ORIGINAL ARTICLE

ARTICLE TYPE AND RESEARCH DESIGN OF PUBLICATIONS IN TWO ASIAN PERIODONTOLOGY JOURNALS FROM 2011-2020 AND THE CHANGING TRENDS

[1]Haritheertham Gayathri, [2]Palanivelu Sivsankar, [3]Hema P, [4]Balasubramanian Madhan

[1]Reader, Department of Periodontology, Sri Venkateshwaraa Dental College, Puducherry, India
[2]Senior Assistant Professor, Department of Periodontics, TamilNadu Government Dental College and Hospital, Chennai, India
[3]Senior Lecturer, Department of Periodontology, Sri Venkateshwaraa Dental College, Puducherry, India
[4]Department of Dentistry, Jawaharlal Institute of Postgraduate Medical Education and Research, Puducherry, India

Correspondence:
Dr. Haritheertham Gayathri
Reader, Department of Periodontology, Sri Venkateshwaraa Dental College, Puducherry, India
Email gayathrimadhan77@gmail.com

ABSTRACT

Aims: The study aimed to evaluate and compare the article type and research design of publications in the Journal of Indian Society of Periodontology (JISP) and Journal of Periodontal and Implant Science (JPIS) and the change in trends from 2011 to 2020.

Materials and Methods: All the scientific publications during the evaluation period were screened and categorized as background resources, case reports, and original articles. The original articles were classified into Primary research and Research syntheses /Summaries, with the former further sub-typed based on research design. Chi-Square / Fisher's exact tests were used to compare the category-wise distribution of publications between the journals and the change in trends within the journals for the block years of 2011-2015 and 2016-2020.

Results: JISP had a higher proportion of case reports (26.5 vs. 5.3%, p<.05) and lesser original articles than JPIS (56.5 vs. 76.6%, p<.05). While Randomized controlled trial (RCT, 32.1%)

was the common primary research design in JISP, nonclinical studies comprised the major bulk in JPIS (47.4%). A 13.7% and 9.8% increase in the proportion of original articles were noted in JISP and JPIS during the second five-year block. JISP also recorded an increase of 2.8% in research synthesis articles.

Conclusions: Increase in the proportion of original articles in both journals, an increase in the proportion of research synthesis and summary publications, and the maintenance of the quantum of RCTs to about one-third of primary research articles by JISP are favorable trends in the purview of Evidence-Based Periodontology. The continued predominance of nonclinical studies in primary research is a potential area for improvement in JPIS.

Key Words: Publication Type, Study Design, Publication Trend, Hierarchy of Evidence

INTRODUCTION

The information on what is published in a scientific journal is of immense use to all its stakeholders. The data may pertain to publication type, focus areas, citation metrics, author profile, geographic distribution, etc.[1–6] These help the authors decide the appropriateness of the journal for their manuscript. They hint to the audience on what to look for from the journal in the future. It serves as a type of feedback for the peer reviewers. Finally, for the editorial board and journal, it helps in quality control. Two important factors that influence the quality and impact of a publication are the type of publication and the research design adopted in the study.[7,8] In the era of evidence-based Periodontology, the latter assumes special significance. There is an increasing preference to publish original articles with research designs placed at the top of the hierarchy of the evidence pyramid.

The Journal of Indian Society of Periodontology (JISP) was started in 1997 as the official journal of The Indian Society of Periodontology.[9] The online publications of the journal are available from 2008 at www.jisponline.com. The Journal of Periodontal and Implant Science

(JPIS) was started in 1971 as the Journal of the Korean Academy of Periodontology.[10] From an annual publication at the start, it has progressively increased the number of issues to six issues per year since 2010. The online publications of JPIS from 1997 can be accessed at https://www.jpis.org. Both journals are peer-reviewed, open-access, and included in PubMed central.

To the best of our knowledge, there is no collated information on the types of articles published in these journals. Hence, the present study was conducted to

1. Evaluate and compare the types of articles and research designs of original articles published in JISP and JPIS from 2011 to 2020 and

2. Examine the change in publication trend, if any, during this decade.

MATERIALS AND METHODS

Classification of publications

All the online publications from 2011 to 2020 at these journal websites were screened and evaluated for content. The non-scientific content (Announcements, messages from office bearers of the society, reviewers list, etc.) and addendum/corrigendum on articles published earlier were excluded from the study. Based on the type of article, the publications were broadly divided into opinion / Background resources (Editorials, letters to the editor, narrative reviews), case reports (including case series), and original articles. Original articles were further classified as Primary Research and Research syntheses & Summaries. The latter included systematic reviews, meta-analyses, clinical practice guidelines, and position papers. Primary research articles were finally subdivided into six types by their study design: nonclinical (animal and in-vitro studies), cross-sectional, case-control, cohort, quasi-experimental study and Randomized Controlled Trial (RCT). This classification system (Figure 1) is based on the hierarchy of evidence pyramid[11–13] and modified from Ramteke et al.[14]

Data Acquisition

Three sessions of consensus discussion and two practice sessions regarding the classification system were held among the authors before the initiation of the study. After familiarizing themselves with the procedure, three assessors (HG, SS, and H) independently evaluated and categorized the publications. The inter-evaluator discordances in the classification of articles were settled by group discussion with the fourth evaluator (BM) before the final data entry.

Data Analysis

The collected information was tabulated in Microsoft Excel 2016 (Microsoft Corporation, Redmond, Washington, USA). Data analysis included the estimation and category-wise comparison of the proportion of publications in these journals with the chi-square test. If statistically significant, this was followed by the Z test with Bonferroni correction for multiple comparisons. In order to analyze the changing trends, the evaluation period was divided into two 5-year blocks as 2011 to 2015 and 2016 to 2020. The differences in the distribution of publications by categories between the blocks within these journals were analyzed for statistical significance with the chi-square test / Fisher's exact test, followed by multiple comparisons using the Z test with Bonferroni correction. The statistical analyses were performed in IBM SPSS statistics 23 for Windows (IBM Corp., Armonk, NY, USA)

RESULTS

The evaluation period contained 1306 and 437 publications in JISP and JPIS, respectively. Of these, 159 publications in JISP and 5 in JPIS were deemed non-scientific and excluded. Hence, 1147 and 432 publications from these journals were finally included for analysis. The category-wise distribution of these publications is presented in Table 1.

The overall differences in the proportions of different article types between the journals

were statistically significant [X^2(2, N=1579) =88.67, p<.001]. Both journals had a similar proportion of original articles (17% in JISP and 18.1% in JPIS). However, JISP had a relatively higher proportion of case reports (26.5% vs. 5.3%, p<.05) and a lesser number of original articles (56.5% vs. 76.6%, p<.05) than JPIS (Figure 2). Primary research articles formed the bulk of original articles in both JISP (98%, n=635) and JPIS (98.8%, n=327). Research synthesis (Systematic Review / Meta-analysis) and summary contributed to a meager 2% of the original articles in JISP and 1.2% in JPIS.

The distribution of primary research publications by research design is presented in Table 1 and Figure 4. RCTs (32.1%, n=204) and cross-sectional studies (31.7%, n=201) were the common among primary research publications in JISP (Figure 3), whereas nonclinical studies were the most frequent in JPIS (47.4%, n=155). JPIS had a relatively higher proportion of nonclinical (47.4% vs. 11%) and cohort studies (12.9% vs. 3.) than JISP, while the reverse was true for cross-sectional studies (12.5% vs. 31.7%), quasi-experimental designs (7.3% vs. 14.6%) and RCTs (11.9% vs. 32.1%). Overall, the differences noted between the two journals for the proportions of various research designs were statistically significant [X^2(5, N=962) =226.57, p<.001]. The distribution of scientific publications based on the types in the Hierarchy of Evidence Pyramid is given in Figure 4.

Compared to the first block years, a statistically significant reduction in the proportion of opinion-based publications (21.1% to 11.8%, p<.05) and an increase in original articles (50.5% to 64.2%) was noted in JISP for the second block years(Table 2). JPIS also demonstrated an increase in the proportion of original articles in the second block years (71.9% to 81.7%, p<.05), but this was at the expense of a 7.4% reduction in case reports (Table 3). While JISP registered an increase of 2.8% increase in Research synthesis and summaries in the second block [X2(1, N=648) =6.47, p=.011], the change for JPIS was statistically non-

significant. Analysis of changes in the study design of primary research publications in JISP revealed an increase in the proportion of cross-sectional studies (26.2% vs. 37.3%, p<0.5) and a concomitant fall in case-control studies (11.1% vs. 2.9%). Though few differences were noted in JPIS, they failed to reach statistical significance.

DISCUSSION

Overall, 43.5% of the scientific publications in JISP were Opinion based articles and case reports, entities at the bottom of the hierarchy of evidence pyramid. At first look, JPIS seemed to fare better in this regard, as original articles comprised over three-quarters of all scientific publications in the journal. However, this was offset by the fact that nearly half of these were nonclinical (in-vitro) studies, which offer no better evidence than either opinion-based resources or case reports. It appears that both journals have recognized the need for improvement in this regard and initiated the trend to publish more original articles. This change has happened at the expense of opinion-based articles in JISP and case reports in JPIS.

Randomized controlled trials are the gold standard among experimental study designs[12] and offer the highest level of evidence among primary research articles. It is commendable that RCTs continue contributing to nearly one-third of the primary research designs in JISP. An increase, albeit minor, in the number of research synthesis articles (systematic reviews and meta-analyses) published over the years is another welcome change in JISP. A research summary in the form of good clinical practice guidelines for managing periodontal disease in patients with diabetes was published recently.[15] These changes imply an upward movement in the hierarchy of the evidence pyramid. On the contrary, the continued dominance of preclinical studies and a reduction in the proportion of RCTs (though not statistically significant) are matters of concern for JPIS.

As there is no similar publication in the literature, the findings of this study could not

be directly compared or contrasted. Some problems encountered during the categorization of the articles and the resulting study limitations merit mention here. Under-reporting of information was the most recurrent issue. The title and abstract of the articles frequently lacked sufficient information on the study design compelling to scan for the same in the material and methods section of the manuscript. When the necessary information was unavailable even here, the only possibility left was an educated guess, a forced limitation of the study. Another common issue was the misclassification of research designs. Finally, the articles were included in a particular research design category based on the information available, even if the substantiating details were missing. For example, the research design was deemed an RCT if the publication claimed so, even if details of randomization were unavailable. Hence the position of an article in a particular category does not imply that it is of the requisite quality.

CONCLUSIONS

The following are the salient conclusions of this study

1. JISP had a higher proportion of case reports and lesser original articles than JPIS.

2. RCT was the common primary research design among original articles in JISP, and nonclinical was the most frequent in JPIS.

3. Over the years, the increase in the proportion of original articles in both journals, maintenance of the quantum of RCTs to about one-third of primary studies, and an increase in the proportion of research synthesis by JISP are favorable changes from the purview of Evidence-Based Periodontology. The continued preponderance of nonclinical studies in primary research is a potential area for improvement in JPIS.

Conflict of Interest: Nil

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Table 1. The category-wise distribution of publications in the Journal of Indian Society of Periodontology and the Journal of Periodontal and Implant Science from 2011-2020.

Category	JISP n (%)	JPIS n (%)	Comparison^{Ɨ}	Post-hoc^{ǂ}
Type of publication				
Opinion / Background resource	195 (17)	78 (18.1)	$X^2(2, N=1579)$ =88.67, $p<.001$	NS
Case Report	304 (26.5)	23 (5.3)		*
Original article	648 (56.5)	331 (76.6)		*
Total	1147	432		
Type of original article				
Primary research	635 (98)	327 (98.8)	$X^2(1, N=979)$ =.817, $p=.366$	
Research Synthesis and Summaries	13 (2)	4 (1.2)		
Total	648	331		
Type of Primary Research (Study design)				
Nonclinical	70 (11)	155 (47.4)		*
Cross-sectional	201 (31.7)	41 (12.5)		*
Case-control	45 (7.1)	26 (8)	$X^2(5, N=962)$ =226.57, $p<.001$	NS
Cohort	22 (3.5)	42 (12.9)		*
Quasi-experimental	93 (14.6)	24 (7.3)		*
RCT	204 (32.1)	39 (11.9)		*
Total	635	327		

JISP – Journal of Indian Society of Periodontology, JPIS- Journal of Periodontal and Implant Science, Ɨ - Chi-square test, ǂ - Z test with Bonferroni correction for multiple comparisons, *- p<.05, NS- Nonsignificant

Table 2. Comparison of the category-wise distribution of publications in the Journal of Indian Society of Periodontology for block years 2011-2015 and 2016-2020

Category	2011-2015 n (%)	2016-2020 n (%)	Comparison[I]	Post-hoc[‡]
Type of publication				
Opinion / Background resource	136 (21.1)	59 (11.8)	X^2(2, N=1147) =25.99, p<.001	*
Case Report	184 (28.5)	120 (24)		NS
Original article	326 (50.5)	322 (64.2)		*
Total	646	501		
Type of original article				
Primary research	324 (99.4)	311 (96.6)	X^2(1, N=648) =6.47, p=.011	*
Research Synthesis and Summaries	2 (0.6)	11 (3.4)		*
Total	326	322		
Type of Primary Research (Study design)				
Nonclinical	36 (11.1)	34 (11)		NS
Cross-sectional	85 (26.2)	116 (37.3)		*
Case-control	36 (11.1)	9 (2.9)	X^2(5, N=635) =24.15, p<.001	*
Cohort	12 (3.7)	10 (3.2)		NS
Quasi-experimental	55 (17)	38 (12.2)		NS
RCT	100 (30.9)	104 (33.4)		NS
Total	324	311		

I - Chi-square test, ‡ - Z test with Bonferroni correction for multiple comparisons, *- p<.05, NS- Nonsignificant

Table 3. Comparison of the category-wise distribution of publications in the Journal of Periodontal and Implant Science for block years 2011-2015 and 2016-2020

Category	2011-2015 n (%)	2016-2020 n (%)	Comparison^{Ɨ}	Post-hoc^{ǂ}
Type of publication				
Opinion / Background resource	43 (19.2)	35 (16.8)	$\chi2(2, N=432)$ $=13.05, P=.001$	NS
Case Report	20 (8.9)	3 (1.5)		*
Original article	161 (71.9)	170 (81.7)		*
Total	224	208		
Type of original article				
Primary research	160 (99.4)	167(98.2)		
Research Synthesis and Summaries	1 (0.6)	3 (1.8)	$p=.623$	
Total	161	170		
Type of Primary Research (Study design)				
Nonclinical	79 (49.4)	76 (45.5)		
Cross-sectional	21 (13.1)	20 (12)		
Case-control	13 (8.1)	13 (7.8)	$\chi2(5, N=327)$	
Cohort	15 (9.4)	27 (16.1)	$=6.12, p=.295$	
Quasi-experimental	9 (5.6)	15 (9)		
Randomized controlled Trial	23 (14.4)	16 (9.6)		
Total	160	167		

Ɨ - Chi-square test / Fisher's Exact Test, ǂ - Z test with Bonferroni correction for multiple comparisons, *- p<.05, NS- Nonsignificant

FIGURE LEGENDS

Figure 1. The classification system of publications
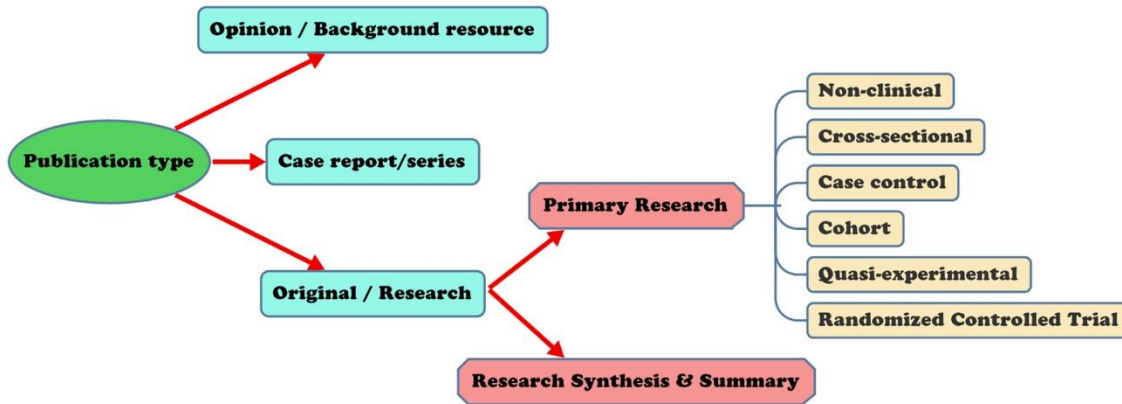

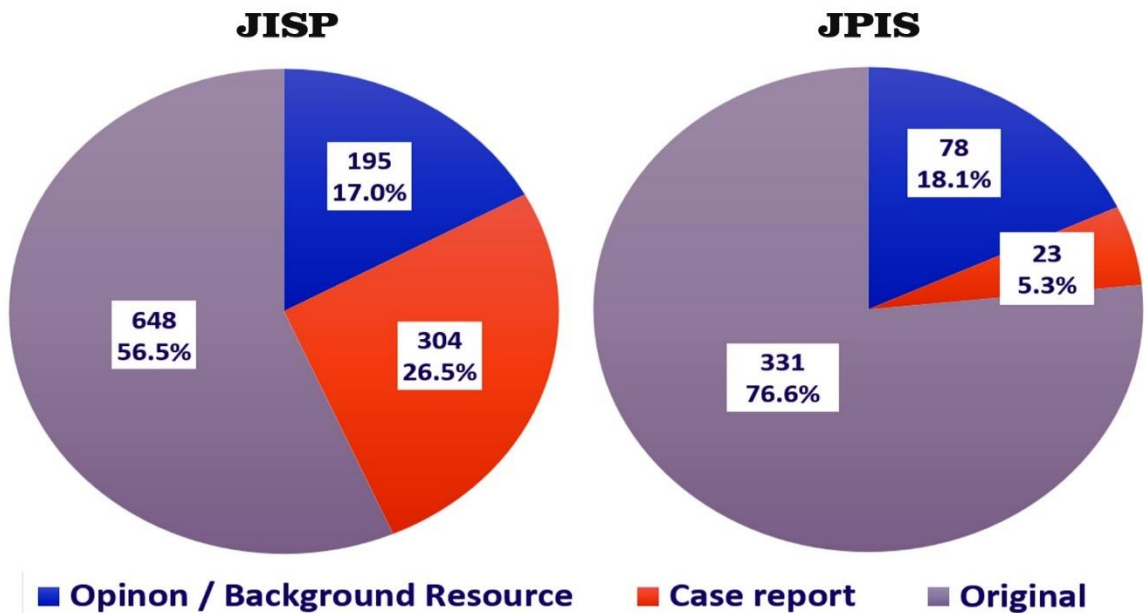**Figure 2. The distribution of publications from 2011-2020 by type**

Figure 3. The distribution of original articles from 2011-2020 by research design
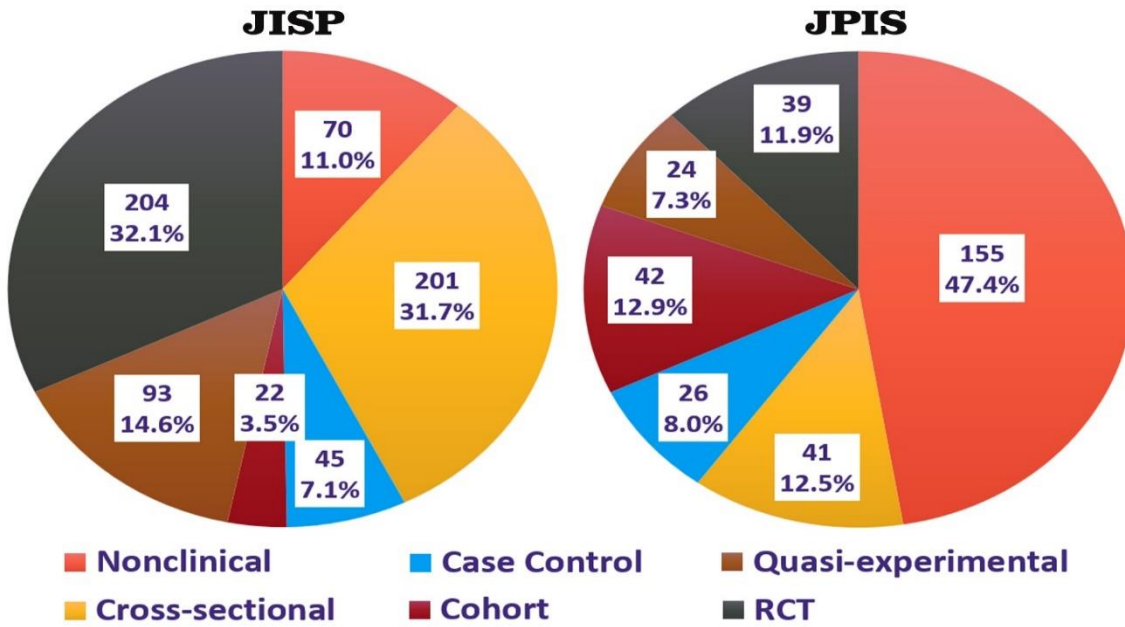

Figure 4. The distribution of scientific publications from 2011-2020, based on the categories in the Hierarchy of Evidence Pyramid