

Analysis And Visualisation Of Research Trends In Maxillofacial Radiology: A General Review

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Abstract: *The body surface relating to jaws and face is called “Maxillofacial region”¹. Injuries and deformities in these regions are fatal and Maxillofacial surgery may be required in critical cases. For proper diagnosis and treatment of cases around this region can be precise by experienced service of maxilla facial radiology department. The bibliometric analysis had been conducted to understand the active authors, organizations, and countries involved in the research domain of “Maxillofacial radiology treatments” 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 countries were the United Kingdom and Germany. The leading organization engaged in the research regarding “Maxillofacial radiology treatments” was the University of Western Cape in South Africa. The most active authors were Schulze R. and Jacobs R.*

Keywords: *Maxillofacial radiology treatments, Bibliometric analysis, VOS viewer, Health*

1. INTRODUCTION

The body surface relating to jaws and face is called “Maxillofacial region”¹. Injuries and deformities in these regions are fatal and Maxillofacial surgery may be required in critical cases. For proper diagnosis and treatment of cases around this region can be precise by experienced service of maxilla facial radiology department. Maxillofacial radiology is a specialization of dentistry². Maxillofacial radiology includes services related to, sialography, cone beam computed tomography (CT), intra-oral imaging, dental panoramic imaging, multislice medical CT, ultrasonography, cephalometric imaging, magnetic resonance imaging, positron emission tomography, and nuclear medicine³. This study focuses on consolidating literature regarding “Maxillofacial radiology” by identifying the leading authors, countries, and organizations engaged in research regarding “Maxillofacial radiology”. 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 “Maxillofacial radiology”
- b) To find out the trends related to research in the “Maxillofacial radiology”

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

1.2 Research Questions

- a) Who are the active researchers working on “Maxillofacial radiology”?

- b) Which are the main organizations and countries working on “Maxillofacial radiology”?

2. RESEARCH METHODOLOGY

This bibliometric analysis had drawn resources only from the Scopus. For the article selection, the Boolean used was TITLE-ABS (Maxillofacial radiology) 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.⁴⁻⁸

3. RESULTS

This first round of search produced an outcome of 61 documents, in four languages, out of which 46 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 43 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 1976 had been shown in Figure 2.

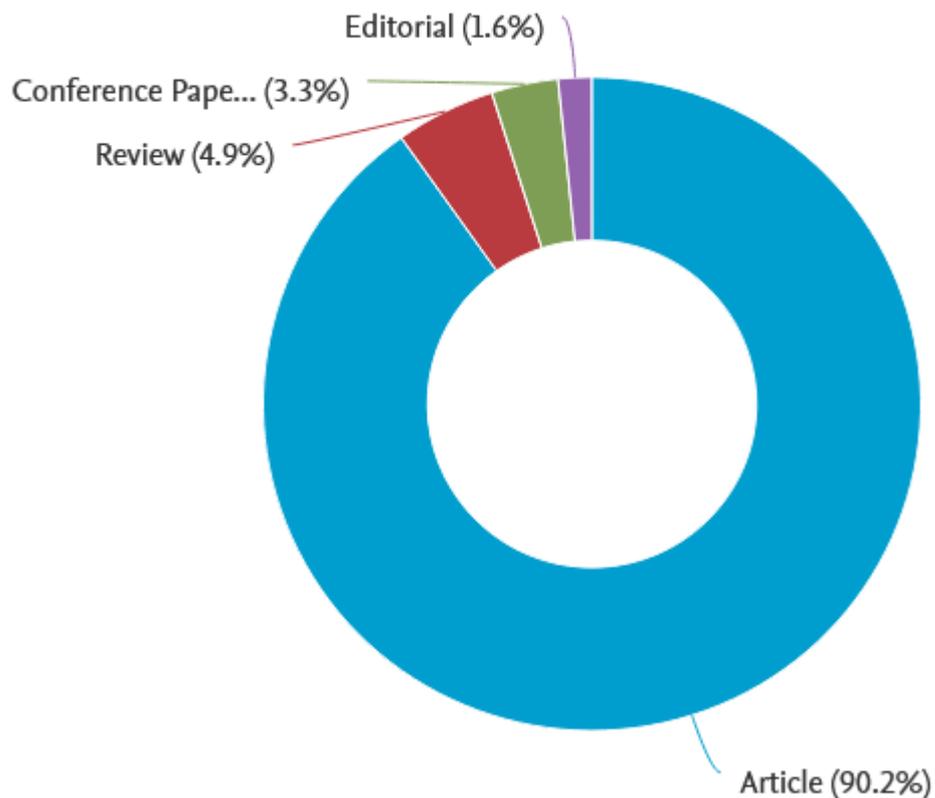


Figure 1: Classification of the documents on “Maxillofacial radiology”, Source: www.scopus.com

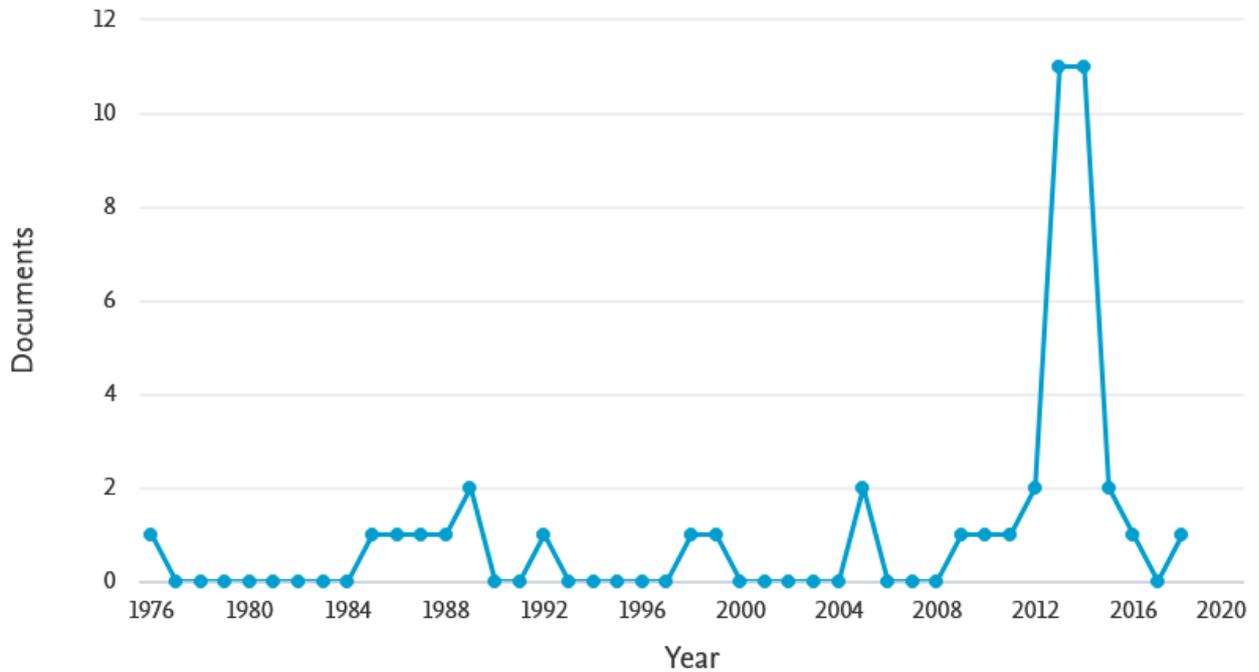


Figure 2: Period wise publication of English articles, Source: WWW.scopus.com

3.1 Who are the leading authors on “Maxillofacial radiology”?

Co-authorship analysis, publication volume, and citation analysis had been used to spot out the leading authors on Maxillofacial radiology. The results of co-authorship analysis and citation analysis using VoS viewer are shown in figure 3 and figure 4 respectively. Leading authors based on publication volume are shown in Figure 5. For a better presentation of the analysis, the parameters used were the minimum number of documents of an author as 10 and the minimum number of citations of authors as one. This combination plotted the map of 35 authors, in seven clusters.

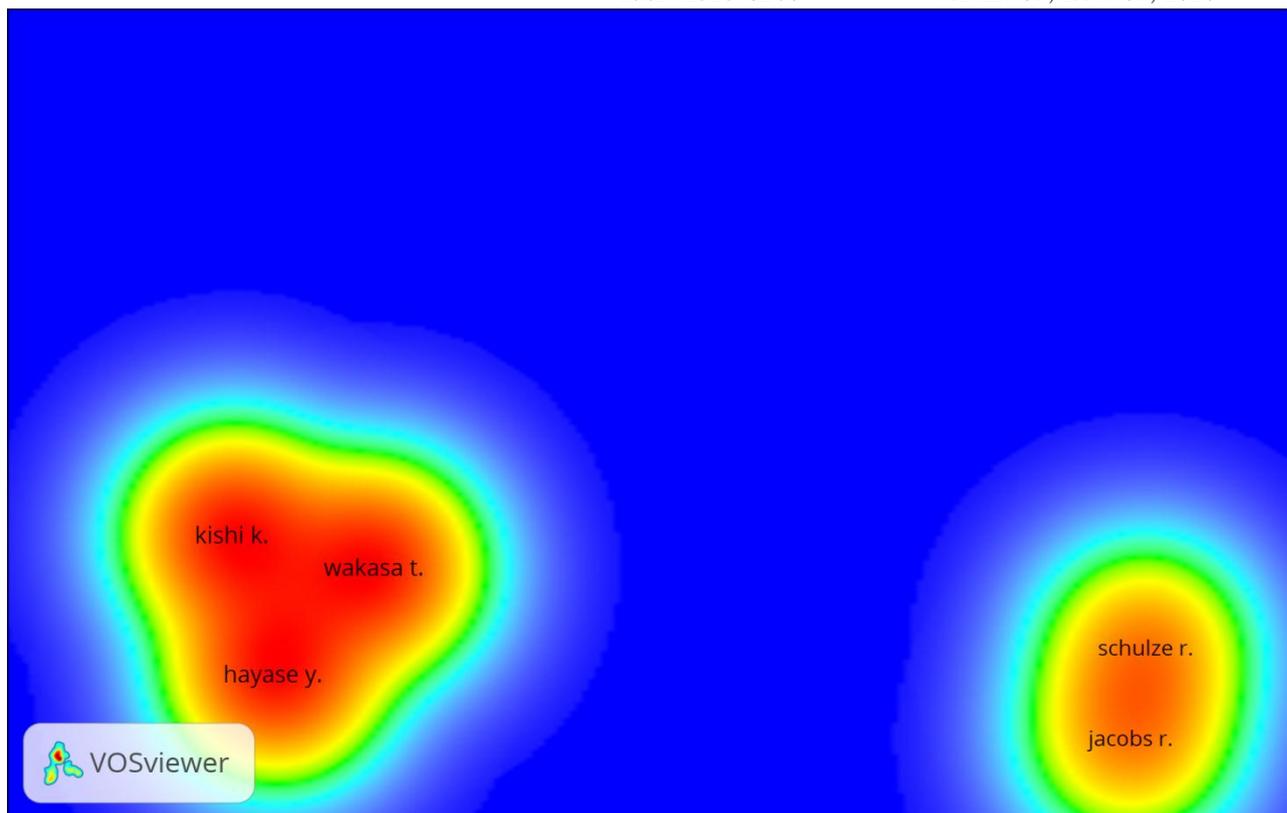


Figure 3: Co-authorship analysis on basis of authors

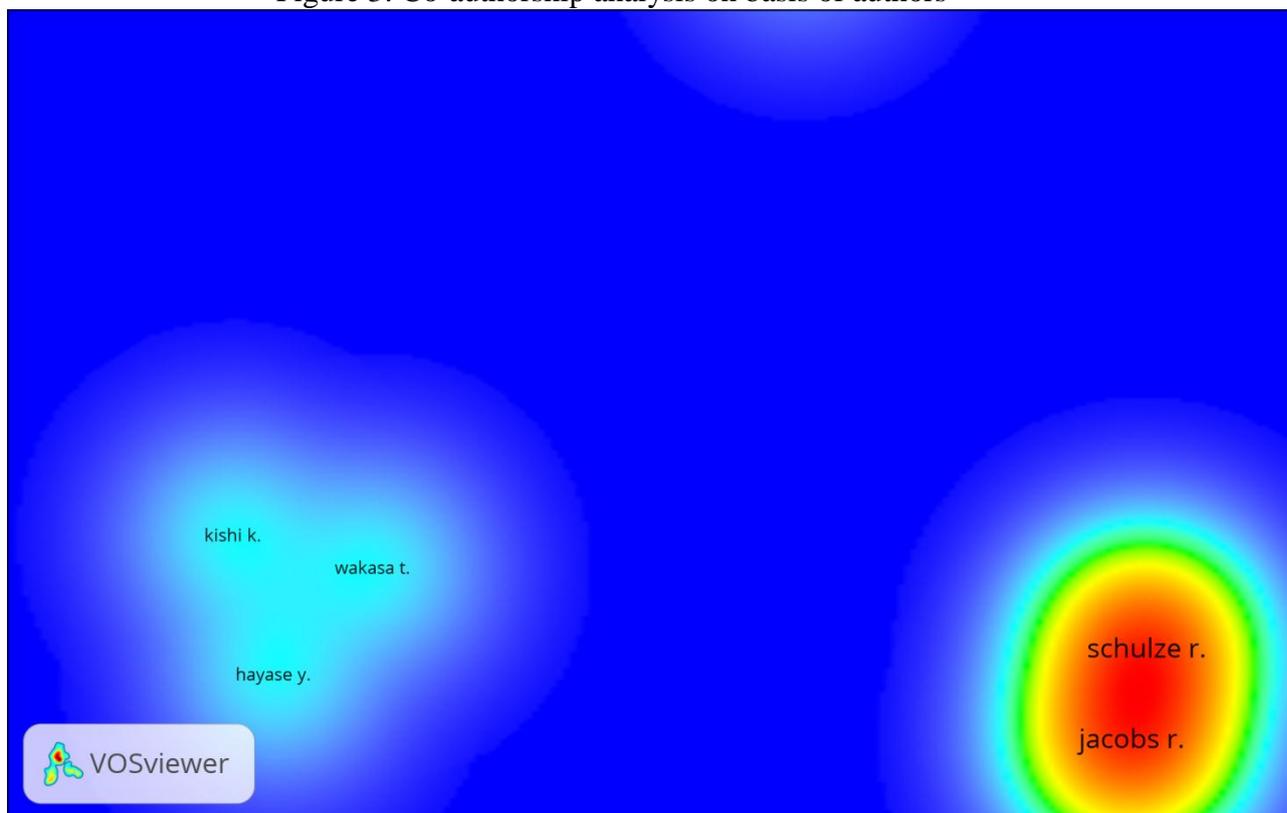


Figure 4: Citation analysis based on authors.

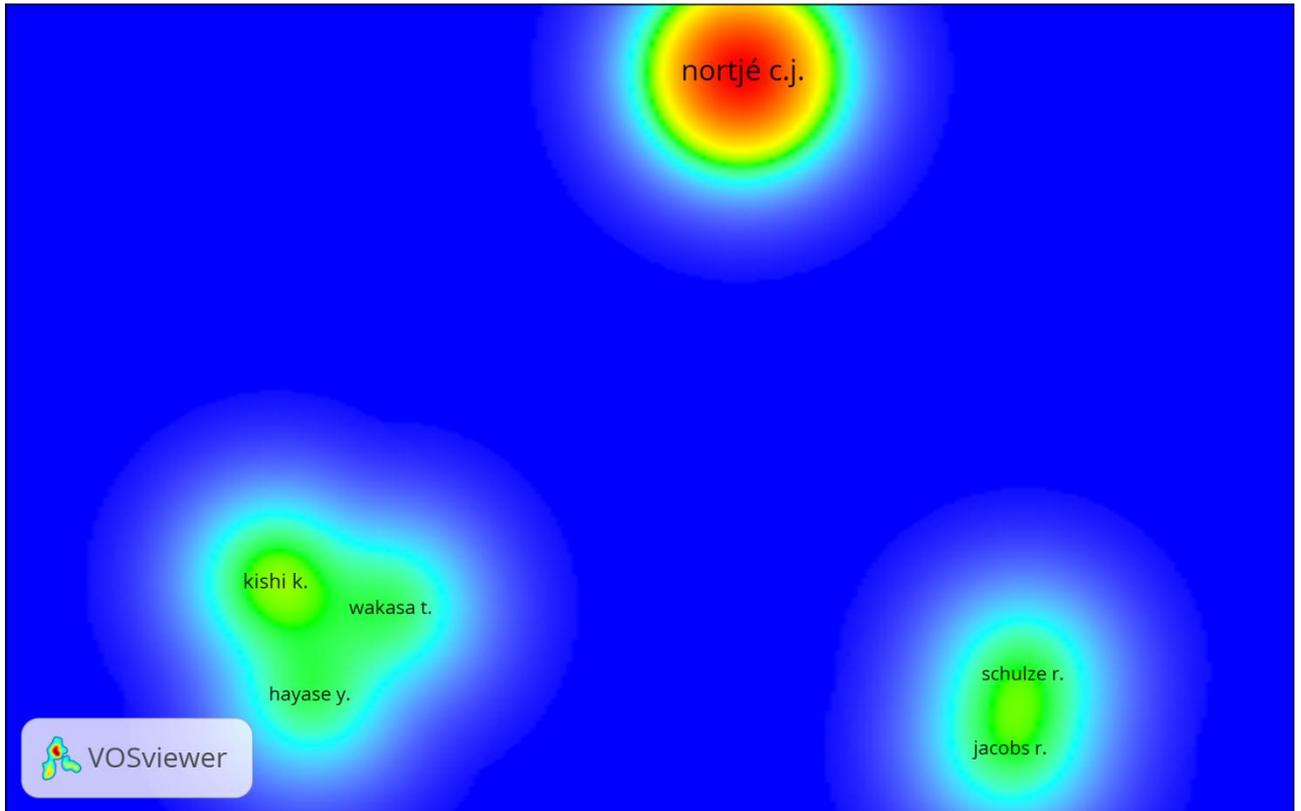


Figure 5: Leading authors based on the publication of documents

In Co-occurrence analysis, we had used all keyword analyses, by keeping the minimum number of occurrences of a keyword as five. This combination plotted the map of 20 thresholds, in three clusters. The overlay visualization of co-occurrence analysis of keywords has been shown in Figure 6.

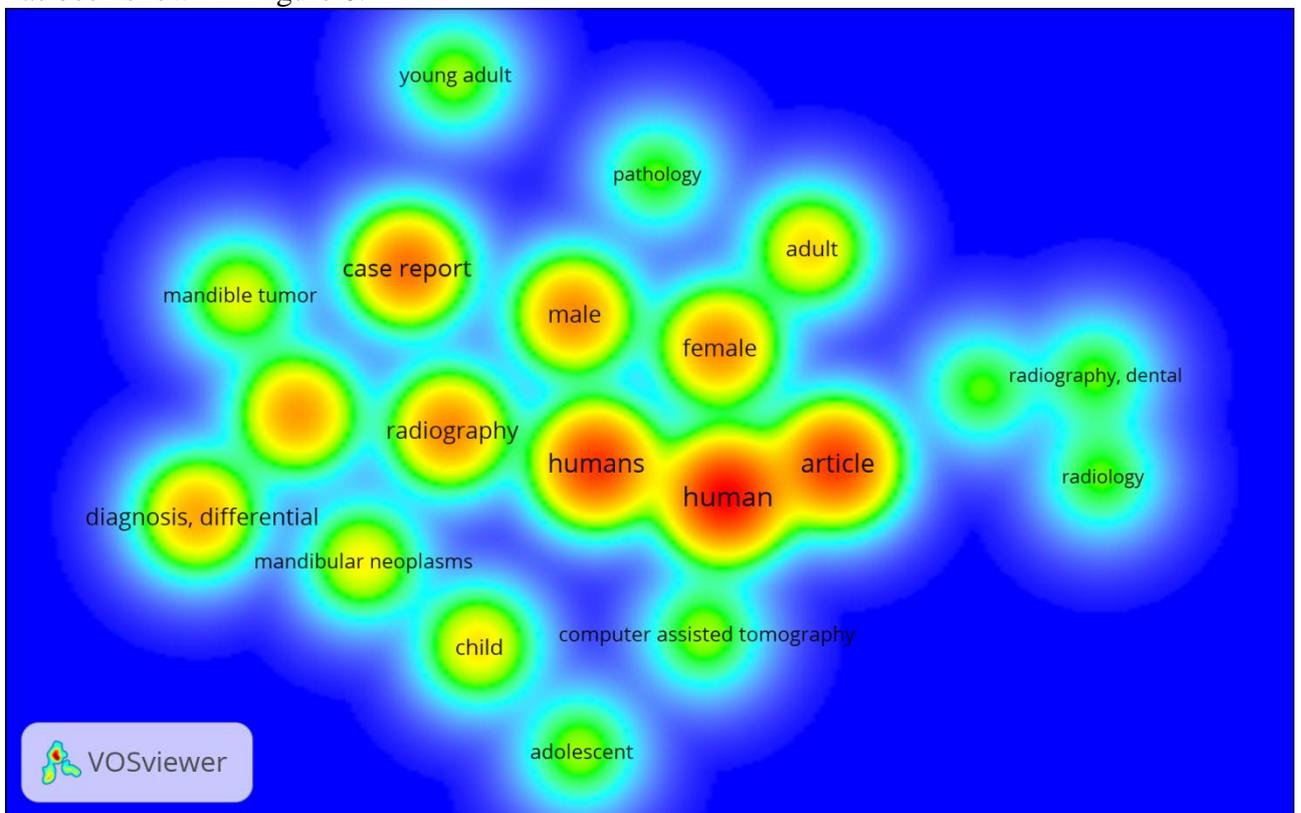


Figure 6: Co-occurrence analysis on basis of all keywords

3.2 Which are the top organizations and countries researching “Maxillofacial radiology”?
 The most leading organizations engaged in research on “Maxillofacial radiology” 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
University of Western Cape	South Africa	7	0	0

Co-authorship analysis and volume analysis in Figure 7 and citation analysis of the countries engaged in the research on “Maxillofacial radiology” had been shown in Figure 8. For a better presentation of the analysis, the parameters used were the minimum number of documents of an author as two and the minimum number of citations of authors as one. This combination plotted the map of 43 countries, 13 clusters.

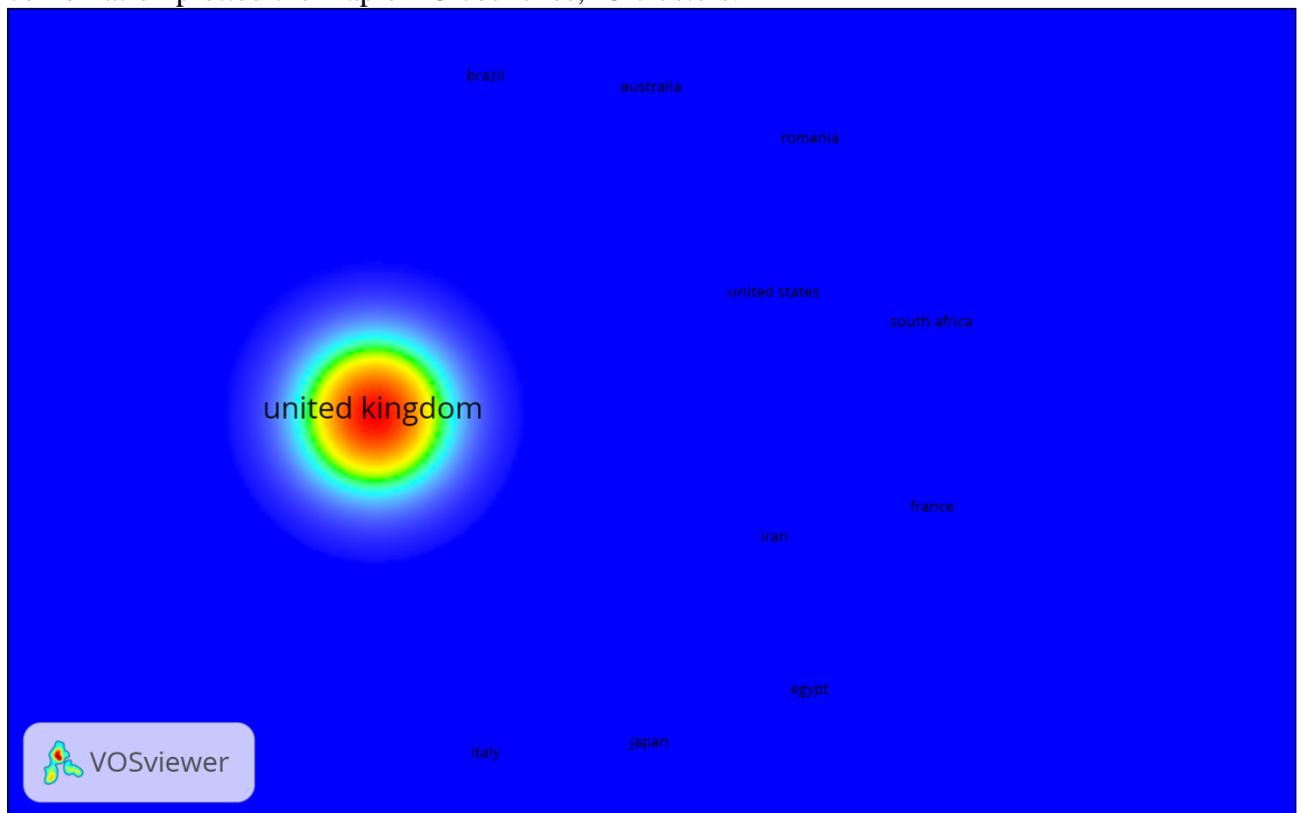


Figure 7: Co-authorship and volume of document analysis on basis of countries

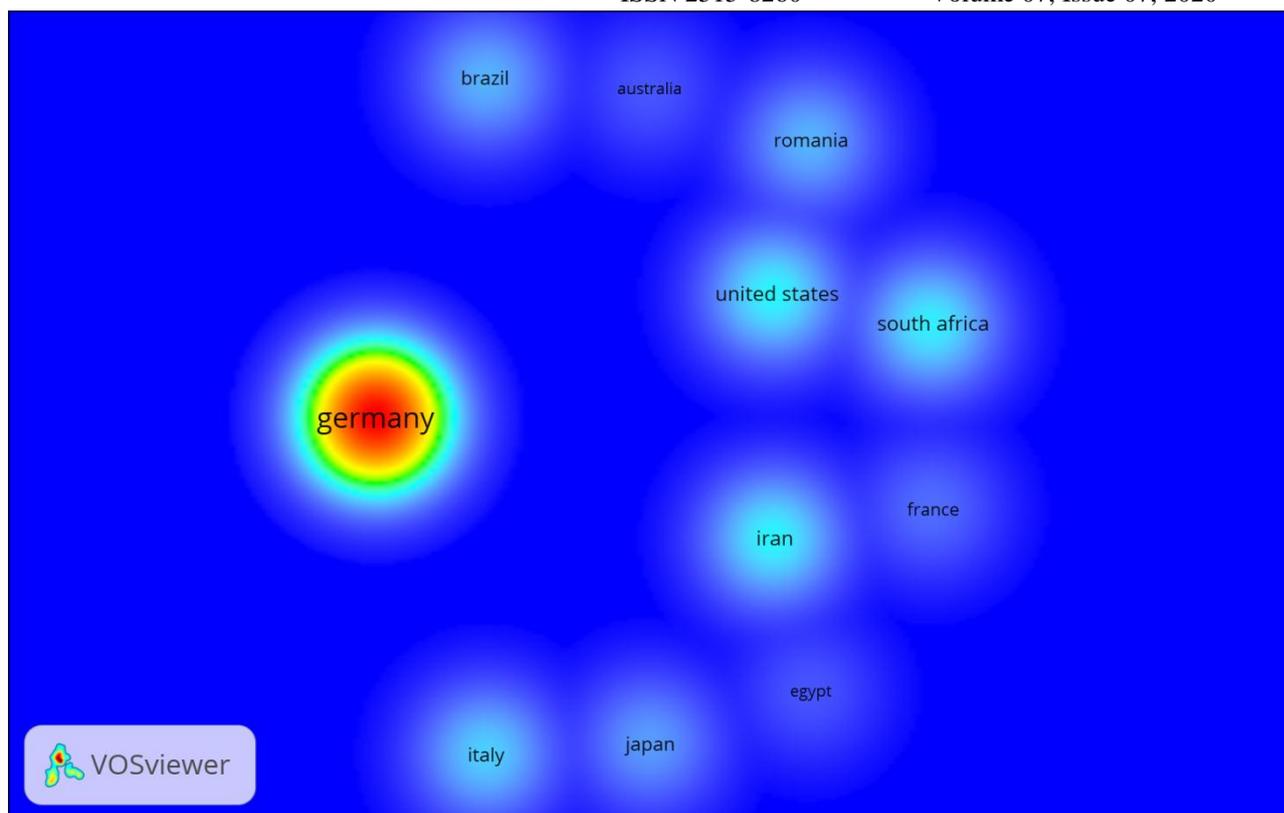


Figure 8: Citation analysis on basis of countries

4. DISCUSSION AND CONCLUSION

Maxillofacial radiology is an interesting research domain and the most active countries of the research domain were the United Kingdom and Germany with the leading position in the citation, publication volume, and co-authorship links. The leading organizations engaged in the research regarding “Maxillofacial radiology” were the University of Western Cape of South Africa. The most active authors who had made valuable contributions related to “Maxillofacial radiology” were Schulze R. and Jacobs R. 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 “Maxillofacial radiology”, this research had observed a gradual increase in research interest regarding the “Maxillofacial radiology” 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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