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Contribution of Indian Pediatric Dentists to Scientific Literature During 2002–2012: a Bibliometric Analysis

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ABSTRACT

Introduction: Bibliometric analysis of publications is necessary to enable clinicians to make evidence based sound clinical decisions. It will also help policy makers & institutions to frame their decisions and policies so as to improve the quality of dental research in India. AIM: The purpose of this study is to identify publication output as well as descriptively and quantitatively characterize the contribution of Indian pediatric dentists to scientific literature through publication trend analysis from 2002 to 2012. **Settings and design:** Cross sectional analytical study. **Material and method:** A bibliometric analysis of publications by Indian pediatric dentists during 2002 to 2012 was performed on data collected from PubMed – MEDLINE database. Only the first author's affiliations were considered and the publications were categorized according to the following variables: year of publication, number of authors, state of origin, type of article, reach of journal and country of publication. **Results:** There were 817 articles by Indian pediatric dentists during the study period. Of all the articles 399 (48.8%) were original research, 377(46.1%) were case reports and 41 (5.0%) were reviews. The inter-annual variation between the reach, country of publication of the journal and type of articles is presented. The growth trend analysis was performed and predictions are presented. **Conclusion:** There has been an increase in the number of publications by Indian pediatric dentists and most of the published work comprises of original research. The potential use of this data is discussed.

Key words: bibliometrics, dental, India, pediatric dentistry, publication trends

1. INTRODUCTION

Each day dental care professionals make decisions about clinical care. Clinical decisions are usually based on experience, standard techniques, knowledge gained from studies, expert guidance, and continuing education. However this is not sufficient due to the complexity of information. It is important that these decisions incorporate the best available scientific evidence in order to maximize the potential for successful patient care outcomes. However, with rapid advances in technology, it is becoming difficult to keep track of the latest findings. Thus it has become more important for clinicians to depend on scientific literature to determine appropriate treatment plans for patients.

Evidence based dentistry (EBD) is defined by American Dental Association (ADA) as an approach to oral health care that requires the judicious integration of systematic assessments of clinically relevant scientific evidence, relating to the patient's oral and medical condition and history, with the dentist's clinical expertise and the patient's treatment needs and preferences (1). It is recently being emphasized upon increasingly so that the clinician can acquire the knowledge needed to successfully manage various oral problems.

One of the methods of assessing available information is bibliometric analysis. It is defined as "the use of statistical methods in the analysis of a body of literature to reveal the historical development of subject fields and patterns of authorship, publication, and use." (2). It allows mapping and generating information and helps in reducing subjectivity in assessment of literature. Various indicators are used for the purpose. However for these indicators to be successfully applied the basic requirement is collection and assessment of data. This is a very important step because if either no literature is available or one cannot gather the literature, the clinician will not have the evidence necessary to improve clinical treatments and decisions.

There have been several studies on bibliometric analysis in various other fields of dentistry in India (3, 4, 5, 6, 7) and for Pediatric dentistry in other parts of the world (8, 9) but there is no such data available for India. The present study focuses on the first step: retrieval and estimation of the availability of literature in pediatric dentistry that one can potentially use to make clinical decisions.

MEDLINE is the bibliographic database of National Library of Medicine®. PUBMED is maintained by National Center for Biotechnology Information (NCBI)

and comprises more than 22 million citations for biomedical literature from MEDLINE (10). It is updated frequently and provides easy access to scientific literature.

The present study was conceptualized with an aim to assess the trends in publications in pediatric dentistry and contributions by Indian pediatric dentists in the last decade from 2002 to 2011 in PubMed-MEDLINE database.

2. METHODOLOGY

Study design

A cross sectional study was carried out in the first week of March 2012 by direct observation of all the abstracts in the PubMed-MEDLINE data base using the time limitation of publication as 1st January 2002 to 31st December 2012, where author affiliation had the words 'Dental' and 'India'. Several Medical Subject Headings (MeSH) Key words such as infant, preschool child, child, adolescent, teeth, pedodontics, pediatric dentistry, pedodontia were also used in the search to avoid missing out any contributions. This study did not require ethical clearance as there was no involvement of human subjects or animals.

Data collection

Selection of articles and Data extraction

This search resulted in a total of 6038 articles. These were separated by year and both the title and abstract were retrieved. Some articles were electronically published earlier while their print version came later; such articles were considered once to avoid duplication.

The following criteria were followed for accumulating the data:

- Only first author affiliation was considered for the study. Only those articles were included where the first author's affiliation was pediatric dentistry;
- Only Indian institutes were considered for the study;

From these abstracts the following information was noted down:

- Year of publication;
- Name of the journal;
- Reach of the journal (Pediatric dentistry specialty journals/ other dental journals / medical journals / others);
- Country of publication (published in India or in other countries);
- Number of authors;
- State of origin;
- Type of research (Original research /Case reports [including case series]/ Reviews). The preface, editorials and organization related communications were excluded because they were not relevant to the scope of this study.

The whole article was retrieved and analyzed if it was not possible to extract the above information from the title and abstract alone.

Data categorization was done by direct physical examination of the abstract of every reference, by two

independent reviewers. In case of disagreement in the evaluation of a given article, it was only categorized when a consensus was reached among the reviewers.

The articles where author affiliation could not be verified were excluded.

Data analysis

The data thus collected was organized and analyzed using the SPSS16.0 version and shown with the use of descriptive statistics. The performance of Indian pediatric dentists has been shown by presenting inter annual and state wise distribution of publications, type of research, Indian / international publications per year and mean number of authors per publication per year. Microsoft excel 2007 was used to assess trend analysis using the present trend of growth of research outputs.

3. RESULTS

Employing the methodology described, 6038 articles were retrieved from the PubMed – MEDLINE database. Out of these, the number of articles published by Indian pediatric dentists was. The contribution of Indian pediatric dentists is 13.53% to the overall literature published in MEDLINE by the Indian dental fraternity during the study period.

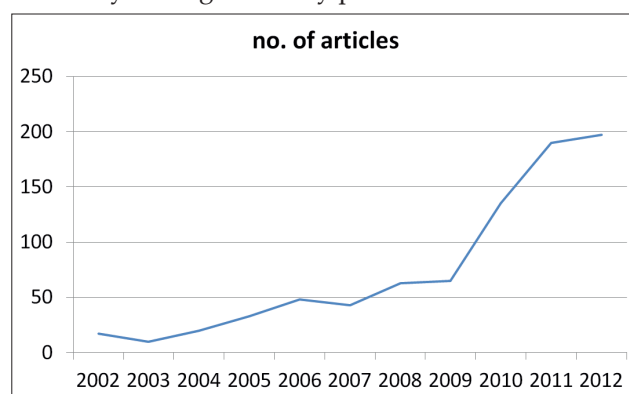


Figure 1. Distribution based on trends of publications by Pediatric dentists during the study period

Figure 1 depicts the inter-annual variation in the publications by Indian pediatric dentists during the study period. Of the total publications based on country of publication of the journal, 294 articles got published in international journals and 523 in Indian journals (Figure 2a).

The articles were published in total of 78 journals. Figure 2b depicts the reach of 817 published articles.

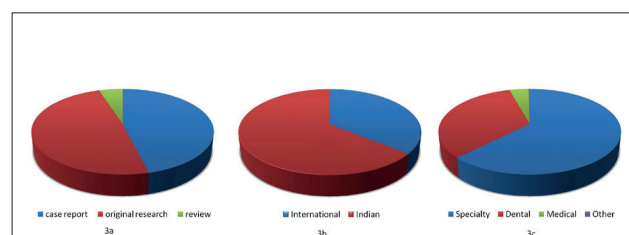


Figure 2. Distribution of publications based on country of publication (2a), type of reach of journal (2b) and type of research (2c)

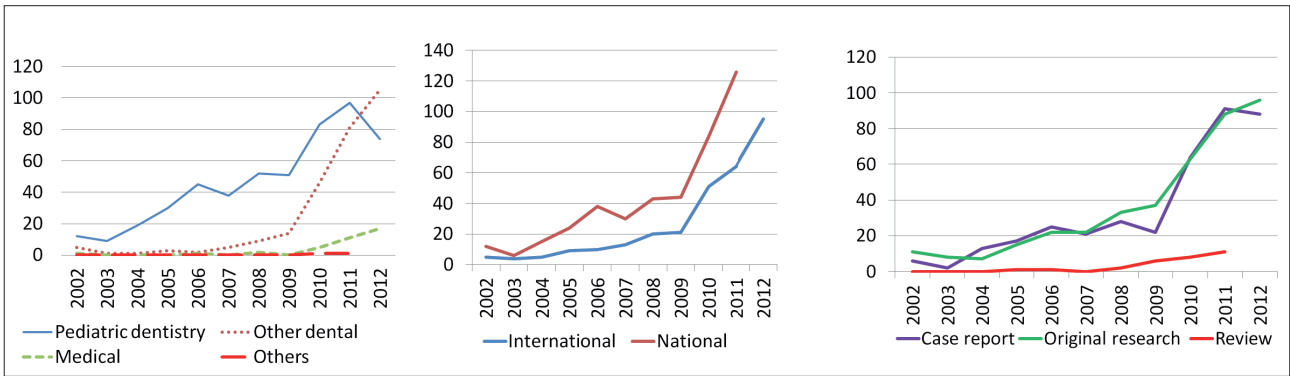


Figure 3. Inter annual changes in distribution of publications based on type of reach of journal (3a), country of publication of journal (3b) and type of research (3c)

62.4% publications were in pediatric dentistry speciality journals. 341 (articles were published in J Indian Soc Pedod Prev Dent followed by 109 (13.3%) in J Clin Pediatr Dent. Of all the articles 399 (48.8%) were research, 377 (46.1%) were case reports and 41 (5%) were reviews (Figure 2c).

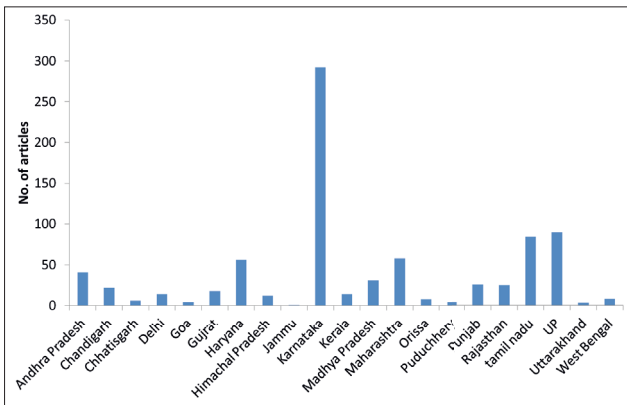


Figure 4. Statewise distribution of articles

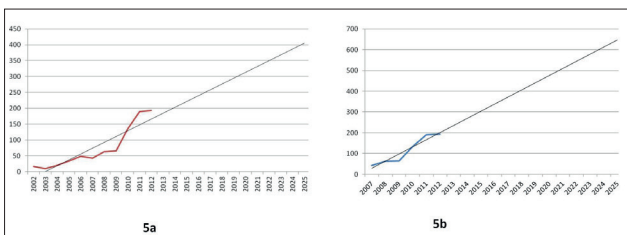


Figure 5. Projection trends using data from 2002 – 2012 (a); projection trends using data from 2010 – 2012 (b)

The mean number of authors was 3.26 ± 1.1236 with a range of 1 to 8 authors. The variation of number of authors with regards to type of reach of journal, country of publication of journal and type of research are shown in Table 1. Figure 3 shows the inter annual changes in reach, country of publication of the journal and type of research. The state wise distribution of publication trends is depicted figure 4. Maximum number of articles have been published by Karnataka 292 (35.7%), followed by Uttar Pradesh 90(11%) and Tamil Nadu 84(10.3%).

The projection of growth trend is depicted in figures 5a and 5b. By the year 2025, approximately 400 articles are expected to be published per year if the

trend of 2002- 2012 continues. However, if the trend of 2010-2012 were considered, the number of article per year by 2025 would be above 650.

4. DISCUSSION

With fast emerging knowledge of techniques and materials due to the widespread connectivity provided by the internet, it has become essential to sort out useful information from the rest (10, 11). It is imperative that clinical decisions should be evidence based to avoid failure in clinical practice. Thus arises the importance of bibliometrics which allows for analysis of scientific productivity and also helps to segregate information in a manner that it can be easily retrieved and utilized. According to Lewison and Devey, “bibliometrics is to scientific papers as epidemiology is to patients” (12). It is a measure of number of publications thus being a benchmark of scientific productivity.

There is no satisfactory method for analysis of scientific research due to its complexity. The major limitation of this study was that it is limited to the Pubmed MEDLINE database. This is not representative of the entire peer reviewed publications. However it has been used earlier successfully by other researchers in analysis of scientific literature (3, 4, 6, 8, 12). Only articles published in English language were considered keeping in mind that it is the language used by Indian scientific community most commonly.

Although there have been studies to analyze dental literature in other specialities in India (3, 4, 5, 6, 7) there is no such compilation of the contribution of Indian pediatric dentists.

Indian pediatric dentists have contributed to 13.53% of all the publications from Indian dental establishments. Most of the articles published are from institutions and mostly private institutes. There is an increased trend of publication since 2005 and a boom in publication trend in 2010 with 135 publications that has further increased to 193 publications in 2012. There could be several reasons for this sudden increase: There has been an increase in the number of dental colleges and number of postgraduate seats.

Dental council of India in 2007 issued revised MDS course regulations which required a certain

minimum number of publications for post graduate teaching (13).

In 2011, Dental council of India introduced eligibility criteria for post graduate teaching and introduced point system based on number of publications (14). This might be a reason for increased publications.

Majority of articles have been published in specialty dental journals. There is a highly significant difference ($p < 0.001$) in trends of publications based on reach of journal per year. Till 2006 trend to publish in specialty journals was more. Authors are now increasingly publishing in general dental journals and from 2010 there has been a sudden increase in publications in medical journals. This might be due to the increase in number of authors and time lag between submission and publication in pediatric dentistry journals. However, there is no increase in the number of specialty journals. Moreover there is an increased awareness about availability of other journals. Young researchers are thus looking for more avenues for publication. J Indian Soc Pedod Prev Dent is the official publication of Indian society of Pedodontics and Preventive Dentistry and is one of the first Indian specialty journals to be indexed in PubMed. The reputation of this journal is the reason that it has accounted for maximum number of publications by Indian pediatric dentists till 2007. Since this journal is published quarterly, it has a limitation of the number of articles that can be published in a year which leads to a time lag between submission and publication. Moreover more journals have become indexed leading to authors sending their papers to other journals.

On comparing contribution of different states per year, highly significant difference ($p < 0.003$) in trends of publications was seen. Karnataka state contributes maximum number of publications per year to the database but its overall contribution has decreased from 76.5% in 2002 to 20.7% in 2012. Uttar Pradesh ranks second in no of publications with a drastic increase in contribution from 2008. This may be due to the fact that the maximum number of post graduate seats were earlier concentrated in Karnataka. More and more colleges in other states across India are now offering post graduate courses and this explains the change in trends in geographical distribution. There was no statistically significant difference between reach and status of journals. On comparing mean number of authors and type of articles, a statistically significant difference ($p = 0.003$) was seen with less number of authors on an average for review publications.

The growth in the number of publications in recent years as observed in figure 5, reflect the efforts being undertaken and indicate the increasing presence of Indian pediatric dentists in the international settings through data bases such as PubMed.

The result of the present study predicts a promising future for the Indian pediatric dentists, however the interpretation of impact of these publications has to be made with caution based on the present study

alone. To fully understand their contribution a qualitative analysis of publications is also required as it is not necessary that a country that has more number of publications is also the one that produces work of the highest quality. In India, regions where this specialty is still in its nascent stage it is important that the young authors are taught finer skills of documentation and research so that the qualitative aspect is more in focus rather than only the quantitative.

5. CONCLUSION

This study was done to quantify the dental literature contributed by Indian pediatric dentists so that it can be utilized to make clinical decisions. There is a marked increase in the pediatric dentistry literature and one should expect it to continually increase. The results of this study could be used to highlight the growth of scientific data by pediatric dentists in India and by institutions and funding bodies to frame essential policies so as to promote the growth of Pediatric dentistry in India. This can be further used to qualitatively assess the available literature so as to enable the clinicians to identify the relevant information required to provide high standards of dental care to their patients.

CONFLICT OF INTEREST: NONE DECLARED.

REFERENCES

1. Policy on Evidence-Based Dentistry. ADA Positions, Policies & Statements. Available online at <http://www.ada.org/1754.aspx>.
2. Young H. The ALA glossary of library and information science. Chicago, IL: American Library Association, 1983.
3. Poorni S, Ramachandran S, Rooban T, Madan Kumar PD. Contributions of Indian conservative dentists and endodontists to the Medline database during 1996-2009: A bibliometric analysis. J Conserv Dent. 2010; 13: 169-172.
4. Shamala RK, Rooban T, Anusa AM, Reddy BVR, Ranganathan K. Bibliometric study of publication by Indian oral and maxillofacial pathologists between 1996 – 2007: A Medline approach. J Orofac Sci. 2010; 2(2): 28-32.
5. Rooban T, Kumar PDM, Ramachandran S. Contribution of Indian dental research to the ScimagoTM database during 1996 – 2007: A preliminary report. Chron Young Sci. 2010; 1: 16-21.
6. Madankumar PD, Narayanan MB, Rooban T, Shivakumar M, Ramachandran S. Publication trends of Indian public health dentist between 1997-2007: A Medline approach. J Indian Asso Public Health Dent. 2010; 15: 182-186.
7. Venkatakrishnan CJ. Bibliometric Study of Publication By Indian Prosthodontists Between 1996-2007: A Medline Approach. J Indian Prosthodont Soc. 2012. DOI 10.1007/s13191-012-0150-9.
8. Yang S, Needleman H, Niederman R. A bibliometric analysis of the pediatric dental literature in MEDLINE. Pediatr Dent. 2001; 23(5): 415-418.
9. Poletto VC, Faraco Jr IM. Bibliometric study of articles published in a Brazilian journal of pediatric dentistry. Braz Oral Res. 2010 Jan-Mar; 24(1): 83-88.
10. Pubmed HOME. Available online at <http://www.ncbi.nlm.nih.gov/pubmed>
11. Lewison G, Devey ME. Bibliometric methods for the evaluation of arthritis research. Rheumatology. 1999; 38: 13-20.
12. Mavropoulos A, Kiliaridis S. Orthodontic literature: an overview of the last 2 decades. Am J Orthod Dentofacial Orthop. 2003; 124(1): 30-40.
13. Dental Council of India. Revised MDS course regulation 2007. Part III Sec 4. Page 3-4. Available online at http://www.dciindia.org/dciregulation_2006_pages/pdf_files/Revised%20MDS%20Course%20Regulations%202007.pdf
14. Criteria for considering the articles/publications in various journals for starting/increase of seats in MDS courses for the session 2012 – 2013. Annexure A. Dated 10/08/2011 Dental Council of India. Available online at http://www.dciindia.org/announcement_pdf_files/pdf_files/ELIGIBILITY%20CRITERIA%20TO%20BE%20A%20PG%20TEACHER.pdf