

ORIGINAL ARTICLE

A BIBLIOMETRIC ANALYSIS OF DENTAL LITERATURE PUBLISHED IN JOURNAL OF COLLEGE OF PHYSICIANS AND SURGEONS OF PAKISTAN, JCPSP

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Background: Bibliometric analysis of a particular specialty published in single journal allows the identification of publication trends, areas of focus and potential domains for future research that could be publishable within the scope of that journal. This study aimed to analyse the characteristics of dental literature published in JCPSP in order to determine the trend of publication of dentistry-related papers in this journal. **Methods:** An electronic and hand search was conducted of all JCPSP issues from 1991 till June 2018. The selected articles were analysed for year of publication, field of study, type of article, the names of first author, their gender and affiliation (institute, country), number of authors in each publication and citation count. Data was statistically analysed using SPSS version 20.0. **Results:** Out of approximately 5,400 published articles, 253 were included for analysis. Articles related to Oral and Maxillofacial surgery were in majority (n=54), followed by Operative Dentistry and Endodontics (n=38). Most (n=103) were original research articles. Pakistani authors contributed the majority of articles (n=184). The greatest number of dental articles were published in the year 2014 and 2017 (n=30). The institutions with the highest number of dental papers were Aga Khan University, Karachi and NIMS Dental College, Jaipur, India. The majority of articles were by Manas Bajpai as first author (n=22 articles). The highest citation count was found to be 55. **Conclusion:** Overall, the proportion of dentistry related articles published in JCPSP is low (4.6%). Researchers working in dental specialties where few publications were observed could be invited to submit relevant publications to JCPSP to broaden the scope of the journal. Foreign authorship should be encouraged to further elevate the standing of this journal. A separate journal for dental research in light of the continually increasing number of dental specialists and researchers is the need of the hour.

Keywords: Bibliometric study; Dental literature; JCPSP

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INTRODUCTION

Bibliometrics is a methodological approach to analyse published scientific literature.¹ The information yielded from such an analysis helps to statistically quantify the gradual influence that publications, institutes and researchers have made towards the propagation of evidence based practices. Because of the vast amounts of knowledge that is generated in any particular scientific field, it becomes essential to evaluate the relevant literature based on various characteristics, making it more meaningful and contextual.

The characteristics of domain or specialty-based articles provides a concise representation of the productivity and research development in that particular domain. Based on this information, themes can be generated to identify emerging areas of scientific performance as well as focusing on knowledge gaps that can

be addressed in future research projects.² Bibliometric data may not be limited to focusing a particular specialty, but can also be assessed and compared in selected journals that publish literature for a specific or similar domain^{3,4} or even on a single journal⁵. When conducted for a particular journal, insight emerges regarding the journal's scope, research orientation and the projected patterns of future research publications, highlighting the evolution of that journal.^{6,7}

Indexing in globally recognized databases is considered an important indicator of the quality of a journal. The United States National Library of Medicine (NLM) is considered the world's largest medical library, maintaining the biggest and most comprehensive database of medical literature known as MEDLINE.⁸ MEDLINE can be accessed through PubMed, which is basically a database access service. Because the NLM only indexes those

journals in MEDLINE which publish scientific literature of exceptional quality and credibility, therefore to be included in this database speaks volumes for the merit of such journals. Currently, four biomedical journals of Pakistan are accessible on PubMed.⁹ These are Journal of College and Physicians of Pakistan (JCPSP), Journal of Pakistan Medical Association (JPMA), Pakistan Journal of Medical Sciences (PJMS) and Journal of Ayub Medical College, Abbottabad (JAMC). Additionally, JCPSP, JPMA and JAMC are indexed in MEDLINE. These journals publish scientific literature from not only medicine and surgery but other healthcare and allied sciences including dentistry.

Dentistry as a specialty has slowly and gradually emerged in Pakistan. This progress includes the evolution of academics, career orientation and institutional policies, as well as research initiatives and development. Even though comprehensive bibliometric analysis of literature in these journals has been published^{6,10-12}, the trend of research publications in dentistry has not been observed in any of the aforementioned top tier biomedical journals of Pakistan.

To observe the articles related to dentistry in these biomedical journals would identify the proportion of publications that belong to dentistry and dental sciences, and the type of articles that are most frequently published. It would also help to highlight the scientific contribution of dental professionals and researches in making a niche among a vast number of research publications within these journals. Since bibliometric data from an extensive number of publications is presented in an easily comprehensible and concise form, therefore if research from any dental specialty is found deficient after such an analysis, it can help motivate and gear-up the scientific initiative in that direction.

In this manner, the journal would also be expected to receive novel ideas and observations for possible publication. Since no such study for dental scientific literature has been conducted for any of these top-quality biomedical journals of Pakistan, therefore the authors aimed to conduct the bibliometric analysis of dental literature published in the JCPSP, which is widely recognized for its multidisciplinary publications and wide readership. Because JCPSP encourages publication of the dissertation of post-graduate fellows (FCPS) including dental specialties as research articles, therefore this journal was chosen to be the first to be analysed among the

local indexed biomedical journals, with consideration that a greater number of pertinent articles could be retrieved. However, the same authors already have a manuscript under-review for a similar study conducted on another indexed local journal, with plans to do the same for all the afore-mentioned journals, followed by a comparative analysis.

The objective of the present study was to conduct bibliometric analysis of all published articles related to dentistry as well as any other pertinent literature of relevance to dental professionals that has been published in the JCPSP, in order to recognize the trend of publication of dental research articles in this journal.

MATERIAL AND METHODS

All issues of JCPSP were hand and electronically searched for articles relevant to dentistry and dental sciences, using keywords in various combinations, including but not limited to dentistry, dental, dental procedures, operative, restorative, endodontics, orthodontics, prosthodontics, oral, oral cavity, oral surgery, maxillofacial and paediatric dentistry. Besides using these keywords, each and every article (both in printed form and those available online) starting from the first volume and issue published in October 1991, till June 2018 was methodically scanned (observing Title, abstract, content) for relevant publications specific to dentistry as well as from other specialties but with relevance to dental professionals. Among such articles, only those articles where the keywords were not matching the content of the paper were to be excluded but no such articles were detected. All printed issues were available at the Faculty of Health Sciences Library, Aga Khan University; hence the hand search was conducted there (KZ, SA).

Only issues published after 2006 onwards were available online on the journal's website, but since the website of the journal (<https://www.jcpsp.edu.pk>) was easily accessible to the authors and was simple to navigate, the authors (KZ, SA) conducted the electronic search themselves. Both authors cross-checked and scrutinized the printed and electronic issues in order to minimize the chance of inadvertently excluding any relevant article, and any disagreement for the suitability of an article was resolved by the third investigator (FRK).

Since both the printed and electronic versions of the issues were easily accessible, hence the assistance of the librarian was not

sought and all aspects of the literature search were conducted by the authors themselves. Around 270 issues, including supplements, with approximately 5,400 articles were evaluated for inclusion. All literature that was retrieved was screened for appropriateness for final selection as per the inclusion criteria (FRK). All scientific publications that were finalized to be included were then characterized based on the year of publication, field of study, type or category of article, the names of first author as well as their gender and affiliation (institute, country), number of authors in each publication and citation count. Data was analysed using SPSS version 20.0 for frequencies of the descriptive variables.

RESULTS

Out of approximately 5,400 articles published in JCPSP between October 1991 and June 2018, a total of 253 articles that were relevant to dentistry were selected with a proportion of 4.6% (Table 1). Out of these articles, most were from the specialty of Oral and Maxillofacial Surgery (n=54), followed by Operative Dentistry & Endodontics (n=38) (Table-2). Based on the category, there were 103 original articles, followed by case report/case series (n=83) and letters to the editors (n=42) (Table 3). The country of affiliation of the first authors is given in Figure-1, with most relevant publications seen from Pakistan (73%), followed by India (18%).

A total of 99 institutes had contributed to the articles relevant to dentistry. The top institutes that had contributed the highest number of papers to this journal are given in Table-4, with the Aga Khan University ranking first. The number of articles published per year are represented in Figure-2. The gender distribution of the first authors is given in Figure 3, where males authors are seen in higher number (n=160) as compared to females. The greatest number of articles were those with two authors, followed by three authors and then articles written by a single author (Table-5).

The first authors with the greatest number of relevant publications were also identified, with the top contributors mentioned in Table-6. The highest number of articles were by Manas Bajpai (n=22 articles). The remaining authors not mentioned in the Table 6 had three or less articles as first authors. The highest number of citations that a dental article published in JCPSP received as indicated by Google Scholar was found to be 55. Table-7 shows the number of citations received by the included dental articles

as seen in Google Scholar. For 19 articles, no citation information could be found.

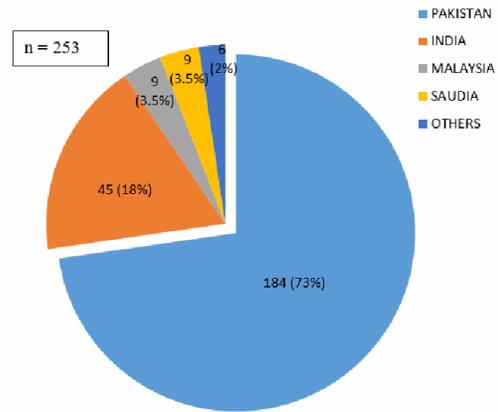


Figure-1: Number of dental publications according to first author's geographical affiliation
 * Others include Jordan, Sudan, Brazil and Ireland, United Kingdom and United States of America

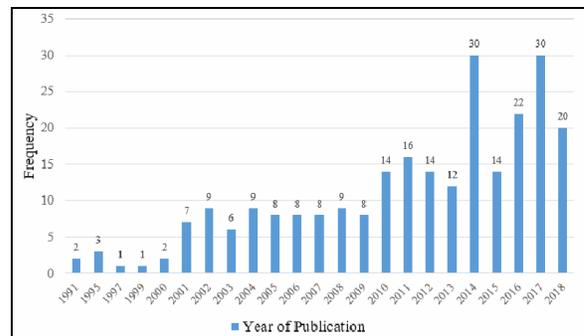


Figure-2: Number of dental articles published in JCPSP per year during 1991-2018

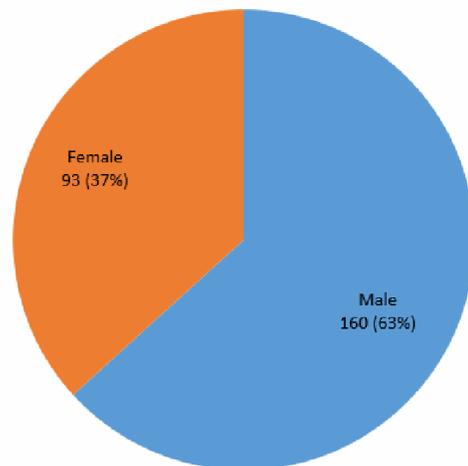


Figure-3: Gender distribution of first authors

Table-1: List of dental and dentistry relevant articles published in JCPSP during 1991-2018

S. No.	Title	Author	Year of publication	Volume	Issue
1.	Comparison of retrograde, primary and secondary bonding materials with tooth substance	Khan TN	2018	28	01
2.	Non-Vascularized autogenous bone grafts for reconstruction of maxillofacial osseous defects	Ahmed W	2018	28	01
3.	Relationship among hypovitaminosis D, maternal periodontal disease, and low birth weight	Khan FR	2018	28	01
4.	Pleomorphic adenoma of submandibular gland with extensive cystic keratinization	Bajpai M	2018	28	01
5.	Increased risk of dental issues in type II diabetics	Chidambarm R	2018	28	01
6.	Aneurysmal bone cyst of mandible with classical histopathological presentation	Bajpai M	2018	28	02
7.	Benign Migratory Glossitis	Khan S	2018	28	02
8.	Orthodontic management of multiple dilacerations	Qadeer TA	2018	28	03
9.	Mandibular Osteomyelitis as a complication of Ramsay Hunt syndrome in an elderly patient	Nath S	2018	28	03
10.	Ulcerative lesions of the palate and lower lip unmasking Sarcoidosis	Bajpai M	2018	28	03
11.	Comparison of geometric design of a brand of stainless-steel K-Files: an in vitro study	Saeedullah M	2018	28	04
12.	Basal Cell Ameloblastoma of mandible: a case with proposed diagnostic criteria	Bajpai M	2018	28	04
13.	Evaluation of microleakage in single-rooted teeth obturated with thermoplasticized gutta-percha using various endodontic sealers: an in-vitro study	Lone MM	2018	28	05
14.	Molecular pathogenesis of chewable tobacco	Baig S	2018	28	05
15.	Peripheral Osteochondroma of buccal mucosa	Bajpai M	2018	28	05
16.	Osteoid Osteoma of jaw in a 54-year male	Bajpai M	2018	28	06
17.	Secondary Ameloblastic carcinoma of mandible with pulmonary metastasis	Tajammul SS	2018	S2-28	06
18.	Successful use of Deltopectoral flap in reconstruction of defect caused by Squamous Cell carcinoma	Abrar Y	2017	S2-28	06
19.	Central Giant Cell Granuloma with aneurysmal bone cyst in a 28-year male patient: a rare concurrence	Chandolia B	2017	S2-28	06
20.	Surgical uncovering and Orthodontic positioning of unerupted maxillary right canine and left central incisor	Mengal N	2017	S2-28	06
21.	Premolar Cystic Ameloblastoma in a child	Pathak S	2017	27	01
22.	Psammomatoid Juvenile Ossifying Fibroma of mandible in a 41-year male patient	Chandolia B	2017	27	01
23.	Cartilaginous Choristoma of gingiva	Bajpai M	2017	27	01
24.	Salivary Duct Carcinoma of the parotid gland: report of two cases in females	Shah SA	2017	27	02
25.	Intramural Unicystic Ameloblastoma	Bajpai M	2017	27	02
26.	Angiomyxolipoma of tongue	Bajpai M	2017	27	04
27.	Cardiologist-Dentist interaction in the dental management of immunocompromised cardiac patient	Chidambaram R	2017	27	04
28.	Application of functional impression technique and use of silicone as bulb for maxillary obturator	Rahman AM	2017	27	05
29.	Good News: dentists are competent in diagnosing undiagnosed sleep apnea	Chidambaram R	2017	27	05
30.	Efficacy and toxicity of concurrent Chemo-radiation in inoperable oral carcinoma in Pakistani population	Rehman A	2017	27	06
31.	Critical analysis of Piezoelectric surgery with Oscillating Saw in bimaxillary orthognathic surgery	Akbar Z	2017	27	06
32.	Five-year follow-up of a coronally advanced flap over grafted bone and restorative composite in maxillary recession defect	Hussain SM	2017	27	06
33.	Multiple Mott cells in periapical lesion of the oral cavity	Arora M	2017	27	06
34.	Rapid and promising technique to treat gummy smile – lip repositioning	Khan MN	2017	27	07
35.	Prognostic potential of N-Cadherin in oral squamous cell carcinoma via immunohistochemical methods	Chandolia B	2017	27	08
36.	Prosthetic rehabilitation of a partially edentulous patient with maxillary acquired defect by a two-piece hollow bulb obturator (using a dentogenic concept)	Kulkarni PR	2017	27	08
37.	Calcifying cystic odontogenic tumor	Bajpai M	2017	27	09
38.	Polymorphous low-grade Adenocarcinoma of hard palate: a histopathological pictorial	Bajpai M	2017	27	10
39.	Rehabilitation of a complex oro-facial defect by modified prosthetic approach	Singh SV	2017	27	11
40.	Solitary Neurofibroma of Gingiva – an immune-histochemical interpretation using S-100	Bajpai M	2017	27	11
41.	Mucoepidermoid carcinoma in a 62-year female	Chandolia B	2017	27	12
42.	Superficial Angiomyxoma of Palate	Bajpai M	2017	27	12
43.	Glandular Odontogenic cyst	Chandolia B	2017	S1-27	03
44.	Osteogenic Sarcoma of mandible	Bajpai M	2017	S1-27	03
45.	Extra-Osseous Odontogenic Myxoma of maxillary gingiva	Bajpai M	2017	S1-27	03
46.	Basal Cell Adenoma of hard palate involving maxillary alveolus	Bajpai M	2017	S2-27	09
47.	Ortho Keratinized Odontogenic Cyst with Dentinoid Formation	Bajpai M	2017	S2-27	09
48.	Giant Osteosarcoma of the mandible	Bajpai M	2016	S2-27	09

49.	Prosthodontic management of Palatopharyngeal incompetency – a case report on palatal lift prosthesis	Kazmi SMR	2016	S2-27	09
50.	Langerhans Cell Histiocytosis involving both jaws in an adult	Salam S	2016	S2-27	09
51.	Comparison of anaesthetic efficacy of 4% articaine primary buccal infiltration versus 2% lidocaine inferior alveolar nerve block in symptomatic mandibular first molar teeth	Zain M	2016	26	01
52.	in-vitro comparative study of in-office and home bleaching agents on surface micro-morphology of enamel	Fatima N	2016	26	01
53.	in vitro comparative study of two different bleaching agents on micro-hardness dental enamel	Fatima N	2016	26	02
54.	Comparison of micro-leakage around temporary restorative materials placed in complex endodontic access cavities: an in-vitro study	Adnan S	2016	26	03
55.	platform-switching to preserve peri-implant bone: a meta-analysis	Aslam A	2016	26	04
56.	occupational hazards among dental surgeons in Karachi	Baig NN	2016	26	04
57.	bilateral radicular cyst with severe destruction of the buccal cortical plate secondary to endodontic failure	Ghafoor R	2016	26	04
58.	frequency of addictive habits and its association with oral diseases among a cross section of Indian police personnel connotation	Singh A	2016	26	05
59.	Epignathus Teratoma	Akhter R	2016	26	05
60.	Determination of prevalence of dental erosion in 12–14 years school children and its relationship with dietary habits	Shahbaz U	2016	26	07
61.	A proposed classification to identify the oral manifestations of Genodermatoses	Arora M	2016	26	07
62.	Intraosseous vascular tumor of mandible	Bajpai M	2016	26	07
63.	Bioimpedance for oral cancer detection in clinical practice and its applicability in developing nations	Bajpai M	2016	26	08
64.	Caries with dental fluorosis and oral health behaviour among 12-year school children in moderate-fluoride drinking water community in Quetta, Pakistan	Sami E	2016	26	09
65.	An in-vitro evaluation of microleakage at the cervical margin between two different class II restorative techniques using dye penetration method	Jawaed NU	2016	26	09
66.	Dentoalveolar heights in vertical and sagittal facial patterns	Islam ZU	2016	26	09
67.	Association of smokeless tobacco with oral cancer – evidence from the south Asian studies: a systematic review	Awan KH	2016	26	09
68.	Intravascular Papillary Endothelial Hyperplasia of palate	Bajpai M	2016	26	09
69.	Papillon-Lefevre Syndrome: prosthodontic rehabilitation of oral function	Aslam A	2016	26	10
70.	Canalicular Adenoma arising in buccal mucosa	Bajpai M	2015	26	11
71.	stafhe bone cavity complicated by periapical infection	Atil F	2015	S2-26	11
72.	Concurrence of Torus Palatinus, Torus Mandibularis and Buccal Exostosis	Khan S	2015	S2-26	11
73.	Comparison of Articaine and Lignocaine for uncomplicated maxillary exodontia	Luqman U	2015	25	03
74.	Relationship and inter observer agreement of tooth and face forms in a Saudi subpopulation	Habib SR	2015	25	04
75.	Severe Gingival Recession: gingival veneer a method of camouflage	Burhan R	2015	25	07
76.	Dentist-Urologist interplay in the dental management of penile prosthesis patient	Ramasamy C	2015	25	08
77.	Clinical evaluation of proximal contact points in fixed prostheses	Qayyum A	2015	25	09
78.	Methods of sterilization and monitoring of sterilization across selected dental practices in Karachi, Pakistan	Ahmed H	2015	25	10
79.	Comparison of efficacy of Carbon Dioxide (CO ₂) laser with cutting diathermy in surgical excision of early carcinoma tongue	Rashid R	2015	25	10
80.	Micromechanical intervention in sandwich restoration	Khan TN	2015	25	11
81.	Comparison of INTERCANINE and INTERMOLAR width between cleft lip palate and normal class I occlusion group	Wahaj A	2015	25	11
82.	Implementation of oral health education to orphan children	Khedekar M	2015	25	12
83.	Tooth-Bleaching: A review of the efficacy and adverse effects of Various tooth whitening products	Majeed A	2015	25	12
84.	Giant Pleomorphic Adenoma of the Parotid Gland	Sajid M	2014	S2-25	10
85.	Oral Manifestations of Osteopetrosis	Ullah A	2014	S2-25	10
86.	Oral Leiomyoma in Retro-molar Trigone	Hira Ejaz KM	2014	S2-25	10
87.	Monoblock obturation technique for non-vital immature permanent maxillary incisors using mineral trioxide aggregate: results from case series	Iqbal Z	2014	24	01
88.	Applicability of Pont's Index in Orthodontics	Rathi MK	2014	24	04
89.	Severe alveolar bone loss around the mandibular incisor teeth as a long-term effect of tongue-piercing	Correa FO	2014	24	05
90.	Postoperative sensitivity of self-etch versus total etch adhesive	Yousaf A	2014	24	06
91.	Overhanging Amalgam Restorations by Undergraduate Students	Quadir F	2014	24	07
92.	Effects of pre-operative submucosal Dexamethasone injection on the postoperative swelling and trismus following surgical extraction of mandibular third molar	Ehsan A	2014	24	07
93.	Frequency of gingival display during smiling and comparison of biometric measurements in subjects with and without gingival display	Khan F	2014	24	07
94.	Submandibular gland involvement in early stage oral cavity carcinomas: can the gland	Ashfaq K	2014	24	08

	be left behind?				
95.	Bilateral maxillary canine-first premolar transposition in permanent dentition	Memon S	2014	24	08
96.	A simplified Indian coding proposed for forensic dental identification	Shamim T	2014	24	08
97.	ophthalmic injuries in orbito-zygomatic fractures	Riaz N	2014	24	09
98.	An analysis of deformities in revision surgeries for secondary unilateral cleft lip	Cheema SA	2014	24	09
99.	Host modulation therapeutics in periodontics: role as an adjunctive periodontal therapy	Shinwari MS	2014	24	09
100.	Comparison of hyoid bone position among cleft lip palate and normal subjects	Wahaj A	2014	24	10
101.	Frequency of p53 gene mutation and protein expression in oral Squamous Cell Carcinoma	Ara N	2014	24	10
102.	Is synthetic mouthwash the final choice to treat oral malodour?	Jameel RA	2014	24	10
103.	interpretive versus didactic learning approach towards oral biology: a student's perspective	Farooq I	2014	24	10
104.	Distribution of Oral Ulcerations in the Western Indian population	Patil S	2014	24	10
105.	Effect of denture cleansers on the color stability of heat cure acrylic resin	Amin F	2014	24	11
106.	Plaque index in multi-bracket fixed appliances	Zafar ul islam	2014	24	11
107.	The effect of selected plant extracts on the development of single-species dental biofilms	Rahim ZHA	2014	24	11
108.	Role of antimicrobial irrigants in root canal treatment	Asghar S	2014	24	11
109.	Developing professionalism: dental students' perspective	Ashar A	2014	24	12
110.	The mean visible labial length of maxillary and mandibular anterior teeth at rest	Khan F	2014	24	12
111.	Dentist-nephrologist symbiosis in the dental management of chronic kidney disease patient	Chidambaram R	2014	24	12
112.	Prosthetic rehabilitation of Papillon Lefevre syndrome	Ahmed B	2014	S2-24	05
113.	Rehabilitating mandibular resection with guide flange prosthesis	Aggarwal H	2014	S2-24	05
114.	MTA monoblock obturation technique in endodontic retreatment	Iqbal Z	2013	S3-24	11
115.	Partial expression of the Papillon-Lefevre syndrome	Shanavas M	2013	S3-24	11
116.	Intra-Parotid Dermoid Cyst: excision through a face lift incision	Shakeel M	2013	S3-24	11
117.	Fibrin sealant as an alternative for sutures in periodontal surgery	Pulikkotil SJ	2013	23	02
118.	A strategic behaviour guidance tool in paediatric dentistry: 'reframing' – an experience	Nuvvula S	2013	23	03
119.	Knowledge and reported practice of antibiotic prescription by dentists for common oral problems	Tanwir F	2013	23	04
120.	The need of paediatric dentistry specialists in Pakistan	Khan FR	2013	23	04
121.	Effectiveness of commonly available surface protecting agents in maintaining microhardness of two cements	Fatima N	2013	23	05
122.	Bioresorbable versus Titanium plates for mandibular fractures	Ahmed W	2013	23	07
123.	Mandibular Ameloblastic Carcinoma	Shahin KA	2013	23	09
124.	A simple working classification proposed for the iatrogenic lesions of teeth and associated structures in the oral cavity	Shamim T	2013	23	09
125.	Is photodynamic therapy with adjunctive non-surgical periodontal therapy effective in the treatment of periodontal disease under immunocompromised conditions?	Javed F	2013	23	10
126.	Xeroderma pigmentosum with melanoma of face and its prosthetic management	Sadaf A	2012	23	10
127.	Oral white lesions: presentation and comparison of oral submucous fibrosis with other lesions	Maqsood A	2012	23	12
128.	Prosthetic management of a patient with Ectodermal Dysplasia	Nandini Y	2012	23	12
129.	Dentoalveolar heights in skeletal class I Normodivergent facial patterns	Shaikh A	2012	22	01
130.	Efficacy of intra-alveolar Chlorhexidine gel in reducing frequency of alveolar osteitis in mandibular third molar surgery	Babar A	2012	22	02
131.	Human Papilloma virus and oral lesions in Gutka eating subjects in Karachi	Baig S	2012	22	03
132.	Transpapillary versus palatal injection technique for maxillary tooth extractions	Janjua OS	2012	22	03
133.	Rapidly progressive periodontal disease associated with human immunodeficiency virus	Hezaimi KA	2012	22	03
134.	Microaesthetics of the smile: extraction vs. non-extraction	Tauheen S	2012	22	04
135.	Forensic Odontology	Shamim T	2012	22	04
136.	Effect of glycemic control on periodontal status	Tanwir F	2012	22	06
137.	Lip line preference for variant face types	Anwar N	2012	22	06
138.	Post-traumatic apexogenesis of immature non-vital permanent incisors	Ghafoor R	2012	22	07
139.	Mandibular reconstruction using osteocutaneous radial forearm flap	Rashid M	2012	22	08
140.	Distraction Osteogenesis for Correcting Maxillo-mandibular Deformities	Bukhari SGA	2011	22	09
141.	A simple working type classification proposed for the psychosomatic disorders of the oral cavity	Shamim T	2011	22	09
142.	Fibrous Dysplasia of mandible	Ashrafi SK	2011	22	11
143.	Comparison of convergence angle of prepared teeth for full veneer metal ceramic crowns	Ghafoor R	2011	21	01
144.	Maxillofacial rehabilitation of a large cleft palate using fixed-removable prosthesis	Ahmed B	2011	21	01
145.	Cervical lymph node metastases in Squamous Cell Carcinoma of tongue and floor of mouth	Ehsan ul haq M	2011	21	01
146.	A New working classification proposed for Forensic Odontology	Shamim T	2011	21	01
147.	Porcelain Fused to Metal (PFM) crowns and caries in adjacent teeth	Ahmad Z	2011	21	03
148.	Oral Hygiene KAP Assessment and DMFT scoring among children aged 11-12 years in	Vakani F	2011	21	04

	an urban school of Karachi				
149	Over dental anxiety problems among university students: perspective from Pakistan	Shaikh MA	2011	21	04
150	Rehabilitation of a large maxillo-facial defect using acrylic resin prosthesis	Ahmed B	2011	21	04
151	En bloc resection of huge Cemento-ossifying Fibroma of mandible: avoiding lower lip split incision	Ayub T	2011	21	05
152	Gaining retention, support and stability of a maxillary obturator	Raja HZ	2011	21	05
153	Effect of different irradiation times on microhardness and depth of cure of a nanocomposite resin	Akram S	2011	21	07
154	Correction of airway obstruction in congenital micrognathia by mandibular Distraction Osteogenesis	Ali SGB	2011	21	07
155	Helicobacter pylori in dental plaque; is it related to brushing frequency, plaque load and oral health status?	Chaudhry S	2011	21	10
156	Clinical applicability of variations in arch dimensions and arch forms among various vertical facial patterns	Anwar N	2010	21	11
157	Lingual Tuberculosis	Naseem K	2010	21	11
158	Composite curing units used in academic dental institutions of Karachi	Khan FR	2010	21	12
159	Forensic Odontology	Shamim T	2010	20	01
160	Vertical facial and dental arch dimensional changes in extraction vs. non-extraction orthodontic treatment	Kumari M	2010	20	01
161	Rehabilitation of nose using silicone based maxillofacial prosthesis	Ahmed B	2010	20	01
162	Oral Lichen Planus: a clinical study	Bajaj DR	2010	20	03
163	Dental maturity amongst various vertical and sagittal facial patterns	Sukhia RH	2010	20	04
164	Oral self-screening among students of Dow university of health sciences	Rasool S	2010	20	06
165	relationship of neutral zone and alveolar ridge with edentulous period	raja hz	2010	20	06
166	Soft tissue profile response in extraction versus non-extraction orthodontic treatment	Khan M	2010	20	07
167	Mucosal Lichen Planus simultaneously involving oral mucosa, conjunctiva and larynx	Shaikh ZI	2010	20	07
168	Dental education in Pakistan: current trends and practices	Amin M	2010	20	08
169	Comparison of three mixed dentition analysis methods in orthodontic patients at AKUH	Memon S	2010	20	08
170	Variability of arch forms in various vertical facial patterns	Anwar n	2009	20	09
171	Replacement of resin-based composite restorations in permanent teeth	Asghar S	2009	20	10
172	Reconstruction of mandible by free fibular flap	Riaz N	2009	20	11
173	Evaluation of dentoalveolar compensation in skeletal class II malocclusion in a Pakistani university hospital setting	Anwar N	2009	19	01
174	Hypodontia and Microdontia associated with hereditary Ectodermal Dysplasia	Ahmed B	2009	19	03
175	Factors associated with non-carious cervical lesions (NCCLs) in teeth	Ahmed H	2009	19	05
176	A study of flare-ups following single-visit root canal treatment in endodontic patients	Kalhor FA	2009	19	07
177	Variations in powder/liquid ratio of a restorative and luting glass ionomer cement in dental clinics	Iqbal K	2009	19	07
178	Frequency and distribution of endodontically treated teeth	Ahmed H	2008	19	10
179	Dental clinic as a health centre for screening of undiagnosed Diabetes	Tanwir F	2008	19	12
180	Comparison of cephalometric norms of esthetically pleasing faces	Jawaid A	2008	19	12
181	Mandibular second premolar with three canals	Syed S	2008	18	
182	Severe recurrent oral ulceration secondary to erosive Lichen Planus	Nadeem A	2008	18	02
183	Ossifying Fibromyxoid Tumor of oral cavity	Sharif MA	2008	18	03
184	Efficacy of chemo-mechanical caries removal with Carisolv	Hussein T	2008	18	04
185	Candida smear-an adjunct for diagnosis of Acantholytic cells in oral Pemphigus Vulgaris	Shamim T	2008	18	06
186	Assessment of psychosocial impact of dental aesthetics	Khan M	2008	18	09
187	Cleidocranial dysplasia in a young girl	Rasool S	2007	18	10
188	A comparison of cephalometric analyses for assessing sagittal jaw relationship	Erum G	2007	18	11
189	Biphasic Synovial Sarcoma of oral cavity	Sharif MA	2007	18	11
190	Frequency of two canals in maxillary second premolar tooth	Sardar KP	2007	17	01
191	Etiology and pattern of maxillofacial injuries in the armed forces of Pakistan	Khan SU	2007	17	02
192	Biphasic resection of a mandibular molar	Qazi SS	2007	17	05
193	Occult metastasis in carcinoma of oral cavity	Ahmed MU	2007	17	06
194	Morphological characteristics affecting extraction decision in class II division 1 malocclusion in females	Bherwani AK	2007	17	08
195	Bisphosphonates: A potential cause of osteonecrosis of jaws	Vohra FA	2006	17	09
196	Commentary on "Oral Stereognostic ability: A test of oral perception	Siddiqui AA	2006	17	11
197	Oral Lichen Planus	Rasool S	2006	17	12
198	Hypohidrotic ectodermal dysplasia	Ahmed B	2006	16	01
199	Localized morphoea associated with oral submucous fibrosis	Mashood AA	2006	16	02
200	Severe postburn contracture of the cheek mucosa leading to false TMJ ankylosis	Cheema SA	2006	16	02
201	Association of smoking with lymph node metastasis in early stages of squamous cell carcinoma of tongue (Letter to the editor)	Nisar YB	2006	16	04
202	Dental education in Pakistan: perception and perspectives	Bokhari SAH	2006	16	09
203	Submandibular duct Sialolithiasis	Shafi M	2005	16	10
204	Dentigerous cyst presenting as facial pain	Manzoor T	2005	16	12
205	Oral Stereognostic ability: a test of oral perception	Ahmed B	2005	16	12
206	Temporal fascia as interpositioning material in cases of temporomandibular ankylosis	Cheema SA	2005	15	01
207	Squamous cell carcinoma of lower lip: An experience with Karapandzic technique	Khan MI	2005	15	02

208	Mucormycosis causing palatal necrosis and orbital apex syndrome	Ali S	2005	15	03
209	Association of smoking with lymph node metastasis in early stages of squamous cell carcinoma of tongue	Hussain A	2005	15	05
210	Oral candidal species among smokers and non-smokers	Rasool S	2005	15	11
211	The efficacy of local infiltration of Triamcinolone Acetonide with lignocaine compared with lignocaine alone in the treatment of post herpetic neuralgia	Amjad M	2004	15	11
212	Modified maxillary protraction headgear for the correction of class III skeletal malocclusion with anterior open bite	Qazi HS	2004	15	12
213	Relation between centric slide and angle's classification	Afzal A	2004	15	08
214	Odontogenic cervical necrotizing fasciitis	Ashar A	2004	14	02
215	Management of oromandibular carcinomas	Rashid M	2004	14	01
216	Frequency of dens evaginatus of permanent anterior teeth	Sobhi MB	2004	14	02
217	Evidence of helicobacter pylori infection in dental plaque and gastric mucosa	Siddiq M	2004	14	04
218	Zygomatic bone fracture	Cheema SA	2004	14	06
219	Surgical management of epithelial parotid tumors	Obaid MA	2004	14	07
220	Comparison of vertical versus lateral condensation technique in obturation of root canal system	Sobhi MB	2003	14	08
221	Efficacy of camphorated paramonochlorophenol to a mixture of honey and mustard oil as a root canal medicament	Sobhi MB	2003	14	10
222	Placement and replacement of dental restorations	Mahmood S	2003	14	10
223	Reconstruction of lip defects with the Karapandzic technique	Rashid M	2003	13	04
224	Penetration depth of NiTi and stainless steel finger spreaders in curved root canals	Sobhi MB	2003	13	02
225	Autotransplantation of endodontically treated third molars	Sobhi MB	2003	13	07
226	Dermoid cyst of the floor of the mouth	Saifuddin	2002	13	07
227	Atypical tongue-tie due to tongue palatal fusion	Saifuddin	2002	13	08
228	Success rate of resin bonded bridges	Rashid S	2002	13	12
229	An in-vitro study of change in working length following instrumentation of 1st molar teeth	Sobhi MB	2002	12	02
230	Skeletal relapse following orthognathic surgery	Burki S	2002	12	02
231	Mucous membrane pemphigoid	Amanat N	2002	12	03
232	Plunging ranula: A surgical complication	Saifuddin	2002	12	08
233	Congenital teratoma of the hard palate (Epiganthus)2002	Khan D	2002	12	09
234	An index study of orthodontic treatment need in a teaching hospital	Bashir U	2002	12	10
235	Comparison of the effects of banded and bonded rapid palatal expansion	Burki S	2001	12	11
236	Management of zygomatic fractures	Nayar MS	2001	12	11
237	Traumatic oral ulceration	Banday N	2001	12	11
238	Rationale for coronoidectomy in the management of temporomandibular joint ankylosis	Akhter MU	2001	11	01
239	Correlation of dental aesthetics with malocclusion severity	Fida M	2001	11	01
240	Management of TMJ ankylosis: A long term comparative study	Akhter MU	2001	11	02
241	The effect of active ingredients on the efficacy of denture fixatives	Ghani F	2001	11	06
242	Clinical evaluation of restorative materials in primary molars	Sobhi MB	2000	11	07
243	A rare case of malignant ameloblastoma with multicentric presentation	Niamat ullah	2000	11	08
244	Hydatid disease of the submandibular gland	Khan N	1999	11	10
245	Orthodontic treatment need in a sample of Pakistani population	Fida M	1997	10	10
246	The carcinoma tongue-incidence risk factors, presentation and treatment	Asif M	1995	10	12
247	Submandibular salivary gland masses: A clinicopathological study	Ma'aita J	1995	09	06
248	Management of congenital cleft lip: An eight year experience	Rashid M	1995	07	05
249	Guided tissue regeneration: a clinical study in the use of bovine collagen	Haider PR	1991	05	03
250	Palatal teratoma	Khan MS	1991	05	03
251	Use of connective tissue autograft in the treatment of gingival recession	Rahman B	2018	05	06
252	The treatment of oral fibrosis with carbon dioxide (CO ₂) Laser	Jilani SA	2018	01	01
253	Surgical restoration of the mouth in oral submucous fibrosis	Hussein M	2018	01	01

Table-2: Number of published papers in various fields of dentistry

S. No.	Field of the study	Number of studies	Percentage
1.	Oral and Maxillofacial Surgery	54	21.3
2.	Operative Dentistry & Endodontics	38	15
3.	Orthodontics	29	11.5
4.	Prosthodontics	29	11.5
5.	Oral Pathology and Histopathology	25	9.9
6.	ENT (Otolaryngology)	16	6.3
7.	Oral Medicine and Diagnosis	11	4.3
8.	Periodontology	11	4.3
8.	Oral Health and Hygiene	6	2.4
9.	Dental Materials	5	2
10.	Plastic Surgery	4	1.6
11.	Forensic Odontology	4	1.6
12.	Others*	21	8.3
	Total	253	100

*Others include Community Dentistry, Knowledge and Dental Education, Paediatric Dentistry, General Surgery, Dermatology, Gastroenterology, Gynaecology, Psychology, Biochemistry, and Pedodontics etc.

Table-3: Number of published papers according to type/category

S. No.	Type of article	Number of studies	Percentage
1.	Original research article	103	40.7
2.	Case reports/series	83	32.8
3.	Letters to the editors	42	16.6
4.	Short communication	10	4
5.	Reviews	09	3.5
6.	Editorials	03	1.2
7.	Others*	03	1.2

*Others include clinical techniques, evidenced based reports, and meta-analysis.

Table-4: Institutes with the highest number of dental articles published in JCPSP (1991-2018)

S. No	Top institutes	Number of articles
1.	Aga Khan University & Hospital, Karachi, Pakistan	27
2.	NIMS University Dental College, Jaipur, India	27
3.	Armed Forces Institute of Dentistry, Islamabad, Pakistan	20
4.	Dow University of Health Sciences	16
5.	Ziauddin University	8
6.	Fatima Jinnah College of Dentistry	8
7.	De'Montmorency College of Dentistry	7

Table-5: Number of authors per paper of dental articles published in JCPSP during 1991-2018

S. No.	Number of authors	Number of articles	Percentage
1	Two	80	31.6
2	Three	49	19.1
3	One	38	15
4	Four	38	15
5	Five	26	10.3
6	Six	15	5.9
7	Seven	4	1.6
8	Eight to Ten	3	1.2
	Total	253	100

Table-6: Authors with the highest number of dental articles as first authors published in JCPSP during 1991-2018

S. No	First Author	Number of articles	Percentage
1.	Manas Bajpai	22	8.6
2.	Thorakkal Shamim	7	2.7
3.	Muhammad Bakhsh Sobhi	7	2.7
4.	Bilal Ahmad	7	2.7
5.	Betina Chandolia	5	1.9
6.	Saeed Ashraf Cheema	4	1.5
7.	Ramasamy Chidambaram	4	1.5
8.	Mamoon Rashid	4	1.5
9.	Salik Rasool	4	1.5

Table-7: Number of citations received by dental articles published in JCPSP during 1991-2018 (n=253)

S. No	Number of Citations	Number of articles	Percentage
1	51-60	1	0.4
2	41-50	2	0.8
3	31-40	2	0.8
4	21-30	12	4.7
5	11-20	22	8.7
6	1-10	137	54.2
7	No citation received	58	22.9
8	No citation information available	19	7.5
		253	100

DISCUSSION

Among the top-tier biomedical journals of Pakistan, the Journal of College of Physicians and Surgeons, Pakistan is unique in being the official journal of the College of Physicians and Surgeons of Pakistan (CPSP). It publishes research findings and scientific papers from

medicine and surgery, as well as from all allied health sciences including dentistry. Research articles are published in various formats including original articles, review articles and case-reports. It is one of the first biomedical journals to be included in the list of impact factor journals from Pakistan, in 2009¹³, with an impact

factor of 0.5.^{12,14} Initially, JCPSP was publishing issues quarterly (from 1991 to 1998), followed by monthly publications since 1999. It is included in the 'Y' category of HEC recognized journals.

This study was conducted in order to gain an overview of the articles published in JCPSP regarding dentistry. All literature related to the various fields of dentistry as well as those that could be of interest to the dental professionals, was analysed. While conducting bibliometric analysis, electronic search is preferred as it is convenient, reliable and exhaustive. However, not all issues of JCPSP are currently uploaded on the journal's website. Therefore, a thorough hand search was also conducted for issues that were available in print. The Faculty of Health Science library at AKUH has subscription to a large number of national and international journals, with both hard and soft copies available. All printed issues of JCPSP were hence found at the library, which made compilation of the relevant data possible. It was found that research papers pertaining to the specialty of Oral and Maxillofacial surgery were most frequently published in JCPSP. We found that the highest number of these research papers were case reports (n=24), followed by original articles (n=14). Since the post graduate training programs in Oral and Maxillofacial surgery were initiated much before those in other specialties of dentistry, therefore overall, there may be a greater number of actively practicing Oral and Maxillofacial surgery specialists. This could explain why scientific literature from this discipline exceeds other dental specialties. Moreover, owing to the unique nature of this specialty compared to other clinical dental fields, oral surgeons are more likely to encounter unusual clinical presentation that translates to case reports. For the second most common field, which was Operative Dentistry & Endodontics, the majority of research publications were original research articles (n=26). In both Orthodontics and Prosthodontics, where 29 articles each were found, there were more original articles (n=25) published in Orthodontics, while more case reports (n=13) were published related to Prosthodontics. Some specialties were categorized as 'Others' in our analysis, and comprised those which had fewer than four articles fulfilling the inclusion criteria or which were not directly related to any field of dentistry, but the publication could be considered relevant to dental practitioners and researchers. Dentistry specific specialties where only few publications were observed included Community Dentistry, Dental Education, Oral Hygiene, Dental Materials and Forensic Odontology. Perhaps dental researchers that are currently working in these domains could be identified, and invited to submit their work to the

journal, so that the scope of journal is broadened and the readers are exposed to a wider array of research work related to these specialties. Overall, original articles comprised the majority of the article type published in JCPSP followed by case reports, which was similar to the findings of a similar study conducted on all publications of JCPSP.¹² Since each issue of JCPSP comprises of mainly original articles, followed by case reports, this finding is to be expected.

Of all the publications from various health care specialties currently being published in JCPSP, it was seen that the overall proportion of research published related to dentistry was only 4.6%. This low proportion could be due to fewer relevant articles published in the earlier issues of JCPSP. This finding was similar to the results of a bibliometric analysis of JCPSP done from 2010 till 2014, where the articles from dentistry comprised only 4.7% of the total articles published in this journal during the timeframe of interest.¹² However, in our study, from 2010 onwards a steady increase in the number of research articles related to dentistry being published in JCPSP was seen. The highest number of articles were published in 2014 and 2017, and this escalating inclusion of dental articles in the journal is a positive sign. With the growing community of dental professionals, specialists and researchers, the journal can expect to see an increasing amount of research articles being submitted for possible publication. The first authors as mentioned in the article's information section revealed that the highest number of publications were authored by Manas Bajpai of the NIMS Dental College, India. Besides being the first author in 22 publications, this author was also observed to have collaborated with other authors hailing from NIMS, whose publications have been included in this analysis, and therefore can be considered to impart a greater contribution in the relevant articles pertaining to dentistry in addition to being a first author. Similarly, other authors who may not necessarily have contributed as first author, but are additional collaborators and supervisors in multiple publications may have a significant impact and need to be highlighted. Perhaps another study based on authorship contribution and collaboration can be conducted analysing all authors of the relevant publications, with visual mapping to determine researcher impact. Since the academic level of the authors were not mentioned, therefore any inference in this regard could not be made. In the selected articles, the number of male authors (63.2%) was found to be more than that of the female authors (36.8%). Nonetheless, it is encouraging to see sizable contribution being made by female dental specialists towards scientific publications as first

authors. In addition, this analysis was derived for first authors only. If additional contributors besides first author were to be analysed, perhaps a different depiction would emerge. Most of the articles were authored by two or three authors. This indicates that in the majority of the publications, there is collaboration between multiple researchers to develop scientific evidence. To make a meaningful deduction from this observation, the affiliation of the contributing authors can also be recorded, so that inter-institutional collaboration could be inferred. The Aga Khan University (AKU) is considered one of the leading institutions in research and development in the field of health sciences. It was seen in this analysis that the highest number of dentistry related articles hailed from this institute. This clearly indicates that research is being encouraged and facilitated among the dental professionals and researchers here and is commendable. Another bibliometric study conducted for the published articles in the Journal of Pakistan Medical Association also presented similar results, with the highest number of publications from AKU,⁶ indicating the major contribution this institute is making in all fields of health sciences. Out of the 27 articles that had the first author hailing from AKU, 20 articles were original articles, out of which 13 articles were from the field of Orthodontics, five articles from Operative Dentistry & Endodontics and one study each related to Periodontology and the field of Oral health and hygiene. NIMS Dental College, Jaipur, India also had similar number of articles, with the difference that there were 16 letters to the editor, 10 case reports and one original article. Armed Force Institute of Dentistry (AFID) was the second institution with the highest number of research publications, with 14 original articles, having six articles from Oral and Maxillofacial Surgery and eight from Operative Dentistry & Endodontics. The greatest contribution to the cumulative dental research seen as published in JCPSP was found to be from Pakistan, with original articles comprising the majority of the publications (n=96). This was followed by case reports/case series (n=64), in contrast to the dental publications from Indian authors, where the majority of the publications were letters to the editor (n=23). This was similar to the publications in JCPSP hailing from Malaysia, where letter to the editor was the most frequent publication type (n=6). Over all, only 27% of the articles were contributed by foreign authors, majority of which was from regional countries. By incentivizing the publication process for foreign researchers and inviting their research findings for possible publication in JCPSP, more original articles can be expected to be seen in this journal from dental

researchers globally. This would also enhance the standing of the journal further, and expose local researchers to international perspectives.

The citations received by dental articles published in JCPSP were observed using Google Scholar. The reason for choosing this search engine to determine the number of citations was that Google Scholar is easily available and hence, the uploaded literature is accessible to a vast majority of scientific community to be cited. At the time of compilation of this study, the article with the highest number of citations was related to Orthodontics¹⁵ and discusses the psychosocial impact of altered dental aesthetics on the emotional state of an individual. This was followed by an article¹⁶ with 44 citations, regarding the evidence of *Helicobacter pylori* infection in dental plaque and gastric mucosa. The article with the third highest number of citations (n=32) was a case report describing the rehabilitation of nose using silicone based Maxillofacial Prosthesis.¹⁷ The citations that these articles have received include those from international impact factor journals, indicating their scientific value. The citations for some of the articles that have been published before 2006 in JCPSP could not be found, most likely because they are not available electronically. Since they are not accessible on-line, they cannot be readily cited by other researchers. It is imperative that the earlier issues of JCPSP be made available online on priority basis so that the relevant articles can be cited by other researchers, subsequently contributing to increasing the journal's impact factor.

Since most biomedical journals of Pakistan publish research articles from all medical and allied fields, therefore in most instances, the adequate representation of research related to dentistry is lacking. As a rapidly expanding field with both undergraduate and postgraduate programs being conducted at multiple institutes and training centers across the country, the initiation of scientific journals exclusively catering to the research findings in the various facets of dentistry seems inevitable. The journals that are currently dedicated to only dental research are not indexed in significant databases, and therefore do not attract as many high-quality research articles as they would if they would be indexed in international databases of considerable repute. Scientific literature related to dentistry is not only published in local biomedical journals, but a large number of research articles are published every year in many International PubMed/Medline indexed journals of high scientific standing. Many of these journals are not readily accessible in Pakistan, resulting in failure to register the impact of such scientific work in the local context. In addition, to bibliometrically analyse dental publications in only

one journal by no means determines the trend of research being conducted in the field of this specialty in Pakistan. In order to identify the trend and evolution of dental research in the country, relevant publications of Pakistani researchers published in both local and international journals need to be evaluated to put forth any estimations in this regard.

The level and quality of the evidence presented in the included articles was not evaluated, which can be considered a limitation of this study. Even though the majority of the included papers were original articles, the authors of this study did not scrutinize the study designs or research methodologies of these articles. It would also be interesting to note how many of these original articles were based on thesis/dissertation work as JCPSP also publishes thesis/dissertation-based studies, which have been approved as part of the requirement of FCPS training and examination under CPSP.

CONCLUSION

The various characteristics of scientific papers related to dentistry published in JCPSP have been identified and analysed. Even though dentistry is now considered a major discipline in both undergraduate and postgraduate academic levels, there was a low proportion of research papers in dentistry published in JCPSP. Based on the data generated through this study, dental researchers working on subject areas for which relatively scant literature has been published in JCPSP could be encouraged to submit their findings to this journal, with the improved possibility of publication. Researchers working on Community Dentistry, Dental Education, Oral hygiene, Dental materials and Forensic odontology should be invited to submit relevant publications to JCPSP in view of the current low number of articles found, with the provision in the journal to publish articles in these domains. Foreign authorship should be encouraged to further elevate the standing of this journal. Considering the significant number of research publications hailing from dentistry, deliberation could be made by JCPSP to either elevate the allocated number of papers reserved for dentistry or develop a journal exclusively for the various subspecialties of dentistry.

Further studies can be conducted to analyse the articles that have been published related to dentistry in other PubMed indexed health science journals of Pakistan. Since the bibliometric analysis of dental literature published in a single journal cannot attempt to determine the trend of the entire research pertaining to dentistry being carried out in Pakistan, therefore another research project focusing on all dentistry related research papers originating

from Pakistan and published in local and international journals could be conducted.

Key messages:

1. Even though the Journal of College of Physicians and Surgeons Pakistan has published considerable number of dental literatures over the years, the overall proportion remains low.
2. The development of specialized domains of dentistry in Pakistan warrants a separate journal exclusively catering to dental publications.
3. The status of JCPSP as a PubMed indexed journal attracts publications from regional countries also.

Conflict of Interests: There are no conflicts of interest regarding this publication.

Disclosure: The authors assume full responsibility and express regret if any relevant dentistry related scientific paper was inadvertently missed from inclusion in the current article, which would be solely due to the extensive number of publications that had to be searched and scrutinized. In addition, the citation count of the included papers was noted at the time of compilation of the data, and authors recognize that more citations may have been received by some papers included in this study by the time this article is published.

AUTHORS' CONTRIBUTION

SA: Concept, Design, Protocol, manuscript composition, KZ: Data collection, data compiling, data analysis, manuscript review. FRK: Protocol review, manuscript review, critical appraisal.

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