ORIGINAL RESEARCH ORİJİNAL ARAŞTIRMA

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A Retrospective Cross-Sectional Bibliometric Analysis of Academic Trends in Orthognathic Surgery in Türkiye: Theses Published Between 1996 and

Türkiye'de Ortognatik Cerrahi Alanındaki Akademik Eğilimlerin Retrospektif Kesitsel Bibliyometrik Analizi: 1996-2024 Yılları Arasında Yayınlanan Tezler

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ABSTRACT Objective: The aim of this study was to conduct a retrospective cross-sectional bibliometric analysis of theses on orthognathic surgery published in Türkiye between 1996-2024. The objective was to evaluate academic productivity, research trends, and methodological characteristics over time. **Material and Methods:** Data were obtained from the National Thesis Center of the Council of Higher Education using predefined keywords related to orthognathic surgery. After excluding irrelevant topics, a total of 201 theses were included in the analysis. Each thesis was categorized based on year of publication, affiliated institution, academic discipline, type of thesis (specialization, master's, or doctoral), research design, and total page count. Descriptive statistical analyses were conducted using Microsoft Excel. **Results:** The number of theses steadily increased over the years, peaking in 2024. Retrospective studies were the most commonly employed design (n=90), followed by prospective studies (n=45) and finite element analyses (n=25). The majority of the theses were produced in the departments of oral and maxillofacial surgery and orthodontics. Doctoral theses had the highest average page counts, indicating greater depth and comprehensiveness. **Conclusion:** This retrospective cross-sectional bibliometric analysis reveals a growing academic interest in orthognathic surgery in Türkiye. While retrospective research remains dominant, the increasing number of prospective and biomechanical studies indicates a shift toward more advanced and interdisciplinary research approaches in the field.

Keywords: Bibliometrics; dentistry; medicine; orthognathic surgery

ÖZET Amaç: Bu çalışmanın amacı, 1996-2024 yılları arasında Türkiye'de ortognatik cerrahi alanında yayımlanan tezlerin retrospektif kesitsel bibliyometrik analizini yaparak akademik üretkenliği, araştırma eğilimlerini ve metodolojik özellikleri değerlendirmektir. **Gereç ve Yöntemler:** Çalışmanın verileri, Yükseköğretim Kurulu Ulusal Tez Merkezi veri tabanında yer alan ve ortognatik cerrahi alanıyla ilişkili olduğu düşünülen tezlerin, belirli anahtar kelimeler kullanılarak yapılan sistematik taraması sonucunda elde edilmiştir. Yapılan tarama sonrasında konu ile doğrudan ilişkili olmayan, içerik açısından değerlendirme kapsamı dışında kalan tezler çalışma dışı bırakılmış; bu elemelerden sonra toplam 201 adet tez çalışma kapsamına dâhil edilmiştir. Değerlendirmeye alınan tezler; yayımlandıkları yıl, hazırlandıkları kurumun türü, ait oldukları akademik disiplin, tez türü, kullanılan araştırma tasarımı ve toplam sayfa sayısı gibi niteliklerine göre sınıflandırılmıştır. Elde edilen verilerin analizi için tanımlayıcı istatistiksel yöntemlerden yararlanılmış olup, bu analizler Microsoft Excel yazılımı kullanılarak gerçekleştirilmiştir. **Bulgular:** Tez sayısında yıllar içinde düzenli bir artış gözlemlenmiş, en yüksek sayıya 2024 yılında ulaşılmıştır. En yaygın araştırma tasarımı retrospektif çalışmalar olmuştur (n=90); bunu prospektif çalışmalar (n=45) ve sonlu elemanlar analizleri (n=25) takip etmiştir. Tezlerin çoğunluğu ağız, diş ve çene cerrahisi ile ortodonti alanlarında üretilmiştir. Doktora tezleri, ortalama sayfa sayısı bakımından en yüksek değerlere sahiptir. **Sonuç:** Bu çalışma, Türkiye'de ortognatik cerrahiye yönelik akademik ilginin giderek arttığını ortaya koymaktadır. Araştırma yöntemlerinde retrospektif çalışmalar hâkim olmakla birlikte, prospektif ve biyomekanik analizlere olan eğilim dikkat çekicidir.

Anahtar Kelimeler: Bibliyometri; diş hekimliği; tıp; ortognatik cerrahi

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In Türkiye, postgraduate theses in the field of health sciences are conducted within the framework of specialization, master's, and Philosophy of Doctorate (PhD) programs.[1] Admission to specialization in dentistry requires success in the Dental Specialty Examination, administered by the Student Selection and Placement Center (Ölçme, Seçme ve Yerleştirme Merkezi). In the field of medicine, this examination is known as the Medical Specialty Exam. Completion of a specialization program necessitates the submission of an approved thesis.

Admission to master's and PhD programs is based on criteria set by university senates, including success in the Academic Personnel and Graduate Education Entrance Exam and previous academic performance. Master's programs with thesis must be completed within 4 semesters, excluding scientific preparation, and must not exceed 6 semesters. Doctoral education spans between 8-12 semesters, and also requires the submission of an approved thesis. However, in postgraduate programs in dentistry, publication of the thesis is not mandatory.[1,2]

Orthognathic surgery has been one of the core components of craniomaxillofacial surgical treatment for over a century. Midfacial and mandibular osteotomies are widely used in contemporary clinical practice to address 3-dimensional (3D) deformities of the maxillomandibular complex. These procedures positively impact occlusion, facial aesthetics, and airway management.[3-5] As orthognathic surgery involves both orthodontic and surgical interventions, a multidisciplinary approach is required.[6-8]

This study employs a bibliometric analysis method based on quantitative techniques and scientific mapping. Bibliometric analysis is a methodological tool that examines academic literature and the relationships among publications in a given field through mathematical and statistical methods. It enables systematic identification of trends in the literature by evaluating academic output produced by individuals or institutions using both textual and visual data representations.[9,10]

Today, bibliometric analysis is widely applied across various scientific disciplines. It helps to understand the developmental trajectories of academic fields by revealing the current status and temporal evolution of scholarly publications.[11] Through classification of collected data based on defined criteria, it allows for reliable and objective interpretation of scientific information.[9,10]

Bibliometric methods have been frequently employed in different areas of dentistry.[12,13] In particular, bibliometric studies in orthodontics began appearing in the early 2000s.[14,15] Such analyses contribute to the effective management, storage, and classification of knowledge in orthodontics.[1,16]

The primary aim of this study is to perform a bibliometric analysis of theses related to orthognathic surgery that were registered in the National Thesis Center of the Council of Higher Education [Yükseköğretim Kurulu Ulusal Tez Merkezi (YÖK)] and published between 1996-2024. The distribution of these theses by year, type, university, research design, and page count were examined to evaluate their current status and identify developmental trends in the field.

MATERIAL AND METHODS

This study utilized a retrospective cross-sectional bibliometric analysis of theses related to orthognathic surgery, available in the YÖK National Thesis Center. The data were collected on February 20, 2025, using a set of defined keywords. The search was performed via the main search function of the YÖK National Thesis Center's website, using the keywords: "ortognatik cerrahi", "ortognatik", "Le Fort", and "sagittal split", with the filter set to "all".

A total of 265 theses were identified and individually reviewed. Theses unrelated to orthognathic surgery or conducted outside the fields of dentistry and medicine were excluded. Additionally, theses focusing on cleft lip and palate anomaly or orofacial distraction osteogenesis were also excluded. After applying these exclusion criteria, 201 theses were included in the final analysis. Theses not indexed in the YÖK National Thesis Center were also excluded from the study.

Each thesis abstract was reviewed individually, and in cases where abstracts lacked sufficient information, full texts were evaluated. The theses were categorized by research type (retrospective, prospective, in vitro, survey studies, finite element analysis,

and others), year of publication, affiliated university, discipline, and page count. Microsoft Excel (Microsoft Corporation, Redmond, WA, USA) was used for data analysis, and the findings were presented through tables and visualized using graphs.

Since the data were obtained entirely from the publicly accessible YÖK National Thesis Center, this study did not require approval from an ethics committee therefore all procedures are carried out in accordance with ethical rules.

Descriptive statistical analyses (totals, percentages, minimum, maximum, mean, frequency tables, and graphical representations) were applied to data grouped by year, university, thesis type, page count, and research method using Microsoft Excel. This enabled a visual mapping of orthognathic surgery theses conducted between 1996-2024.

ETHICAL STATEMENT:

This study does not require ethics committee approval. Data were obtained through the publicly available YÖK National Thesis Center.

RESULTS

A total of 201 theses were included in the study. The annual distribution revealed that the highest number of theses (n=27) was published in 2024. In terms of institutional output, the universities with the highest number of theses were: Ankara University (n=20), İstanbul University (n=20), Marmara University (n=18), Gazi University (n=15), Hacettepe University (n=15), and Erciyes University (n=15) (Table 1).

There were 4 types of theses: Master's, Medical Specialty, PhD and Dental Specialty theses. Regarding research design, retrospective studies were the most common (n=90), followed by prospective studies (n=45), finite element analyses (n=25), survey-based studies (n=22), and in vitro studies (n=10). The distribution of research types among theses is presented in Figure 1.

Theses were conducted across 17 different cities, with the majority originating from İstanbul, followed by Ankara and Kayseri (Figure 2).

Theses were associated with 5 academic disciplines were: Oral and Maxillofacial Surgery, Or-

TABLE 1: Top 10 Universities with the highest number of theses

University	Number of theses
Ankara University	20
İstanbul University	20
Marmara University	18
Erciyes University	15
Hacettepe University	15
Gazi University	15
İstanbul Medipol University	11
Çukurova University	10
Bezm-i Alem Vakıf University	10
Atatürk University	9

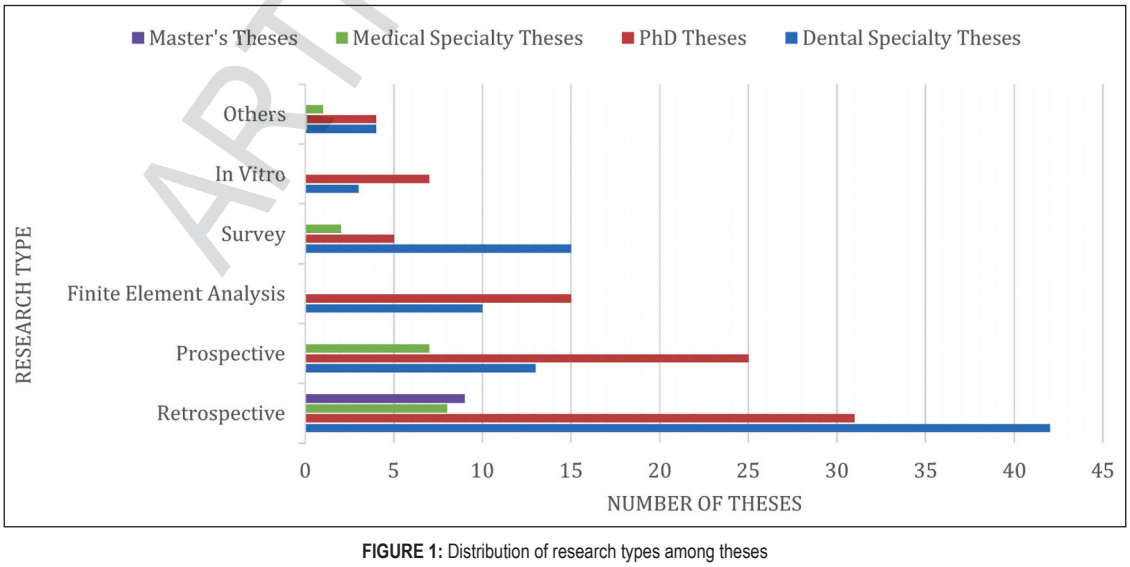

FIGURE 1: Distribution of research types among theses

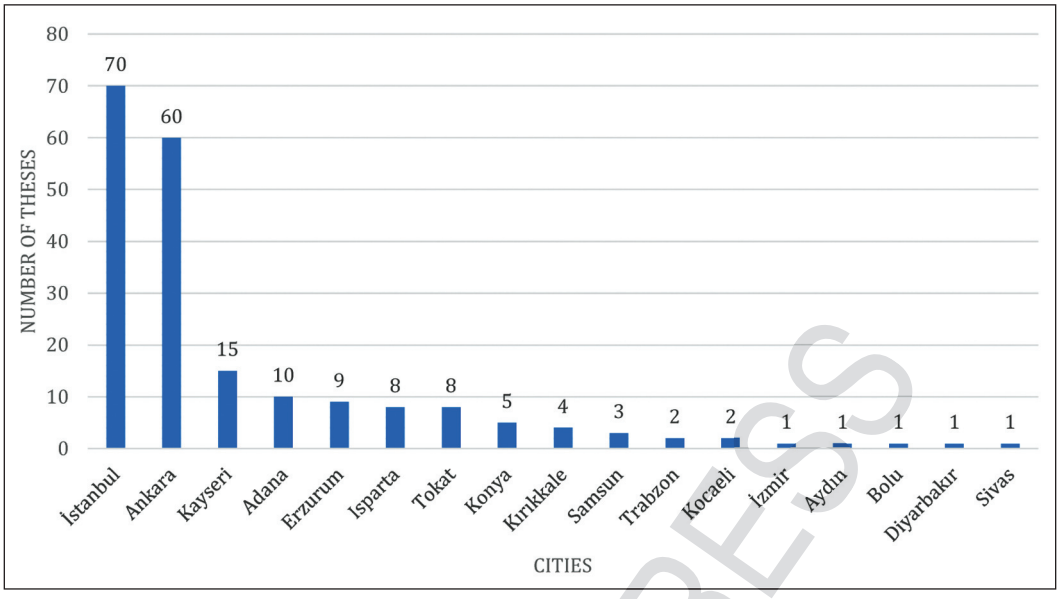

FIGURE 2: Distribution of theses according to cities

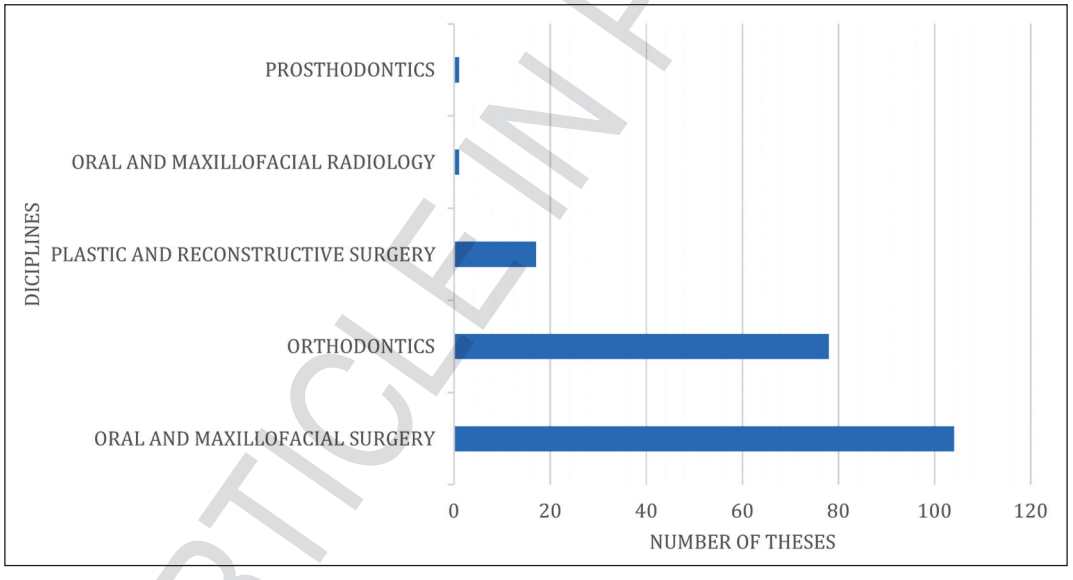

FIGURE 3: Distribution of theses according to disciplines

thodontics, Plastic and Reconstructive Surgery, Oral and Maxillofacial Radiology, and Prosthodontics. The highest number of theses was produced in the field of Oral and Maxillofacial Surgery, followed by Orthodontics (Figure 3).

In terms of page length, PhD theses had the highest average number of pages, followed by master's theses, while specialization theses had the shortest average length (Figure 4).

DISCUSSION

This study presents a bibliometric analysis of theses on orthognathic surgery conducted in Türkiye, highlighting academic productivity, research trends, and methodological distribution. The findings demonstrate a steady increase in theses output over the years, peaking in 2024. This trend reflects the growing academic interest and scientific exploration of or-

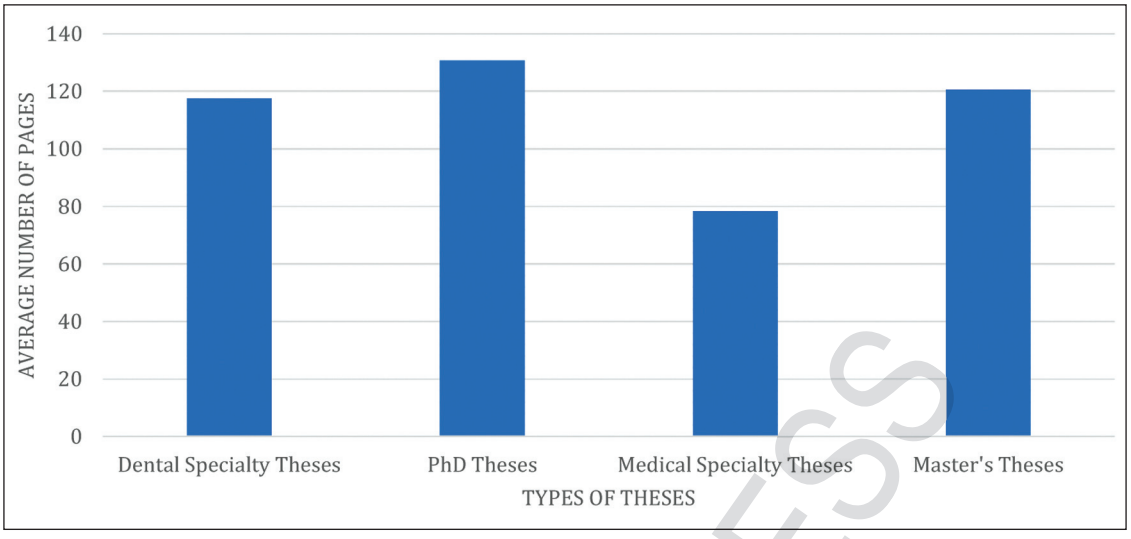

FIGURE 4: Distribution of average page numbers according to types of theses

thognathic surgery. The increase in dental schools and graduates in recent years has contributed to a more competitive job market, thereby increasing the demand for specialization.[17] Previous bibliometric studies in other disciplines have also shown a consistent rise in thesis production over time.[1] Similarly, a longitudinal analysis of top-cited orthodontic literature reported that research output increased notably over the past 3 decades, with newer technologies such as cone beam computed tomography and skeletal anchorage drawing greater attention.[18]

Retrospective studies were identified as the most frequently used research method, indicating a reliance on clinical records in this field. However, the observed increase in prospective studies in recent years suggests a shift toward more comprehensive, follow-up-based, and experimental designs. This trend mirrors international findings; for instance, Aura-Tormos et al.[19] demonstrated that observational designs, particularly cross-sectional and retrospective studies, were dominant in orthodontic research journals. Additionally, the application of biomechanical methods such as finite element analysis (FEA) has gained attention, particularly for evaluating the structural properties of surgical plates and implants.[20-22] National data also reflect a diversification in methodology, with an increasing number of computer-based studies and FEA-driven investigations reported in postgraduate orthodontic theses.[23] In parallel with these national trends, global literature also highlights the growing influence of digital technologies in orthognathic surgery research-particularly through FEA and simulation-based methodologies. Since the early 2010s, there has been a steady rise in studies utilizing computer-aided design tools and 3D modeling techniques to investigate biomechanical aspects of surgical interventions.[24,25] This reflects a broader academic shift toward quantitative, model-driven approaches, aligning with the increased interest in FEA applications observed in Turkish postgraduate orthodontic theses.

Institutionally, public universities emerged as the leading contributors, with Ankara and İstanbul Universities producing the most theses. The cities with the highest output-İstanbul, Ankara, and Kayseri-correspond to the locations of these institutions. A prior study in orthodontics also identified these universities as leading contributors to thesis production, which may be attributed to their extensive academic staff and larger patient populations.[1] Similar patterns have been observed in international bibliometric studies. For instance, Aura-Tormos et al.[19] analyzed over 7,000 articles published in JCR-listed orthodontic journals and reported that more than 80% of the publications originated from public institutions. This highlights the pivotal role of academic infras-

tructure-such as university-based departments and publicly funded research units-in driving scientific productivity in orthodontics. The dominance of public-sector contributions underscores how institutional support, research funding, and access to postgraduate training collectively shape the global output of orthodontic scholarship.[19] Moreover, when it comes to surgically oriented research such as orthognathic surgery, the availability of specific physical infrastructure becomes even more critical. Operating rooms equipped for general anesthesia, interdisciplinary collaboration with surgical units and access to clinical cases are prerequisites for both clinical application and experimental design.[26] The lack of such facilities in certain institutions may significantly limit research opportunities in this subfield, contributing to institutional disparities in academic output.

The analysis revealed that orthognathic surgery theses were primarily associated with 3 main disciplines: Oral and Maxillofacial Surgery, Orthodontics, and Plastic and Reconstructive Surgery. The dominance of Oral and Maxillofacial Surgery is expected, given that orthognathic procedures fall directly under its clinical scope. The substantial number of orthodontic theses also reflects the close relationship between orthognathic surgery and orthodontic treatment. This multidisciplinary integration is consistent with international bibliometric evaluations, where the most-cited publications on orthognathic surgery emerged from collaborative efforts between orthodontists and surgeons, particularly in areas such as virtual planning and airway-related interventions.[27]

In terms of thesis type, PhD theses had the highest page count, followed by master's and specialization theses. This likely reflects the broader scope and more detailed data analysis required at the doctoral level. Similar observations were made in a recent national analysis, where doctoral-level orthodontic theses more frequently employed advanced methodologies such as finite element modeling and 3D imaging.[23]

In summary, the findings indicate that while retrospective studies continue to dominate, there is an increasing trend toward prospective and biomechanical research. Although variations in productivity exist among universities, academic interest in orthognathic surgery appears to be intensifying nationwide. This trend aligns with international reports highlighting the growing scholarly focus on surgical planning, virtual simulations, and interdisciplinary collaboration.[18,27] These developments position Türkiye as an actively evolving contributor to the advancement of this field.

CONCLUSION

This study conducted a comprehensive bibliometric analysis of theses in the field of orthognathic surgery in Türkiye, examining academic productivity, research trends, and methodological distribution. Key findings are as follows:

- The number of theses on orthognathic surgery has steadily increased over the years, with the highest output recorded in 2024.
- Retrospective studies were the most common research type, although prospective studies and finite element analyses have become increasingly prevalent.
- Most theses were conducted within the disciplines of Oral and Maxillofacial Surgery and Orthodontics, underscoring the multidisciplinary nature of orthognathic surgery.

This analysis provides a comprehensive overview of the current state of academic work in orthognathic surgery in Türkiye and highlights potential areas for future development. Encouraging research at other institutions and supporting multi-center studies would expand the educational and scientific capacity of orthognathic surgery and enrich the national academic landscape.

Source of Finance

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Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: *Tulca Büyükpatır Türk;* ***Design:*** *Tulca Büyükpatır Türk;* ***Control/Supervision:*** *Tulca Büyükpatır Türk;* ***Data Collection and/or Processing:*** *Barış Erkut Türk;* ***Analysis and/or Interpretation:*** *Barış Erkut Türk;* ***Literature Review:*** *Barış Erkut Türk;* ***Writing the Article:*** *Tulca Büyükpatır Türk;* ***Critical Review:*** *Tulca Büyükpatır Türk.*

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