



# A Review on IOT in dentistry

Priyanka Shukla, Assistant Professor, Department of Computer Science & Engineering, GALgotias University

## Abstract

Lithium is one of the most used metals for implants. The Review analysis had been conducted to understand the active authors, organizations, journals, and countries involved in the research domain of “Lithium dental-crown”. All published articles related to “Lithium dental-crown” from “Scopus”, were analyzed using the Meta Analysis to develop analysis tables and visualization maps. This article had set the objective to consolidate the scientific literature regarding “Lithium-dental crown” and also to find out the trends related to the same. The leading Journals were Journal of Prosthetic Dentistry. The leading organization engaged in the research regarding the Lithium-dental crown was the University of Zurich, Switzerland. The most active author who had made valuable contributions related to Lithium dental crown was Ozcan M. and Kern M.

**Keywords:** Lithium, Dental-crown, Material engineering, Review analysis, Meta Analysis,

## 1. Introduction

An engineered medical device to replace a missing or damaged biological structure is known as an implant. Different types of metals and materials are used to create implants. Lithium-doped biological-derived hydroxyapatite coatings can improve the mechanical characteristics and other properties of the implant. Lithium metal had diversified applications in the medical field, especially in dentistry.

Dental crowns are important dental implant applications using lithium metal. Dental crowns fabricated with Lithium disilicate can have a long survival level and the Fabrication of dental crowns with Lithium disilicate is an important medical application of Lithium metal (Cardelli, Belletti and Murmura, 2014) (Maló *et al.*, 2014) (Mitsias *et al.*, 2014); Lithium silicate dental crowns. Lithium-based dental crowns had long term survival.

Material engineering and surface engineering can play a significant role in improving the performance and life of Lithium dental crown–implants along with measures for reducing toxicity and hypersensitivity of the metal implants. Future research can also be on surface coatings by using, metal implants using Lithium. This Review analysis will be a useful platform for future researchers by realizing the top researchers, organizations, and countries involved in research regarding Lithium dental crown implants.



This article is arranged into four sections. 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 and discussion. The fourth section deals with the conclusion. The following research objectives and research questions were framed for conducting Review analysis systematically.

### 1.1 Research Objectives

- a) To consolidate the literature regarding Lithium dental crown-implants
- b) To find out the trends related to research in Lithium dental crown-implants

### 1.2 Research Questions

- a) Who are the active researchers working on Lithium dental crownimplants?
- b) Which are the main organizations and countries working on Lithium dental crownimplants?
- c) Which are the main journals onLithium dental crownimplants?

## 2. Research Methodology

Scopus files had been used for this article. For the article selection, the Boolean used was TITLE-ABS-KEY(Lithium dental crown). All the tables in this paper were created by using Microsoft Excel and Meta Analysis. Grammarly was used for spelling and grammar checks. Mendeley was used for article review and citation. This paper had been inspired by Review analysis in its presentation style, analysis, and methodology from the works.

## 3. Results and discussion

### 3.1 Results

This first round of search produced an outcome of 641 documents, in eight languages, out of which 615 documents were in English. The classification of document categories is shown in Table 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 569 English articles (both open access and others) and had been used to conduct Review analysis and visualization using Meta Analysis. The English research articles in this domain since 1972 had been shown in Figure 1.

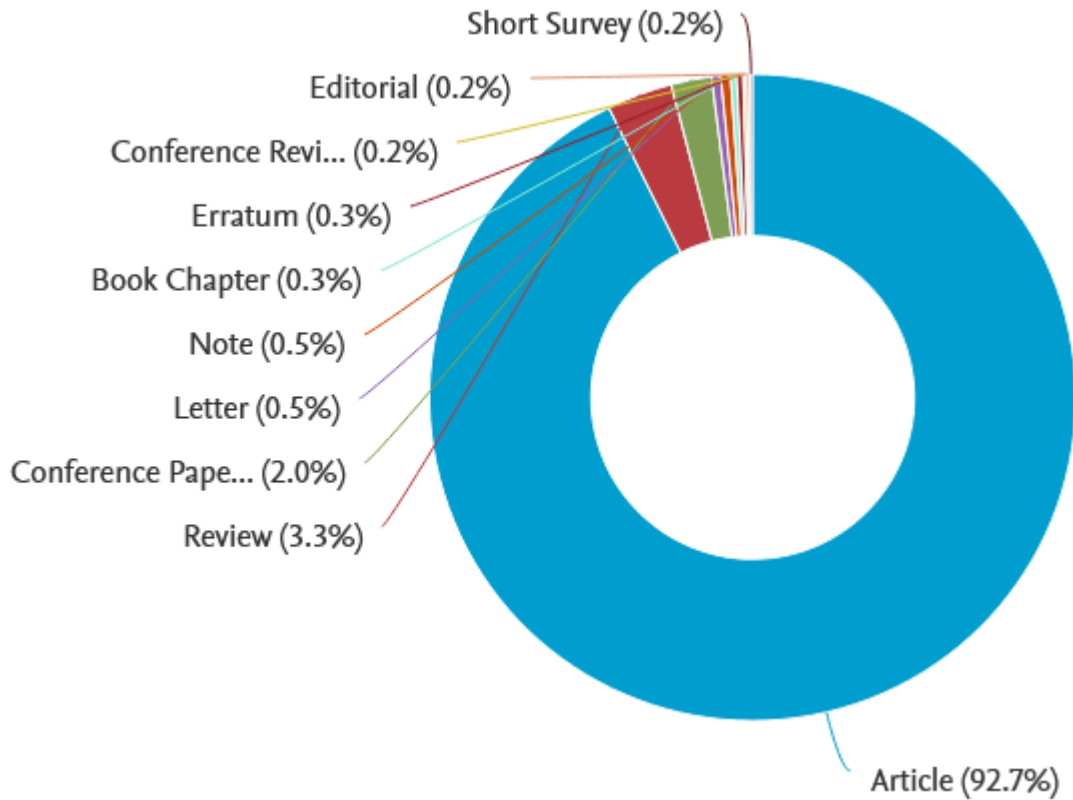


Figure 1: Classification of the documents on “Lithium dental-crown

Co-authorship analysis of top authors had been shown in Table1. For a better presentation of the analysis, the parameters used were the minimum number of documents of an author as six and the minimum number of citations of authors as one (Singh and Kumar, 2013). This combination plotted the map of 29 authors, in 10 clusters. The overlay visualization map of co-authorship analysis plotted in Table1, points out the major researchers with their strong co-authorship linkages and clusters involved.

The citation analysis of top authors had been shown in table 1, along with co-authorship links. For the citation analysis, the parameters used were the minimum number of documents of an author as one and the minimum citations of an author as one.

Table 1: Highlights of most active authors

Description	Authors	Documents	Citations	Average citations per documents	Link strength
Authors with the highest publication,	Ozcan M.	19	260	13.1	64



and links					
Authors with the highest citations	Kern M	16	609	38	45

In Co-occurrence analysis, we had used all keyword analyses, by keeping the minimum number of occurrences of a keyword as 100. This combination plotted the map of 29 thresholds, in three clusters. The overlay visualization of co-occurrence analysis of keywords has been shown in Table 2. The leading organizations engaged in research on “Lithium dental crown” had been found out by the volume of publications and citation analysis, the parameters used are the minimum number of documents of an organization as one and the minimum number of citations of organizations as one. The leading organizations in the research regarding “Lithium dental crown”, with the highest number of publications and citations, were the University of Kiel, Germany (Refer to table 2).

Table 2: Highlights of the most active organization

Organizations	Country	Documents	Citations	Average Citations per document
University of Zurich	Switzerland	34	685	20.1

Co-authorship analysis of the countries engaged in the research on “Lithium dental-crown” had been shown in Table 3. The overlay visualization map of co-authorship analysis plotted in Table 3, points out the main countries with their strong co-authorship linkages and clusters involved.

The citation analysis of top countries had been shown in table 3, along with co-authorship links. For the citation analysis, the parameters used were the minimum number of documents of a country as one and the minimum citations of the country as one.

Table 3: Highlights of Active Countries

Description	Country	Documents	Citations	Link strength
The country with the highest publication, citations, and co-authorship links	United States of America	144	3375	93

The most active country in this research domain was the United States of America, with the highest number of publications, links, and citations.



Link analysis and citation analysis were used to identify the most active journal in this research domain. We have taken the parameters of the minimum number of documents of a journal as one and the minimum number of citations of a journal as one for the link analysis and citation analysis. Highlights of the most active and relevant journals related to “Lithium dental crown” are shown in table 4. Table 4 shows the journal activity of this research domain through parameters of publication volume, citations, and co-authorship linkages.

Table 4: Analysis of journal activity

Description	Journal details	Documents	Citations	Average citations per documents	Links
Journal with the highest publications, citations, and links	Journal of Prosthetic Dentistry	87	2515	20.8	468

From the above discussion regarding the Review patterns in the research regarding Lithium dental crown, this research had observed a gradual increase in research interest regarding Lithium dental crown 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 Table 2). The most active authors in this research domain were Kern M. and Ozcan M. with the highest citations and publication and co-authorship links respectively (Refer to table 1). The overlay analysis of top countries researching Lithium dental crown indicates that the United States of America was the leading country relating to the highest number of publications, citations, and co-authorship links (Refer to Table 5). The top journal of this research domain was identified as the Journal of Prosthetic Dentistry. From these wide sources of information, researchers can focus on top journals where they can identify the most relevant and highly cited articles regarding Lithium dental crown.

#### 4. Conclusion

Lithium dental crown was an interesting research domain and the most active journals related to this research domain were Journal of Prosthetic Dentistry. The most active country was the United States of America. The leading organization engaged in the research regarding the Lithium-dental crown was the University of Zurich, Switzerland. The most active author who had made valuable contributions related to Lithium dental crown was Ozcan M. and Kern M. with the highest publication and co-authorship links, and citations respectively. This research domain offers a new avenue for researchers and future research can be on innovations in Lithium-dental crowns.

#### References



1. Boutin, P. (1974) 'Total hip arthroplasty with aluminium prosthesis [ARTHROPLASTIE TOTALE DE LA HANCHE PAR PROTHESE EN ALUMINE]', *Acta Orthopaedica Belgica*, 40(5–6), pp. 744–754.
2. Christel, P. *et al.* (1986) 'ALUMINIUM OXIDE CERAMIC-TITANIUM ALLOY MATERIALS FOR TOTAL HIP REPLACEMENT.', in Lin O.C.C., C. E. Y. S. (ed.) *Materials Science Monographs*. Taipei, Taiwan: Elsevier, Amsterdam, Neth, pp. 277–288.
3. Grübl, A. *et al.* (2006) 'Serum aluminium and cobalt levels after ceramic-on-ceramic and metal-on-metal total hip replacement', *Journal of Bone and Joint Surgery - Series B*, 88(8), pp. 1003–1005. doi: 10.1302/0301-620X.88B8.17870.
4. Hebeisen, J. C. and Cox, B. M. (2004) 'The effect of HIP processing on the properties of A356 T6 cast aluminum steering knuckles', *SAE Technical Papers*. doi: 10.4271/2004-01-1027.
5. Hebeisen, J. C., Cox, B. M. and Rampulla, B. (2004) 'HIP of aluminum castings', *Advanced Materials and Processes*, 162(4), pp. 38–40.
6. Heimke, G., Griss, P. and Jentschura, G. (1976) 'Two years of clinical experience with aluminium oxide ceramic parts for hip joint replacement [ZWEI JAHRE KLINISCHE ERFABRUGEN MIT A12O3 KERAMIKTEILEN FUR DEN HUFTGELENKERSATZ]', *Medizinal Markt*, 24(9), pp. 310–313.
7. Hinrichs, F., Boudriot, U. and Griss, P. (2000) 'Ten-year results of a cemented mild grit blasted Titanium-Aluminium-Vanadium stem in Total-Hip-Arthroplasty [10-Jahres-ergebnisse mit einem zementierten feingestahlten Titan-Aluminium-Vanadium-Hüftendoprothesenschaft]', *Zeitschrift fur Orthopadie und Ihre Grenzgebiete*, 138(1), pp. 52–56. doi: 10.1055/s-2000-10113.
8. Ingram, A. J. (1988) 'Soft tissue sarcoma associated with aluminum oxide ceramic total hip arthroplasty.', *Clinical Orthopaedics and Related Research*, (235), pp. 311–312.
9. Kedra, H. *et al.* (1987) 'Biocorundum--a new/type of poreless ceramic material of aluminum oxide for the manufacture of the elements of hip joint prosthesis. Biological and technological studies [Biokorund--nowa odmiana bezporowatego spieku ceramicznego z tlenku glinu--przeznaczon]', *Polimery w medycynie*, 17(1–2), pp. 3–28.
10. Kubota, M. *et al.* (1998) 'Crack propagation properties on hip-treated cast aluminum alloys', *Materials Science Research International*, 4(3), pp. 193–199.