Application of artificial intelligence in dentomaxillofacial imaging: A science mapping approach

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Background: Artificial intelligence has recently been applied to radiographic images in the field of dentistry, especially Oral and Maxillofacial (OMF) radiology. Radiological imaging diagnosis plays important roles in clinical patient management. Artificial intelligence is recently gaining wide attention for its high performance in recognizing images. Recent researches on artificial intelligence in OMF radiology have mainly used convolutional neural networks, which can perform image classification, detection, segmentation, registration, generation, and refinement.

Objective: The aim of this study is a brief report on the use of artificial intelligence in recent research in various fields of oral and maxillofacial imaging.

Methods: Scopus database was searched in Jun 10, 2021 with the following query TITLE-ABS-KEY ((“machine learning” OR “deep learning”) AND image) AND SUBJAREA (DENT). Bibliometric data of 91 results analyzed via VOSviewer software using author keyword co-occurrence, co-citation and co-authorship network analysis.

Results: convolutional neural network, digital imaging/radiology and panoramic radiography were the hottest topics. Dentomaxillofac radiol, sci rep and angle orthod had the most influence on the network. Among authors ariji y and fukuda m had the most influence on the network.

Conclusions: Due to the high performance of deep learning in image recognition tasks, the application of this technology to radiological imaging is increasing. With the development of artificial intelligence, it can be predictable to change clinical practice by helping radiologists practice with better performance, greater reliability, and enhanced workflow for more appropriate recommendations. Development of automatic diagnosis systems, the establishment of treatment plans, and the fabrication of treatment tools could be the other outcomes for this technology. OMF radiologists will play a key role in the development of artificial intelligence applications in this field.

Therefore, we suggest interdisciplinary research in related sciences in the country to be supported by research centers and research institutes. And thus we can benefit from new technologies and researchers in engineering sciences in the clinical and preclinical fields.

Biography

Aida Karagah works at Qazvin University of Medical Sciences, Iran.

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