

Bibliometric Study of Publication By Indian Prosthodontists Between 1996–2007: A Medline Approach

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Abstract Bibliometric study of a subject will help administrators and policy makers to frame policies for the growth of the subject. Prosthodontics is an integral part of dental sciences and no bibliometric study has been done on Indian prosthodontics publications. Publications from Indian Dental establishments during 1996–2007 were collected from Medline and data were collected. First author's affiliations were only considered. Publications by prosthodontists were considered for this study. Predictor variables: year, number of author, state Outcome variables: type and reach of journal, type of article. There were 43 articles fulfilling the criteria. Prosthodontist from nine different states published in 12 different journals. Thirteen (30.2 %) were case reports, 23 (53.5 %) were research, 4 (9.3 %) were reviews and 3 (7 %) were technical note. The inter-annual variation between the type and reach of article and type of articles is presented. The growth trend analysis was performed and predictions are presented. Prosthodontist exhibited a trend to publish in general dental journals, publish case reports, in international journals. The mean numbers of authors in each type are discussed. The potential use of this data are discussed.

Keywords India · Dental · Prosthodontics · Bibliometrics

Introduction

The quantitative and qualitative analysis of scientific research outputs in biomedical fields is a complex phenomenon and

no single accepted methodology has been identified that fully satisfies the needs of researchers, institutions and administrators. Analysis of publication has various parameters with each having several merits and demerits. Because of the controversies, very few objective data have been published to determine research ranking in the field of dentistry. This kind of analysis may contribute to the development of scientific and technological policies in dentistry, which is of special relevance in emerging fields that are currently undergoing rapid transformation [1, 2].

India had ranked 26th position in terms of number of peer reviewed published dental manuscripts in the period 1999–2003 using ISI database approach. (0.66 % of all contribution globally) This was produced by 366 authors, with a productivity of 0.361, a mean of inter-annual variation rate of percentual average increase during study of the productivity (refers to the yearly variation expressed in percentage variation in the productivity and number of authors from India with respect to the preceding year) and the number of Indian authors as 16.31 percentage, of the Indian dental scientific production of India as related to general scientific production as 0.241, and only 9 documents from India appeared in the five top 5 journals with highest impact factor [2].

Medline is a widely accessed database created by the National Center for Biotechnology Information and National Institute of Health, USA. This database is updated almost daily and contains bibliographic details of millions of manuscripts in all fields of life sciences. It is accessed by almost all life science researchers, who are in pursuit of scholarly articles published all over the world. It is National Library of Medicine, USA's initiative and a bibliographic database which is freely accessible. [2, 3].

Against this background of achievement and ongoing challenges, this study was undertaken to assess the

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visibility of publication by Indian Prosthodontists in Medline database, as there are no published details from India regarding the Medline indexed publications by these specialists.

Methodology

Previously published methodology was employed for this study [1]. During the last fortnight of November 2009, data were collected using the method as described below. Using the time limitation of publication date limit of 1st January 1996–31st December 2007, all articles where author's affiliation had the word "Dental" AND "India" was selected. No journal or types of article limitation were set. All articles, from all types of journal including basic sciences, clinical medical sciences and dental journals were included. All the articles that were displayed were considered for the analysis. The following criteria's were followed for accumulating the data: (A). First author's affiliation was only considered for the study as Medline does not list the affiliation of co-authors. Though this will cause sizable underestimation of the contribution of the specialty in the dental scientific research output of the country, non availability of access as well as only first authorship's are presently being considered for advancement of academical positions, first authorship was only considered for this study. (B) Non-dental (medical articles) from dental institutions were also included for the study but under a separate category. (C) Only Indian institutions were considered for the study. An article was included in the study satisfying the inclusion and exclusion criteria and only if it had been published by Prosthodontists.

From this collection of articles, the following were noted down—year of publication, number of authors, name of the journal, reach of the journal (depending on the readership—specialty/general dental/medical journal or others), Geographical availability of the journal (published in India or at other nations), specialty (Dental) of the first author (All dental specialties, basic medical sciences or others), state of origin, type of research [case reports (including case series)/reviews (excluding systematic review)/original research (encompass epidemiological, comparative, qualitative, cross sectional, longitudinal, in vivo and clinical trial studies)/technical notes/others (such as editorial etc.)]. There were certain issues such as improper citation of name of the institution/department and non citation of state of origin. Considering the data as visible on the National Institute of Health website, the database for the study was prepared and no corrections and addition/deletions were performed by the authors. Those set of data that were missing were labeled as "Not mentioned" and all such data were included in the study [1].

All data thus gathered were entered in SPSS software version 16.0. From this database, the performance of department of prosthodontics is presented. Descriptive analysis were performed and presented. Inter-annual distributions, state wise distribution, types of research are presented. Mean number of authors per document in each year are also presented. Microsoft Excel 2007 was used to assess the trend analysis using the present trend of growth of research output.

Result

There were 1,335 publications available. Of this, there were 978 publications fulfilling the criteria outlined in methodology. Four articles were e-published in 2007 and published in 2008 in print. They were also included in the study making the total articles to 982.

The number of articles published in relation to Prosthodontics was 43 and this contribution was 4.4 % to the overall dental literature published by Indian dental establishment in Medline during the study period.

Figure 1 depicts the inter-annual variation in the publication by Indian prosthodontists during the study period. Figure 2 depicts the journals and frequency in which Indian Prosthodontists publication appeared during the study period. Figure 3 depicts the reach, geographical availability of journal and type of articles. Of the published articles, 46.5 % were in specialty dental journals, 53.5 % in general dental journals, 58.1 % in International journals and remaining 41.9 % in Indian journals. Of all the articles, 13 (30.2 %) were case reports, 23 (53.5 %) were research, 4 (9.3 %) were reviews and 3 (7 %) were technical note. Prosthodontists from nine Indian states were visible in Pubmed. Karnataka published 23 (53.5 %) articles followed by Tamil nadu 6 (14 %) and Goa 4 (9.3 %).

The entire articles were published in 12 journals. The details are given in Table 1. The mean number of authors

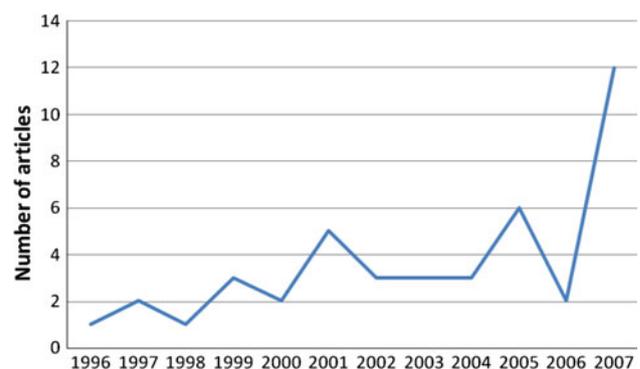


Fig. 1 Year wise distribution of number of manuscript submitted by prosthodontists during the study period

Fig. 2 Journals in which articles by Indian prosthodontists were published

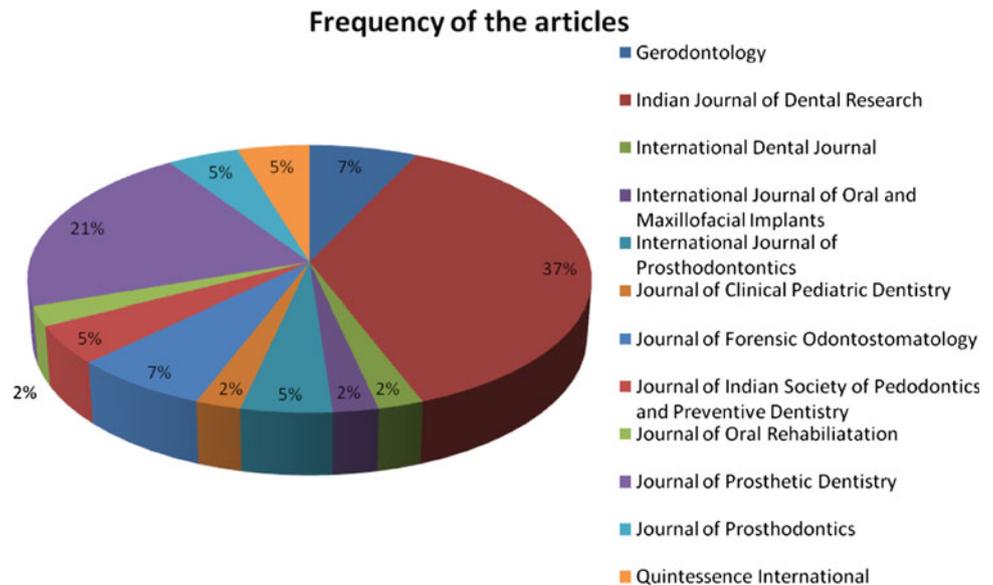
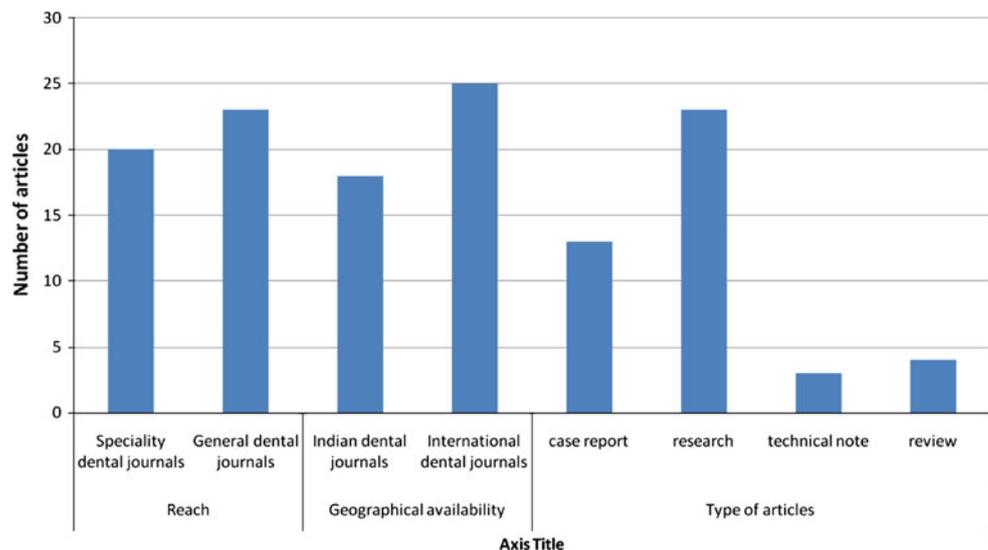


Fig. 3 Classification of all prosthodontics articles submitted during the study period in Medline database



was 2.79 ± 0.88 with a range of 1–4 authors. The variation of number of authors with regards to type of reach of journal, Geographical availability of journal and type of research are described in Table 2.

The projection of the growth trend is depicted in Figs. 3 and 4. By the year 2050, approximately 30 is expected to be produced in the trend of 1996–2007 (Fig. 4) and by 2050 it would be 108 article per year, if the trend of 2004–2007 were considered (Fig. 5).

Discussion

Publication analysis, as with any method chosen to assess scientific production, does not cover the entirety of scientific production. However Medline is not representative of

entirety of the peer-reviewed publication [1, 2]. Only indexed peer reviewed publication are listed in Medline and they have own established criteria's for a journal to be "indexed" in Medline. However, it has been successfully used in other published partial analyses of dental research production, including Public Health Dentistry in India [1–4]. Further this article suffers from a drawback of being quantitative and not qualitative. Furthermore, the use of "Dental" and "India" would have missed publication by others in non-dental fraternity. Being a nascent field in India, Most of the prosthodontist research work emanates from academic institution. Publication by Indian Prosthodontists is mostly from dental schools. Even so, if they are a part of such institution, use of word "Dental" will be referred in such an affiliation.

Periodical evaluation of the scientific research is important for various professional societies, individual

Table 1 Statewise distribution of articles during the study period

State	Number of articles	Percentage	Valid percentage
Karnataka	23	53.49	54.76
New Delhi	2	4.65	4.76
Tamil Nadu	6	13.95	14.29
Chandigarh	3	6.98	7.14
Kerala	1	2.33	2.38
Andhra Pradesh	1	2.33	2.38
Maharashtra	1	2.33	2.38
Goa	4	9.30	9.52
Madhya Pradesh	1	2.33	2.38
Total	42	97.67	100.00
Missing details	1	2.33	
	43	100.00	

Table 2 The mean number of authors between reach, status of journals and type of articles

	N	Mean ± SD number of authors	95 % Confidence Interval for Mean		P value
			Lower	Upper	
Reach					
Specialty dental journals	20	2.8 ± 0.83	2.41	3.19	0.95
General dental journals	23	2.78 ± 0.95	2.37	3.19	
Geographical availability					
Indian	18	2.94 ± 1.06	2.42	3.47	0.34
International	25	2.68 ± 0.75	2.37	2.99	
Type of article					
Case reports	13	2.92 ± 0.86	2.4	3.44	0.21
Research	23	2.91 ± 0.9	2.52	3.3	
Technical note	3	2 ± 0.00	2	2	
Review	4	2.25 ± 0.96	0.73	3.77	

scientists, scholarly institutions, and funding organizations to frame policies and take necessary actions. The quality of scientific contributions is estimated from the long-term impact that it has made on the concerned field and similar outcomes [5, 6]. In Indian Context, Public health dentists have published a similar study to assess their contribution [1].

Prosthodontists have contributed to only <5 % of all the articles from Indian dental establishments. All of these

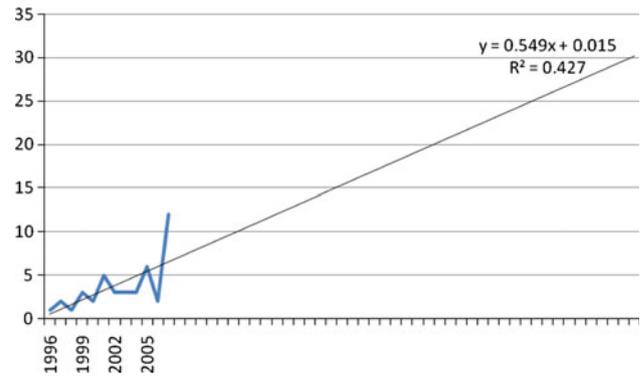


Fig. 4 Growth prediction and equation of Indian Oral and Maxillo-facial Pathology Publication output based on the previous performance using 1996–2007 growth trend. X axis—year, Y axis—number of publications

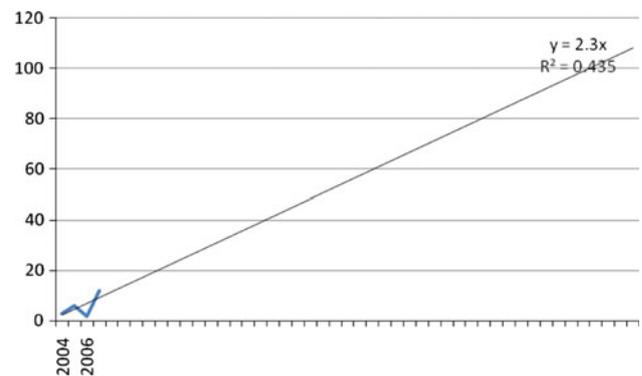


Fig. 5 Growth prediction and equation of Indian Oral and Maxillo-facial Pathology Publication output based on the previous performance using 2004–2007 growth trend. X axis—year, Y axis—number of publications

articles are from institutional (100 %) and largely from private institutions. There is a drastic increase in Prosthodontist publication in 2007 (Fig. 1). Similarly majority of articles are published in general dental journals rather than other type of journals and as seen in Fig. 2, this trend appears to be recent. There is a greater publication in international journals than Indian journals. As observed in Fig. 2, there is an increasing trend to publish in international journals, rather than Indian journals during the last phase of the study period. Major bulk of Indian Prosthodontists were research reports (Fig. 2). This phenomenon could be explained by an increase in number of Dental colleges across India and Prosthodontist and has been reported in Public health dentistry too [1, 6–8]. As there are very few articles in this aspect across the globe to refute the results of this study, the results of this study cannot be compared against any published literature. Very few countries have tried to analyze their literature outputs [9, 10].

Dental colleges and their enrollment capacity in India have drastically increased in the early part of 21st century owing to an increased participation from private sector. Reports of regional inequality and geographical distribution in the location of dental education schools in India with a bias toward economically better-off regions. This resulted in a state of growth in the dental education sector with increased overall access, but with inequality in such an access [8]. This is also reflected in the trend in the result of this study by the difference in the state wise distribution and increasing inter-annual publication rates. This trend has been also observed in the Public Health Dentistry Study too [1].

The interpretation of scholarly output of Indian Prosthodontist has to be made with caution based on present study alone as (1) Only Medline database was considered (2) Only first authorship was considered (3) only Medline indexed literature search was considered (4) Affiliated organization without word “Dental” would not have been picked up from Medline using the search criteria employed and (5) Present study lacks the qualitative dimension. The growth in the number of publications in recent years as observed in graph 4, reflect the efforts being undertaken and the higher prosthodontist publications in international journals indicates the increasing presence of Indian Prosthodontists in the international settings through databases such as Medline.

India has its own peer reviewed journal, *Journal of Prosthodontics*, published bi-annually and accommodates eight to ten scholarly articles per issue. This journal, though available on-line freely, is not indexed by Medline as of January 2010. However it is claimed to be recognized by several other databases (as per the website claim). If this journal is Medline indexed, the number of Prosthodontist publishing in Medline will increase drastically. With increasing awareness to get published and a conducive environment to get published, many prosthodontists will get published provided the geographical and economical inequalities are taken care by imparting selective training and equal opportunity. The results of this study would help them in identifying the areas that had to be promoted, providing the finer skills of documentation, reporting skills and imparting stronger research methodological skills. Such measures may cause an explosion in Medline publication and even exceeding the growth predictions [1].

The qualitative results of similar studies were not consistent with the quantitative findings, and several countries

that produced most publications were not always those that produced work of the highest quality [1, 2]. Future work should include the qualitative dimension of Indian prosthodontists to understand the impact that Indians make in the field of Prosthodontists.

Conclusion

Descriptive study of Indian Prosthodontists publication during 1996–2007 in Medline database is presented. The loco-regional variation and inter-annual variation are presented. The result of this study could be used by various professional societies, individual scientists, scholarly institutions, and funding organizations to frame essential policies regarding the improvement of the science of prosthodontists in India.

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