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Original Article

Fifty most cited Turkish Orthopedics and Traumatology articles in international literature: A bibliometric analysis

Mehmet Yalcinozan

Near East University Hospital, Department of Orthopedics and Traumatology, Nicosia, TRNC

Abstract

Aim: The aim of this study is to identify the 50 most cited Turkish papers in international Orthopedic literature and analyze them to define the subconscious scientific behaviors of Turkish Orthopedic surgeons and the contributive characteristics of Turkish Orthopedic surgeons for the science at the last four decade.

Material and Methods: WoS Core Collection was searched for the Turkish Orthopedic articles between 1980 and 2019 in all fields with pre-defined terms. Data including the number citations, age of the article, subcategories, number of authors, journals names, impact factors and publishers, institution names, numbers and categories, Level of Evidence (LoE) and article language were collected. A correlation analysis (Pearson for parametric and Spearman for nonparametric values) was performedbetween the impact factors and citation numbers (C), and also citation rates (C/R). A chi-square test was performed between citation numbers and levels of evidence. A value of $p < 0.05$ was considered to be statistically significant.

Results: All of the 50 articles were original articles that were written in English. The citation counts were between 164 and 44. The article ages were between 27(C:60, C/R: 2.22/yr) and 2(C: 50, C/R: 25/yr). Tweenty-three different journals were found in the analysis. The mean level of evidence (LoE) was found 3. 84% of the papers were studied in a University hospital.

Conclusion: This bibliometric study showed no statistically significant correlation between the data analyzed. On the other hand, this study also revealed once again that there was no correlation between citation numbers and journal impact factors as expected. Additionally, this study also showed that Turkish Orthopedic scientists are getting citations independent of journal impact factors.

Keywords: Bibliometric; citation; study; traumatology; Turkish; orthopedic

INTRODUCTION

Citation number of a paper is a useful value to determine the academic influence of either the idea or the work done for the paper (1). Therefore it should give useful information to the other authors for their writings and be easily accessible (2). Orthopedic surgery writings date back to sixteenth-century BC. Later then in nineteenth-century first the "Centralblatt der orthopädischen Chirurgie" in Germany started as an Orthopedic specialized academic journal. Right after that in 5 years, American Orthopedic Association started publishing Transactions of the American Orthopedic Association (aka. Journal of Bone and Joint Surgery) (3). With time and evolving medical sciences over 200 journals are being published at this specialty (4). Such an academic publishing volume may comprimise the citability of scientifically more valuable articles or increase citations of less valuable papers. The scientific community evolved indexing or evaluating systems such as h-index to measure a researcher's academic importance (5,6). These systems mostly use the citeability of the researcher to reach a final value. Therefore the citations become nowadays more important than before. Nevertheless, citations tell us about the influence of the paper in generating practice or further research with the readership of that particular article (7). While there are some bibliometric studies for Orthopedics and traumatology field from different countries (4,8,9), to the best of our knowledge there is no study which focused on Orthopedic publications from Turkey.

There is a known debate about arts between the most known phrases "Art for art's sake." and "Art for life's sake". This debate can be applied to academic life too. Are we doing science for science's sake or life's sake? The aim of this study was to identify the 50 most frequently cited Turkish Orthopedics articles in international literature and to analyze the contributive characteristics of Turkish Orthopedic surgeons for the science in the last four decades to determine the factors to increase the academic quality by influencing more citable studies.

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Corresponding Author: Mehmet Yalcinozan, Near East University Hospital, Department of Orthopedics and Traumatology, Nicosia, TRNC **E-mail:** mehmet.yalcinozan@med.neu.edu.tr

MATERIAL and METHODS

Web of Science Core Collection was searched for the 50 most frequently cited Turkish Orthopedic articles between 1980 and 2019 in all fields with the terms "arthroscopy, arthroscopic, Orthopedic, arthroplasty, trauma, fracture, amputation, bone tumor, hand surgery, vertebrae, orthopedic". The study was carried out in June 2019. The literature search was then narrowed with filtering options by the country and the articles not originating from Turkey were excluded. The acquired search list was sorted by the citation numbers and all found articles were saved to create the list to analyze. All data were collected from including articles which were written by orthopedic surgeons. The collected data were citation numbers, the year of publication, orthopedic subcategories, author numbers, journal names, impact factors and publisher companies, institution of the first author, institution numbers and categories, and article languages. The only excluding criteria were the affiliation to a foreign institution of the first author. Also, the citation rates were calculated by dividing the citation numbers to the year since publication. The level of evidence ratings of the papers were added to analyze.

A correlation analysis (Pearson for parametric and Spearman for nonparametric values) was performed between the impact factors and citation numbers (C), and also citation rates (C/R). A chi-square test was performed between citation numbers and levels of evidence. A value of $p < 0.05$ was considered to be statistically significant.

RESULTS

All of the 50 articles were original articles that were written in English. The highest number of citations was 164 (one article) and the lowest was found to be with 44 (three articles) citations. (Table 1) The mean citation value was 65.66 and the median value was 57 - 59. General Orthopedics was the most common sub-specialty among these 50 articles Orthopedic that were included to the study (Table 2).

Table 1. List of 50 most cited Turkish orthopaedics and traumatology articles in international literature

Rank	Most cited papers	Citation	C/R
1	Alanay A, Acaroglu E, Yazici M, Oznur A, Surat A. Short-segment pedicle instrumentation of thoracolumbar burst fractures - Does transpedicular intracorporeal grafting prevent early failure? Spine. 2001;26(2):213-7.	164	9.11
2	Tandogan RN, Taser O, Kayaalp A, Taskiran E, Pinar H, Alparslan B, et al. Analysis of meniscal and chondral lesions accompanying anterior cruciate ligament tears: relationship with age, time from injury, and level of sport. Knee Surgery Sports Traumatology Arthroscopy. 2004;12(4):262-+.	139	9.27
3	Tezeren G, Kuru I. Posterior fixation of thoracolumbar burst fracture - Short-segment pedicle fixation versus long-segment instrumentation. Journal of Spinal Disorders & Techniques. 2005;18(6):485-8.	118	9.08
4	Ozkoc G, Circi E, Gonc U, Irgit K, Pourbagher A, Tandogan RN. Radial tears in the root of the posterior horn of the medial meniscus. Knee Surgery Sports Traumatology Arthroscopy. 2008;16(9):849-54.	100	9.09
5	Sahin V, Karakas ES, Aksu S, Atlihan D, Turk CY, Halici M. Traumatic dislocation and fracture-dislocation of the hip: A long-term follow-up study. Journal of Trauma-Injury Infection and Critical Care. 2003;54(3):520-9.	98	6.13
6	Ozalay M, Akpinar S, Karaeminogullari O, Balcik C, Tasci A, Tandogan RN, et al. Mechanical strength of four different biceps tenodesis techniques. Arthroscopy-the Journal of Arthroscopic and Related Surgery. 2005;21(8):992-8.	94	6.71
7	Balci N, Balci MK, Tuzuner S. Shoulder adhesive capsulitis and shoulder range of motion in type II diabetes mellitus: Association with diabetic complications. Journal of Diabetes and Its Complications. 1999;13(3):135-40.	91	4.55
8	Sen C, Kocaoglu M, Eralp L, Gulsen M, Cinar M. Bifocal compression-distraction in the acute treatment of grade III open tibia fractures with bone and soft-tissue loss - A report of 24 cases. Journal of Orthopaedic Trauma. 2004;18(3):150-7.	83	5.53
9	Yazici M, Acaroglu ER, Alanay A, Deviren V, Cila A, Surat A. Measurement of vertebral rotation in standing versus supine position in adolescent idiopathic scoliosis. Journal of Pediatric Orthopaedics. 2001;21(2):252-6.	83	4.61
10	Gunal I, Kose N, Erdogan O, Gokturk E, Seber S. Normal range of motion of the joints of the upper extremity in male subjects, with special reference to side. Journal of Bone and Joint Surgery-American Volume. 1996;78A(9):1401-4.	79	3.43
11	Demirhan M, Kilicoglu O, Altinel L, Eralp L, Akalin Y. Prognostic factors in prosthetic replacement for acute proximal humerus fractures. Journal of Orthopaedic Trauma. 2003;17(3):181-8.	75	3.94
12	Kanatli U, Yetkin H, Cila E. Footprint and radiographic analysis of the feet. Journal of Pediatric Orthopaedics. 2001;21(2):225-8.	72	4.69

13	Baktir A, Turk CY, Kabak S, Sahin V, Kardas Y. Flexor tendon repair in zone 2 followed by early active mobilization. Journal of Hand Surgery-British and European Volume. 1996;21B(5):624-8.	72	3.13
14	Sener N, Tozun R, Asik M. Femoral shortening and cementless arthroplasty in high congenital dislocation of the hip. Journal of Arthroplasty. 2002;17(1):41-8.	71	4.24
15	Bilgen OF, Atici T, Durak K, Karaeminogullari O, Bilgen MS. C-reactive protein values and erythrocyte sedimentation rates after total hip and total knee arthroplasty. Journal of International Medical Research. 2001;29(1):7-12.	71	3.94
16	Yazar M, Sarban S, Kocyigit A, Isikan UE. Synovial fluid and plasma selenium, copper, zinc, and iron concentrations in patients with rheumatoid arthritis and osteoarthritis. Biological Trace Element Research. 2005;106(2):123-32.	69	4.93
17	Asik M, Ciftci F, Sen C, Erdil M, Atalar A. The Microfracture Technique for the Treatment of Full-Thickness Articular Cartilage Lesions of the Knee: Midterm Results. Arthroscopy-the Journal of Arthroscopic and Related Surgery. 2008;24(11):1214-20.	67	6.09
18	Kabak S, Halici M, Tuncel M, Avsarogullari L, Baktir A, Basturk M. Functional outcome of open reduction and internal fixation for completely unstable pelvic ring fractures (Type C) - A report of 40 cases. Journal of Orthopaedic Trauma. 2003;17(8):555-62.	66	4.13
19	Oguz E, Sehirlioglu A, Altinmakas M, Ozturk C, Komurcu M, Solakoglu C, et al. A new classification and guide for surgical treatment of spinal tuberculosis. International Orthopaedics. 2008;32(1):127-33.	66	6.00
20	Kocaoglu M, Eralp L, Rashid HU, Sen C, Bilsel K. Reconstruction of segmental bone defects due to chronic osteomyelitis with use of an external fixator and an intramedullary nail. Journal of Bone and Joint Surgery-American Volume. 2006;88A(10):2137-45.	65	5.00
21	Altay T, Gunal I, Ozturk H. Local injection treatment for lateral epicondylitis. Clinical Orthopaedics and Related Research. 2002(398):127-30.	65	3.82
22	Asik M, Sen C, Kilic B, Goksan SB, Ciftci F, Taser OF. High tibial osteotomy with Puddu plate for the treatment of varus gonarthrosis. Knee Surgery Sports Traumatology Arthroscopy. 2006;14(10):948-54.	64	4.92
23	Rodop O, Kiral A, Kaplan H, Akmaz I. Primary bipolar hemiprosthesis for unstable intertrochanteric fractures. International Orthopaedics. 2002;26(4):233-7.	63	3.71
24	Kutlu A, Memik R, Mutlu M, Kutlu R, Arslan A. Congenıtal dıslocatıon of the hıp and ıts relatıon to swaddlıng used ın turkey. Journal of Pediatric Orthopaedics. 1992;12(5):598-602.	60	2.22
25	Karaca F, Aksakal B, Kom M. Influence of orthopaedic drilling parameters on temperature and histopathology of bovine tibia: An in vitro study. Medical Engineering & Physics. 2011;33(10):1221-7.	59	7.38
26	Benli IT, Acaroglu E, Akalin S, Kis M, Duman E, Un A. Anterior radical debridement and anterior instrumentation in tuberculosis spondylitis. European Spine Journal. 2003;12(2):224-34.	57	3.56
27	Avci S, Yilmaz C, Sayli U. Comparison of nonsurgical treatment measures for de Quervain's disease of pregnancy and lactation. Journal of Hand Surgery-American Volume. 2002;27A(2):322-4.	56	3.29
28	Sar C, Eralp L. Surgical treatment of primary tumors of the sacrum. Archives of Orthopaedic and Trauma Surgery. 2002;122(3):148-55.	54	3.18
29	Demirhan M, Atalar AC, Kilicoglu O. Primary fixation strength of rotator cuff repair techniques: A comparative study. Arthroscopy-the Journal of Arthroscopic and Related Surgery. 2003;19(6):572-6.	54	3.38
30	Yilmaz C, Colak M, Yilmaz BC, Ersoz G, Kutateladze M, Gozlugol M. Bacteriophage Therapy in Implant-Related Infections An Experimental Study. Journal of Bone and Joint Surgery-American Volume. 2013;95A(2):117-25.	54	9.00
31	Aydin N, Kocaoglu B, Guven O. Single-row versus double-row arthroscopic rotator cuff repair in small- to medium-sized tears. Journal of Shoulder and Elbow Surgery. 2010;19(5):722-5.	54	6.00
32	Erdemli B, Yilmaz C, Atalar H, Guzel B, Cetin I. Total hip arthroplasty in developmental high dislocation of the hip. Journal of Arthroplasty. 2005;20(8):1021-8.	52	3.71
33	Bozkurt M, Yilmaz E, Atlihan D, Tekdemir L, Havitcioglu H, Gunal I. The proximal tibiofibular joint. Clinical Orthopaedics and Related Research. 2003(406):136-40.	51	3.19
34	Asik M, Sen C, Tuncay I, Erdil M, Avci C, Taser OF. The mid- to long-term results of the anterior cruciate ligament reconstruction with hamstring tendons using Transfix technique. Knee Surgery Sports Traumatology Arthroscopy. 2007;15(8):965-72.	50	4.17

35	Gormeli G, Gormeli C, Ataoglu B, Colak C, Aslanturk O, Ertem K. Multiple PRP injections are more effective than single injections and hyaluronic acid in knees with early osteoarthritis: a randomized, double-blind, placebo-controlled trial. Knee Surgery Sports Traumatology Arthroscopy. 2017;25(3):958-65.	50	25.00
36	Saglik Y, Atalar H, Yildiz Y, Basarir K, Gunay C. Surgical treatment of osteoblastoma : A report of 20 cases. Acta Orthopaedica Belgica. 2007;73(6):747-53.	50	4.17
37	Binnet MS, Basarir K. Risk and outcome of infection after different Arthroscopic anterior Cruciate ligament reconstruction techniques. Arthroscopy-the Journal of Arthroscopic and Related Surgery. 2007;23(8):862-8.	49	4.08
38	Karatoprak O, Unay K, Tezer M, Ozturk C, Aydogan M, Mirzanli C. Comparative analysis of pedicle screw versus hybrid instrumentation in adolescent idiopathic scoliosis surgery. International Orthopaedics. 2008;32(4):523-8.	47	4.27
39	Gulman B, Tuncay IC, Dabak N, Karaismailoglu N. Salter ınnomınate osteotomy ın the treatment of congenıtal hıp dıslocatıon - a long-term revıew. Journal of Pediatric Orthopaedics. 1994;14(5):662-6.	47	1.88
40	Asik M, Sener N. Failure strength of repair devices versus meniscus suturing techniques. Knee Surgery Sports Traumatology Arthroscopy. 2002;10(1):25-9.	47	2.76
41	Heybeli N, Kutluhan S, Demirci S, Kerman M, Mumcu EF. Assessment of outcome of carpal tunnel syndrome: A comparison of electrophysiological findings and a self-administered Boston questionnaire. Journal of Hand Surgery-British and European Volume. 2002;27B(3):259-64.	47	2.76
42	Tatari H, Baran O, Sanlidag T, Gore O, Ak D, Manisali M, et al. Primary intramuscular hydatidosis of supraspinatus muscle. Archives of Orthopaedic and Trauma Surgery. 2001;121(1-2):93-4.	46	2.56
43	Omeroglu H, Bicimoglu A, Agus H, Tumer Y. Measurement of center-edge angle in developmental dysplasia of the hip: a comparison of two methods in patients under 20 years of age. Skeletal Radiology. 2002;31(1):25-9.	46	2.71
44	Kabak S, Halici M, Tuncel M, Avsarogullari L, Karaoglu S. Treatment of midclavicular nonunion: Comparison of dynamic compression plating and low-contact dynamic compression plating techniques. Journal of Shoulder and Elbow Surgery. 2004;13(4):396-403.	46	3.07
45	Goksan SB, Bursali A, Bilgili F, Sivacioglu S, Ayanoglu S. Ponseti technique for the correction of idiopathic clubfeet presenting up to 1 year of age. A preliminary study in children with untreated or complex deformities. Archives of Orthopaedic and Trauma Surgery. 2006;126(1):15-21.	46	3.54
46	Esenyel C, Demirhan M, Esenyel M, Sonmez M, Kahraman S, Senel B, et al. Comparison of four different intra-articular injection sites in the knee: a cadaver study. Knee Surgery Sports Traumatology Arthroscopy. 2007;15(5):573-7.	46	3.83
47	Altay M, Bayrakci K, Yildiz Y, Erekul S, Saglik Y. Secondary chondrosarcoma in cartilage bone tumors: report of 32 patients. Journal of Orthopaedic Science. 2007;12(5):415-23.	46	3.83
48	Urguden M, Soyuncu Y, Ozdemir H, Sekban H, Akyildiz FF, Aydin AT. Arthroscopic treatment of anterolateral soft tissue impingement of the ankle: Evaluation of factors affecting outcome. Arthroscopy-the Journal of Arthroscopic and Related Surgery. 2005;21(3):317-22.	45	3.21
49	Dogruel H, Atalar H, Yavuz OY, Sayli U. Clinical examination versus ultrasonography in detecting developmental dysplasia of the hip. International Orthopaedics. 2008;32(3):415-9.	45	4.09
50	Kesmezacar H, Ayhan E, Unlu MC, Sekar A, Karaca S. Predictors of Mortality in Elderly Patients With an Intertrochanteric or a Femoral Neck Fracture. Journal of Trauma-Injury Infection and Critical Care. 2010;68(1):153-8.	44	4.89

The oldest article was published 27 years (C:60, C/R: 2.22/yr) and the newest was published 2 years (C: 50, C/R: 25/yr) ago. Further analysis revealed that the vast majority of the most cited articles were 11-18 years old. (Table 3) The calculated C/R rates ranged between 1.88/yr and 25/yr. but the second most C/R paper had a rate of 9.27/yr. Therefore the most C/R paper with 25/yr was determined as an extrememem sample. Mean C/R was 5.04/yr.

There was a wide range of journals, 23 journals were found at the analysis and nearly half of these journals (48%) had published only 1 (2%) paper each. Knee Surgery, Sports Traumatology, and Arthroscopy (KSSTA) journal was at the first place with publishing 7 papers (14%) (Table 4). At the analyze of publisher companies there were 10 different companies in total. The vast majority of the determinative was published by 3 major companies (Springer, Lippincott Williams Wilkins, and W.B. Saunders) with Springer having the most published articles (16 articles, 32%). The former W.B. Saunders and Mosby publishing companies are now owned by Elsevier, but the company names have been kept as they were (Table 5). Regarding the 23 journals, 14 were orthopedic journals, 7 medical orthopedicjournals

Table 2. Article count by orthopaedic subspecialities

Sub-specialty	Article count
General Orthopaedics	19 (38%)
Arthroscopy	9 (18%)
Vertebrae Surgery	6 (12%)
Paediatric Orthopaedics	6 (12%)
Orthopaedic Trauma	4 (8%)
Orthopaedic Oncology	3 (6%)
Arthroplasty	2 (4%)
Orthopaedic Deformity Surgery	1 (2%)

Table 3. Article counts by age groups

Age Groups	Article Count
0-9	5 (%10)
10-19	41 (%82)
20-29	4 (%8)

and just 2 were non- medical. An obvious heterogeneity was found as LoE of the studies. The median LoE was found 2 – 4 (Table 6).

The author counts of the articles ranged from 2 to 7. The majority of the studied articles had 5 (32%) or more authors (Table 7). There were 45 unique first authors, Asik M and

Table 4. List of article counts and impact factors of the journals

Journal Name	Article count	Impact Factor
Knee Surgery, Sports Traumatology, Arthroscopy	7 (14%)	3.210
Arthroscopy	5 (10%)	4.330
International Orthopaedics	4 (8%)	2.377
Journal of Paediatric Orthopaedics	4 (8%)	1.853
Archives of Orthopaedic and Trauma Surgery	3 (6%)	1.967
Journal of Bone & Joint Surgery	3 (6%)	4.583
Journal of Trauma	3 (6%)	2.459
Clinical Orthopaedics and Related Research	2 (4%)	4.091
Journal of Arthroplasty	2 (4%)	3.339
Journal of Hand Surgery - British	2 (4%)	0.844
Journal of Shoulder and Elbow Surgery	2 (4%)	2.849
Journal of Trau.-Injury Inf. and Critical Care	2 (4%)	2.961
Acta Orthopaedica Belgica	1 (2%)	0.542
Biological Trace Element Research	1 (2%)	2.361
European Spine Journal	1 (2%)	2.634
Journal of Diabetes and Its Complications	1 (2%)	2.792
Journal of Hand Surgery - America	1 (2%)	1.776
Journal of International Medical Research	1 (2%)	1.023
Journal of Orthopaedic Science	1 (2%)	1.264
Journal of Spinal Disorders & Techniques	1 (2%)	2.310
Medical Engineering & Physics	1 (2%)	1.923
Skeletal Radiology	1 (2%)	1.567
Spine	1 (2%)	2.792

Sen C were primary or co-authors of five articles, followed by Eralp L and Yilmaz B with four articles and Acaroglu E, Atalar H, Demirhan M, Gunal I, Halici M, Kabak S, Tandogan RN and Taser O with three articles each. All of the three articles authored or co-authored by Tandogan RN were also at the top 10 most cited articles which were analyzed at this study. Also, most of the papers were originating from a single center (n:23, 46%). All of the single-center studies were from University Hospitals. Another half of the papers were multicentric (2 centers 34%, 3 centers 12% and 4 centers 6%, 6 centers 2%) studies. Regarding the affiliations of the first authors, there was a serious difference between the institution categories. 84% of the papers were studied at any University hospital (54.8% single-center studies).

Table 5. Article counts by publishing companies

Publisher	Article count
Springer	17 (34%)
Lippincott Williams Wilkins	13 (26%)
WB Saunders	6 (12%)
Churchill - Livingstone	4 (8%)
JBJS	3 (6%)
Elsevier	2 (4%)
Mosby	2 (4%)
Acta Medica Belgica	1 (2%)
Humana Press	1 (2%)
Sage	1 (2%)

Table 6. List of mean citation numbers and article counts by LoE of the articles

Level of Evidence	Article Count	Mean Citation numbers
I	3 (6%)	102.3
II	16 (32%)	61.69
III	10 (20%)	73.5
IV	16 (32%)	62.1
V	5 (10%)	52

Table 7. Article counts by writer numbers of articles

Writer counts	Article count
2	4 (8%)
3	8 (16%)
4	5 (10%)
5	16 (32%)
6	12 (24%)
7	5 (10%)

DISCUSSION

The word "citation" can be explained as a reference to a book, paper, or author, especially in a scholarly work. Reference to a known fact or proven thesis will help to increase the power of persuasion of an article as a researcher explains any rationale about the research or arguing hypothesis. Therefore citations are used to strengthen an argument of an article. The presentation of a high-quality paper is important for the improvement of scientific literature and also for the scientific position and career of an author. That makes the citability an important factor to determine the quality of an article. As there are many features to make a paper more citable some of them can differ internationally. This research aims to identify the features of published orthopedic articles by Turkish Orthopedic surgeons.

It takes time to get citations for an article and with time the citation increases, also measuring the importance of an article just with citation count would create a bias against newer papers. Therefore the yearly citation number of an article, defined as citation rate (C/R) at this study, should become important to determine the quality of an article (10). But neither journal impact factor (r=0.191, p=0.183) nor levels of evidence (p=0.747) has been found correlated with C/R of articles like as some other bibliometric studies (4).

The analyze of subspecialties, unlike other bibliometric studies this research showed that Turkish orthopedic surgeons mostly cited with studies about general orthopedics or major subspecialties of orthopedics like Paediatric orthopedics or vertebrae (7-9). That may be as a result of the lack of Turkish orthopedic surgeons subspecialty interests orthopedic. There was no correlation between the citation numbers and subspecialties (r=0.345) and statistically significance was seen (p=0.014). Also, no statistically significant correlation was found between citation numbers and levels of evidence, as mentioned in other studies (11,12). (p=0.747)

Regarding the Journals, Turkish Orthopedic surgeons seem to have a wide range of Journal choice and none of them found clearly popular among Turkish surgeons. Further analyze revealed that more specialized medical journals give a greater chance to be cited. There were not many articles published at the non-medical journals. On the other hand the orthopedic journals are not superior for getting attention on a subject and get cited. For example, the papers published by the journals "Biological Trace Element Research" and "Medical Engineering and Physics" 69 and 59 citations in order and placed to the 17th and 26th rank at the list. There was a slight correlation (r=0.215, p=0.133) between the citation numbers and publishing Journal, but it was found statistically insignificant. This result supports the theory called Bradford's law, which advocates that many researchers gather their citations from a number of core journals (13). On the other hand, this study also revealed once againthat there is no correlation (r=0.083, p=0.566) between citation numbers and journal

impact factors as expected (4,11). Impact factor is known and expected as an important scientometric criterion to determine the quality of the journal, but this bibliometric study showed us that Turkish Orthopedic scientists are getting citations independent from the journal impact factors (14).

The analysis by age groups showed that the citability of the articles has been significantly decreased since the last decade. That phenomenon may have many reasons. One of the most effective reasons is that academical concerns may have changed by the time. The more quantitative features at the estimated criteria for academic promotion may lead to the reduction of qualitative features of published articles. The first 25 of the articles had 2054 citations in sum with a mean age of 16,08 yrs and the last 25 had 1229 in sum with a mean age of 13,06 yrs. This also supports the idea that older articles gained more citations causing higher rates. As the citation is one of the important determinative factors for the quality of the paper, one can say that newer Turkish Orthopedic papers started to lose their scientific power at the last decade.

The analyzing of author and institution counts showed that most of the articles had more than one researcher from a single institution. There should be no doubt that a team will reach more success in scientific subjects. The close relationship between researchers or higher communication abilities and sharing the workload of a researcher will affect the result positively. Also, there was an interesting finding in terms of institution types. In the vast majority of the papers (%84), the authors were affiliated to the university hospitals. The articles from training & research hospitals were only %10 and the private hospitals had no significant difference (%6). Although both, university and training & research hospitals, are in the same category in the Turkish Republic; the superiority of Universities may have some reasons as higher academic aims, specialized scientific concerns, more theoretical burden, the possibility of multidisciplinary work, having more research possibilities or facilities, etc. But the biggest advantage of University hospitals may be the lesser workload of academic staff and experience with more advanced or rare cases.

CONCLUSION

Reading, understanding, analysing and most importantly changing the academic concerns may help to present scientificly higher quality papers. With those aims, Turkish Orthopedic surgeons may increase their contribution to the scientific literature by reaching more readers and researchers. This is why we young Turkish academicians should choose to track senior academicians. Further bibliometric studies which compare the Turkish and international most cited papers are needed to determine the factors which may be useful to produce more influencing and citable articles for Turkish Orthopedic Society members.

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Mehmet Yalcinozan ORCID: 0000-0002-2772-1137

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