

A Bibliometric Study on the Top 101 Most-Cited Articles of Dental Journals of the Middle East/North Africa Countries From 2011 to 2021



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Abstract

Introduction: This retrospective descriptive study evaluated the Scopus-indexed dental journals and their most-cited documents affiliated with the Middle East and North Africa (MENA) countries from 2011 to 2021.

Methods: Dental journals affiliated with MENA countries, their bibliometric indicators (SJR, CiteScore, SNIP, and H-index), and the 101 most cited articles of the considered journals were extracted and studied through descriptive statistics. In addition, the “citation per year” of each top 101 articles was calculated. Spearman’s rho test was used for pairwise comparisons of the correlation coefficient values between each two of the considered bibliometric indicators.

Results: The number of citations of the 101 most-cited papers ranged from 35 to 203. The mean (SD) citations of studied articles were 61.33 (37.58) and the median was 46. Furthermore, CiteScore had the highest significant correlation with SJR ($r=0.828$, $P<0.001$). Moreover, the citation per year of the top 101 documents had no significant relationship with any of the journals’ bibliometric indicators.

Conclusion: Because journal performance and citation rate are multi-dimensional concepts, a single metric cannot express them thoroughly despite correlations between indices. “European Journal of Dentistry” from Turkey, “Saudi Dental Journal” from Saudi Arabia, and “Iranian Endodontic Journal” and “Journal of Lasers in Medical Sciences” both from Iran had the highest ranks in the SCImago portal and the highest scores in bibliometric indices amongst the MENA dental journals.

Keywords: Bibliometrics; Citations; CiteScore; Dental journals; Medical journalism; Middle East.



Introduction

Scientometric and bibliometric studies explore various kinds of scientific activities and investigate the trend and spread of different areas of research publications by the application of statistical methods.^{1,2} Academic journals have important roles in building a collective knowledge base and validating the quality of research.³ Assessments of such journals will help visualize changes in scientific publications and evaluate the research output of affiliated countries.⁴

Bibliometric analyses in dental disciplines and evaluation of dental journals were not common in the past.⁵ Bibliometric analysis can aim to study changes in research trends and contemporary advances in the dentistry field, the most common study designs, the centers of excellence, and the scientific impacts of

different articles in dental sciences.⁶ Through such studies, a significant rise in terms of the number of journals, scientific articles, acquired citations, and also an upward trend in bibliometric indicators have been observed.⁵ Last decade, several bibliometric studies were conducted in different areas of dentistry, such as endodontics,¹ periodontics,⁷ oral and maxillofacial surgery,⁸ and orthodontics.⁹ Moreover, some bibliometric studies have evaluated dental journals in recent years.¹⁰⁻¹²

Scopus database, as one of the largest citation databases of peer-reviewed literature, covers a larger area of science than “Web of Science Group/Clarivate Analytics”. It provides intelligent tools for tracking and analyzing global research production and citation analysis.^{13,14} Based on the information from the Scopus database, “The SCImago Journal & Country Rank” ranks journals of

different subject areas published from different regions/countries in the world. Its indicators can be used to evaluate countries in various scientific domains.¹⁵

In the recent decade, the established Scopus-associated citation-based qualitative indicators including SCImago Journal Rank (SJR), CiteScore, and source normalized impact per paper (SNIP) have frequently been used to evaluate journal quality information.¹⁶ SJR can be obtained by considering the average number of received citations in the selected year by the documents published in the journal in the previous three years and weighing the affiliated journals (according to their citation rates together with a negative effect of self-citations) from which the citations are taken.^{15,17} CiteScore calculates the average number of citations received in a calendar year by all documents published in that journal in the previous three years.¹⁷ SNIP of a journal is a ratio that indicates the average number of citations per paper published in a journal and divides it by relative database citation potential in the journal's subject field.³ H-index which is created by Hirsch¹⁸ expresses "the journal's number of articles (H) that have received at least H citations".¹⁸ In addition, "Cites per document" has also indicated the average citations per document for 1 to 4 years.¹⁹

The Middle East and North Africa (MENA) consist of countries with different levels of economic growth, health status, and scientific activities.²⁰ Although there has been underinvestment in public health and medical education and research in some MENA countries,²¹ growth has picked up across the region and is projected to strengthen through the next few years.²⁰ Yet achieving improvement in those fields will require the collaboration of health policymakers and healthcare professionals.²² Recently, a special emphasis on strengthening regional oral health research has been recommended.²³

As far as we have reviewed the literature, no study has been conducted on dental journals from the MENA countries. Thus, the aim of the present study was a bibliometric evaluation of the Scopus-indexed dental journals published from/affiliated with the MENA countries. We focused on the evaluation of the 101 most cited articles of the abovementioned journals from 2011 to 2021 and their Scopus-associated bibliographic indicators.

Methods

Our study was a retrospective descriptive investigation that focused on the 2011 to 2021-time duration.

Search Strategy and Data Extraction

Initially, the names of the MENA countries were extracted by searching the World Atlas portal, and they were listed.²⁴ To search the academic dental journals of those countries, we used the SCImago website (www.scimagojr.com). "Journal Ranks Explorer", "Dentistry"

and "All subject categories" were selected as the "Subject areas". In the "Regions/countries" box, "Middle East" was selected. Moreover, "Journals" was our considered "Publication Type". The journals' list and their rankings based on the SJR index were retrieved by LR.

In order not to have selection bias, another review of dental journals published by MENA countries and indexed in the Scopus database was conducted. In the "Sources" selection option of the Scopus portal, "Dentistry" was selected as the "Subject area". After obtaining the names of all Scopus-indexed journals in the field of dentistry, the name of each aforementioned journal was entered in the search box of "SCImago Journal & Country rank" to find whether the affiliated country was amongst the focused countries. Furthermore, if the name of a MENA country was a component of the name of a Scopus-indexed dental journal, the journal was considered for further investigation in this study, even if the affiliated country was not geographically located in the MENA region.

The retrieved names of the journals were searched in the Scopus portal to extract their CiteScore, SNIP, and Scopus coverage years (available at the homepage of the Scopus database, and directly at <http://info.scopus.com/journalmetrics/> for all Scopus-indexed journals). Then, SCImago Journal Rankings (<https://www.scimagojr.com/journalrank.php>) were further investigated to find out the SJR and H-Index of the journals. One author (LR) undertook the search in the specified databases. Then, another author (JA) rechecked the indices and searched articles. If there was any problem in the search process, SA was asked and his opinion was applied.

Inclusion Criteria

The top 101 documents with the highest number of citations published in the reviewed journals were extracted from the Scopus database (in January 2022) and included in the study. The subject/subfield of dentistry and the study type/design of each article were determined. In addition, the names of the first author, corresponding author, and their affiliated institutes/countries were obtained.

In this study, "cites per document" was calculated in the title of "citation per year" as the average citation of an article over each year for the 101 most cited articles. The citation number of each of those top articles was divided by the number of years passed from its publication year to the year 2021.

Statistical Analysis

The data were entered into Excel 2013 software (Microsoft Corp, Redmond, WA, USA). SPSS software (SPSS version 26.0; IBM, Armonk, NY, USA) was used for data analysis. The 101 most cited articles from reviewed journals were studied through descriptive statistics. The frequencies of different subjects/subfields of dentistry and study designs

in the aforementioned articles were extracted. Also, the frequencies of the names of the first/corresponding authors and their affiliated institutes/countries were obtained.

For statistical analysis, first, the distribution of the obtained variables was assessed with the Kolmogorov-Smirnov test. As it revealed that selected variables had a non-normal distribution, the correlation between each two of four established bibliometric indices (SJR, CiteScore, SNIP, and H-index) was measured with Spearman's rho test for all combinations of the bivariate pair, having pairwise comparisons of the correlation coefficients values.¹⁷ Similarly, Spearman's rho test analyzed the relationship between "citations per year" of each of the 101 most cited articles of investigated journals and each of those four established bibliometric indices.

Results

Of the total 12 Scopus-indexed dental journals affiliated with the MENA countries, Turkey with 5 journals published the highest number of dental journals. Iran with 3 and Saudi Arabia with 2 journals were in the 2nd and 3rd ranks. One of Saudi's journals has been published

in a country outside the region.

Table 1 summarizes the investigated journals and their rankings based on the SJR index that was obtained from the SCImago portal. Amongst the abovementioned journals, "European Journal of Dentistry" from Turkey ranked first, "Saudi Dental Journal" from Saudi Arabia, "Iranian Endodontic Journal" and "Journal of Lasers in Medical Sciences" both from Iran were next in line.

The reason for considering the top 101 most-cited articles instead of 100 was because articles #100 and #101 both had 35 citations, and article #101 was the last article to have 35 citations. The number of citations to article #102 was 34 times.

In the review of the 101 most-cited articles published in the above journals from 2011 to 2021 (Table 2), the number of citations received by those documents ranged from 35 to 203. In addition, the mean (SD) citations of 101 top articles were 61.33 (37.58) and the median of citations was 46. "European Journal of Dentistry" (30.7%), "Saudi Dental Journal" (17.8%), and "Open Dentistry Journal" (17.8%) presented the majority of top papers. Moreover, considering citation density, one review article²⁵ published in "Journal of Lasers in Medical Sciences"

Table 1. Dentistry Journals From the Middle East in SCImago Ranking Database, Journal Publisher's Country, and Their Bibliometric Indices

Journal Title	Subject Area and Category	Country	Publisher	SJR 2020	H-Index	CiteScore 2020	SNIP 2020	Scopus Coverage Years
European Journal of Dentistry	Dentistry <i>Dentistry (miscellaneous)</i>	Turkey	Georg Thieme Verlag	0.625	31	3.5	2.067	2009, 2011-2021
Saudi Dental Journal	Dentistry <i>Dentistry (miscellaneous)</i>	Saudi Arabia	King Saud University/ Elsevier	0.527	24	3.8	2.048	2009-2021
Iranian Endodontic Journal	Dentistry <i>Dentistry (miscellaneous)</i>	Iran	Iranian Center for Endodontic Research	0.513	22	3.0	0.815	2010-2021
Journal of Lasers in Medical Sciences	Dentistry <i>Dentistry (miscellaneous)</i> Medicine <i>Dermatology</i> <i>Nephrology</i> <i>Orthopedics and Sports</i> <i>Medicine</i> <i>Surgery</i> <i>Urology</i>	Iran	Laser Application in Medical Sciences Research Center	0.443	21	2.5	1.262	2010-2021
Open Dentistry Journal	Dentistry <i>Dentistry (miscellaneous)</i>	United Arab Emirates	Bentham Science Publishers	0.428	25	2.3	1.033	2011-2021
Dental Research Journal	Dentistry <i>Dentistry (miscellaneous)</i>	Iran	Wolters Kluwer Medknow Publications	0.334	17	1.8	0.911	2009-2021
European Endodontic Journal	Dentistry <i>Dentistry (miscellaneous)</i>	Turkey	Kare Publishing	0.302	6	0.8	0.524	2016-2021
Saudi Endodontic Journal	Dentistry <i>Dentistry (miscellaneous)</i>	Saudi Arabia	Wolters Kluwer Medknow Publications	0.272	8	1.2	0.877	2015-2021
Journal of International Dental and Medical Research	Dentistry <i>Dentistry (miscellaneous)</i>	Turkey	Ektodermal Displazi Grubu	0.259	13	1.3	0.759	2009-2021
Turkish Journal of Orthodontics	Dentistry <i>Orthodontics</i>	Turkey	Aves	0.241	4	0.7	0.851	2018-2021
Case Reports in Dentistry	Dentistry <i>Dentistry (miscellaneous)</i>	Egypt	Hindawi	0.221	11	1.0	0.561	2013-2021
Cumhuriyet Dental Journal	Dentistry <i>Dentistry (miscellaneous)</i>	Turkey	Cumhuriyet University Faculty of Dentistry	0.221	5	1.0	0.722	2010-2021

Table 2. List of the Top 101 Most-Cited Articles, Their Authors, Year of Publishing and the Affiliated Journals (2011-2021)

Rank	Document title	Authors	Year	Source	Cited by
1	Biological effects of low level laser therapy	Farivar et al ²⁵	2014	Journal of Lasers in Medical Sciences	203
2	Current aspects on oral squamous cell carcinoma	Markopoulos ²⁶	2012	Open Dentistry Journal	197
3	Natural product as the storage medium for an avulsed tooth - A systematic review	Rajakeerth and Nivedhitha ²⁷	2019	Cumhuriyet Dental Journal	191
4	Mechanisms of guided bone regeneration: A review	Liu and Kerns ³⁰	2014	Open Dentistry Journal	171
5	Comparative evaluation of salivary malondialdehyde levels as a marker of lipid peroxidation in early childhood caries	Subramanyam et al ³¹	2018	European Journal of Dentistry	157
6	Evaluation of knowledge among general dentists in treatment of traumatic injuries in primary teeth: A cross-sectional questionnaire study	Ravikumar et al ³²	2017	European Journal of Dentistry	144
7	Comparison of quality of obturation and instrumentation time using hand files and two rotary file systems in primary molars: A single-blinded randomized controlled trial	Govindaraju et al ³³	2017	European Journal of Dentistry	140
8	Orthodontic extrusion of Ellis Class VIII fracture of maxillary lateral incisor – The sling shot method	Felicita ³⁴	2018	Saudi Dental Journal	137
9	Different treatment modalities followed by dental practitioners for ellis class 2 fracture – a questionnaire-based survey	Jose et al ²⁸	2020	Open Dentistry Journal	130
10	Shape optimal and clean more	Teja and Ramesh ³⁵	2019	Saudi Endodontic Journal	122
11	Orthodontic management of a dilacerated central incisor and partially impacted canine with unilateral extraction – A case report	Felicita ³⁶	2017	Saudi Dental Journal	104
12	Tooth-bleaching procedures and their controversial effects: A literature review	Alqahtani ³⁷	2014	Saudi Dental Journal	99
13	Failure of endodontic treatment: The usual suspects	Tabassum and Khan ³⁸	2016	European Journal of Dentistry	98
14	A review on miswak (<i>Salvadora persica</i>) and its effect on various aspects of oral health	Halawany ³⁹	2012	Saudi Dental Journal	97
15	A systematic review of population-based dental caries studies among children in Saudi Arabia	Al Agili ⁴⁰	2013	Saudi Dental Journal	94
16	Guidelines for dental care provision during the COVID-19 pandemic	Alharbi et al ²⁹	2020	Saudi Dental Journal	88
17	Comparison of the Efficacy of Three Different Bone Regeneration Materials: An Animal Study	Anbu et al ⁴¹	2019	European Journal of Dentistry	86
18	Prevalence of early childhood caries and associated risk factors in preschool children of urban Bangalore, India: A cross-sectional study	Prakash et al ⁴²	2012	European Journal of Dentistry	85
19	A brief historical perspective on dental implants, their surface coatings and treatments	Abraham ⁴³	2014	Open Dentistry Journal	83
20	Antimicrobial efficacy of five essential oils against oral pathogens: An in vitro study	Thosar et al ⁴⁴	2013	European Journal of Dentistry	75
21	The effect of surface roughness on ceramics used in dentistry: A review of literature	Rashid ⁴⁵	2014	European Journal of Dentistry	74
22	The need for virtual reality simulators in dental education: A review	Roy et al ⁴⁶	2017	Saudi Dental Journal	72
23	Three-dimensional imaging techniques: A literature review	Karatas and Toy ⁴⁷	2014	European Journal of Dentistry	70
24	Congenitally missing teeth (hypodontia): A review of the literature concerning the etiology, prevalence, risk factors, patterns and treatment	Rakhshan ⁴⁸	2015	Dental Research Journal	67
25	Concentrated growth factors as an ingenious biomaterial in regeneration of bony defects after periapical surgery: A report of two cases	Malli Sureshbabu et al ⁴⁹	2019	Case Reports in Dentistry	66
26	Academic distress, perceived stress and coping strategies among dental students in Saudi Arabia	Al-Sowygh ⁵⁰	2013	Saudi Dental Journal	64
27	Evaluation of surface roughness and hardness of different glass ionomer cements	Bala et al ⁵¹	2012	European Journal of Dentistry	64
28	Clinical approach of high technology techniques for control and elimination of endodontic microbiota	Chiniforush et al ⁵²	2015	Journal of Lasers in Medical Sciences	63
29	A review of computer-aided design/computer-aided manufacture techniques for removable denture fabrication	Bilgin et al ⁵³	2016	European Journal of Dentistry	62
30	Management of peri-implantitis	Prathapachandran and Suresh ⁵⁴	2012	Dental Research Journal	62
31	Clinical performance of a new biomimetic double network material	Dirxen et al ⁵⁵	2013	Open Dentistry Journal	62
32	The zirconia ceramic: Strengths and weaknesses	Daou ⁵⁶	2014	Open Dentistry Journal	59

Table 2. Continued.

Rank	Document title	Authors	Year	Source	Cited by
33	Effect of low level laser therapy on proliferation and differentiation of the cells contributing in bone regeneration	Amid et al ⁵⁷	2014	Journal of Lasers in Medical Sciences	57
34	Nanotechnology and dentistry	Ozak and Ozkan ⁵⁸	2013	European Journal of Dentistry	56
35	Alveolar antral artery isolation during sinus lift procedure with the double window technique	Maridati et al ⁵⁹	2014	Open Dentistry Journal	55
36	A review of early displaced maxillary canines: Etiology, diagnosis and interceptive treatment	Litsas and Acar ⁶⁰	2011	Open Dentistry Journal	54
37	Fem and von mises analysis of OSSTEM® dental implant structural components: Evaluation of different direction dynamic loads	Cervino et al ⁶¹	2018	Open Dentistry Journal	51
38	The antimicrobial activity of azadirachta indica, mimusops elengi, tinospora cardifolia, ocimum sanctum and 2% chlorhexidine gluconate on common endodontic pathogens: An in vitro study	Mistry et al ⁶²	2014	European Journal of Dentistry	51
39	Dental evidence in forensic identification – an overview, methodology and present status	Krishan et al ⁶³	2015	Open Dentistry Journal	50
40	The prevalence of dental anxiety and fear in patients referred to Isfahan Dental School, Iran	Saatchi et al ⁶⁴	2015	Dental Research Journal	50
41	Evaluation of the marginal fit of full ceramic crowns by the microcomputed tomography (micro-CT) technique	Demir et al ⁶⁵	2014	European Journal of Dentistry	50
42	Survival rate of different fixed posterior space maintainers used in Paediatric Dentistry – A systematic review	Ramakrishnan et al ⁶⁶	2019	Saudi Dental Journal	49
43	Adverse effects of orthodontic treatment: A clinical perspective	Talic ⁶⁷	2011	Saudi Dental Journal	49
44	Allergic effects of the residual monomer used in denture base acrylic resins	Rashid et al ⁶⁸	2015	European Journal of Dentistry	47
45	Effect of incorporation of silane in the bonding agent on the repair potential of machinable esthetic blocks	Zaghloul et al ⁶⁹	2014	European Journal of Dentistry	47
46	Evaluation of root anatomy of permanent mandibular premolars and molars in a Korean population with cone-beam computed tomography	Park et al ⁷⁰	2013	European Journal of Dentistry	47
47	Evaluation of degree of conversion and hardness of dental composites photoactivated with different light guide tips	Galvão et al ⁷¹	2013	European Journal of Dentistry	47
48	Antimicrobial photodynamic therapy: An effective alternative approach to control bacterial infections	Mahmoudi et al ⁷²	2018	Journal of Lasers in Medical Sciences	46
49	Factors affecting polymerization of resin-based composites: A literature review	AlShaafi ⁷³	2017	Saudi Dental Journal	46
50	Alveolar ridge augmentation with titanium mesh. A retrospective clinical study	Poli et al ⁷⁴	2014	Open Dentistry Journal	46
51	Atomic force microscopy of bacteria from periodontal subgingival biofilm: Preliminary study results	Germano et al ⁷⁵	2013	European Journal of Dentistry	46
52	Propolis: Chemical composition and its applications in endodontics	Ahangari et al ⁷⁶	2018	Iranian Endodontic Journal	45
53	A review on vital pulp therapy in primary teeth	Parisay et al ⁷⁷	2015	Iranian Endodontic Journal	45
54	Children's perception of their dentists	Alsarheed ⁷⁸	2011	European Journal of Dentistry	45
55	Apical surgery: A review of current techniques and outcome	von Arx ⁷⁹	2011	Saudi Dental Journal	45
56	A review on prevention and treatment of post-orthodontic white spot lesions - evidence-based methods and emerging technologies	Bergstrand and Twetman ⁸⁰	2011	Open Dentistry Journal	45
57	How effective the problem-based learning (PBL) in dental education. A critical review	Alrahlah ⁸¹	2016	Saudi Dental Journal	44
58	Mechanisms of laser-tissue interaction: II. tissue thermal properties	Ansari et al ⁸²	2013	Journal of Lasers in Medical Sciences	44
59	Can antimicrobial photodynamic therapy (aPDT) enhance the endodontic treatment?	Chiniforush et al ⁸³	2016	Journal of Lasers in Medical Sciences	43
60	Evaluation of root morphology and root canal configuration of premolars in the Turkish individuals using cone beam computed tomography	Bulut et al ⁸⁴	2015	European Journal of Dentistry	43
61	Prevalence and severity of temporomandibular disorders among university students in Riyadh	Habib et al ⁸⁵	2015	Saudi Dental Journal	43
62	New approaches in vital pulp therapy in permanent teeth	Ghodusi et al ⁸⁶	2014	Iranian Endodontic Journal	43
63	Quantitative and qualitative analysis of microorganisms in root-filled teeth with persistent infection: Monitoring of the endodontic retreatment	Endo et al ⁸⁷	2013	European Journal of Dentistry	43
64	Protein-signaled guided bone regeneration using titanium mesh and Rh-BMP2 in oral surgery: A case report involving left mandibular reconstruction after tumor resection	Cicciù et al ⁸⁸	2012	Open Dentistry Journal	42

Table 2. Continued.

Rank	Document title	Authors	Year	Source	Cited by
65	Histomorphometric evaluation of anorganic bovine bone coverage to reduce autogenous grafts resorption: Preliminary results	Maiorana et al ⁸⁹	2011	Open Dentistry Journal	42
66	Safety and effectiveness of low-level laser therapy in patients with knee osteoarthritis: A systematic review and meta-analysis	Rayegani et al ⁹⁰	2017	Journal of Lasers in Medical Sciences	41
67	Morse taper dental implants and platform switching: The new paradigm in oral implantology	Macedo et al ⁹¹	2016	European Journal of Dentistry	41
68	A review of antibacterial agents in endodontic treatment	Rahimi et al ⁹²	2014	Iranian Endodontic Journal	41
69	Microleakage at enamel and dentin margins with a bulk fills flowable resin	Scotti et al ⁹³	2014	European Journal of Dentistry	41
70	Diode laser application in soft tissue oral surgery	Azma and Safavi ⁹⁴	2013	Journal of Lasers in Medical Sciences	41
71	Surgical options in oroantral fistula treatment	Borgonovo et al ⁹⁵	2012	Open Dentistry Journal	41
72	Dental patients' awareness and knowledge in using dental implants as an option in replacing missing teeth: A survey in Riyadh, Saudi Arabia	Al-Johany et al ⁹⁶	2010	Saudi Dental Journal	41
73	Implantology and periodontal disease: The panacea to problem solving?	Matarese et al ⁹⁷	2017	Open Dentistry Journal	40
74	Outcomes of vital pulp therapy in permanent teeth with different medicaments based on review of the literature	Akhlaghi and Khademi ⁹⁸	2015	Dental Research Journal	40
75	Ethylendiaminetetraacetic acid in endodontics	Mohammadi et al ⁹⁹	2013	European Journal of Dentistry	40
76	Survey of perceived stress-inducing problems among dental students, Saudi Arabia	Al-Saleh et al ¹⁰⁰	2010	Saudi Dental Journal	40
77	The antimicrobial sensitivity of Streptococcus mutans and Streptococcus sangius to colloidal solutions of different nanoparticles applied as mouthwashes	Ahrari et al ¹⁰¹	2015	Dental Research Journal	39
78	Antimicrobial efficacy of mineral trioxide aggregate with and without silver nanoparticles	Samiei et al ¹⁰²	2013	Iranian Endodontic Journal	39
79	The effect of luting agents and ceramic thickness on the color variation of different ceramics against a chromatic background	de Azevedo Cubas et al ¹⁰³	2011	European Journal of Dentistry	39
80	Periodontal health status in patients treated with the Invisalign® system and fixed orthodontic appliances: A 3 months clinical and microbiological evaluation	Levrini et al ¹⁰⁴	2015	European Journal of Dentistry	38
81	The applications of cone-beam computed tomography in endodontics: A review of literature	Kiarudi et al ¹⁰⁵	2015	Iranian Endodontic Journal	38
82	Comparison of two routes of administration of dexamethasone to reduce the postoperative sequelae after third molar surgery: A systematic review and meta-analysis	Troiano et al ¹⁰⁶	2018	Open Dentistry Journal	37
83	IL6 and IL10 are genetic susceptibility factors of periodontal disease	Scapoli et al ¹⁰⁷	2012	Dental Research Journal	37
84	A cone-beam computed tomography study of the root canal morphology of anterior teeth in a Turkish population	Altunsoy et al ¹⁰⁸	2014	European Journal of Dentistry	36
85	Salivary alpha-amylase activity and salivary flow rate in young adults	Arhakis et al ¹⁰⁹	2013	Open Dentistry Journal	36
86	Effectiveness of lasers in the treatment of dentin hypersensitivity	Asnaashari and Moeini ¹¹⁰	2013	Journal of Lasers in Medical Sciences	36
87	The effect of one-step and multi-step polishing systems on the surface roughness and microhardness of novel resin composites	Erdemir et al ¹¹¹	2012	European Journal of Dentistry	36
88	Comparison of the cleaning capacity of Mtwo and ProTaper rotary systems and manual instruments in primary teeth	Azar et al ¹¹²	2012	Dental Research Journal	36
89	Microleakage comparison of four dental materials as intra-orifice barriers in endodontically treated teeth	Yavari et al ¹¹³	2012	Iranian Endodontic Journal	36
90	Strategies used to inhibit postoperative swelling following removal of impacted lower third molar	Sortino and Cicciù ¹¹⁴	2011	Dental Research Journal	36
91	Self-reported dental health attitudes and behaviour of dental students in Turkey	Yildiz and Dogan ¹¹⁵	2011	European Journal of Dentistry	36
92	Effectiveness of chitosan tooth paste from white shrimp (Litopenaeus vannamei) to reduce number of Streptococcus mutans in the case of early childhood caries	Achmad and Ramadhany ¹¹⁶	2017	Journal of International Dental and Medical Research	35
93	Patient-centered evaluation of microsurgical management of gingival recession using coronally advanced flap with platelet-rich fibrin or amnion membrane: A comparative analysis	Agarwal et al ¹¹⁷	2016	European Journal of Dentistry	35
94	Photodynamic therapy - A non-Invasive treatment modality for precancerous lesions	Maloth et al ¹¹⁸	2016	Journal of Lasers in Medical Sciences	35

Table 2. Continued.

Rank	Document title	Authors	Year	Source	Cited by
95	An in vitro comparison of antimicrobial effects of curcumin-based photodynamic therapy and chlorhexidine, on <i>Aggregatibacter actinomycetemcomitans</i>	Najafi et al ¹¹⁹	2016	Journal of Lasers in Medical Sciences	35
96	Knowledge, attitudes, and experience of dentists living in Saudi Arabia toward child abuse and neglect	Al-Dabaan et al ¹²⁰	2014	Saudi Dental Journal	35
97	Prevalence of dental caries among 12-14 year old children in Qatar	Al-Darwish et al ¹²¹	2014	Saudi Dental Journal	35
98	Comparison of phenotype and differentiation marker gene expression profiles in human dental pulp and bone marrow mesenchymal stem cells	Ponnaiyan and Jegadeesan ¹²²	2014	European Journal of Dentistry	35
99	Treatment outcomes of primary molars direct pulp capping after 20 months: A randomized controlled trial	Fallahinejad Ghajari et al ¹²³	2013	Iranian Endodontic Journal	35
100	A cephalometric comparative study of class II correction with Sabbagh universal spring (SUS2) and forus FRD appliances	Oztoprak et al ¹²⁴	2012	European Journal of Dentistry	35
101	Correlation between metabolic syndrome, periodontitis and reactive oxygen species production. A pilot study	Patini et al ¹²⁵	2017	Open Dentistry Journal	35

had the highest citation number of 203. That review was about low-level laser therapy. The second rank belonged to another review²⁶ with 197 citations that highlighted the essential points of oral squamous cell carcinoma. In the third rank, with a citation density of 191, was a systematic review of the storage medium for an avulsed tooth.²⁷ In addition, the highest number of “citations per year” belongs to three articles published in “Open Dentistry Journal”,²⁸ “Cumhuriyet Dental Journal”,²⁷ and “Saudi Dental Journal”,²⁹ respectively (with 130, 95.5, and 88 citations per year, respectively).

Furthermore, the most studied subjects/subfields of dentistry were endodontics (24.8%), pediatric dentistry (9.9%), and oral/dentofacial surgery (7.9%). Review articles (39.6%), original in vitro studies (17.8%), and original questionnaire studies (8.9 %) were the most common study designs.

As shown in Table 3, according to the affiliation of corresponding authors, the countries affiliated with the highest number of most-cited articles were Iran (24.7%), India (18.8%), Italy (13.8%), and Saudi Arabia (12.8%). Table 4 shows the academic institutions which had the most contributions to the publication of highly cited articles as the affiliation of corresponding authors, with at least 2% contribution. The “College of Dentistry, King Saud University, Saudi Arabia” (10.9%) and “Saveetha Dental College, Chennai, India” (10.9%) were the institutions with the highest number of top documents. Table 5 shows the names of the most productive corresponding and first authors in the publication of highly cited articles in the considered journal, with at least a 2% total contribution. Cicciu, M. (7.9%) from Italy, and Azar M.R. (3.0%) and Bahador, A. (3.0%) both from Iran were the corresponding authors with the highest number of articles in the top 101. In addition, the first authors with the highest number of publications (all of whom contributed equally to 2%) were Felicita, A.S. from India, Rashid, H. from Pakistan, and Chiniforush, N. from Iran.

In the review of the corresponding authors and the first

Table 3. List of the Countries Contributing Over the Years Considered, in the Publication of Most-Cited Documents in the Dental Journals From the Middle East Countries, Frequency, and Percent of Their Papers

Rank of Country	Country Name	Frequency	Percent
1	Iran	25	24.7
2	India	19	18.8
3	Italy	14	13.8
4	Saudi Arabia	13	12.8
5	Turkey	9	8.9
6	Brazil	4	4.0
7	Greece	3	3.0
8	Pakistan	3	3.0
9	United States	2	2.0
10	Australia	1	1.0
11	Denmark	1	1.0
12	Egypt	1	1.0
13	Germany	1	1.0
14	Indonesia	1	1.0
15	Lebanon	1	1.0
16	Qatar	1	1.0
17	South Korea	1	1.0
18	Switzerland	1	1.0
Total		101	100

authors, both were from the same institution in 89 articles (88%). The only two cases of international collaboration were first between “Faculty of Health Sciences, University of Copenhagen, Denmark” and “Stockholm, Sweden”, and second between “Federal University of Santa Catarina, Florianopolis/SC, Brazil” and “Universidade Fernando Pessoa, Porto, Portugal”, respectively. Moreover, the collaboration between different universities in a country was observed in 10 papers.

“Saudi Dental Journal”, “European Journal of Dentistry”, “Iranian Endodontic Journal”, and “Journal of Lasers in Medical Sciences” achieved the highest CiteScore and SJR amongst the considered journals,

Table 4. Most Productive Academic Institutions in the Publication of Highly Cited Documents in Dental Journals From the Middle East Countries, With at Least 2% Contribution

Rank of Institution	Institution Name, Affiliated City, and Country	Frequency	Percent
1	King Saud University, Riyadh, Saudi Arabia	11	10.9
1	Saveetha University, Chennai, India	11	10.9
2	University of Messina, Messina, Italy	7	6.9
3	Shahid Beheshti University of Medical Sciences, Tehran, Iran	6	5.9
4	Tehran University of Medical Sciences, Tehran, Iran	3	3.0
5	Mashhad University of Medical Sciences, Mashhad, Iran	2	2.0
5	Shiraz University of Medical Sciences, Shiraz, Iran	2	2.0
5	Ziauddin University, Karachi, Pakistan	2	2.0

Table 5. Most Productive Authors in the Publication of Highly Cited Documents in Dental Journals From the Middle East Countries, With at Least 2% Contribution

Rank of Author	Author Name	Author Role, Frequency	Institution Name, Affiliated City, and Country	Total Frequency	Total Percentage of Contribution
1	Cicciu, M. ^{59,61,74,75,88,89,106,114}	Corresponding author, 7 papers; corresponding author and first author, 1 paper	University of Messina, Messina, Italy	8	7.9
2	Azar, M.R. ^{68,112,126}	Corresponding author, 2 papers; corresponding author and first author, 1 paper	Shiraz University of Medical Sciences, Shiraz, Iran	3	3.0
2	Bahador, A. ^{52,83,119}	Corresponding author, 3 papers	Tehran University of Medical Sciences, Tehran, Iran	3	3.0
3	Felicita, A. ^{34,36}	Corresponding author and first author, 2 papers	Saveetha Dental College, Chennai, Italy	2	2.0
3	Rashid, H. ^{45,68}	Corresponding author and first author, 2 papers	Ziauddin University, Karachi, Pakistan	2	2.0
3	Forghani, M. ^{77,86}	Corresponding author, 2 papers	Mashhad University of Medical Sciences, Mashhad, Iran	2	2.0
3	Chiniforush, N. ^{52,83}	First author, 2 papers	Tehran University of Medical Sciences, Iran	2	2.0

respectively. Moreover, the highest values in SNIP belong to “European Journal of Dentistry”, “Saudi Dental Journal”, and “Journal of Lasers in Medical Sciences”, respectively. Furthermore, “European Journal of Dentistry”, “Open Dentistry Journal”, and “Saudi Dental Journal” gained the highest “H-index”. The mean (SD) of the H-index of the reviewed journals was 15.58 (9.01). In addition, “Saudi Dental Journal”, “Dental Research Journal”, and “Journal of International Dental and Medical Research” had the longest continuous indexing time in Scopus from 2009 to 2021.

In analyzing the correlation between different bibliometric indices, the distribution of the variables was not normal. Through Spearman’s rho test, correlations between variables were obtained. CiteScore had statistical correlations with SJR ($r=0.828$, $P<0.001$), with SNIP ($r=0.732$, $P<0.001$), and with H-index ($r=0.472$, $P<0.001$). Thus, CiteScore and SJR had the highest correlations. Another index that we calculated was the citation per year for each of the 101 top articles of MENA dental journals. The citation per year of a paper did not have any statistical relationship with journals’ established bibliometric indices including SJR, CiteScore, SNIP, and H-index.

Discussion

Dental journals, which demonstrate the status and

progress of the academic environments, are invaluable in evaluating the researcher’s and countries’ research performance in the dentistry field¹⁰. Amongst considered journals, “European Journal of Dentistry” from Turkey, “Saudi Dental Journal” from Saudi Arabia, and “Iranian Endodontic Journal” and “Journal of Lasers in Medical Sciences” both from Iran had the highest rankings in “SCImago Database”, respectively.

To evaluate the considered journals, several indices have been studied. Any single metric of journal bibliometric analysis is not perfect. A scholarly communication system is a complex approach, and journal performance and citation measures are multi-dimensional concepts that are not possible to be expressed in a single indicator.³ Despite decades of research on bibliometric indicators, there is still a deep gap among funders, policymakers, publishers, and researchers to reach a common understanding of journal-based metrics (such as CiteScore) and altmetric-based metrics (such as the H-index) to have a balanced evaluation of research output.¹²⁷

According to the SCImago portal, and based on SJR, among dental journals affiliated with the Middle East countries, “European Journal of Dentistry” published in Turkey ranked first. This journal also had the highest majority of top papers and the highest SNIP and H-index amongst the reviewed journals. Furthermore, Turkey had the highest number of scientific documents in the

“Dentistry” field in the region.

Amongst the studied journals affiliated with MENA countries, in the SCImago ranking, “Saudi Dental Journal” was in the second rank. Furthermore, this journal achieved the highest CiteScore. In addition, the second rank in SNIP and in having the majority of top papers belonged to this journal. Simultaneously and with the same rank, the “College of Dentistry, King Saud University, Riyadh, Saudi Arabia” and “Saveetha Dental College, Chennai, India” had the highest number of top documents. Furthermore, published documents on health sciences by researchers in Saudi Arabia had significant growth in the last decade.¹²⁸

Based on SJR and CiteScore, two journals from Iran, “Iranian Endodontic Journal” and “Journal of Lasers in Medical Sciences”, stood at the third and fourth ranks amongst the reviewed journals. Moreover, the highest number of most-cited articles were affiliated with Iran, and according to the SCImago portal, Iran had the second-highest number of published scientific documents in the field of “Dentistry”. Another investigation declared that there was a progressive trend in the number of dentistry articles originating from Iran in the PubMed database.¹²⁹ Also, a previous comparison between Iran and other regional countries had shown a noticeable rise in the number of papers from different Iranian universities in the special field of endodontics in PubMed-indexed journals.¹³⁰ In addition, citations to articles written by Iranian authors in international endodontic textbooks have increased during the recent decade.¹³¹

In the present study, CiteScore, SJR, SNIP, and H-index showed significant correlations. The highest correlation value was found between CiteScore and SJR. Similar to the results we obtained, a bibliometric analysis indicated that IF, SNIP, CiteScore, and SJR were all significantly correlated.¹³² In addition, another study on the impact of open-access journals pointed out a significant correlation among CiteScore, H-index, and SJR.¹³³ Although contrary to the results of our study, the highest correlation value was between CiteScore and the H-index.¹³³ Moreover, the analysis of the pairwise comparison of bibliometric indicators suggested no interchangeability between them.¹⁷

Another index that we calculated was the citation per year for each of the 101 top articles in MENA dental journals. The citation per year of the 101 top documents had no significant relationship with any of the other studied indices. Thus, in the evaluated journals, the citation density of each article depended more on the characteristics of the article itself than on the characteristics of the journal. However, our findings were contrary to the results of a study in the field of medicine which indicated that citation rates of the studied articles had a significantly positive relationship with the journals’ SJR and SNIP.¹³⁴ Therefore, it is recommended that

scientific periodical publishing of each subject area be evaluated through various bibliometric indices which demonstrate different aspects of their characteristics.

One of our main limitations was that most dental journals published in MENA countries are not indexed or have been just recently indexed in “Clarivate/Web of Science Group”; therefore, they could not be evaluated according to their impact factors (IF). Instead of IF, we evaluated several other indicators, including CiteScore which has the most similarity to journal IF. However, IF computes the metric applying the two previous years as a basis for the citation count, but CiteScore uses a three-year period.¹³⁵

As the results of this study indicated, in dental journals of the MENA region, the number of citations to an article was more dependent on the quality of the article itself than the indices of the journal in which it was published. Furthermore, different bibliometric indices evaluated the number of citations in different conditions. Therefore, researchers can be recommended not to pay attention to just one or two indices of a journal to publish their article and to consider a set of bibliometric indicators and all the features and specifications of a scientific journal. Moreover, it is recommended that the dental journals of the Middle East/North Africa be reviewed in the next 5 years. Until then, journals included in the “Emerging Sources Citation Index” from this region will probably be indexed in the “Clarivate/Web of Science Master Journal List” and their IF can be reviewed.

Conclusion

Reviewing the scientific journals and the citation density of their documents needs a multifaceted approach to have a more comprehensive evaluation of the journal rankings. Among the reviewed bibliometric indices, CiteScore and SJR had the highest correlation. No significant correlation was observed between citations per year of the top 101 documents and any of the journals’ bibliometric indicators.

Furthermore, “European Journal of Dentistry” from Turkey, “Saudi Dental Journal” from Saudi Arabia, and “Iranian Endodontic Journal” and “Journal of Lasers in Medical Sciences” both from Iran have achieved the highest values in various bibliometric indicators and the highest places in “SCImago Journal Rankings”, respectively.

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Competing Interests

The authors had no conflict of interest.

Ethical Approval

Not applicable.

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