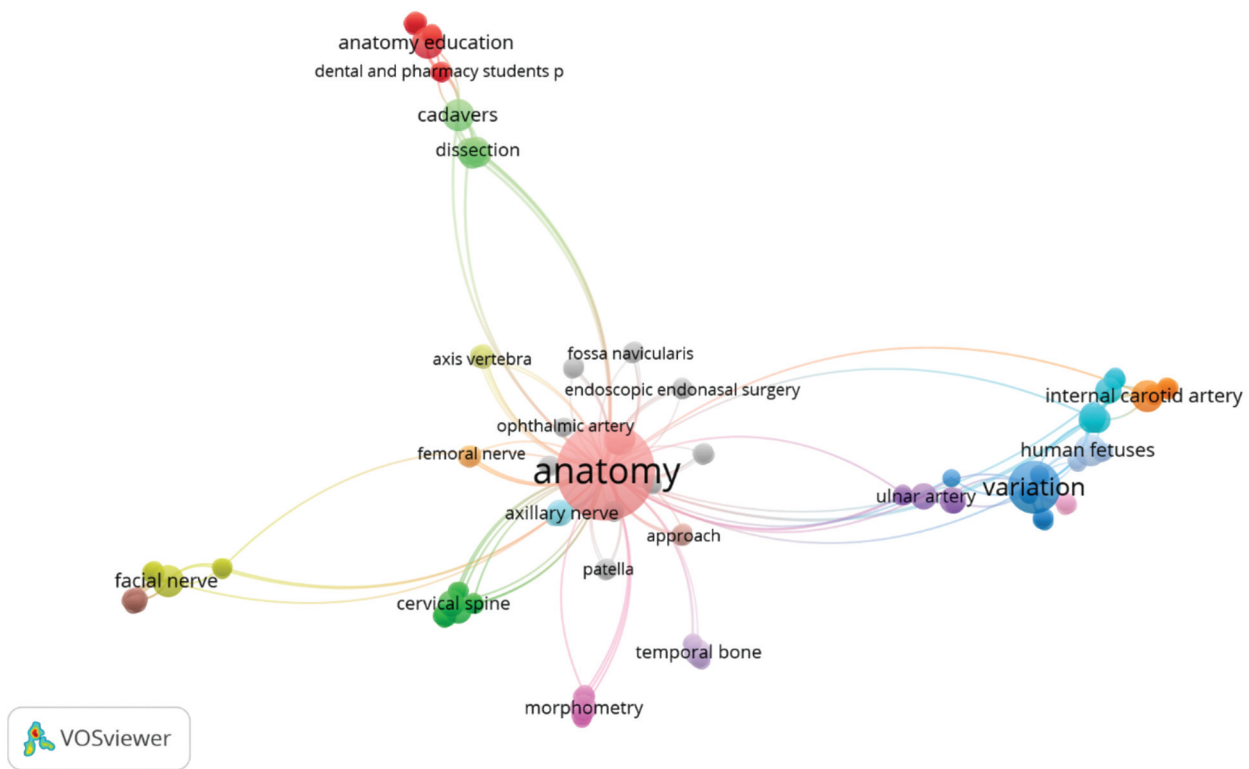


Figure 1. Keyword analysis.

citation databases. It indexes many journals and articles. The data in the study were collected by searching the word ‘anatomy’ in the ‘all fields’ category in the Web of Science (WoS) database. Articles with at least 1 citation written in English and published internationally by the researchers of our country between 1980 and 10.09.2023 were included in the study. The one hundred most cited articles were identified and exported from the Web of Science (WoS) database. Detailed data analysis was conducted in VOSviewer 1.6.19 software. This analysis software allowed us to create maps by processing interrelated information.

Results

Based on our analysis, the article “Acknowledging the use of human cadaveric tissues in research papers: Recommendations from anatomical journal editors” by Iwanaga et al. and contributed from Türkiye by Nihal Apaydın and Gülgün Şengül was the most cited article with 234 citations.

The keyword analysis showed that research articles from Türkiye mostly used the words ‘anatomy, variation, stereology, MRI, and facial nerve’ (Figure 1). The type and number of studies and the journals and the number of citations are given in Tables 1 and 2.

According to the co-authorship analysis of the authors, a network map was created by setting a criterion of at least 1 publication and at least 1 citation to identify the authors who collaborated the most. According to the analysis performed among the authors with the highest collaboration, 7 large clusters and 27 authors were found (Figure 2).

A reference to a common work cited by two independent sources is called a bibliometric match. This shows that

Table 1
Types and number of studies.

Study type	Number
Cadaver study	33
Radiological study	25
Clinical study	13
Animal experiment	6
Studies with healthy individuals	6
Dry bone	4
Fetal cadaver	3
Editor review	2
Anatomy training	2
Veterinary anatomy	6
Total	100

Table 2
Number of citations by journal.

Journal	Number of citations
Surgical and Radiologic Anatomy	278
Clinical Anatomy	101
Folia Morphologica	78
International Journal of Morphology	73
Annals of Anatomy Anatomischer Anzeiger	49
Journal of the Anatomical Society of India	21
Anatomia Histologia Embryologia Journal of Veterinary Medicine Series	16
Journal of Anatomy	18
Microscopy Research and Technique	15
Anatomical Record Advances in Integrative Anatomy and Evolutionary Biology	10
Acta Anatomica	7
Anatomia Histologia Embryologia Journal of Veterinary Medicine Series C Zentralblatt für Veterinarmedizin Reihe	6
Brain Structure and Function	5
Acta Zoologica	5
Cells Tissues Organs	2
Anatomical Record Part A Discoveries in Molecular Cellular and Evolutionary Biology	2
European Journal of Morphology	2

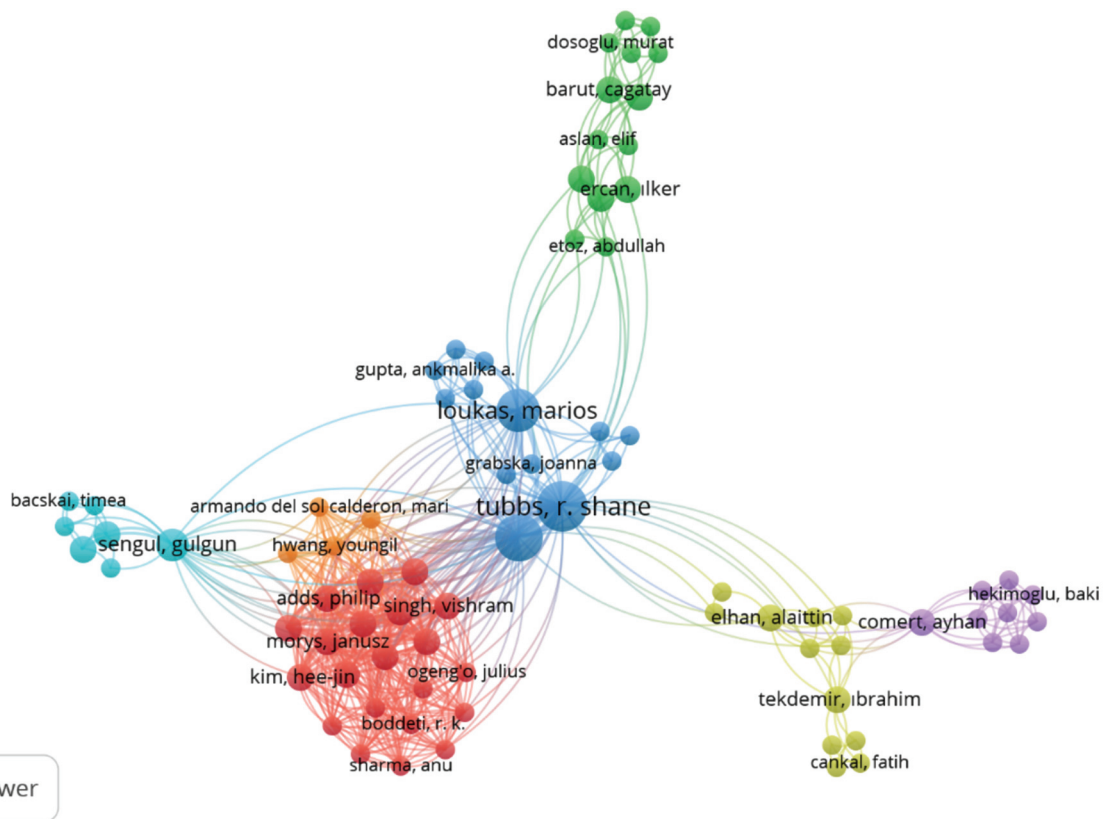


Figure 2. Co-authorship analysis.

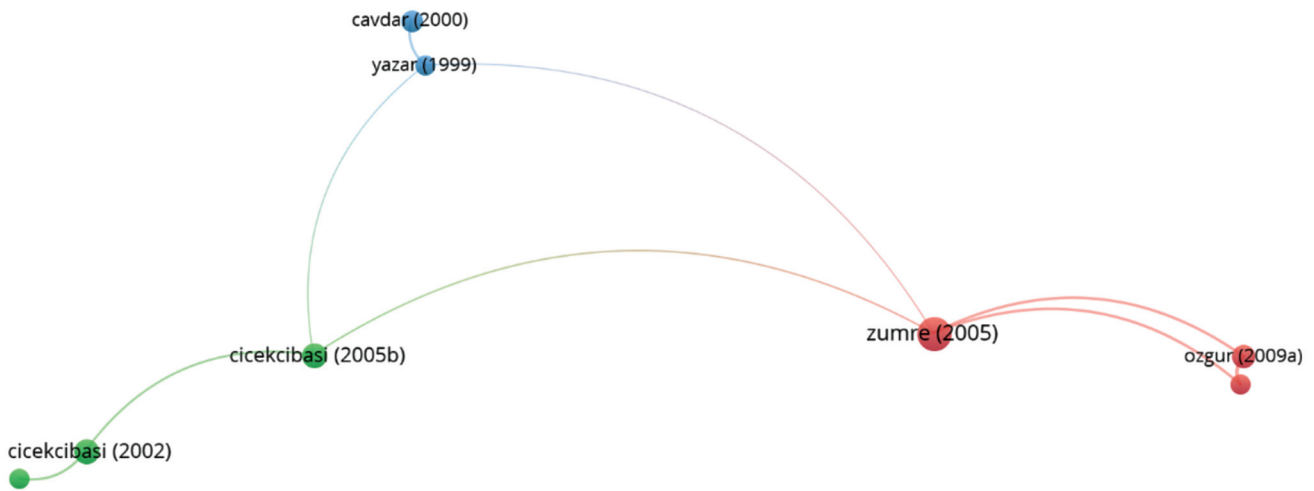


Figure 3. Bibliographic match analysis of texts.

the two sources focus on the same research or subject. Figure 3 shows the bibliographic match analysis of the texts selected with the criterion of receiving at least 1 citation.

The citation analysis of the institutions selected with the criterion of having published at least 1 work and received 1 citation is presented in Figure 4, the analysis of the authors’ reference to other countries is given in Figure 5, and the analysis of the authors reference to each other is shown in Figure 6.

Discussion

Bibliometric studies provide quantitative information about the historical development of the area of science studied. Moreover, bibliometric research provides insight

into the future vision of a scientific area. Many scientists have made significant contributions to the history of anatomy, which starts with Andreas Vesalius (1514–1564), known as the father of modern anatomy and the author of the book *De humani corporis fabrica*.^[1,4] Anatomical studies that started with animal dissection have acquired various areas of study under the influence of advancing technology over the years. Animal experiments, radiological studies, clinical studies, and artificial intelligence applications are some of them. In the present study, we aimed to identify the trend anatomy topics and journals with the bibliometric analysis of the 100 most cited articles in the history of the Turkish Republic and the change in the areas of study over the years.

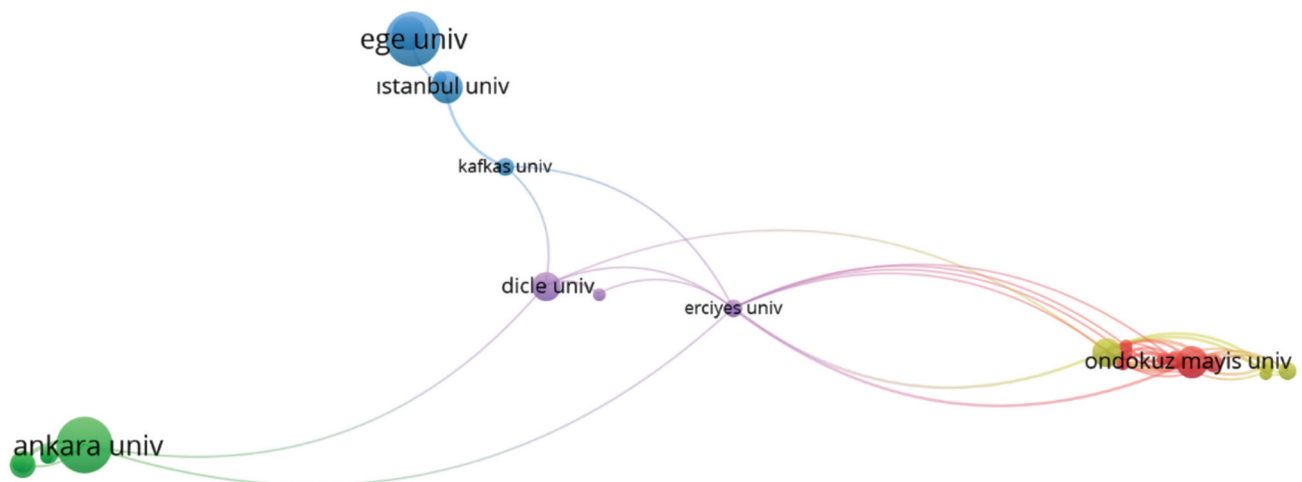


Figure 4. Citation analysis of institutions.

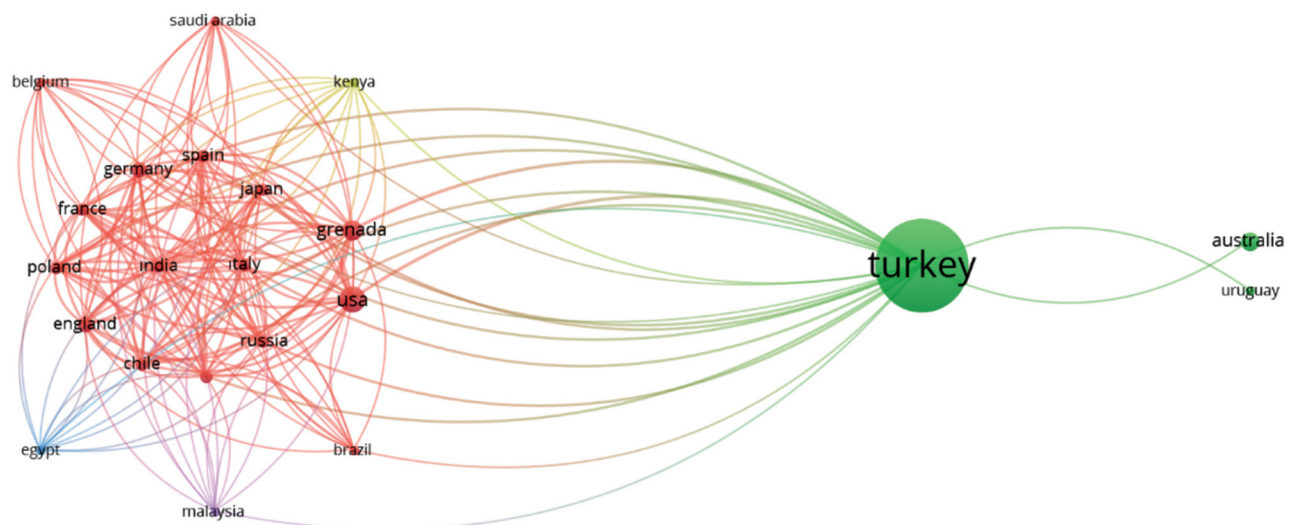


Figure 5. Analysis of authors' reference to other countries.

Gürses et al.^[6] examined the publication rates of oral and poster presentations at national anatomy congresses held in Türkiye between 2007 and 2008 and found that the most preferred journal was Surgical and Radiologic Anatomy. In another study, Tellioglu et al.^[7] stated that the highest publication rate of the publications by Turkish anatomists between 2000 and 2014 was in Surgical and Radiologic Anatomy. Furthermore, in a study conducted by selecting Türkiye and in the category of anatomy and morphology, in which studies up to 2019 through the Web of Science (WoS) database were included, Bahşi et al.^[8] reported that the most cited journal was Surgical and Radiologic Anatomy. Similar to these two studies, the most preferred journal in this study was found to be Surgical and Radiologic Anatomy. In our study, the most cited anatomy journal was found as Surgical and Radiologic Anatomy. We believe that the number of cita-

tions of journals is significant for making studies by anatomists more accessible and visible.

In the bibliometric analysis conducted for the period between 2007 and 2018 in the journal "Anatomy", the official publication organ of the Turkish Society of Anatomy and Clinical Anatomy, Adanır et al.^[9] reported that the article type with the highest citation average was "anatomy education" when the number of citations was reviewed according to article types. Upon evaluating the original articles, clinical and cadaver studies were stated to have the highest citation average. Meanwhile, it was reported that studies with the highest citation average in case reports were cadaver studies. In our study, the most cited cadaver studies regarding the subject are followed by radiological studies and clinical studies. Bibliometric analysis shows that cadaver studies constitute a significant part in the field of anatomy. We think that cadaver

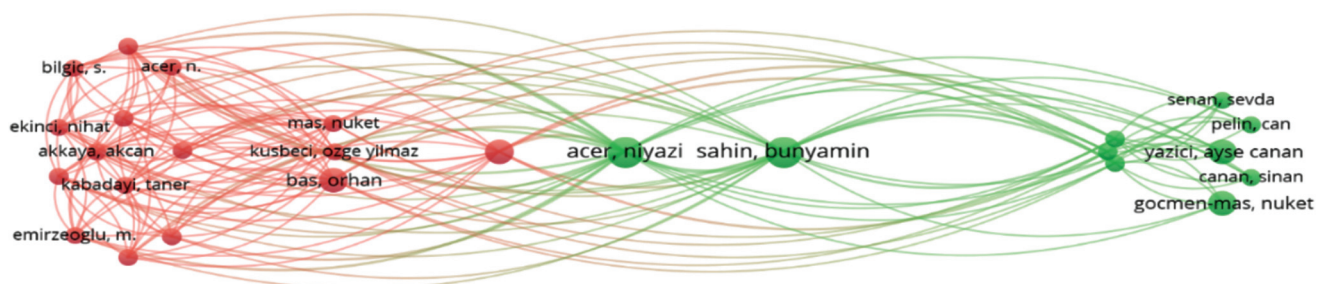


Figure 6. Analysis of authors' reference to each other.

studies are necessary to guide research in the field of anatomy and improve the quality of education.

In the citation analysis of the institutions in the Web of Science (WoS) database, Bahşi et al.^[8] reported that the most cited institutions by the authors of our country were Ankara University, Hacettepe University, and Dicle University. In our study, when the citation analysis of the institutions was performed, the most cited institutions were found to be Ankara University, Hacettepe University, and Ege University. We assume that the establishment dates of the institutions and the opportunities offered to the institutions affect the number of citations. The limitation of the study is that only articles in the Web of Science (WoS) database were included in the study. In addition, articles published in 1980 and before are not included in this database.

Conclusion

As a result, bibliometric studies have some limitations, but they provide valuable information in the field of anatomy. Although research in the field of anatomy has gradually evolved toward neuroanatomy and radiology studies throughout the history of the Turkish Republic and worldwide, cadaver and morphometry studies remain important. It is clear that anatomy studies are still regarded as the main implementation area of all medical knowledge. We think that the bibliometric analysis of the 100 most cited anatomy articles in the hundredth year of the Turkish Republic will help anatomists find gaps in the literature and find inspiration for their future studies.

Conflict of Interest

The authors declare that there is no conflict of interest.

Author Contributions

HE: conception, data collection and/or processing, literature review; KÖ: supervision, data collection and/or processing, analysis and/or interpretation, critical review; İH: design, literature review, critical review; YK: concep-

tion, design, supervision, analysis and/or interpretation, literature review, critical review.

Ethics Approval

In this study, all guidelines specified to be applied within the scope of the “Scientific Research and Publication Ethics Directive for Higher Education Institutions” were followed. There is no need to obtain ethics committee approval in our study.

Funding

No support was received from any institution or organization in the study.

References

1. Tubbs RL, Gonzales J, Iwanaga J. The influence of ancient Greek thought on fifteenth century anatomy: Galenic influence and Leonardo da Vinci. *Childs Nerv Syst* 2018;34:1095–01.
2. Dirik D, Eryılmaz İ, Erhan T. A Bibliometric analysis using VOSviewer of publications on post-truth. *Sosyal Mucit Academic Review* 2023;4:164–88.
3. Hu Y, Yu Z, Cheng X, Luo Y, Wen C. A bibliometric analysis and visualization of medical data mining research. *Medicine (Baltimore)* 2020;99:e20338.
4. Petekkaya E. The most cited articles in anatomy: an update study. *Eurasian Journal of Medical Investigation* 2019;4:6–13.
5. Standing S. A brief history of topographical anatomy. *J Anat* 2016; 229:32–62.
6. Gürses IA, Gayretli O, Gurtekin B, Ozturk A. Publication rates and inconsistencies of the abstracts presented at the national anatomy congresses in 2007 and 2008. *Balkan Med J* 2017;34:64–70.
7. Tellioglu AM, Karakas S, Polat AG. A survey of scientific publications in the field of anatomy conducted in Turkey during 2000–2014. *Meandros Medical and Dental Journal* 2015;16:1–3.
8. Bahşi İ, Adanır SS, Kervancıoğlu P, Orhan M, Govsa F. Bibliometric analysis of Turkey’s research activity in the anatomy and morphology category from the Web of Science database. *European Journal of Therapeutics* 2021;27:268–80.
9. Adanır SS, Bahşi İ, Kervancıoğlu P, Orhan M, Cihan ÖF. Bibliometric analysis of articles published in Anatomy, the official publication of the Turkish Society of Anatomy and Clinical Anatomy between 2007–2018. *Anatomy* 2020;14:39–43.

ORCID ID:

H. Ertürk 0000-0003-3892-1035;
K. Öztürk 0000-0002-5552-8684;
İ. Hiz 0000-0001-5407-7669;
Y. Kastamoni 0000-0002-3504-5853



Correspondence to:

İhsan Hiz, MD
Department of Anatomy, Faculty of Medicine,
Süleyman Demirel University, Isparta, Türkiye
Phone: +90 0542 289 32 50
e-mail: drihsanhiz@gmail.com

Conflict of interest statement: No conflicts declared.

This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs 4.0 Unported (CC BY-NC-ND4.0) Licence (<http://creativecommons.org/licenses/by-nc-nd/4.0/>) which permits unrestricted noncommercial use, distribution, and reproduction in any medium, provided the original work is properly cited. *How to cite this article:* Ertürk H, Öztürk K, Hiz İ, Kastamoni Y. Bibliometric analysis of the most cited one hundred anatomy articles in the 100th year of the Turkish Republic. *Anatomy* 2024;18(1):19–24.