

Bibliometric analysis of three international journals on public health dentistry: A comparative study from 2011 to 2020

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Abstract

Background and Objective

The research question was to conduct a comparative analysis of articles published, citations, grants and authors co-occurrence in three journals of Public health dentistry namely Journal of Public Health (JIF-1.821), Community Dentistry and Oral Epidemiology (JIF-3.803) and Community Dentistry Health (JIF-1.079). This study was triggered, because of the constant growth of the academic production of articles in the world. The objective of this study is to describe the design of studies published in the period 2011 - 2020 of the three mentioned journals.

Material and Methods

A retrospective, observational, comparative study was conducted for JPHD, CDOE and CDH. All issues of JPHD, CDH and CDOE from 2011 to 2020 were manually searched and also assessed through Scopus database. The data were organized and analyzed using software SPSS version 21.0; and citation mapping process using VOSviewer software.

Results

A total of 1544 articles were retrieved from all the three journals. The largest number of manuscripts was published in the Community Dentistry and Oral Epidemiology journal. The pattern of study design in JPHD (65.69%) and CDH (74.79%) was majorly cross-sectional studies followed by cohort studies (19.46%) and randomized controlled trials (8.34%) respectively. In all the three journals, maximum authors were more than three in number. Majority of the original research work focused on oral health such as oral health status, literacy, oral health quality of life.

Conclusion

The publication pattern in all the three journals was interestingly related to each other; most articles published were original research work intending an enhanced inclination of researchers toward observational affirmations.

Keywords: Bibliometry-Research-Public Health Dentistry-Oral Health-Dental Caries

Introduction

Public health dentistry is a branch of dentistry that deals with prevention of disease, prolonging life and promoting physical and mental efficiency through organized community efforts. It has also been described as a specialty that, above all, provides preventive and global therapeutic dental care not only to an individual but to a community. Therefore, public health dentistry is becoming more and more engaged in offering patients the various dental treatments in health care¹.

Since ages, scientific journals play a significant role in providing the relevant data to the researchers². It is a periodical publication intended to promote the progress of science, usually by reporting new research³. In 1994, Schaffner had identified five distinct parts of journals which they work in scholarly communities such as building a collective knowledge base, passing information, validating the quality of research, distributing rewards and building scientific communities⁴.

Assessing the research activity is significant in carrying out proper planning and policy making. In 1969 Pritchard initially

described bibliometrics as “the application of mathematical and statistical methods applied to categorize books and other media of communication.” It chiefly concerns the analytical process of metadata elements as the author(s), the publication place, the associated subject keywords, and the citations^{5,6}. It is a statistical tool which shows quantitatively the analysis of written publications. It also consists of review of the literature, indicating the number, evaluation and main trends of publications concerning a specific subject⁷.

Community Dentistry and Oral Epidemiology (CDOE), Journal of Public Health Dentistry (JPHD) and Community Dental Health (CDH) are some of the top cited journals in Scopus under General Dentistry category with rankings 16,42 and 69 respectively. Community Dentistry and Oral Epidemiology is a bimonthly peer-reviewed medical journal covering dental public health and the application of epidemiology to dentistry. It was established in 1973 and is published by John Wiley & Sons. The impact factor for the year 2020 is 3.383 according to Journal Citation Reports (Clarivate Analytics). It stands at 26/91 in Dentistry, Oral Surgery & Medicine and 69/203 in Public, Environmental & Occupational Health.

The Journal of Public Health Dentistry commenced in 1940 and has been devoted to the advancement of public health dentistry through the expedition of affiliated research, practice, and policy developments. Three main types of articles are published: original research articles ; methods articles and review articles .As per the 2020 Journal Citation Reports by Clarivate Analytics,it is ranked at 73/91 (Dentistry, Oral Surgery & Medicine)and 152/203 (Public, Environmental & Occupational Health) with a journal impact factor of 1.821.

Community Dental Health (CDH) is the official journal of the British Association for the Study of Community Dentistry and the European Association of Dental Public Health which is concerned with dental public health and related subjects.Peter G Robinson is the editor in chief and the impact factor for 2018 was 1.079.

The necessity of a bibliometric analysis is that the various impact factors, collaboration, like documents numbers, citations, and co-authorship rate are examined quantitatively. This study was triggered, given the expedited and constant growth of the academic production of articles in the world. In addition the study was required because it provides critical ideas on the most prolific authors, affiliations, countries, and institutions, within the field of interest⁸.

Previously conducted bibliometry studies have not been able to assess the salience and standard of internationally applauded journals namely JPHD,CDOE and CDH which is followed widely by all dental academicians ,epidemiologists Public Health Professionals⁹⁻²⁰.Therefore,this analysis is a conjunctive attempt to assess the salience and standard of internationally applauded journals namely JPHD,CDOE and CDH .The research question was to analyse the patterns of articles published, citations,grants and authors co-occurrence by authors and countries. The objective of this study is to describe the design of studies published in the period 2011 - 2020 of the three mentioned journals.

Methodology

Study Design

A descriptive, observational, comparative and retrospective study was conducted for JPHD, CDOE, and CDH .The criteria for selecting the journals were to include journals falling under the category of General dentistry in Scopus . The international journals were searched from the issues available in the library of Kalinga Institute of Dental Sciences from time period of 2011 to 2020 and assessed by two chief investigators.The journals were also assessed through Scopus database. A standardized data derivation plan of action was planned as a flowchart for acquiring the data. (Figure 1)

The following data or variables were extracted from each article analyzed:

1. Study design-Original Research(Cross sectional,Cohort Study,Case Control),Review article,systematic review and meta analysis,Randomized controlled trial,Qualitative analysis,Mixed method,Quasi experiments,in-vitro
2. Focus of Study-All the research articles were further divided under
 - A. Oral Health
 - B. Dental Caries
 - C. Dental Care/Dental Service Utilisation
 - D. Periodontal issues
 - E. Fluoride
 - F. Oral Cancer
 - G. Tobacco
 - H. Others such as nutrition,internet health,dental fear,anxiety,tooth loss etc
3. The number of authors were categorized based on having single,two,three or more than three authors

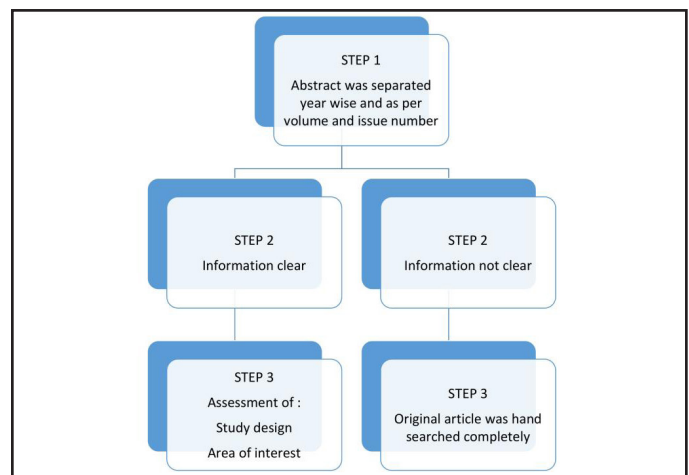


Figure 1 :- Flowchart of Data Derivation

D. Periodontal issues

E. Fluoride

F. Oral Cancer

G. Tobacco

H. Others such as nutrition,internet health,dental fear,anxiety,tooth loss etc

3. The number of authors were categorized based on having single,two,three or more than three authors

Search strategy

For the extraction of the articles, all the three journals were searched individually. In the search fields, the title was used to search all the manuscripts in Scopus database.

The following formula was used in Scopus: SOURCE-ID (24412) AND (LIMIT-TO (PUBYEAR,2020) OR LIMIT-TO (PUBYEAR,2019) OR LIMIT-TO (PUBYEAR,2018) OR LIMIT-TO (PUBYEAR,2017) OR LIMIT-TO (PUBYEAR,2016) OR LIMIT-TO (PUBYEAR,2015) OR LIMIT-TO (PUBYEAR,2014) OR LIMIT-TO (PUBYEAR,2013) OR LIMIT-TO (PUBYEAR,2012) OR LIMIT-TO (PUBYEAR,2011)) AND (LIMIT-TO (DOCTYPE,"ar") OR LIMIT-TO (DOCTYPE,"re")) AND (LIMIT-TO (LANGUAGE,"English")) AND (LIMIT-TO (SRCTYPE,"j"))

Inclusion criteria

1. Manuscripts in JPHD,CDOE and CDH journals indexed in Scopus
2. Manuscripts JPHD,CDOE and CDH journals in English language in Scopus
3. Manuscripts from 2011 to 2020 in JPHD,CDOE and CDH journals in Scopus

Data collection

For the elaboration of the descriptive analysis, the Microsoft Excel program was used where the means, standard deviation, and percentages of the numerical and categorical variables expressed in tables are tabulated. Scopus search tools were used for bibliometric calculations. On February 22, 2022, 1544 manuscripts corresponding to the period January 2011 to December 2020 were downloaded from all three journals, and refined through metadata analysis. PlumXmetrics were derived of top five articles cited of the three journals overall from 2011 to 2021 from Scopus database.

Statistical Analysis

The data were collected and entered in WPS Excel

Table 1 Types of Study Design,number of authors,area of interest in three journals

Study Design	JPHD n(%)	CDOE n(%)	CDH n(%)
Cross Sectional study	270(65.69)	386 (59.11)	359(74.79)
Systematic Review	10(2.43)	108 (16.53)	35(7.29)
Cohort study	80(19.46)	78 (11.94)	19(3.95)
Case Control	24(5.83)	25 (3.82)	2(0.41)
RCT	9(2.18)	34 (5.2)	40(8.34)
In-vitro	2(0.48)	-	5 (1.04)
Qualitative	14(3.4)	10 (1.53)	10(2.08)
Quasi	1(0.24)	-	3 (0.62)
Mixed	1(0.24)	-	5 (1.04)
Multivariable analysis	-	12 (1.83)	2 (0.41)
Number of Authors			
One author	9 (2.1)	30 (4.59)	24 (5)
Two authors	37 (9)	53 (6.58)	40 (8.34)
Three authors	62 (15.08)	109 (16.69)	82 (17.08)
More than three authors	303 (73.72)	461 (70.59)	334 (69.58)
Area of Interest			
Oral Health	153(37.22)	320 (49)	180(37.5)
Dental Caries	59 (14.35)	96(14.7)	78(16.25)
Dental Care/Services/ Utilisation	67(16.30)	30(4.59)	46(9.58)
Periodontal problems	10(2.43)	12 (1.83)	20(4.16)
Oral Cancer	7(1.70)	12 (1.83)	6(1.25)
Tobacco	9(2.18)	14 (2.14)	39(8.12)
Fluoride	21(5.1)	34 (5.2)	6(1.25)
Others	85(20.68)	135 (20.67)	105(21.87)

In Table 2 Co-Authorship among Top 5 authors of all three journals individually have been done using Vos viewer by taking minimum number of documents of author and minimum number of citations of an authors as one. Brennan d.s. and Ekanayake I. had a total link strength of 4 and 5 with 54 citations and 11 citations each respectively.

PlumXmetrics of top 5 articles have been elaborated in table 3 according to Scopus database. For all forms of scholarly research output, PlumX collects and compiles the necessary research metrics. It is categorised into 5 separate categories namely Citations (Scopus, pubmed, Policy, Clinical) ; Usage (Abstract view, Full text view, Link outs); Captures (Exports, Readers save) ; Mentions (News, Counts, References) and Social Media (Facebook, Twitter). The top five CDOE articles were published in 2011, 2012, 2013, and 2016. The study by Abanto J. et al.²² had the most usage and citations. However, the Silva MJ et al.²⁶ study was shared on Facebook about twenty times. Regarding CDH, the study by O'Mullane et al.²⁷ included 386 captures and 148 total citations. Out of all the publications from the three journals, it was also shared the most—151 times.

The citation mapping was done only for Community Dentistry and Oral Epidemiology because it contained the maximum number of articles. With a minimum number of five occurrences per keyword, 1256 words were represented in five large clusters: Oral Health, Epidemiology, Caries, Dental Caries, Public Health which were interrelated with all the keywords in dentistry. (Figure 2)

With two documents per country and with a minimum of one citation, forty three clusters were found, where the citation force was mainly represented by United Kingdom, and the United States, Australia, Brazil and Canada as the main countries. (Figure 3)

With two documents per country and with a minimum of two citation, 444 clusters were found. The most documents and citations were by the following authors :Peres m.a. ,Tsakos g. and Watt r.g. (Figure 4). In Figure 5, the h-Index, or Hirsch index, measures the impact of a particular scientist rather than a journal. "It is defined as the highest number of publications of a scientist that received h or more citations each while the other publications have not more than h citations each." For example, a scholar with an h-index of 5 had published 5 papers, each of which has been cited by others at least 5 times.

Table 2 :- Co-Authorship among Top 5 authors of all three journals

AUTHOR	DOCUMENTS	CITATIONS	TOTAL LINK STRENGTH
Community Dentistry and Oral Epidemiology			
Brennan d.s.	4	54	4
Arrow p.	4	56	3
Han d.-h.	3	29	3
Spencer a.j.	4	30	3
Do l.g.	2	12	2
Community Dental Health			
Ekanayake l.	5	11	5
Baker s.r.	2	5	2
Bernabé e.	2	12	2
Hakeberg m.	2	6	2
Hirata s.	2	6	2
Journal of Public Health Dentistry			
Mascarenhas a.k.	3	2	3
Altman d.	2	4	2
Atchison k.a.	2	6	1
Chi d.l.	2	4	0
Griffin s.	2	8	0

Table 3- PlumXmetrics of Top 5 articles of CDOE,CDH,JPHD from 2011 to 2021 according to Scopus database [22-36]

PLUMXMETRICS		CDOE					CDH					JPHD				
Year in which articles published		2011	2013	2012	2013	2016	2016	2013	2016	2012	2012	2011	2020	2011	2011	2011
Citations	Scopus,	238	237	216	182	149	146	101	92	53	49	451	128	119	109	103
	Crossref,															
	Pubmed															
	P o l i c y citation	1	3	8	6	-	2	-	1	-	-	6	-	2	3	4
	C l i n i c a l citation	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-
Usage	A b s t r a c t views	3010	1574	648	1918	375	-	-	-	-	-	1264	2	4237	1083	432
	F u l l t e x t views	346	1096	210	416	222	-	-	-	-	-	90	-	129	79	169
	L i n k o u t	63	212	77	280	139	-	-	-	-	-	42	-	128	48	89
Captures	R e a d e r s	321	439	236	335	409	386	172	229	120	77	483	122	322	371	162
	E x p o r t	240	154	76	267	81	-	-	-	-	-	29		62	29	86
	s a v e s															
Mentions	N e w s	-	-	-	-	4	1	-	-	-	-	-	-	-	-	-
	C o u n t s	-	-	-	-	1	-	-	-	-	-	-	-	1	-	-
	R e f e r e n c e s	-	-	-	-	1	1	-	-	-	-	-	-	1	--	
S o c i a l Media	F a c e b o o k	1	-	1	-	20	151	-	-	-	-	-	-	-	-	-
	T w e e t s	-	1	1	5	3	1	-	-	-	-	8	-	-	1	-

Discussion

A great deal of scientific research has been made available through scientific journals, which help disseminate the results obtained.

The valuing of clinical conducts based on evidence helps to assess methodological quality that provides the answers to the patients' requests. Thus, bibliometric analysis plays a pivotal component in quality assessment of the scientific journal highlighting the loopholes and showing the way for improvement.

The outcome of the study was that in JPHD, majority of the studies conducted comprised of data from National Health and Nutrition Examination Survey, 2011 to 2016. NHANES is specially planned to assess the health and nutritional status of adults and children in the United States. This survey is unique in that it combines interviews, physical examinations, and administers tests of physical activity and fitness that include both children and adolescents. Data collection on the recent NHANES began in early 1999 and still remains a constant yearly study. Each year approximately 7,000 randomly-selected habitats across the U.S participate in the latest NHANES³⁷.

Studies conducted also collected data from Brazilian Oral Health Survey. This survey was conducted in order to evaluate the oral health of Brazil and assess the services of the National Health Systems. This study is often mentioned as Smiling Brazil 2010 or SB Brazil 2010. A total of 37,519 participants those who participated were interviewed and received dental examinations in their homes. The survey targeted the age groups of children 5 years old, children 12 years old, adolescents 15-19 years old, adults 35-44 years old, and adults 65-74 years old³⁸.

It was seen that the magnitude of the articles were of multiple authors from different private educational institutes emphasizing the importance of teamwork for the research/survey as well as its coverage. Similar results were also described by the previous bibliometric studies done by Thanukodi³⁹, Thanuskodi⁴⁰ and Chatterjee⁶. One possible reason may be that the educational institutes encourages more of research work as a part of the postgraduate course.

In 2014, a bibliometric analysis was conducted by Jain et al.⁴¹ between two journals namely Journal of Indian Association of public health dentistry (JIAPHD) which is the official journal of IAPHD since 2002 and CDOE from 2002 -2013. About 78% of the articles in CDOE were descriptive and analytical observations but in our study 59% studies were descriptive analysis. Articles focusing on caries prevalence, experience were found in 22 % in CDOE. But in our study, there was a decrease in studies focusing on caries were only 96(14.7).

Recently, another bibliometry study has been conducted by Karishma et al.⁴² on the publication trends of articles in the Journal of Indian Association of Public Health Dentistry over a period of 7 years from 2014 to 2020. The assessment of the study design published in the journal showed a dominance of cross sectional studies which was in accordance to our findings followed by experimental studies. Majority of the articles consisted of multiple authors which is according to the present study. However, contrastingly according to Warraich et al.,⁴³ majority of articles were of single authors. Thus, the take home message from this research work is that authors should focus on conducting more systematic reviews

as it is the best form of evidence and at the top of hierarchy of evidence.

Next, coming to the limitations of this subject, is that not much literature is available for comparison of the study results of other journals. Secondly, only the Scopus database was evaluated, which could omit the recovery of studies published in other important databases such as Web of Science. Thirdly, bias could have occurred because of the manual search of articles and omission of surveys published in languages other than English. Lastly, the omission of recently published articles since 2021, such as manuscripts that have recently been accepted and have not yet been published. However, we consider that the findings obtained from the Scopus database provide robust information and evidence⁴⁴.

Conclusion

The bibliometric analysis between three esteemed journals showed fascinating pattern. It was reasoned that most studies were original researches that included mostly the cross sectional studies indicating a demand for more better dental research. United States and United Kingdom had maximum number of citations. It was also further indicated the areas of interest where limited study has been conducted. Furthermore, a disparity was observed between the implementation of National oral health policy which would serve as a tool for secondary data.

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Authors' contribution

All authors read and approved the final version of the manuscript.

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