

# Analysis and Visualisation of Research Trends in Periradicular Surgery: A General Review

Dr.Saravanan P.S Professor<sup>1</sup>,

HOD,Dr.Narayana reddy M Professor<sup>2</sup>

*Meenakshi Academy of Higher Education and Research*

*narayanareddy@mmchri.ac.in*

## **Abstract**

*Periradicular Surgery is a specialized surgery, focusing on face reconstructive surgery, facial trauma surgery, oral cavity, head, neck mouth, jaws, and facial cosmetic surgery. The bibliometric analysis had been conducted to understand the active authors, organizations, and countries involved in the research domain of “Periradicular Surgery” by using the published articles from “Scopus”. The resources were analyzed using the VOS viewer to develop analysis tables and visualization maps. The most active country of the research domain was the United States of America and Brazil. The leading organization engaged in the research regarding “Periradicular Surgery” was the Universidade Estacio de Sa of Brazil. The most active authors were Taschieri S., Testori T, and Siqueira J.F*

**Keywords:** *Periradicular Surgery, Bibliometric analysis, VOS viewer, Health*

## **1. Introduction**

Endodontic is the diagnosis, treatment, and prevention of diseases of the dental pulp and the surrounding tissues<sup>1-2</sup>. The dental surgery relating to endodontic and extraarticular apical infection at apical foreman or lateral canals or iatrogenic perforations is called Periradicular surgery. Periradicular surgery will be more crucial if there is periapical and periodontal infection too. Apicoectomy and root resection are common examples of this surgery. Periradicular surgery is essential in cases where orthograde retreatment is not possible, other surgical failures, other treatments are impossible due to infection, a cyst. The tooth-specific assessment for the periradicular surgery involves inspection of the existing condition of teeth, the possibility for restoration, an inspection of root and crown, etc, inspection of the maxillary sinus, bone thickness, and possibility for other treatments<sup>3</sup>. This study focuses on consolidating literature regarding “Endodontic surgery” by identifying the leading authors, countries, journals, and organizations engaged in research regarding “Endodontic surgery”. The first section is the introduction, followed by the discussion of the methodology by which the research was conducted. The third section deals with results. The fourth section deals with the discussion and conclusion.

### **1.1 Research Objectives**

- a) To consolidate the literature regarding the “Periradicular Surgery”

- b) To find out the trends related to research in the “Periradicular Surgery”

The following research questions are framed for conducting bibliometric analysis systematically.

### 1.2 Research Questions

- a) Who are the active researchers working on “Periradicular Surgery”?
- b) Which are the main organizations and countries working on “Periradicular Surgery”?

## 2. Research Methodology

This bibliometric analysis had drawn resources only from the Scopus. For the article selection, the Boolean used was TITLE-ABS (“Periradicular Surgery”) on 31/12/2020. All the tables in this paper were created by using Microsoft Excel and VOS Viewer. Grammarly was used for spelling and grammar checks. Mendeley was used for article review and citation. This paper had been inspired by bibliometric analysis in its presentation style, analysis, and methodology from the works.<sup>4-8</sup>

## 3. Results

This first round of search produced an outcome of 149 documents, in five languages, out of which 142 documents were in English. The classification of document categories is shown in Figure 1. For improving the quality of the analysis, we had selected only the peer-reviewed articles and all other documents had not been considered. Thus after using filters “Article” and “English” the second round search produced an outcome of 129 English articles (both open access and others) and had been used to conduct bibliometric analysis and visualization using VOS Viewer. The English research articles in this domain since 1970 had been shown in Figure 2.

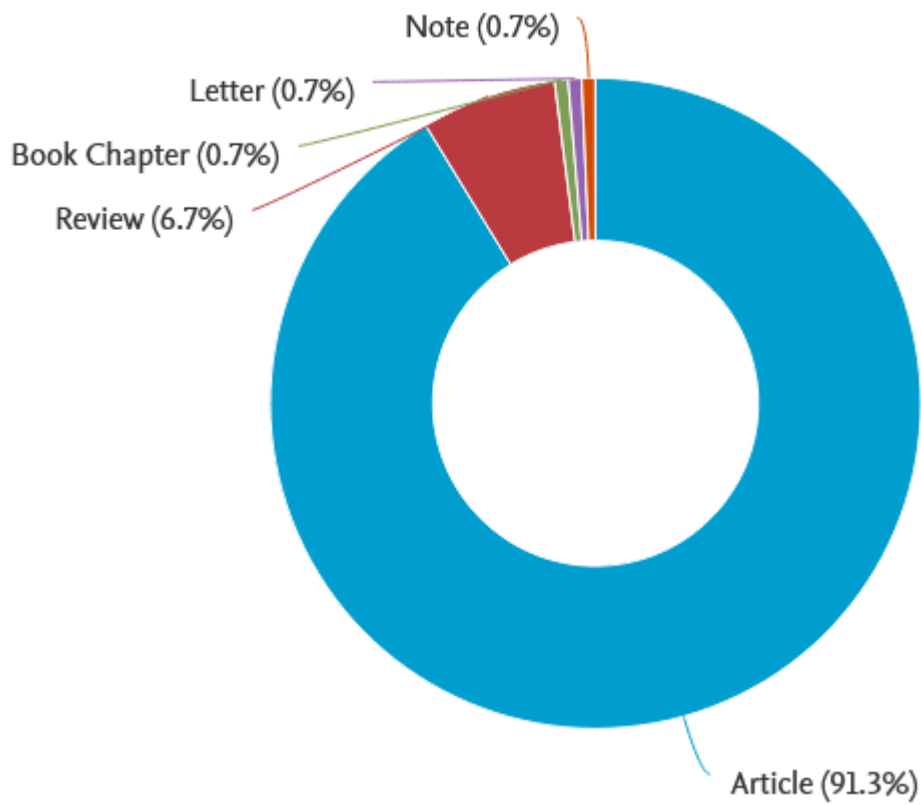


Figure 1: Classification of the documents on “Periradicular Surgery”, Source: www.scopus.com

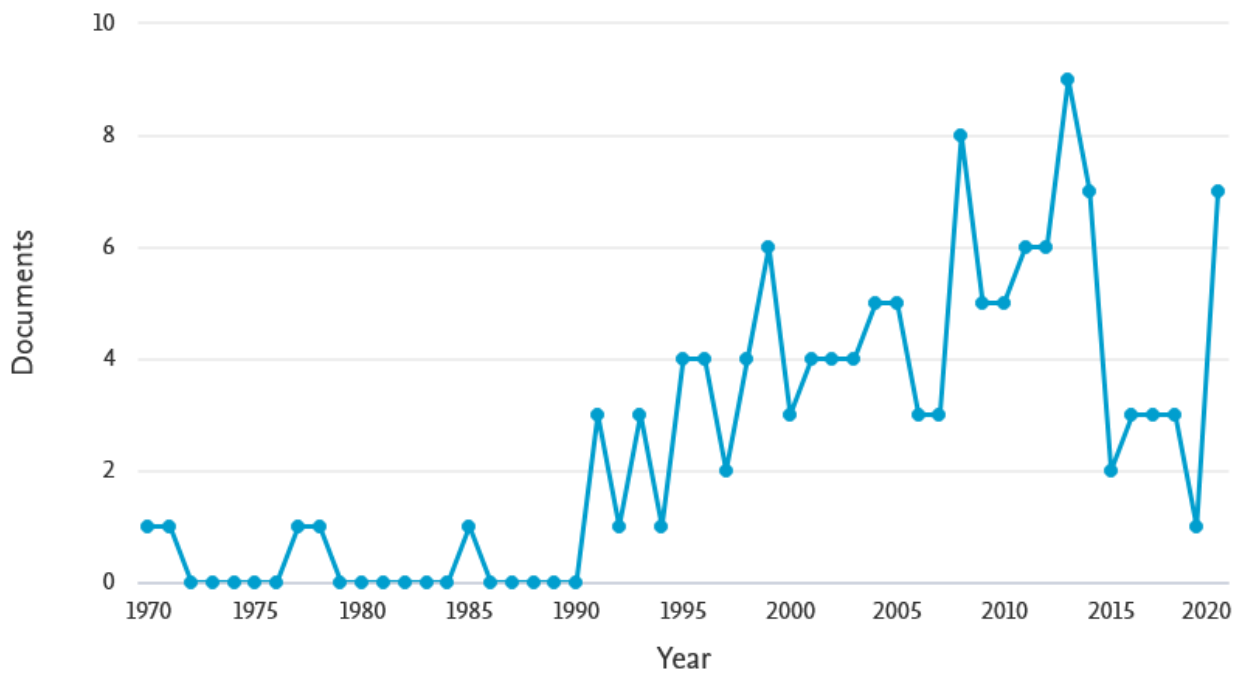


Figure 2: Period wise publication of English articles, Source: WWW.scopus.com

### 3.1 Who are the leading authors on “Periradicular Surgery”?

Co-authorship analysis, publication volume, and citation analysis had been used to spot out the leading authors on Periradicular Surgery. The results of co-authorship analysis using VoS viewer are shown in figure 3 and publication volume and citation analysis in figure 4. For a better presentation of the analysis, the parameters used were the minimum number of documents of an author as three and the minimum number of citations of authors as one. This combination plotted the map of 23 authors, in 11 clusters.

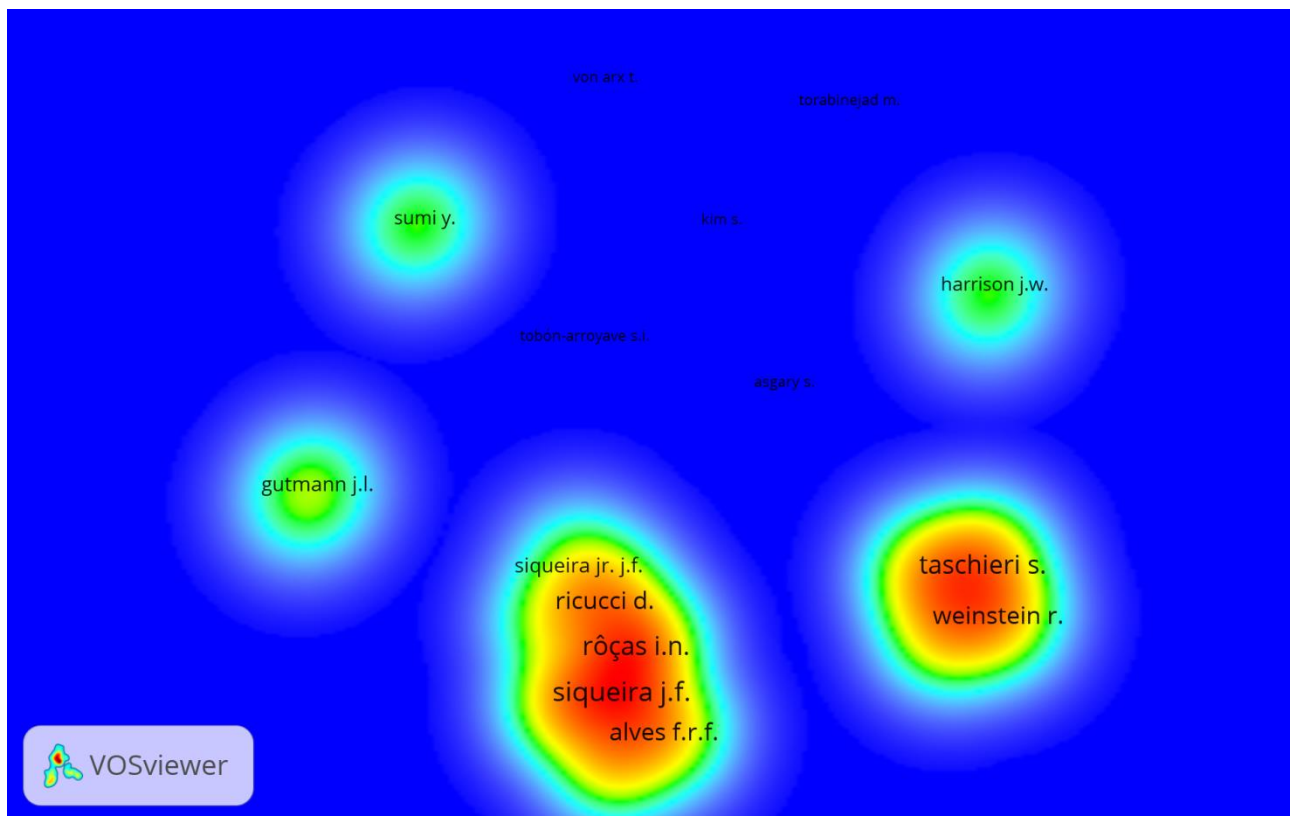


Figure 3: Co-authorship analysis on basis of authors

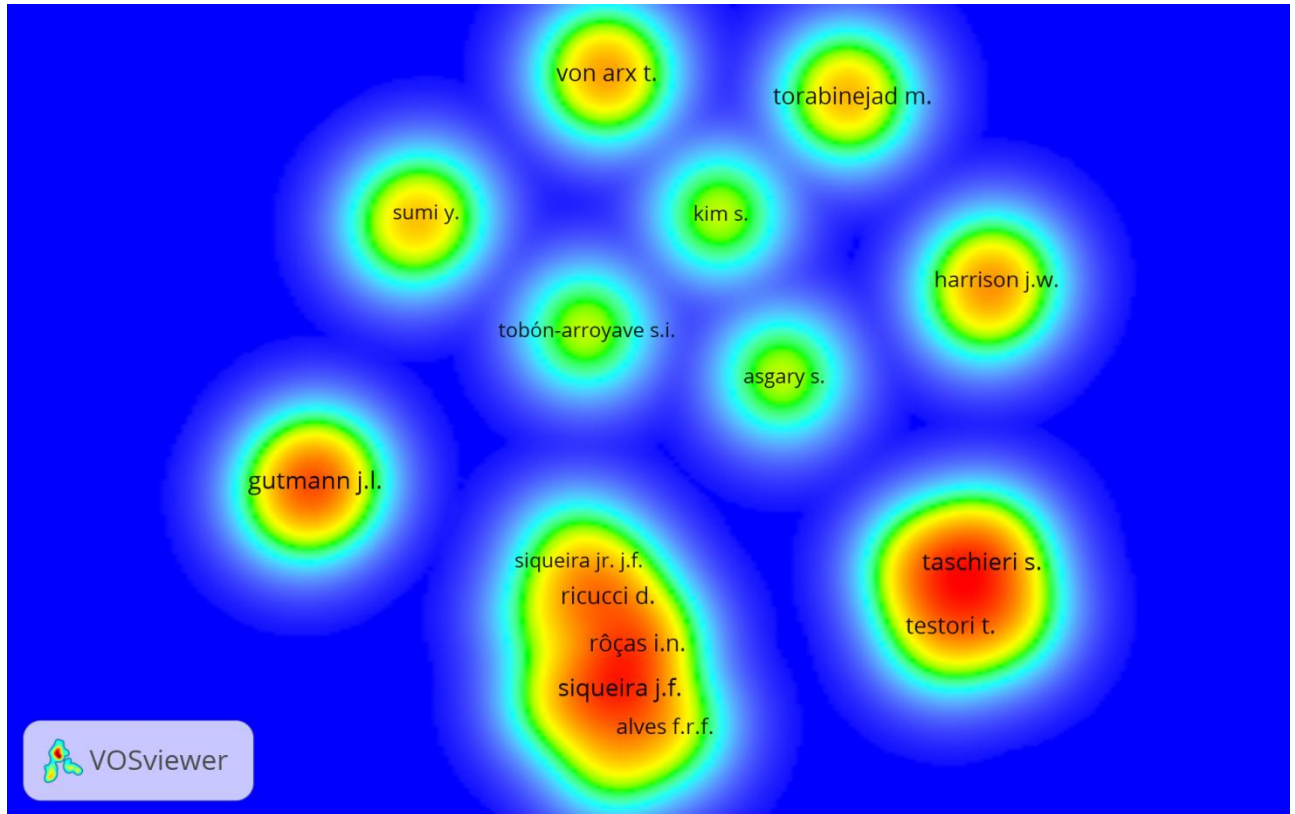


Figure 4: Publication volume analysis and citation analysis on basis of authors

In Co-occurrence analysis, we had used all keyword analyses, by keeping the minimum number of occurrences of a keyword as 20. This combination plotted the map of 31 thresholds, in three clusters. The overlay visualization of co-occurrence analysis of keywords has been shown in Figure 5.

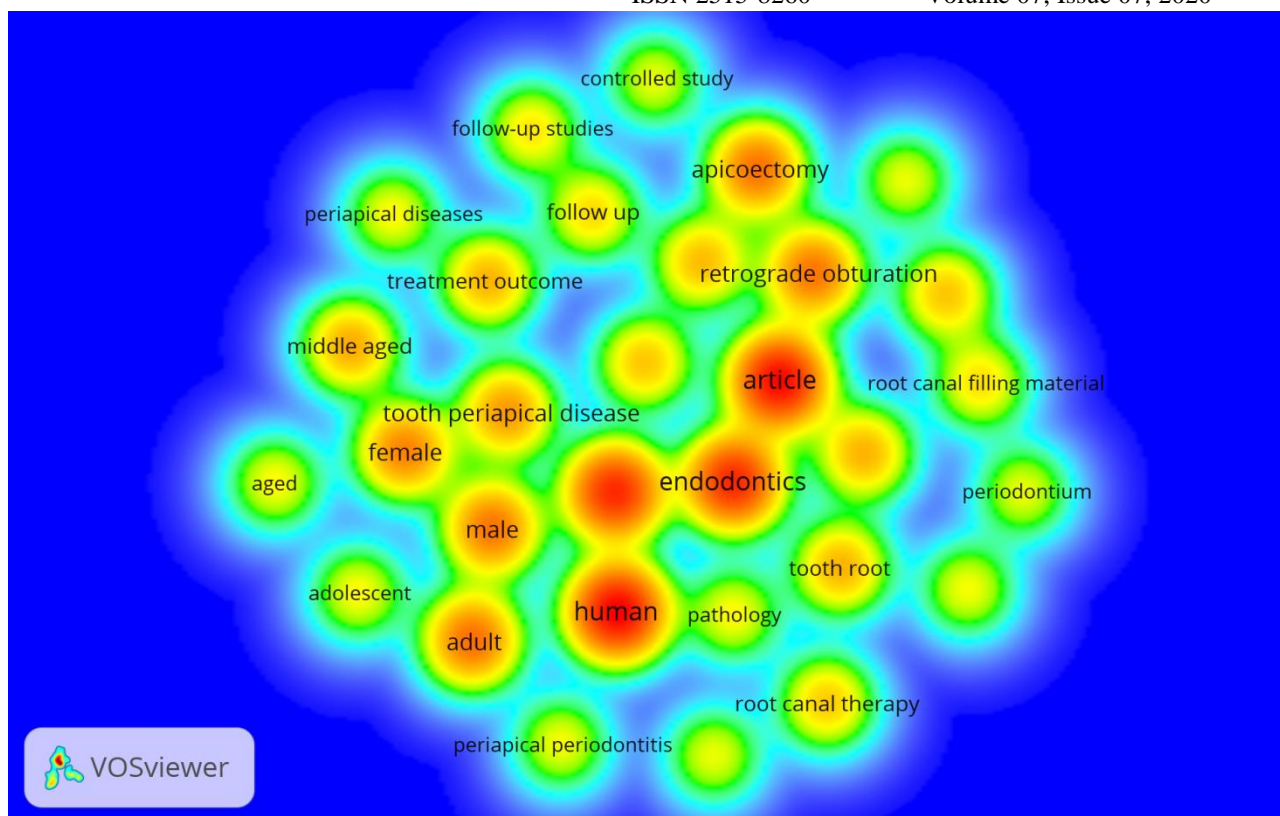


Figure 5: Co-occurrence analysis on basis of all keywords

### 3.2 Which are the top organizations and countries researching “Periradicular Surgery”?

The most leading organizations engaged in research on “Periradicular Surgery” had been found out by the citation analysis and basis of publication. The result of the above analysis is shown in table 1.

Table 1: Highlights of the most active organization

Organizations	Country	Documents	Citations	Average Citations per document
Universidade Estacio de Sa	Brazil	7	275	39.5

Co-authorship analysis and citation analysis of the countries engaged in the research on “Periradicular Surgery” had been shown in Figure 5 and Figure 6. Volume analysis is shown in figure 7. For a better presentation of the analysis, the parameters used were the minimum number of documents of an author as one and the minimum number of citations of authors as one. This combination plotted the map of 38 countries, 25 clusters.

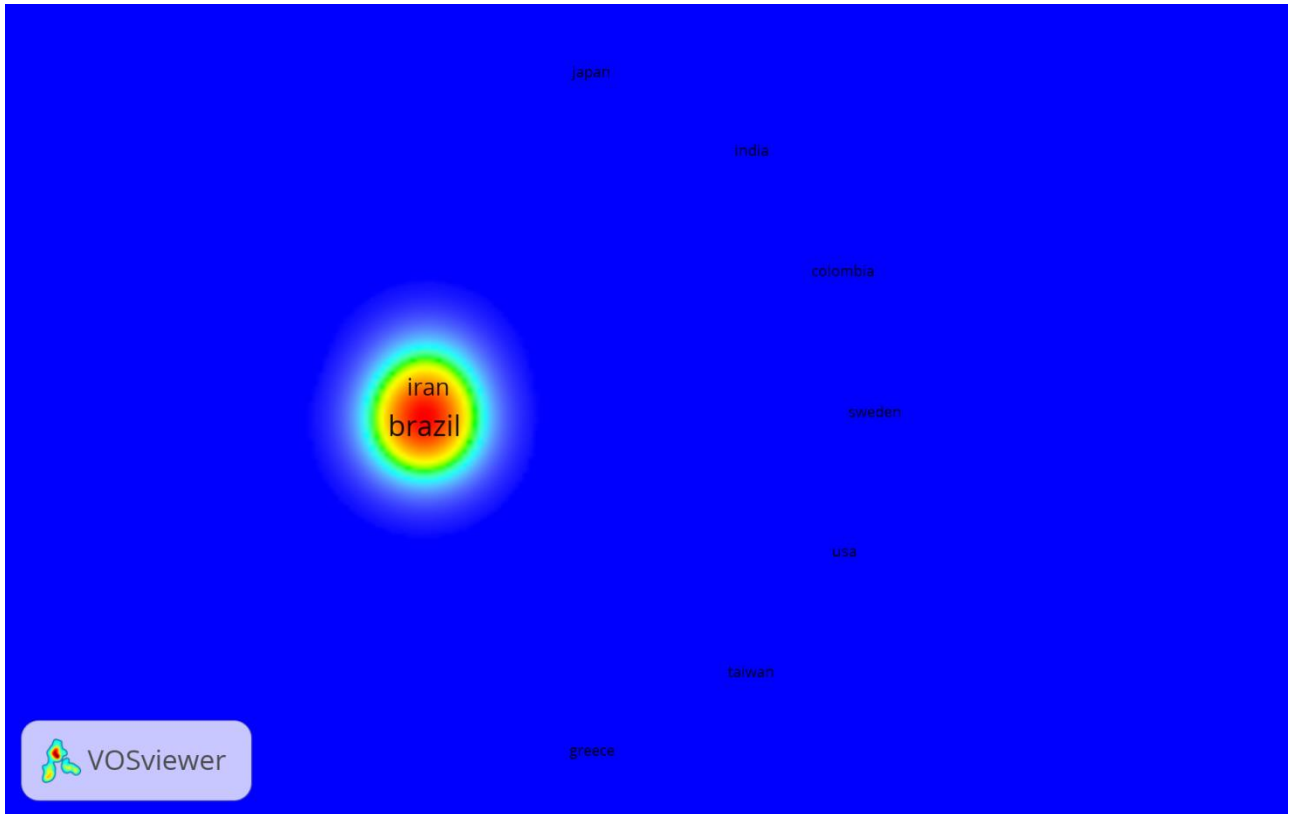


Figure 6: Co-authorship analysis on basis of countries

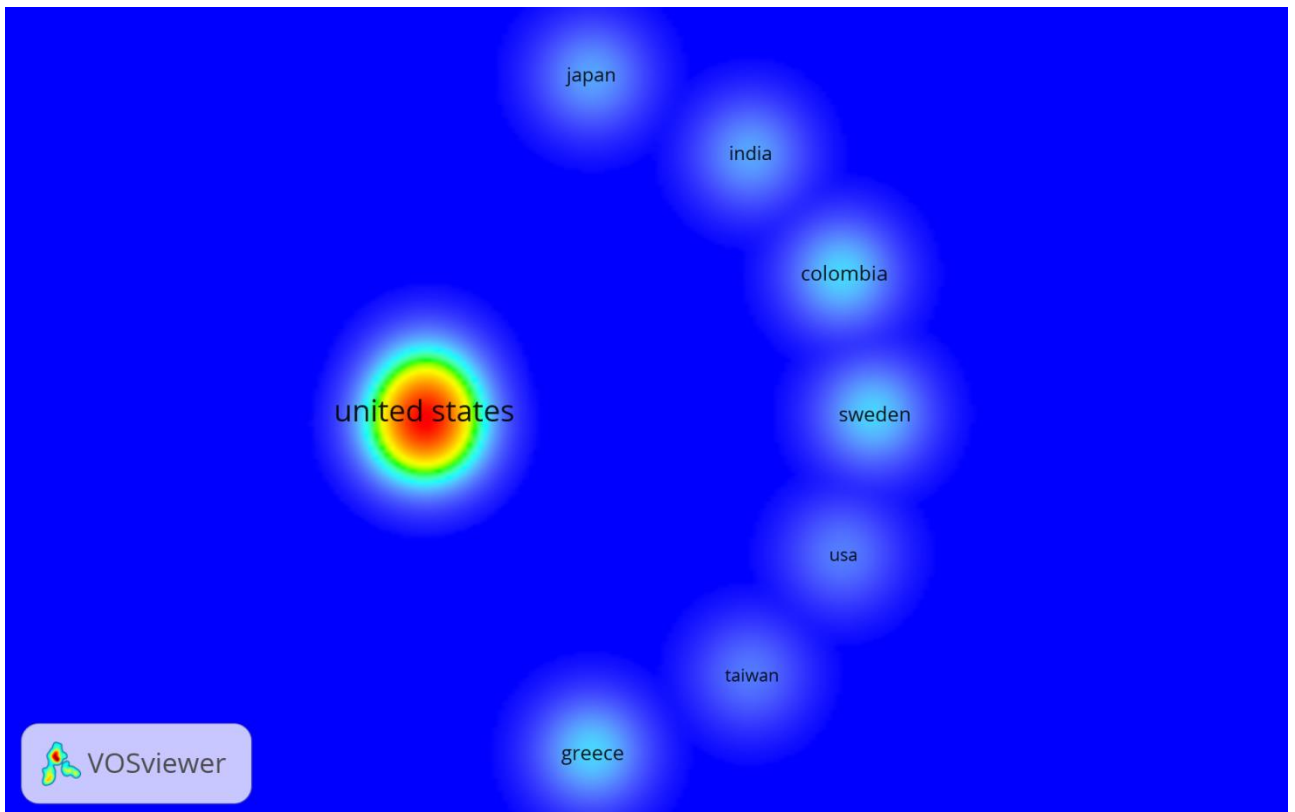


Figure 7: Leading countries in the publication of documents and citation

#### 4. Discussion and Conclusion

Periradicular Surgery is an interesting research domain and the most active country of the research domain was the United States of America and Brazil with the leading position in the citation, publication volume, and co-authorship links. The leading organization engaged in the research regarding “Periradicular Surgery” was the Universidade Estacio de Sa of Brazil. The most active authors who had made valuable contributions related to “Periradicular Surgery” were Taschieri S., Testori T, and Siqueira J.F with the leadership in publications, citations, and co-authorship links. This research domain offers a new avenue for researchers regarding future research. From the above discussion regarding the bibliometric patterns in the research regarding the “Periradicular Surgery”, this research had observed a gradual increase in research interest regarding the “Periradicular Surgery” from the starting of the millennium and the momentum is going on positively. This points out the relevance and potential of this research domain (Refer to Figure 2).

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