

A Comprehensive Analysis of the Factors Influencing Academic Productivity in Endodontics in Turkey

Türkiye’de Endodonti Alanında Akademik Üretkenliği Etkileyen Faktörlerin Kapsamlı Analizi

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ABSTRACT

Objectives: The present study aims to analyse the factors influencing academic productivity in endodontics in Turkey, with a particular focus on academic status of faculty members (professors, associate professors, and assistant professors), cities hosting university, and university type (state vs. foundation universities) in Turkey.

Materials and Methods: The study data of a total of 269 academics in department of endodontics of the universities in Turkey were obtained through an advanced search of YOK akademik, Web of Sciences, and Google Scholar Akademik. The H-index, number of articles, and citation rates for each academic were determined by utilizing these global platforms.

Results: State universities have produced a greater number of publications ($P = 0.017$), and faculty members at these institutions have demonstrated higher H-indices. ($P = 0.019$). Professors have significantly higher H-indices, total publication, and citation counts ($P < 0.05$). The H-index and citation rates of male academics were found to be significantly higher than those of female academics ($P = 0.009$ and $P = 0.007$, respectively). There were no significant differences in research metrics among universities in metropolitan and other cities ($P > 0.05$).

Conclusions: Despite limitations, these findings offer valuable insights into academic performance dynamics across various contexts. The findings highlight the necessity of increasing support and equitable opportunities for female academics and those working at foundation universities to enhance research capacity and academic performance in the field of endodontics in Turkey.

Keywords: Academic performance, academic success, endodontics, manuscript, publications.

ÖZ

Amaç: Bu çalışma, Türkiye’deki endodonti alanında akademik üretkenliği etkileyen faktörleri analiz etmeyi amaçlamaktadır. Özellikle öğretim üyelerinin akademik statüsü (profesör, doçent ve doktor öğretim üyesi), şehir dağılımı ve üniversite türü (devlet üniversitesi vs. vakıf üniversitesi) üzerine odaklanılmıştır.

Gereç ve Yöntemler: Türkiye’deki üniversitelerin endodonti anabilim dalında görev yapan toplam 269 akademisyene ait veriler, YÖK Akademik, Web of Science ve Google Scholar Akademik platformlarından ileri düzey arama yapılarak elde edilmiştir. Bu küresel platformlar kullanılarak her bir akademisyenin H-indeksi, makale sayısı ve atıf oranları belirlenmiştir.

Bulgular: Devlet üniversitelerinde daha fazla makale yayımlanmış ($P = 0,017$) ve bu üniversitelerde görev yapan akademisyenlerin H-indeksi değerleri daha yüksek bulunmuştur ($P = 0,019$). Profesörlerin H-indeksi, toplam yayın sayısı ve toplam atıf sayısı anlamlı derecede daha yüksektir ($P < 0,05$). Erkek akademisyenlerin H-indeksi ve atıf oranları, kadın akademisyenlere göre anlamlı derecede daha yüksek bulunmuştur (sırasıyla $P = 0,009$ ve $P = 0,007$). Metropol ve diğer şehirlerdeki üniversiteler arasında araştırma metrikleri açısından anlamlı bir fark bulunmamıştır ($P > 0,05$).

Sonuçlar: Çalışma sınırlamalarına rağmen bu bulgular, çeşitli bağlamlarda akademik performans dinamiklerine dair değerli veriler sunmaktadır. Bulgular, özellikle kadın akademisyenlere ve vakıf üniversitelerinde görev yapan akademisyenlere, akademik araştırma yapmak için destek ve eşit fırsatların artırılmasının, Türkiye’de endodonti alanında araştırma kapasitesinin ve akademik performansın geliştirilmesi açısından önemli olduğunu ortaya koymaktadır.

Anahtar Kelimeler: Akademik başarı, akademik performans, endodonti, makale, yayınlar.

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INTRODUCTION

The academic roles of higher education institutions comprise three major components: educator, researcher, and clinician (Edgar & Geare, 2013; Jauch & Glueck, 1975). The importance of research productivity, recognized as one of the three core functions of higher education, has been rapidly increasing in light of novel developments. In recent years, there has been a notable advancement in scientific research within the fields of medicine and dentistry, largely due to the technological innovations that have led to improvements in techniques and materials, which in turn have enhanced the quality of life (Pellino et al., 1984).

In the field of endodontics, research plays a pivotal role in advancing clinical practices and enhancing patient care through innovations in techniques, materials, and treatment outcomes (Siqueira & Rôças, 2008). The field of endodontics, which focuses on root canal treatments and associated biological responses, has been substantial growth in research output, driven by technological advancements and evolving clinical protocols (Connert et al., 2022; Siqueira & Rôças, 2014). Globally, researchers are increasingly recognizing the importance of academic productivity as it directly correlates with the dissemination of evidence-based practices, improvements in patient care, and the advancement of dental technologies (Joyce & Cartwright, 2019). In addition to the provision of routine patient care, it is imperative that active involvement in a range of scientific research activities is regarded as an indispensable aspect of professional education and development, particularly for those engaged in academic institutions. In Turkey, policies and practices aimed at enhancing research productivity in higher education have become more prominent in recent years (Özsoy & Balyer, 2023).

As the demand for high-quality research increases, there has been a growing emphasis on the factors that influence academic productivity, particularly among dental professionals (Demarco et al., 2020). It was mostly reported that research productivity is highly variable and influenced by numerous factors (Jung, 2012). The following factors were identified as influencing the research environment: individual characteristics (gender and years of experience), workload (time spent teaching, conducting research and instruction time for doctoral programmes), research style (research preference, collaboration, applied and multi-disciplinary research) and institutional characteristics (performance-based management, commercial orientation and shared governance) (Jones & Preusz, 1993; Hoskin, 2020). Factors such as academic rank, type of university, geographical location, and institutional resources have been demonstrated to significantly impact research output in specialized fields like endodontics (Doğramacı & Rossi-Fedeles, 2022).

In light of the aforementioned points, the aim of this study was to investigate academic productivity of the academic faculty members (professor, associated professor, and PhD assistant professor) who are affiliated

with the Department of Endodontics in state or foundation universities in Turkey.

MATERIALS AND METHODS

In the present study, ethical approval was not required, as the study relied entirely on publicly available data. All stages of the research were conducted in accordance with the principles of the Helsinki Declaration.

This comparative study was conducted in January 2025. Data were obtained from publicly accessible university websites and international academic databases, including YÖK Akademik (<https://akademik.yok.gov.tr/>), WoS InCites electronic database (<https://www.webofscience.com/wos/author/author-search>), and Google Scholar Akademik (<https://scholar.google.com/>), because of their global recognition as a credible and comprehensive database (Alryalat et al., 2019; Falagas et al., 2008). The current study was designed in accordance with a similar methodology that had previously been employed by Eliacik and Karahan (Eliacik & Karahan, 2021).

All information about a total of 439 academics in endodontics was collected from the Yüksek Öğretim Akademik Arama (<https://akademik.yok.gov.tr/AkademikArama/>) online website. Faculty members' names, genders, academic titles, affiliated universities, and cities were recorded. The type of university was classified as state or foundation. A total of 137 duplicate records (due to different spellings of surnames) and 24 academics whose data could not be found were excluded from the study. Nine academics affiliated with universities located in the Turkish Republic of Northern Cyprus were excluded from the study. A total of 269 academics, affiliated with the Department of Endodontics within the Faculty of Dentistry of universities in Turkey, were included in the present study.

For each academic, bibliometric indicators including H-index, total citation count, and total number of publications were retrieved from Web of Science website (the researchers section on the website) as of January, 2025. WoS InCites electronic database and Google Scholar Akademik were utilized in cases sufficient information could not be obtained. This process enabled us to access the total number of articles and citation rates available in reliable records for each academic. Universities were grouped according to their geographical locations (city), and comparisons were made based on gender, academic title, university type, and city. The data were collected by two independent observers (V.H.A and N.G) and subsequently compared and in case of discrepancy, data was rechecked and corrected. All data were recorded in Microsoft Excel program (Microsoft, 2023).

The normality of the distribution was evaluated using the Shapiro Wilk test, revealing that the data deviated from a normal distribution across all groups ($P < 0.05$). The Mann Whitney U test and Kruskal Wallis test were used to compare groups with non-parametric data. A significance level of $P < 0.05$ was considered statistically significant. All

statistical analyses were performed using Jamovi (Version 2.3.28.0; The Jamovi Project, Sydney, Australia).

RESULTS

Overall, 269 academics were identified in Department of Endodontics of the universities in Turkey. The dependent and independent variables are shown in Table 1.

Table 1. Conceptual framework.

Independent Variables	Dependent Variable
☐ Gender	☐ H-index
☐ Academic status	☐ Number of articles
☐ Cities hosting universities	☐ Number of citations
☐ University type (State /Foundation)	

Two-hundred-and-one state universities and 68 foundation universities included in the study. Among the 269 academics, 94 were professor (Prof.), 73 were associate professors (Assoc. Prof), and 102 were PhD assistant professor (Asst. Prof.). Out of these, 126 were male and 143 were female. The distribution of the proportions of academics working in two different types of universities by city is illustrated in Figure 1. It was determined that, the number of academics working at foundation universities (n=54) is higher than that at state universities (n=28) in Istanbul. In Izmir, 11 academics were working at state universities, while 2 were affiliated with foundation universities. In Ankara, 31 academics working at state universities while 5 at foundation university. The highest number of faculty members was found in Istanbul (n=82).

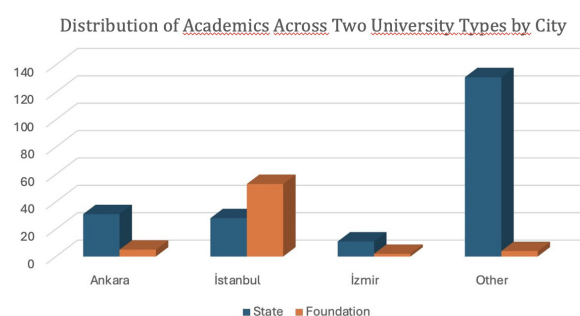


Figure 1. The number of faculty members in different types of universities across cities.

The descriptive statistics of dependent variables are presented in Table 2. A significant differences in H-indices, the number of articles published, and the number of citations received was observed among academics at varying academic ranks ($P < 0.001$) (Table 3). A pairwise comparisons were performed to determine the source of this difference (Table 4). The H-index, total count of articles, and total citations of professors were found to be significantly higher ($P < 0.05$) compared to those of associate professors and PhD assistant professor (Table 4). Similarly, the H-index, total publication counts, and total citation rates of associate professors were statistically significantly higher ($P < 0.001$) than those of PhD assistant professor (Table 4).

The H-index and citation rates of male academics were found to be significantly higher than those of female academics ($P = 0.009$ and $P = 0.007$, respectively). However, no significant difference was observed between genders regarding the number of articles published ($P = 0.086$) (Table 5).

Table 2. Descriptive statistics of academic performance data.

Descriptives	N	Mean	Median	SD	Min.	Max.
H-index	269	8.11	5.00	7.96	0	54
Number of articles	269	32.73	25.00	28.97	0	165
Number of citations	269	498.57	134.00	1000.01	0	8593

Table 3. Descriptive statistics and comparisons of academic performance regarding to academic status

	Academic status	N	Mean	Median	SD	Min.	Max.	P value
H-index	Prof.	94	13.26	12.00	9.84	1	54	<0.001*
	Assoc. Prof.	73	8.89	8.00	5.05	1	24	
	Asst. Prof.	102	2.81	2.00	2.71	0	16	
Number of articles	Prof.	94	53.51	44.00	34.99	4	165	<0.001*
	Assoc. Prof.	73	32.51	28	15.42	7	92	
	Asst. Prof.	102	13.75	10.50	12.79	0	89	
Number of citations	Prof.	94	1036.05	520.00	1488.62	3	8593	<0.001*
	Assoc. Prof.	73	383.92	213.00	429.97	4	1820	
	Asst. Prof.	102	85.29	24.00	174.36	0	1330	

Kruskal Wallis test, *P value significant at the 0.05 level.

Table 4. Post hoc comparisons of academic status groups for H-index, number of articles, and number of citations

Comparison		Post-hoc comparisons	
Dependent variable	Academic status (Independent variables)	W	P
H-index	Prof. Assoc. Prof.	-3.97	0.014*
	Prof. Asst. Prof.	-13.60	< .001*
	Assoc. Prof. Asst. Prof.	-12.73	< .001*
Number of articles	Prof. Assoc. Prof.	-6.68	< .001*
	Prof. Asst. Prof.	-14.13	< .001*
	Assoc. Prof. Asst. Prof.	-12.33	< .001*
Number of citations	Prof. Assoc. Prof.	-4.06	0.011*
	Prof. Asst. Prof.	-12.92	< .001*
	Assoc. Prof. Asst. Prof.	-11.32	< .001*

Dwass-Steel Pairwise analysis. *P value significant at the 0.05 level.

Table 5. Descriptive statistics and group comparisons of academic metrics according to gender

	Gender	N	Mean	Median	SD	Min.	Max.	P value
H-index	Male	126	9.56	6.50	8.91	0	54	0.009*
	Female	143	6.83	5.00	6.80	0	50	
Number of articles	Male	126	37.71	27.00	34.28	0	165	0.086
	Female	143	28.35	24.00	22.53	0	142	
Number of citations	Male	126	644.54	200.00	1123	0	8593	0.007*
	Female	143	369.95	116.00	860	0	8284	

Mann Whitney U test, *P value significant at the 0.05 level.

Statistical analysis revealed that academics affiliated with state universities had significantly higher H-index ($P = 0.048$) and number of articles ($P = 0.017$) compared to those from foundation universities. However, no significant difference was found in the number of citations between the two groups ($P = 0.134$) (Table 6).

Table 6. Descriptive statistics and comparison of academic performance according to university type

	Type	N	Mean	Med.	SD	Min.	Max.	P value
H-index	State	201	8.53	6.00	8.15	0	54	0.048*
	Foundation	68	6.88	5.00	7.29	0	32	
Number of articles	State	201	34.04	27.00	27.93	0	148	0.017*
	Foundation	68	28.87	21.50	31.73	0	165	
Number of citations	State	201	524.78	141.00	1067.34	0	8593	0.134
	Foundation	68	421.49	117.50	768.74	0	3356	

Mann Whitney U test, *P value significant at the 0.05 level.

In the comparison of cities, they were categorized as the three major cities (Istanbul, Ankara, Izmir) and cumulatively other cities. There is no significant difference among Istanbul, Ankara, Izmir, and other cities with regard to the H-index ($P = 0.055$), the number of articles ($P=0.070$), and the number of citations ($P=0.081$).

DISCUSSION

In Turkey, academic productivity in the field of dentistry has demonstrated notable progress over the last decade. Between 2010 and 2020, the number of dental publications originating from Turkey increased by 67%, reflecting a growing commitment to scientific research (Demirci, 2021; Uslu, 2019). However, despite this increase, the quantity of research produced in Turkey was found to be comparatively low in comparison to the output of leading global research centres, with countries such as the United States, the United Kingdom, and China having produced a greater number of publications in dentistry (Demir, 2018).

In today's context, where research productivity is emphasized both as a criterion for international success and as a key aspect of dental professionals' career goals, factors that can enhance publication output and improve Turkey's global ranking in academic achievements have become a focal point of interest in studies. Many factors may affect the academic productivity, such as whether the funding of the university, type of the university, the academic status, etc. To the best of our knowledge, no study has previously evaluated the factors influencing academic productivity in the field of endodontics. This study addresses a significant gap in the existing literature on the subject by conducting a comprehensive investigation and presenting a detailed analysis of the factors influencing academic productivity in the field of endodontics.

Despite the absence of a universally accepted metric for the quantification of academic productivity, markers including total number of publications as well as total number of publication citations are frequently used for this purpose (Garner, 2018; García-Villar, 2021). The number of publications and citations, among other metrics, serve as key indicators of scholarly success across various disciplines, including endodontics (Abramo & D'Angelo, 2018). The studies aimed at evaluating the increasingly significant concept of 'scientific productivity' in our country have frequently taken publication and citation rates into consideration (Bazeley, 2010; Chow & Harrison, 1998; Wills et al., 2013). Consequently, in the present study, H-index, the number of publications, and the number of citations were used as the basis for measuring research productivity.

Factors such as funding of institution, geographical location, and academic rank have been identified as key determinants of research productivity (Heng et al., 2020; Tamtekin, 2017). The findings of another study indicated that, for 63.7% of the participants, the primary factor impeding research productivity was not individual but environmental such as location, economic class etc. (Ak & Gülmez, 2014). A study evaluating academic productivity in state and foundation universities in South East Nigeria found that academic productivity was higher in state universities compared to foundation ones (Mbachu, 2022). However, the authors noted that this region belongs to a lower economic class, which contributes to the overall lower levels of academic productivity (Mbachu, 2022). A recent study conducted at Saudi universities has revealed

that state universities produce a greater number of published papers than their foundation counterparts (Gadhoom, 2016). In accordance with these results, we found that the state universities have a greater number of articles and also higher H-index, when compared to foundation universities. It can be hypothesised that the underlying cause of this observed disparity between state and foundation type universities is the greater level of foundation support, incentives, and contributions to academic research and activities observed in state universities.

Although the number of academics in each state university in Istanbul is greater than that in each foundation university, the total number of academics in foundation universities has surpassed the total count of academics in state universities due to the fact that the total number of foundation universities exceeds that of state universities in Istanbul.

In the present study, the number of female academics in the field of endodontics was found to be higher than that of their male counterparts. However, the H-index and citation rates of male academics were found to be statistically significantly higher than those of female academics ($P = 0.009$ and $P = 0.007$, respectively). This result is consistent with the findings of a similar study conducted by Eliacik and Karahan in the field of pedodontics (Eliacik & Karahan, 2021). On the other hand, no significant difference was found between genders regarding the number of articles published ($P = 0.086$). Regardless of an author's publication count, a low citation rate will result in a low H-index. For instance, the H-index is particularly limited for studies published in journals that are unlikely to attract citations (Hönekopp & Kleber, 2008). In this study, the H-index recorded was based on data from Web of Science. Due to these factors, although there was no significant difference in total publication count between genders, differences were found in citation rates and H-index values.

It is reported that academic rank plays a crucial role, as professors and associate professors generally produce more research outputs compared to their junior colleagues (Abramo et al., 2016). According to these findings of the present study, it was observed that H-index, total publication counts, and total citation rates of professors were found to be significantly higher ($P < 0.05$) compared to those of associate professors and PhD assistant professor (Table 4). Similarly, the H-index, total publication counts, and total citation rates of associate professors were statistically significantly higher ($P < 0.001$) than those of PhD assistant professor. Consequently, it is clear that there is a direct correlation between academic status and academic performance.

The results of this study showed that no discernible discrepancy was identified between Istanbul, Ankara, Izmir, and other cities with respect to the H-index, the number of articles, and the number of citations. Conversely, it was reported that faculty members in metropolitan universities, with greater access to research funding and infrastructure, tend to publish more frequently compared

to those in smaller or rural institutions (Uslu, 2019). This difference can be attributed to a number of factors. While larger cities may offer greater resources, the high patient density and the pressures of metropolitan living may limit the time available for academic research despite infrastructural advantages, compared to other cities. It is therefore hypothesised that the three major cities, such as Istanbul, Ankara and Izmir, may exhibit similar academic performance averages to those of other cities.

As with any study, the present study is also subject to certain limitations. It should be noted that data related to academics who are active in their field but whose information is not accessible through YÖK Akademik or Web of Science, and Google Scholar could not be included in the present study. Also, the findings of the study are limited by the specific time period during which the search was carried out. The results of this study may vary depending on the specific period and institutional affiliation of the academics during the data collection phase, as academic performance was assessed only within the timeframe of the study. On the other hand, academics may have recently transitioned between state and foundation universities or between cities. As a consequence of the inherent difficulty in identifying such transitions, this study is constrained by this limitation. To address these limitations, future studies should consider alternative approaches, such as conducting searches across multiple time periods and databases. This would facilitate a more comprehensive analysis of academic productivity of the academics in the field of endodontics.

CONCLUSION

Despite its limitations, this comprehensive analysis provides valuable insights into the dynamics of academic productivity within the field of endodontics in Turkey, revealing significant disparities influenced by academic rank, gender, and university type.

The present study reveals that academic productivity in the field of endodontics in Turkey is higher among male academics, professors, and those affiliated with state universities. These findings offer a valuable benchmark for the evaluation of academic performance and highlight the critical need to enhance incentives, support mechanisms, and equitable opportunities, particularly for female academics and those working at foundation universities.

The implementation of such improvements to strengthen research capacity in these underperforming areas will contribute to elevating overall academic achievement across Turkey and reducing disparities within the field. It is imperative to acknowledge that the promotion of equitable opportunities for scholarly advancement across all academic ranks, genders, and institution types is pivotal to the promotion of sustainable growth and excellence in endodontic research on a national scale.

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Conflicts of Interest

The authors declare that they have no conflict of interest.

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