



The One Hundred Most Cited Articles from Turkey about Pilonidal Disease: A Bibliometric Study

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ABSTRACT

Aim: To bibliometrically identify the top 100 most cited articles from Turkey concerning pilonidal disease (PD) and analyze their features.

Method: Databases searched in July 2021 included Web of Science (WoS) and Google Scholar to identify the most cited articles from studies about PD from Turkey. Each paper was evaluated in terms of publication year, number of authors, study group's institution, type and subject of the article, number of references, number of citations, and host journal.

Results: The mean number of citations of the first 100 articles was 37.5. The articles were published in 37 different journals. The leading journal was Diseases of the Colon and Rectum. There was no correlation between journal impact factors and citation counts. Ninety-three of the articles were clinical trials. There was no correlation between the article type and the number of citations. The most frequently discussed topic was flap repairs, with 51 articles. In the last decade there was an increase in the number of articles concerning the application of phenol. The most productive decade was 2010-2019, with 51 articles. While Gülhane Military Medical Academy had the highest number of articles and total citations, Harran University Faculty of Medicine had the most cited article and the highest number of citations per article. In addition, 38 of the top 100 most cited papers in the WoS database were sent from Turkey.

Conclusion: Turkey leads the world literature in articles on the PD. Diseases of the Colon and Rectum is the leading journal for Turkish PD studies. While flap repairs are the most discussed topic, the number of publications on the application of Phenol has increased in the last ten years.

Keywords: Pilonidal disease, bibliometrics, citations, flap repair, phenol application

Introduction

Citation is a reference to another article, and although it is not a stand-alone criterion, it gives a clue about the quality of an article, its contribution to science and the academic effectiveness of the author.^{1,2} The impact factor, which indicates the quality of medical journals, is calculated according to the citation analysis of that journal.

Science Citation Index Expanded calculates impact factors according to the citation count of more than 10,000 journals in different fields. With the global development of biomedical publishing, the number of publications from Turkey has increased significantly. Articles from Turkey on hydatid cyst, pilonidal disease (PD), breast diseases and inguinal hernia are highly cited in the field of general surgery.¹

Although there are similar studies in the literature, there is no bibliometric study on PD. The aim of this study was to identify the most cited articles about PD from Turkey.

Materials and Methods

Database Search

In July 2021, a search was conducted on the Web of Science to identify the most cited articles amongst studies from Turkey about PD. The keywords "PD" and "pilonidal sinus" were added to the search line. These keywords were searched for in titles, abstracts and keywords. Retrieved articles which were not about PD, or books/book sections and congress presentations were excluded from the study.

Ethical Approval

All data in this study were obtained from public access sources. Therefore, ethical approval was not required. No contact was made with the authors or their institutions to collect further data for the purposes of this study.



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Evaluation of Data

In this study, the Declaration of Helsinki developed by the World Medical Association was adhered to for medical research involving human material and data. The 100 most cited articles were listed according to the number of citations and their full texts were retrieved. Each article was evaluated in terms of the publication year, the number of authors, the type of article (prospective study, retrospective study, systematic review, meta-analysis, case report-series, survey studies, laboratory studies), the subject of article (primary closure, flap repairs, epidemiology, phenol application, other), the institution of the study group, the number of references, the number of WoS citations, the number of Google Scholar (GSch) citations, the journal name, the journal area (surgery, dermatology, other), the journal impact factor, and the country of the journal.

Statistical Analysis

SPSS, version 22.0 was used for statistical analysis of the data (IBM Corp, Armonk, NY, USA). Qualitative variables are presented as frequency, and quantitative variables as mean and standard deviation (SD). The differences between the mean values were determined using the One-Way ANOVA test. A correlation coefficient (r) was calculated using the Spearman correlation test to determine the relationship of the recorded parameters with the citation numbers of the articles. A $p < 0.05$ was considered statistically significant.

Results

Of the top 100 most cited articles about PD in WoS, 38 were from Turkey. The top 100 most cited articles sent from Turkey are presented in Table 1. The total number of citations of the first 100 articles was 3,753 (range: 12-119) in WoS and 7,316 (range: 17-250) in GSch. While the mean \pm SD number of citations was 37.53 ± 24.5 in WoS, it was 73.16 ± 50.72 in GSch. The number of citations, the number of authors, and the number of references by publication year were evaluated in three consecutive decades (Table 2). The articles on the list were published after 1995. The most recent article was published in 2017. The most articles were published in 2010 (13 articles). The most productive 10 years were 2010-2019 (51 articles). As was expected, the number of citations increased as the publication year got older ($p < 0.001$, Table 2).

Fifty one articles on flap repairs were published. Especially in the last two decades, articles on flap repairs were prominent. Of the 13 publications on phenol application, 11 were published between 2010-2019. In addition, primary repair (14 articles), epidemiology of PD (13 articles), and others (9 articles) were other categories examined in the articles (Table 3).

Forty nine of the articles were prospective studies and 44 were retrospective studies. The number of clinical trials was significantly higher compared to other types of studies ($p < 0.001$). The study type had no significant effect on the number of citations (Table 4). The first 100 articles were published by 43 different institutions. The list included 64 articles from 26 university hospitals, 32 articles from 13 training and research hospitals, 3 articles from 3 state hospitals, and 1 article from 1 private hospital. There were 32 articles from Ankara, 13 from İstanbul, 5 from Mersin, 5 from Elazığ, and 45 from other provinces. The institution that published the highest number of articles and had the highest total number of citations in the list was Gülhane Military Medical Academy. Harran University Faculty of Medicine had the most cited article and the highest number of citations per article (Table 5). When the citation numbers of university hospitals and training and research hospitals were compared, no significant difference was found.

The articles were published in 37 journals. Diseases of the Colon and Rectum was the leading journal on the list, publishing 22 articles (Table 6). Fifty nine of the articles were published in journals in the United States, 11 in the United Kingdom, 5 in Japan, 4 in India, 3 in Germany, and 18 in other countries. Of the journals on the list, 78 were surgical journals and 22 were journals in other fields (general medicine, dermatology, plastic surgery, and pediatrics) (Table 7). The number of citations for articles in surgical journals was significantly higher than journals for other specialities ($p = 0.04$). There was no significant relationship between journal impact factors and citation counts ($r = 0.134$, $p = 0.18$ for WoS citations). The mean values of impact factors of dermatology and surgical journals were higher than for other speciality journals (3.94 ± 1.2 and 3.26 ± 1.4 , $p = 0.002$, respectively). The number of authors ranged from 1 to 9, with a mean of 5.02 ± 1.7 . There was no significant relationship between the number of authors and the number of citations ($r = -0.049$, $p = 0.63$ for WoS citations).

Discussion

Although high citation counts do not measure the quality of an article by itself, it indicates that the article is of scientific interest and is being discussed.¹ The average number of citations of the last articles of a journal is an important criterion in determining the impact factor.³ It is expected that the citation numbers of publications in journals with high impact factor are high. However, in our study, there was no significant correlation between the journal impact factor and the number of citations.

Even the best scientific articles need years to reach high numbers of citations.¹ A published article starts to get citations after 1-2 years and approaches the maximum

Table 1. Top 100 pilonidal disease articles

	References	WoS citations	GSch citations
1	Akinci OF, Bozer M, Uzunköy A, Düzgün ŞA, Coşkun A. Incidence and aetiological factors in pilonidal sinus among Turkish soldiers. <i>Eur J Surg</i> 1999;165(4):339-342. doi:10.1080/110241599750006875	119	250
2	Ertan T, Koc M, Gocmen E, Aslar AK, Keskek M, Kilic M. Does technique alter quality of life after pilonidal sinus surgery?. <i>Am J Surg</i> 2005;190(3):388-392. doi:10.1016/j.amjsurg.2004.08.068	105	207
3	Akinci OF, Coskun A, Uzunköy A. Simple and effective surgical treatment of pilonidal sinus: asymmetric excision and primary closure using suction drain and subcuticular skin closure. <i>Dis Colon Rectum</i> 2000;43(5):701-707. doi:10.1007/BF02235591	104	210
4	Akca T, Colak T, Ustunsoy B, Kanik A, Aydın S. Randomized clinical trial comparing primary closure with the Limberg flap in the treatment of primary sacrococcygeal pilonidal disease. <i>Br J Surg</i> 2005;92(9):1081-1084. doi:10.1002/bjs.5074	97	198
5	Mentes BB, Leventoglu S, Cihan A, Tatlicioglu E, Akin M, Oguz M. Modified Limberg transposition flap for sacrococcygeal pilonidal sinus. <i>Surg Today</i> 2004;34(5):419-423. doi:10.1007/s00595-003-2725-x	96	195
6	Urhan MK, Kücükel F, Topgul K, Ozer I, Sari S. Rhomboid excision and Limberg flap for managing pilonidal sinus: results of 102 cases. <i>Dis Colon Rectum</i> 2002;45(5):656-659. doi:10.1007/s10350-004-6263-4	91	186
7	Bozkurt MK, Tezel E. Management of pilonidal sinus with the Limberg flap. <i>Dis Colon Rectum</i> 1998;41(6):775-777. doi:10.1007/BF02236268	83	157
8	Topgöl K, Ozdemir E, Kiliç K, Gökbayir H, Ferahköşe Z. Long-term results of limberg flap procedure for treatment of pilonidal sinus: a report of 200 cases. <i>Dis Colon Rectum</i> 2003;46(11):1545-1548. doi:10.1007/s10350-004-6811-y	76	143
9	Cubukçu A, Gönüllü NN, Paksoy M, Alponat A, Kuru M, Ozbay O. The role of obesity on the recurrence of pilonidal sinus disease in patients, who were treated by excision and Limberg flap transposition. <i>Int J Colorectal Dis</i> 2000;15(3):173-175. doi:10.1007/s003840000212	75	152
10	Eryilmaz R, Sahin M, Alimoglu O, Dasiran F. Surgical treatment of sacrococcygeal pilonidal sinus with the Limberg transposition flap. <i>Surgery</i> 2003;134(5):745-749. doi:10.1016/s0039-6060(03)00163-6	75	154
11	Mentes O, Bagci M, Bilgin T, Ozgul O, Ozdemir M. Limberg flap procedure for pilonidal sinus disease: results of 353 patients. <i>Langenbecks Arch Surg</i> 2008;393(2):185-189. doi:10.1007/s00423-007-0227-9	73	146
12	Erdem E, Sungurtekin U, Neşşar M. Are postoperative drains necessary with the Limberg flap for treatment of pilonidal sinus?. <i>Dis Colon Rectum</i> 1998;41(11):1427-1431. doi:10.1007/BF02237061	71	115
13	Can MF, Sevinc MM, Hancerliogullari O, Yilmaz M, Yagci G. Multicenter prospective randomized trial comparing modified Limberg flap transposition and Karydakias flap reconstruction in patients with sacrococcygeal pilonidal disease. <i>Am J Surg</i> 2010;200(3):318-327. doi:10.1016/j.amjsurg.2009.08.042	69	147
14	Gencosmanoglu R, Inceoglu R. Modified lay-open (incision, curettage, partial lateral wall excision and marsupialization) versus total excision with primary closure in the treatment of chronic sacrococcygeal pilonidal sinus: a prospective, randomized clinical trial with a complete two-year follow-up. <i>Int J Colorectal Dis</i> 2005;20(5):415-422. doi:10.1007/s00384-004-0710-5	68	129
15	Cihan A, Ucan BH, Comert M, Cesur A, Cakmak GK, Tascilar O. Superiority of asymmetric modified Limberg flap for surgical treatment of pilonidal disease. <i>Dis Colon Rectum</i> 2006;49(2):244-249. doi:10.1007/s10350-005-0253-z	68	112
16	Ersoy E, Devay AO, Aktimur R, Doganay B, Ozdoğan M, Gündoğdu RH. Comparison of the short-term results after Limberg and Karydakias procedures for pilonidal disease: randomized prospective analysis of 100 patients. <i>Colorectal Dis</i> 2009;11(7):705-710. doi:10.1111/j.1463-1318.2008.01646.x	68	137
17	Cihan A, Mentes BB, Tatlicioglu E, Ozmen S, Leventoglu S, Ucan BH. Modified Limberg flap reconstruction compares favourably with primary repair for pilonidal sinus surgery. <i>ANZ J Surg</i> 2004;74(4):238-242. doi:10.1111/j.1445-2197.2004.02951.x	63	109
18	Dogru O, Camci C, Aygen E, Girgin M, Topuz O. Pilonidal sinus treated with crystallized phenol: an eight-year experience. <i>Dis Colon Rectum</i> 2004;47(11):1934-1938. doi:10.1007/s10350-004-0720-y	60	133
19	Harlak A, Mentes O, Kilic S, Coskun K, Duman K, Yilmaz F. Sacrococcygeal pilonidal disease: analysis of previously proposed risk factors. <i>Clinics (Sao Paulo)</i> 2010;65(2):125-131. doi:10.1590/S1807-59322010000200002	60	161

20	Aydede H, Erhan Y, Sakarya A, Kumkumoglu Y. Comparison of three methods in surgical treatment of pilonidal disease. <i>ANZ J Surg</i> 2001;71(6):362-364.	56	111
21	Karakayali F, Karagulle E, Karabulut Z, Oksuz E, Moray G, Haberal M. Unroofing and marsupialization vs. rhomboid excision and Limberg flap in pilonidal disease: a prospective, randomized, clinical trial. <i>Dis Colon Rectum</i> 2009;52(3):496-502. doi:10.1007/DCR.0b013e31819a3ec0	53	92
22	Dilek ON, Bekereciodlu M. Role of simple V-Y advancement flap in the treatment of complicated pilonidal sinus. <i>Eur J Surg</i> 1998;164(12):961-964. doi:10.1080/110241598750005147	52	84
23	Akin M, Leventoglu S, Menten BB, et al. Comparison of the classic Limberg flap and modified Limberg flap in the treatment of pilonidal sinus disease: a retrospective analysis of 416 patients. <i>Surg Today</i> 2010;40(8):757-762. doi:10.1007/s00595-008-4098-7	51	78
24	Gurer A, Gomceli I, Ozdogan M, Ozlem N, Sozen S, Aydin R. Is routine cavity drainage necessary in Karydakias flap operation? A prospective, randomized trial. <i>Dis Colon Rectum</i> 2005;48(9):1797-1799. doi:10.1007/s10350-005-0108-7	50	92
25	Ates M, Dirican A, Sarac M, Aslan A, Colak C. Short and long-term results of the Karydakias flap versus the Limberg flap for treating pilonidal sinus disease: a prospective randomized study. <i>Am J Surg</i> 2011;202(5):568-573. doi:10.1016/j.amjsurg.2010.10.021	49	96
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27	Mentes O, Bagci M, Bilgin T, Coskun I, Ozgul O, Ozdemir M. Management of pilonidal sinus disease with oblique excision and primary closure: results of 493 patients. <i>Dis Colon Rectum</i> 2006;49(1):104-108. doi:10.1007/s10350-005-0226-2	47	95
28	Oram Y, Kahraman F, Karıncaoğlu Y, Koyuncu E. Evaluation of 60 patients with pilonidal sinus treated with laser epilation after surgery. <i>Dermatol Surg</i> 2010;36(1):88-91. doi:10.1111/j.1524-4725.2009.01387.x	46	79
29	Neşşar G, Kayaalp C, Seven C. Elliptical rotation flap for pilonidal sinus. <i>Am J Surg</i> 2004;187(2):300-303. doi:10.1016/j.amjsurg.2003.11.012	45	85
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33	Kayaalp C, Aydin C. Review of phenol treatment in sacrococcygeal pilonidal disease. <i>Tech Coloproctol</i> 2009;13(3):189-193. doi:10.1007/s10151-009-0519-x	44	93
34	Nursal TZ, Ezer A, Çalışkan K, Törer N, Belli S, Moray G. Prospective randomized controlled trial comparing V-Y advancement flap with primary suture methods in pilonidal disease. <i>Am J Surg</i> 2010;199(2):170-177. doi:10.1016/j.amjsurg.2008.12.030	41	84
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37	Arslan K, Said Kokcam S, Koksall H, Turan E, Atay A, Dogru O. Which flap method should be preferred for the treatment of pilonidal sinus? A prospective randomized study. <i>Tech Coloproctol</i> 2014;18(1):29-37. doi:10.1007/s10151-013-0982-2	39	69
38	Guner A, Boz A, Ozkan OF, Ileri O, Kece C, Reis E. Limberg flap versus Bascom cleft lift techniques for sacrococcygeal pilonidal sinus: prospective, randomized trial. <i>World J Surg</i> 2013;37(9):2074-2080. doi:10.1007/s00268-013-2111-9	38	68
39	Can MF, Sevinc MM, Yilmaz M. Comparison of Karydakias flap reconstruction versus primary midline closure in sacrococcygeal pilonidal disease: results of 200 military service members. <i>Surg Today</i> 2009;39(7):580-586. doi:10.1007/s00595-008-3926-0	37	79
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42	Kepeneci I, Demirkan A, Celasin H, Gecim IE. Unroofing and curettage for the treatment of acute and chronic pilonidal disease. <i>World J Surg</i> 2010;34(1):153-157. doi:10.1007/s00268-009-0245-6	34	70
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46	Kement M, Oncel M, Kurt N, Kaptanoğlu L. Sinus excision for the treatment of limited chronic pilonidal disease: results after a medium-term follow-up. <i>Dis Colon Rectum</i> 2006;49(11):1758-1762. doi:10.1007/s10350-006-0676-1	32	45
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60	Yildiz T, Elmas B, Yucak A, Turgut HT, İlce Z. Risk Factors for Pilonidal Sinus Disease in Teenagers. <i>Indian J Pediatr</i> 2017;84(2):134-138. doi:10.1007/s12098-016-2180-5	23	48
61	Gecim IE, Goktug UU, Celasin H. Endoscopic Pilonidal Sinus Treatment Combined With Crystallized Phenol Application May Prevent Recurrence. <i>Dis Colon Rectum</i> 2017;60(4):405-407. doi:10.1097/DCR.0000000000000778	23	33
62	Tezel E, Bostanci H, Anadol AZ, Kurukahvecioğlu O. Cleft lift procedure for sacrococcygeal pilonidal disease. <i>Dis Colon Rectum</i> 2009;52(1):135-139. doi:10.1007/DCR.0b013e31819734f8	23	38

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67	Saray A, Dirlik M, Çağlıkulekci M, Turkmenoglu O. Gluteal V-Y advancement fasciocutaneous flap for treatment of chronic pilonidal sinus disease. <i>Scand J Plast Reconstr Surg Hand Surg</i> 2002;36(2):80-84. doi:10.1080/028443102753575211	21	36
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WoS: Web of Science, GSch: Google Scholar

number of citations in 10 years.¹ However, it may take 10-20 years for an article to be fully recognized and reach the maximum number of citations.⁴ The lists in which the articles are ordered according to the number of citations are

dynamic and their order may change over time.² Similarly, the articles that are not yet in the top 100 list may enter the list, or the order of some articles that are already in the list may change.² In addition, the citation and publication numbers

of the authors in the top 100 list may not fully reflect their overall productivity in these fields.² Van Noorden et al.⁵ reported that 43.8% of all scientific publications were never cited, and 1.84% of all scientific publications remained in the 100-999 citation range.

Some publications that are expected to receive high citations may receive very low citations. For example, Salk⁶ titled "Considerations in the preparation and use of poliomyelitis virus vaccine" published in the Journal of the American Medical Association (JAMA) in 1955 has surprisingly received only 127 citations in GSch to date. Again, Sabin's et al.⁷ landmark article "Live Oral Poliovirus Vaccine" has received only 236 citations since it was published in JAMA in 1960 on GSch. The 1944 article by Avery et al.⁸ heralding the era of molecular biology, could only reach 620 citations in Garfield's⁹ 100 citation classics published in 1987,

whereas today the number of citations in GSch was 4978. Garfield⁹ cited the article by Watson and Crick¹⁰ describing the double helix of DNA, which was almost the most debated article in the history of Science and received less than 1,300 citations in 1987, as an example of under-cited articles. However, the number of citations for this article has reached 15,858 in GSch today.

In our study, the most cited articles on PD were reviewed in order to evaluate the contribution of our country to the World literature. Thirty eight of the 100 most cited articles on this subject in the world were from Turkey. Turkey is far ahead of other countries in these publications, and this finding suggests that our country dominates the world literature. In addition, Mayir et al.¹ reported that 15.4% of the most cited articles in the field of general surgery in Turkey were related to PD.

Table 2. Average number of citations, author number and number of references for the most cited 100 Turkish articles about pilonidal disease by decade of publication

Data	1990-1999	2000-2009	2010-2019	p-values
Article counts	6	43	51	<0.001
WoS citations	77±32.02	45.5±25.6	26.2±12.9	<0.001
GSch citations	141±81.4	90.2±51.8	50.8±29.4	<0.001
Author numbers	3.7±1.97	4.8±1.6	5.3±1.7	0.045
Reference numbers	17.5±7	22.3±11.5	22.5±8.4	0.49

WoS: Web of Science, GSch: Google Scholar

Table 3. Distribution of article topics by decade

Topics	1990-1999	2000-2009	2010-2019	Total
Primary closure	1	8	5	14
Flap repairs	4	24	23	51
Epidemiology	1	6	6	13
Phenol application	-	2	11	13
Other topics	-	3	6	9

Table 4. Average number of citations by type of article

Type of study	Number of articles	WoS citations	GSch citations
Prospective clinical trial	49	41.08±25.3	79±52
Retrospective clinical study	44	35.7±24.6	70.6±51.8
Review, systematic review, and meta-analysis	2	30.5±19.1	63.5±41.7
Case reports or case series	2	18.5±7.8	35±19.8
Letter or comment to the editor	2	25±11.3	46.5±10.6
Survey study	1	21	47
p-values	<0.001	0.62	0.74

WoS: Web of Science, GSch: Google Scholar

Table 5. Institutions of the most cited authors and data on citations

Institution	Total number of citations	Total number of articles	WoS citations	GSch citations	Highest citation count for an article
Gülhane Military Medical Academy	712	7	45.6±23.5	101.7±50.4	161
Gazi University Faculty of Medicine	474	5	49.6±28.1	94.8±62	195
Harran University Faculty of Medicine	460	2	111.5±10.6	230±28.3	250
Ankara Numune Training and Research Hospital	434	6	37.7±33.7	67.4±29	207
Mersin University Faculty of Medicine	368	5	35.6±34.8	73.6±71.5	198
Bezmialem Vakıf University Faculty of Medicine	351	5	31.2±25.6	70.2±53.8	154
Başkent University Faculty of Medicine	269	3	46.3±6.1	89.7±4.9	93
Firat University Faculty of Medicine	259	4	30.5±20.2	64.8±46	133
İnönü University Faculty of Medicine	258	4	33±16.1	64.5±36.4	96
University of Health Sciences Turkey, Konya Training and Research Hospital	235	4	33±5	58.8±12.3	69

WoS: Web of Science, GSch: Google Scholar

Table 6. Leading journals in the “Top 100 List” in pilonidal disease publications

Name of journal	Number of articles
Diseases of the Colon and Rectum	22
Techniques coloproctology	5
Colorectal disease	5
World Journal of Surgery	5
American Journal of Surgery	5
Surgery today	5
Surgery	4
International surgery	4
International Journal of Colorectal Disease	3
The European Journal of Surgery	3
Dermatologic surgery	3
Clinics	3

Table 7. Distribution of variables by journal fields

Journal field (n)	Impact factor	WoS citations	GSch citations
Surgery (78)	3.26±1.4	41.56±25.6	80.5±52.6
General medicine (12)	1.7±0.94	24.9±14.5	53.8±41.1
Dermatology (5)	3.94±1.2	22.4±14	42±23.2
Plastic surgery (4)	2.53±1.53	19.5±3.4	33.5±5.3
Pediatrics (1)	1.97	23	48
p-values	0.002	0.04	0.09

WoS: Web of Science, GSch: Google Scholar

Søndenaa et al.¹¹ published the most cited article from all global PD articles, with 237 citations in WoS and 523 citations in GSch. Akıncı et al. published the most cited article from Turkey and received 119 citations in WoS and 250 citations in GSch (Table 1). The article by Akıncı et al. was ranked seventh among the most cited PD articles in the world.

In our study, only three articles passed the 100 citation threshold in the WoS database, while another 23 articles were cited more than 50 times. In the GSch database, 23 articles passed the 100 citation threshold, and another 30 articles received more than 50 citations. While the average number of citations in WoS was 37.5, the average number of citations in GSch was 73.2. In our study, the number of articles increased significantly in the 2000-2009 period, and the most productive decade was 2010-2019.

In the bibliometric study conducted by Manuel Vázquez et al.¹² in 2019, the median number of citations of the first 100 articles citing general surgery published in five journals with the highest impact factor was 490. In our list, the median number of citations was 30 in WoS and 56 in GSch.

These 100 Turkish articles about PD were published by 43 institutions. Of the 10 most productive institutions, 8 were university hospitals while 45 articles were from Ankara (n=32) and İstanbul (n=13). Bas et al.¹³ reported the apparent superiority of university hospitals in their bibliometric analysis on liver transplantation. In addition, 90% of the 271 articles in Onat’s¹⁴ bibliometric analysis investigating Turkey’s contribution to medical publications were shown to be published by university hospitals. In our study, training hospitals were successfully included in the list together with university hospitals. We think that this

may be due to the fact that the treatment of PD can be easily applied in all surgical units. In our list, 64 articles were published from 26 university hospitals and 32 articles from 13 training and research hospitals. Ankara Numune Training and Research Hospital ranked second in the list according to the number of articles (Table 5). PD is a chronic inflammatory condition that is more common in young adult males.¹⁵ This is probably reflected in the finding that Gülhane Military Medical Academy, where the majority of its patients were young male soldiers, ranked first in the list with seven publications (Table 5).

The articles on the list were published in 37 different journals. In previous citation analyses, this figure varied between 10 and 46.^{2,16-20} Paladugu et al.²¹ reported that the first 100 articles in general surgery were published in only 10 surgical journals. In our study, 78 of the articles were published in surgical journals and the number of citations from surgical journals was significantly higher (Table 7). The Diseases of the Colon and Rectum was found to be the best and leading journal in this study with 22 articles (Table 6). Of the publications on the list, 59 were published in United States journals.

Systematic review, meta-analysis and randomized controlled studies are considered the most valuable publications. In our study, there were 93 clinical studies, 49 of which were prospective and 44 were retrospective, in the top 100 list. Prospective studies had higher citation counts than other studies, but there was no significant difference. There was no significant correlation between the type of study and the number of citations (Table 4). In our study, the number of studies on flap repair was high. In addition, the number of studies about phenol application increased in the last few years (Table 3).

Study Limitations

There are some limitations of our study. Search for titles, abstracts and keywords was performed by typing “PD” and “pilonidal sinus” in the WoS database search line. However, articles on PD outside the search criteria might be overlooked. New articles that could not reach a sufficient number of citations were left out of the top 100 lists. This situation creates a limitation for new and current articles.²² In addition, book chapters and congress presentations were excluded from the study.

Conclusion

Turkey is far ahead of other countries in articles on PD and dominates the world literature. Diseases of the Colon and Rectum is the leading journal for the most cited Turkish research about PD. While flap repairs are the most discussed topic, the number of publications on the application of phenol has increased in the last ten years.

Ethics

Ethics Committee Approval: All data in this study were obtained from public access sources. Therefore, ethical approval was not required. No contact was made with the authors or their institutions to collect further data for the purposes of this study.

Informed Consent: Informed consent were not required.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: A.Ş., G.Ş., Concept: A.Ş., G.Ş., Design: A.Ş., G.Ş., Data Collection or Processing: A.Ş., G.Ş., Analysis or Interpretation: A.Ş., G.Ş., Literature Search: A.Ş., G.Ş., Writing: A.Ş., G.Ş.

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