TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

UNIVERSIDAD CIENTÍFICA DEL SUR

FACULTAD DE POSGRADO DE CIENCIAS DE LA SALUD

"OSTEOINTEGRACIÓN DE IMPLANTES DENTALES EN PACIENTES IRRADIADOS: ESTUDIO BIBLIOMÉTRICO"

Tesis para optar el Título de:

SEGUNDA ESPECIALIDAD EN IMPLANTOLOGÍA ORAL

Presentado por:

Jean Paul Montoya Mercado (0009-0002-6075-4632)

Rosabelle Garcia Herencia (0009-0003-3720-3880)

Asesor:

Frank Roger Mayta Tovalino (0000-0002-3280-0024)

Lima – Perú

2026

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

UNIVERSIDAD CIENTÍFICA DEL SUR

FACULTAD DE POSGRADO DE CIENCIAS DE LA SALUD

"OSTEOINTEGRACIÓN DE IMPLANTES DENTALES EN PACIENTES IRRADIADOS: ESTUDIO BIBLIOMÉTRICO"

Tesis para optar el Título de:

SEGUNDA ESPECIALIDAD EN IMPLANTOLOGÍA ORAL

Presentado por:

Jean Paul Montoya Mercado (0009-0002-6075-4632)

Rosabelle Garcia Herencia (0009-0003-3720-3880)

Asesor:

Frank Roger Mayta Tovalino (0000-0002-3280-0024)

Lima – Perú

2026

Tesis publicada con autorización del autor
No olvide citar esta tesis

ACTA DE SUSTENTACIÓN DE TESIS

Lima, 15 de junio de 2026.

Los integrantes del Jurado de tesis:

Presidente: Dr. EMILIO ALFREDO CAFFERATA CHEA
Miembro 1: CD. ESP. FERNANDO CLIVE SONGHURST JAIME
Miembro 2: Dra. ROCIO GENG VIVANCO

Se reúnen para evaluar la tesis titulada: "OSTEOINTEGRACIÓN DE IMPLANTES DENTALES EN PACIENTES IRRADIADOS: ESTUDIO BIBLIOMÉTRICO" con código de proyecto: POS-84-2024-00624.

Presentada por los egresados:

- JEAN PAUL MONTOYA MERCADO; ROSABELLE GARCIA HERENCIA

Para optar el Título Profesional de Segunda Especialidad en Implantología Oral

Asesorados por: Dr. FRANK ROGER MAYTA TOVALINO

Luego de haber evaluado el informe final de tesis y evaluado el desempeño del estudiante del posgrado de Estomatología en la sustentación, se concluyen de:
Manera unánime (X)
Por mayoría ( )

Calificar a:

Tesista: JEAN PAUL MONTOYA MERCADO			Nota (en letras): dieciséis (16)
Aprobado ( )	Aprobado - Muy buena (X)	Aprobado - Sobresaliente ( )	Desaprobado ( )

Tesista: ROSABELLE GARCIA HERENCIA			Nota (en letras): dieciséis (16)
Aprobado ( )	Aprobado - Muy buena (X)	Aprobado - Sobresaliente ( )	Desaprobado ( )

Los miembros del jurado firman en señal de conformidad.



Dr. EMILIO ALFREDO CAFFERATA CHEA
Presidente del Jurado
DNI. 47496759



Dra. ROCIO GENG VIVANCO
Miembro 2
DNI. 70506620



CD. ESP. FERNANDO CLIVE SONGHURST JAIME
Miembro 1
DNI. 42755537



Dr. FRANK ROGER MAYTA TOVALINO
Asesor
DNI. 42896775

UNIVERSIDAD CIENTÍFICA DEL SUR
POSGRADO ESTOMATOLOGÍA
SEGUNDA ESPECIALIDAD EN IMPLANTOLOGÍA ORAL
DECLARACIÓN DE ORIGINALIDAD DE CONTENIDO DE INFORME FINAL DE TESIS[13]

Lima, 25 de junio Del 2026

Señor:

Percy Mayta Tristan
VICERRECTOR ACADÉMICO DE INVESTIGACIÓN DESARROLLO E INNOVACIÓN
Universidad Científica del Sur
Presente.-

De nuestra consideración,

Yo: Jean Paul Montoya Mercado y Rosabelle García Herencia, egresados del Posgrado en Estomatología de la Universidad Científica del Sur, en conjunto con el asesor Frank Roger Mayta Tovalino, declaramos que este informe final de tesis/ trabajo de investigación titulado: "OSTEOINTEGRACIÓN DE IMPLANTES DENTALES EN PACIENTES IRRADIADOS: ESTUDIO BIBLIOMÉTRICO", sustentado para obtener el título de Segunda Especialidad en Implantología Oral es original.

Es decir, no contiene plagio parcial ni total, cuando se utilizó información de fuentes externas se reconoció la autoría mediante la adecuada citación y los resultados obtenidos son producto entero de mi (nuestra) investigación y no han sido falseados ni fabricados. Todo esto en cumplimiento del Código de ética en la investigación, Reglamento del Comité de Integridad Científica, Reglamento de Propiedad Intelectual, Normas y procedimientos de los trabajos de investigación para la obtención de títulos profesionales y grados académicos[14], que afirmamos conocer en su totalidad.

Por ello, en caso de identificarse alguna situación de plagio, falsificación o fabricación de resultados, nos allanamos al proceso de investigación que establezca la Universidad y las posibles sanciones que pudieran surgir.

Firmamos en conformidad con lo declarado,



Jean Paul Montoya Mercado (TESISTA)
DNI: 42500144



Rosabelle García Herencia (TESISTA)
DNI: 47296023



Frank Roger Mayta Tovalino (ASESOR)
DNI: 42896775

[13] En conformidad con la Resolución del Consejo Directivo N° 084-SUNEDU/CD
[14] Los documentos están en: https://investigacion.cientifica.edu.pe/reglamentos/

INFORME DE REVISIÓN DE ORIGINALIDAD

Título del documento evaluado. Osteointegración de implantes dentales en pacientes irradiados: estudio bibliométrico

Autores. Jean Paul Montoya Mercado; Rosabelle Garcia Herencia

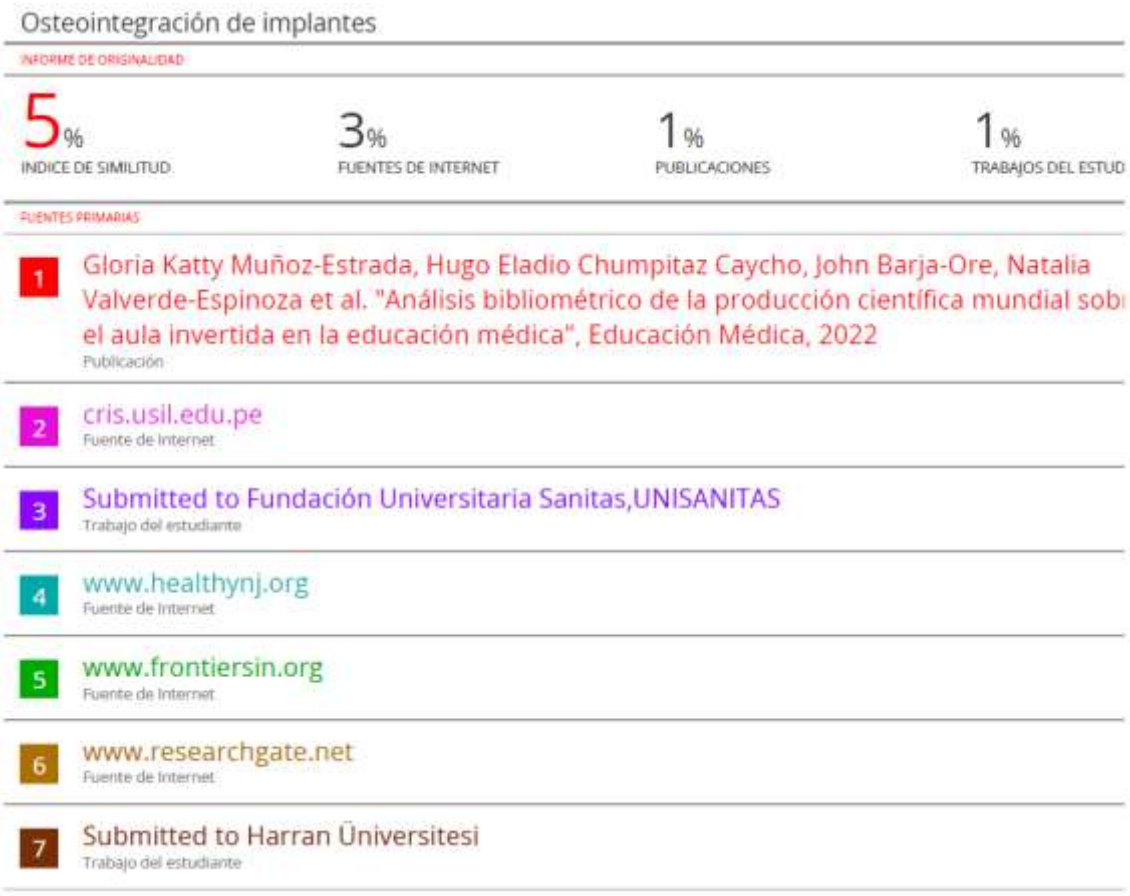
Mecanismo de revisión de originalidad. Evaluación con Turnitin (ID 2998020616)

Código de registro. POS-84-2024-00624

Resultado de la evaluación. 5%

Revisado por. Magaly Kelly Guerrero Huaracallo.

Comentarios sobre la revisión. Filtros usados: excluir fuentes de menos de 12 palabras.



Osteointegración de implantes

INFORME DE ORIGINALIDAD

5%	3%	1%	1%
INDICE DE SIMILITUD	FUENTES DE INTERNET	PUBLICACIONES	TRABAJOS DEL ESTUD

FUENTES PRIMARIAS

1	Gloria Katty Muñoz-Estrada, Hugo Eladio Chumpitaz Caycho, John Barja-Ore, Natalia Valverde-Espinoza et al. "Análisis bibliométrico de la producción científica mundial sobr el aula invertida en la educación médica", Educación Médica, 2022	Publicación
2	cris.usil.edu.pe	Fuente de Internet
3	Submitted to Fundación Universitaria Sanitas,UNISANITAS	Trabajo del estudiante
4	www.healthynj.org	Fuente de Internet
5	www.frontiersin.org	Fuente de Internet
6	www.researchgate.net	Fuente de Internet
7	Submitted to Harran Üniversitesi	Trabajo del estudiante

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

DEDICATORIA

A mis padres, Juan y Lourdes, por su constante apoyo, consejos, enseñanzas y formación personal; a mi hermano Alexander, por ser mi inspiración y ejemplo para seguir.

Jean Paul Montoya

Este proyecto se lo dedico a mi madre Madeleine por ser una mujer tan fuerte, valiente y perseverante, que me enseñó a seguir adelante con mis objetivos y aunque ya no este físicamente a mi lado sé que estará orgullosa de este logro.

Rosabelle García

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

AGRADECIMIENTOS

Damos un agradecimiento especial a nuestras familias por creer en nosotros, brindándonos ánimos, aliento, motivación constante y fuerzas para poder concluir esta etapa final de nuestra formación profesional.

Deseamos agradecer a los doctores Pedro Tinedo y Frank Mayta, así como al grupo BEERS por su constante dedicación, tiempo e inagotable paciencia que mostraron hacia nosotros durante el desarrollo de nuestra tesis.

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

ÍNDICE

		Pág.
	Título	1
	Resumen	2
	Abstract	3
	Versión en inglés	5
I.	Introduction	5
II.	Materials y methods	7
III.	Results	8
IV.	Discussion	11
V.	Conclusions	14
VI.	References	15
	Versión inicial enviada para publicar	19
	Versión en español	33
I.	Introducción	33
II.	Materiales y métodos	35
III.	Resultados	36
IV.	Discusión	38
V.	Conclusiones	41
VI.	Referencias bibliográficas	42
VII.	Anexos	46

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

ARTÍCULO DE ESTUDIO BIBLIOMÉTRICO ENVIADO A PUBLICAR

Original Article

OSTEOINTEGRACIÓN DE IMPLANTES DENTALES EN PACIENTES IRRADIADOS: ESTUDIO BIBLIOMÉTRICO

OSSEOINTEGRATION OF DENTAL IMPLANTS IN IRRADIATED PATIENTS: A BIBLIOMETRIC STUDY

TÍTULO ABREVIADO: OSTEOINTEGRACIÓN Y PACIENTES IRRADIADOS

Jean Paul Montoya-Mercado[1], Rosabelle García-Herencia[1], Pedro Luis Tinedo-López[1]

Fran Espinoza-Carhuancho[2], Josmel Pacheco-Mendoza[2], Frank Mayta-Tovalino[2]

[1]Carrera de Estomatología, Universidad Científica del Sur, Lima, Perú.
[1]School of Dentistry, Universidad Científica del Sur, Lima, Perú.
[2]Grupo de Bibliometría, Evaluación de evidencia y Revisiones Sistemáticas (BEERS), Human Medicine Career, Universidad Científica del Sur, Lima, Perú

Correspondencia: PhD. Frank Mayta-Tovalino, Faculty of medicine, Universidad Científica del Sur

Correo: fmaytat@cientifica.edu.pe

Conflictos de interés: Los autores declaran no tener algún conflicto de interés.

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

RESUMEN

Objetivo: La radiación a la que son expuestos los pacientes como protocolo frente al tratamiento del cáncer continúa siendo de interés por los clínicos debido a la falta de certeza sobre las implicaciones que tiene sobre los tejidos blandos y estructuras óseas. El presente estudio bibliométrico tuvo como objetivo evaluar la producción científica de la osteointegración en implantes dentales en pacientes irradiados.

Materiales y métodos: El presente análisis recuperó publicaciones indexadas en Scopus, mediante el uso de los términos médicos (MeSH) de la biblioteca Nacional de Medicina (NLM) con la finalidad de precisar la búsqueda, los metadatos obtenidos fueron analizados con SciVal, Bibliometrics 3.0 R versión 4.2.3 y VOSviewer versión 1.6.20.

Resultados: El estudio bibliométrico analizó 25 documentos de 18 fuentes en el periodo de 2018-2024, donde se destacó que las instituciones con mayor producción científica provinieron de Alemania con un promedio de 8 artículos en total, resaltando el autor Heiland Max del Charité – Universitätsmedizin Berlin que obtuvo el mayor h-index con 39 citaciones.

Conclusiones: De los datos analizados se determinó que Alemania y Brasil fueron los países que aportaron la mayor cantidad de artículos y que obtuvieron a su vez el mayor número de autores con más citaciones por publicación.

Palabras clave: Dental implant, Osseointegration, Radiated patients, Radiation therapy

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

ABSTRACT

Background: To analyze the osseointegration of dental implants in irradiated patients through a bibliometric study.

Materials and methods: A descriptive and a retrospective bibliometric study was conducted, focusing on English-language scientific publications indexed in Scopus from January 2018 to May 2024. To maintain quality and relevance, the study excluded abstracts, letters to the editor, book reviews, opinions, and symposium reports. The search, conducted on May 11, 2024, utilized the MeSH terms from The National Library of Medicine along with Boolean operators to refine the search. Relevant indicators such as citation count, publications by country, year, author, journal quartile, and more were examined. The data were analyzed using SciVal, Mendeley, Bibliometrix, and VOSviewer software.

Results: The research identified 25 relevant papers, with an annual growth rate of 16.73%. The average number of citations per paper was 9.8, with a total of 846 references and 144 authors. German institutions led in scientific production, with the highest impact seen at Hospital Santa Catarina of Brazil. Brazilian authors showed the highest citation impact, while Heiland Max attained the highest h-index. Most publications were within the first (Q1,n=14) and second (Q2,n=6) quartiles, with 2021 standing out as the year with the highest impact. Collaboration maps highlighted international cooperation between several countries such as the USA, Spain, China, and Chile.

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

Conclusion: The study provides a comprehensive bibliometric analysis of osseointegration of dental implants in irradiated patients, highlighting key trends and collaborations in the field.

Keywords: Dental implant, Osseointegration, Radiated patients, Radiation therapy

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

VERSIÓN EN INGLÉS APROBADA PARA PUBLICAR

The Journal of Contemporary Dental Practice

I. INTRODUCTION

Cancer is a major global health issue, responsible for 16.8% of all deaths worldwide and nearly 23% of deaths from non-communicable diseases. According to the Global Cancer Observatory`s 2022 report, around 20 million people were expected to be diagnosed with cancer that year, with nearly 10 million losing their lives to the disease. [1]

Oral cancer is a malignant neoplasm affecting the tissues and structures of the oral cavity. It can originate as a primary lesion in the mouth, metastasize from a distant site, or spread from a contiguous area.[2] Treatment typically involves surgical procedures, with or without radiotherapy or chemotherapy.[3] Dental extractions may be necessary if located near a tumor or during pre-radiation screening.

Treatment choices depend on various factors, including the tumor type and stage and the patient`s overall health.[4] Surgical resection is the preferred initial treatment for most patients with oral cancer and often involves complex procedures, such as mandibulectomies, maxillotomies, and neck dissection.[5,6]

Patients who undergo radiotherapy after surgery experience changes in bone structure at vascular, cellular, and metabolic levels. Initially, there is increased blood

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

flow to the tissue (hyperemia), but over time, reduced vascularity can occur, potentially leading to osteoradionecrosis.[6] These treatments result in early and late side effects, with early side effects occurring during radiation therapy and late side effects potentially arising weeks or years after treatment.[7]

Oral rehabilitation following radical cancer surgery is a demanding procedure.[8] Because of changes in bone and soft tissues, dental implants can be placed at different stages: before treatment, immediately after tooth extraction during ablative surgery, or after completing radiotherapy.[9] It is suggested that the radiation dose in the maxilla be limited to assist in dental implant placement.[9]

Radiation dose mapping is a useful tool, as different sites in the oral cavity receive varying doses of radiation.[10] A recent study found that one of the main causes of dental implant loss after radiotherapy was exposure to a radiation dose greater than 50 Gy.[11] For implants placed before radiotherapy during ablative surgery, the ideal threshold for radiation reduction was found to be greater than 40 Gy.[12]

Conducting a study based on various bibliometric indicators can reveal which journals are most effective for article dissemination. Bibliometric studies have examined the most cited articles in dentistry and its specialties, including endodontics, orthodontics, periodontics, and implant dentistry.[13] Hence, the increasing number of patients requiring dental implants after radiation therapy serves as the basis for this study. Radiation therapy may negatively affect the osseointegration of implants and compromise their long-term success. With this study, the existing literature will be critically analyzed to identify patterns trends and crucial collaborations in the field, resulting in better treatment outcomes and strategies for irradiated patients. The results are highly relevant for both researchers

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

and clinicians, identifying the most influential institutions and authors and highlighting areas of greatest impact. This facilitates potential collaborations, guides future research, and helps clinicians stay abreast of the latest advancements to improve outcomes in irradiated patients.

Thus, the aim of this study was to evaluate the bibliometric characteristics of scientific publications on osseointegration of dental implants in irradiated patients.

II. MATERIALS AND Y METHODS

Study design

A descriptive, retrospective bibliometric study was conducted. The inclusion criteria considered scientific publications in English indexed in Scopus from January 2018 to May 2024, while abstracts, letters to the editor, book reviews, opinions, and symposium reports were excluded.

Data collection

The search began on May 11, 2024, with Scopus as the database of choice, in which the medical terms function (MeSH) of the National Library of Medicine (NLM) was used in conjunction with the Boolean operators “AND,” “OR,” and “NOT” in order to refine the search, defining the following strategy: TITLE-ABS-KEY (“Osseointegration” OR “biointegration” OR “bone integration” OR “bone-implant integration” OR “bone-to-implant integration” OR “osteointegration” OR “ingrowth” OR “biocompatibility” OR “osteogenesis” OR “resorption” OR “dental implant” OR “artificial teeth” OR “Oral implantology”) AND TITLE-ABS-KEY (“irradiated patients” OR “patients with radiation injuries” OR “patients with

Tesis publicada con autorización del autor
No olvide citar esta tesis

radiation damage" OR "radiation-exposed patients" OR "patients undergoing irradiation" OR "patients receiving radiation therapy" OR "patients in radiation treatment" OR "irradiation-treated patients" OR "patients receiving irradiated blood components" OR "radiated patients" OR "patients exposed to radiation" OR "patients treated with radiation" OR "radiation therapy patients") AND PUBYEAR > 2017 AND PUBYEAR < 2025.

Bibliometric parameters

Indicators such as the number of citations, year, author, journal, publications by country, journal quartile, type of publication, h-index, CiteScore, and SCImago Journal Rank (SJR) were used. In the same way, thematic maps were used to analyze the collaboration between countries and the co-occurrence of keywords.

Data analysis

The SciVal program (Elsevier) was used to analyze the metadata, which enabled us to obtain the bibliometric data of the scientific publications in .xls files. This information was processed using Mendeley software to check for duplicates, and the metadata were exported to Bibliometrix 3.0 R version 4.2.3 and VOSviewer version 1.6.20 software.

III. RESULTS

Between 2018 and 2024, 25 documents from 18 sources were analyzed, revealing an annual growth rate of –16.73%. The documents had an average age of 3.32 years and received an average of 9.8 citations each, totaling 846 references. The study included 144 authors, with an average of 6.2 co-authors per document, and featured one single-

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

authored publication. Additionally, 12% of the collaborations were international. The publications consisted of 20 articles and five reviews (Table 1).

The study analyzed the scholarly output and citation impact of various institutions from 2018 to 2024. Leading the way, Hospital General Universitario Gregorio Marañón in Spain produced three publications, averaging 12 views and 20 citations per publication. German institutions such as the Berlin Institute of Health, Charité-Universitätsmedizin Berlin, Free University of Berlin, and the University of Freiburg each had two publications with 13 views and 10 citations per publication. Santa Catarina Hospital in Brazil stood out with 23.5 views and 37 citations per publication from its two studies. King's College London in the UK and the University of Amsterdam and Vrije Universiteit Amsterdam in the Netherlands each had two publications, with significant citation counts. Amsterdam UMC contributed one publication with 14 views and 17 citations, highlighting a diverse and internationally collaborative research effort (Table 2).

Among the key authors, Raúl Antúnez-Conde from Hospital General Universitario Gregorio Marañón in Spain had three publications, averaging 6.7 citations per publication, and an *h*-index of 4. Brazilian authors Benites Condemn and Anthony Froy from Unisagrado University Center, as well as Camila Lopes Cardoso from Universidade de São Paulo, and Marcos Martins Curi from Santa Catarina Hospital, each had two publications with a high citation impact of 18.5 per publication. Max Heiland from Charité- Universitätsmedizin Berlin had two publications and a remarkable h-index of 39 (Table 3).

From 2018 to 2024, a total of 24 documents were analyzed across various CiteScore quartiles. The majority of the documents (14) were in Q1, with notable peaks in 2021

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

(five documents) and a consistent output across other years. In Q2, six documents were identified, with 2021 again showing a higher impact with three documents. Q3 had three documents, mostly concentrated in 2020. Finally, Q4 had just one document, published in 2023. The overall distribution highlights a focus on high-impact journals, particularly in 2021 (Table 4).

The study analyzed the scholarly output and citation impact across various Scopus sources. Clinical Oral Investigation and International Journal of Oral and Maxillofacial Surgery each had three publications, with Clinical Oral Investigation averaging 10 citations per publication and an SJR of 0.91. The International Journal of Oral and Maxillofacial Surgery led with 13.7 citations per publication and an SJR of 0.884. Other notable sources include the British Journal of Oral and Maxillofacial Surgery and Frontiers in Oncology, each with two publications and significant citation counts. Clinica Terapeutica and Clinical Oral Implant Research stood out for their high citations per publication, with Clinica Terapeutica reaching 18 citations and Clinical Oral Implant Research achieving an SJR of 1.691 (Table 5).

These maps of international collaboration illustrate a few instances of international contributions, particularly partnerships, including one between the Netherlands and China, Spain, and Chile, and the United States and Italy (Fig. 1). The collaborative networks presented a clear vision of the world of scientific cooperation amongst countries.

In Fig. 2, a collaborative network was identified as having seven nodes representing subjects with terms that were related most frequently within the database with 255 keywords. By a detailed survey of the network made, it could be stated that the first node (blue color) was primarily organized around the term “dental implants,” the

Tesis publicada con autorización del autor
No olvide citar esta tesis

second node (red color) was associated with the term "adult," whose boundaries extended to "middle-aged," "osteolysis," "fibula graft," among others, while in the case of the third node (brown color), the term "head and neck neoplasm" was clustered. The clustered set at the center of the map underlined strong connections of keywords, while the least number of connections of nodes was at the extremes of the map.

IV. DISCUSSION

Over time, various analyses have been conducted, including literature reviews, systematic reviews, and clinical case reports, to examine the interaction or effects of radiation on bone tissue and its relationship with oral implantology in cancer patients. However, few studies have addressed the scientific production and impact of publications on this topic. Therefore, the present analysis aimed to quantify the scholarly output on osseointegration of dental implants in irradiated patients from 2018 to 2024.

This was achieved through a keyword search in the Scopus database, classifying the results by author name, journal, institution, and international collaboration.

According to research by Gupta et al.[14] the survival rates of dental implants placed in non-irradiated areas were higher (93.9%) compared to those placed in irradiated areas (85.8%). Similarly, Toneatti et al.[15] observed a survival rate of 97% after a follow-up period of 37.7 months.

Our study highlighted the high scientific production of both German authors and institutions, without leaving aside the contribution made by authors from Brazil, of which the researcher Curi Marcos Martins stands out, with an average of 18.5

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

citations per publication and an *h*-index of 17; the Hospital General Universitario Gregorio Marañón of Spain was the institution with the highest number of publications, with an average of three articles on the osseointegration of dental implants in irradiated patients. Impact is an important measure that ranks journals according to their number of citations and generally designates their reputation. Among the journals selected from the top 10 with the highest impact are Clinical Oral Implants Research (1.691), Frontiers in Oncology (1.138), Journal of Clinical Medicine (0.935), Clinical Oral Investigations (0.91), and International Journal of Oral and Maxillofacial Surgery (0.884). Following the same line, we highlight that most of the publications were made in the year 2021, grouping them within the first quartile (Q1) and second quartile (Q2).

In our analysis, it was observed that collaboration between countries had international contributions, but only on one occasion between the United States and Italy, the Netherlands and China, and Spain and Chile, unlike what was found in the study by Yang et al.[16] who analyzed trends in oral cancer, showing that the United States had the highest scholarly output with 35 publications. Similarly, in the work of Singh et al.[17] on trends and current topics in oral cancer research, it was shown that the countries with the highest number of publications were the United States, India, and China, with 465, 279, and 228 articles, respectively.[17]

In our analysis, it was observed that international collaboration occurred, but only in isolated instances, such as between the United States and Italy, the Netherlands and China, and Spain and Chile. This contrasts with the findings of Yang et al.,[16] who analyzed trends in oral cancer and found that the United States had the highest number of documents with 35 publications. Similarly, Singh et al.[17] reported that the

Tesis publicada con autorización del autor
No olvide citar esta tesis

countries with the highest number of publications in oral cancer research were the United States, India, and China, with 465, 279, and 228 articles, respectively. The limited international collaboration in our study period could be attributed to several factors, including the specialized nature of research on osseointegration in irradiated patients, which may require specific expertise and resources that are not widely available. Additionally, geopolitical and economic barriers, as well as differences in research priorities and funding availability, may have hindered broader international cooperation.[16,17]

One of the topics of greatest interest for researchers in the development of bibliometric studies on oral cancer was the risk factors and composition of the microbiota, which could lead to oral squamous cell carcinoma.[18,19] The most important journal in the field of research was "Oral Oncology", with 10 publications and 428 citations, making it the most productive scientific journal.[19] On the other hand, in the research conducted by Liu et al.,[20] the journals with the highest number of publications of articles related to the use of radiotherapy in cancer were "The International Journal of Radiation Oncology, Biology, and Physics" with 42 articles, followed by the "Journal for Immunotherapy of Cancer and Frontiers in Oncology" with 39 and 35 articles, respectively.

According to the bibliometric study by Qiu et al.[21] on mucosal lesions caused by cancer therapies, the most productive institutions were based in the USA, with the University of Adelaide, the University of Texas, and the Memorial Sloan Kettering Cancer Center leading in research output. Similarly, Escoto et al.[22] found that the University of California had the highest number of publications, averaging seven articles with 2,827 citations, followed by the American Cancer Society, which

Tesis publicada con autorización del autor
No olvide citar esta tesis

published five articles with 32,982 citations.

The strength of the present one lies in offering a full and quantitative view of the process of osseointegration of dental implants among irradiated patients. This study aimed at keeping track of key trends in the field, collaboration among countries, and the evolution of research in this topic via bibliometric methodology and leading tools such as SciVal, Mendeley, Bibliometrix, and VOSviewer.[23] Additionally, the selection of articles indexed in the Scopus indexing standard assures a decent quality and relevancy of articles included, providing a sound basis for future research investigations and extending their search into other databases.

During the research, certain limitations were discovered; it is worth mentioning that a bibliometric study will depend on the availability of the articles retrieved using the search strategy; for this reason, we must first consider that the data collection was based on Scopus; therefore, future research could include bibliographic citations from the Embase, Medline, and Web of Science databases. Second, designing a search strategy to distinguish relevant from irrelevant publications was highly complex. Third, there was a linguistic bias because the search was limited to articles published in English related to osseointegration, implants, and periodontics.[24,25] Finally, the automatic software algorithms may introduce bias because not all publications could be exported to SciVal due to metadata incompatibility.

V. CONCLUSIONS

The growing number of published articles pointed to an evident rise in interest in identifying the most prolific and cited countries, institutions, journals, and authors. Our analysis revealed Germany and Brazil produced the highest number of

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

publications, with Brazilian authors exhibiting the maximum impact of citation. Notably, Antúnez- Conde Raúl from Spain was the biggest contributor. Such findings can be very helpful to clinicians and researchers in improving treatment modalities and prognoses for irradiated patients for whom dental implants may be useful. Being aware of trends and key contributor's enables clinicians to maintain current advancements and promote collaborative efforts favorable for patient care.

VI. REFERENCES

1. Bray F, Laversanne M, Sung H, et al. Global cancer statistics 2022: Globocan estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin 2024;74:229–263.

2. Tandon P, Dadhich A, Saluja H, et al. The prevalence of squamous cell carcinoma in different sites of oral cavity at our rural health care centre in Loni, Maharashtra: A retrospective 10-year study. Contemp Oncol 2017;21(2):178–183.

3. Spijkervet F, Schuurhuis J, Stokman M, et al. Should oral foci of infection be removed before the onset of radiotherapy or chemotherapy? Oral Dis 2021;27(1):7–13.

4. Mattila V, Wilkman T, Avellán N, et al. Survival of dental implants and occurrence of mucosal overgrowth in patients with head and neck cancer treated with/without radiotherapy and mucosal graft: 2-year follow-up. Clin Oral Investig 2024;28(1):111–117.

5. Almangush A, Mäkitie A, Triantafyllou A, et al. Staging and grading of oral squamous cell carcinoma: An update. Oral Oncol 2020;107:104799.

Tesis publicada con autorización del autor
No olvide citar esta tesis

6. Kende P, Ranganath S, Landge J, et al. Survival of dental implants on irradiated jaws: A systematic review and meta-analysis. J Maxillofac Oral Surg 2022;21(3):787–795.

7. Brook I. Late side effects of radiation treatment for head and neck cancer. Radiat Oncol J 2020;38(2):84–92.

8. Di Carlo S, De Angelis F, Ciolfi A, et al. Timing for implant placement in patients treated with radiotherapy of head and neck. Clin Ter 2019;170(5):345–351.

9. In 'T Veld M, Schulten E, Leusink F. Immediate dental implant placement and restoration in the edentulous mandible in head and neck cancer patients: A systematic review and meta-analysis. Curr Opin Otolaryngol Head Neck Surg 2021;29:126–137.

10. Tsai C, Verna N, Owosho A, et al. Predicting radiation dosimetric distribution in different regions of the jaw in patients receiving radiotherapy for squamous cell carcinoma of the tonsil. Head Neck 2019;41(10):3604–3611.

11. Wolf F, Spoerl S, Gottsauner M, et al. Significance of site-specific radiation dose and technique for success of implant-based prosthetic rehabilitation in irradiated head and neck cancer patients: A cohort study. Clin Implant Dent Relat Res 2021;23(3):444–455.

12. Li J, Feng K, Ye L, et al. Influence of radiotherapy on dental implants placed in individuals before diagnosed with head and neck cancer: Focus on implant-bed-specific radiation dosage. Clin Oral Investig 2022;26(9):5915–5922.

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

13. López A, Tarazona B, Vidal A, et al. The 100 most cited articles in peri-implant diseases. A bibliometric study of the web of science. J Clin Exp Dent 2022;14(11):920–925.

14. Gupta S, Mortellaro C, Panda S, et al. Dental implant survival rate in irradiated and non-radiated patients: A systematic review and meta-analysis. J Biol Regul Homeost Agents 2021;35(2):53–65.

15. Toneatti DJ, Graf RR, Burkhard JP, et al. Survival of dental implants and occurrence of osteoradionecrosis in irradiated head and neck cancer patients: A systematic review and meta-analysis. Clin Oral Investig 2021;25(10):5579–5593.

16. Yang X, Yang X, Ji T, et al. A bibliometric analysis of the papers on oral potentially malignant disorder in oral oncology. Oral Oncol 2022;132:1–3.

17. Singh A, Singh R, Sapkota D. Current trends and themes of oral cancer research: A bibliometric analysis of publications from 2011 to 2022 in prominent oral pathology related journals. Oral Oncol Rep 2023;6:1–8.

18. Gu Z, Liu Y. A bibliometric and visualized in oral microbiota and cancer research from 2013 to 2022. Discov Oncol 2024;15(1):1–24.

19. Pérez O, Millones P, Valencia A, et al. Risk factors for oral cancer: Thematic trends and research agenda. J Pharm Pharmacogn Res 2023;11(5):887–901.

20. Liu Y, Jiang X, Wu Y, et al. Global research landscape and trends of cancer radiotherapy plus immunotherapy: A bibliometric analysis. Heliyon 2024;10(5):1–25.

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

21. Qiu L, Zhang D, Ou Z, et al. Cancer therapy induced mucosal injury from 2001 to 2021: A bibliometric analysis. J Oral Pathol Med 2023;52(5):410–417.

22. Escoto L, Delgadillo L, Ternovoy S, et al. Top 100 most cited papers on diagnostic aids for oral cancer: A bibliometric analysis. J Stomatol Oral Maxillofac Surg 2024;125(6):1–9.

23. Mayta-Tovalino F, Diaz-Barrera ME, Runzer-Colmenares FM, et al. RAMIBS: Reporting and measurement of items for bibliometric or scientometric studies in health sciences. J Int Oral Health 2024;16:253– 256.

24. Mendoza-Azpur G, Gallo P, Mayta-Tovalino F, et al. A case series of vertical ridge augmentation using a nonresorbable membrane: A multicenter study. Int J Periodontics Restorative Dent 2018;38(6): 811–816.

25. Perez E, Salinas L, Mendoza R, et al. Osseointegration of dental implants in patients with congenital and degenerative bone disorders: A literature review. J Int Soc Prev Community Dent 2023;13(3):167–172.

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

VERSIÓN INICIAL EN INGLÉS ENVIADA PARA PUBLICAR

The Journal of Contemporary Dental Practice

I. INTRODUCTION

Cancer remains a significant global public health challenge, causing at least one in six deaths (16.8%) worldwide and accounting for nearly one in four deaths (22.8%) from non-communicable diseases. In a statistical update provided by the Global Cancer Observatory in 2022, it was announced that 20 million people will be diagnosed with cancer, and almost 10 million will die.[1]

Oral cancer is a malignant neoplasm affecting the tissues and structures of the oral cavity. It can originate as a primary lesion in the mouth, metastasize from a distant site, or spread from a contiguous area.[2] Treatment is based on surgical procedures, with or without radiotherapy or chemotherapy.[3] Dental extractions may be necessary if located near a tumor or during pre-radiation screening.[3] Treatment choices depend on various factors, including the tumor type and stage and the patient`s overall health.[4] Surgical resection is the preferred initial treatment for most patients with oral cancer and often involves complex and morbid procedures, such as mandibulectomies, maxillotomies, and neck dissection.[5,6]

It is worth mentioning that patients who receive radiotherapy after surgery present with alterations in bone structure at the vascular, cellular, and metabolic levels. Initially, tissue hyperemia is observed, followed by a decrease in vascularity than can lead osteoradionecrosis of the bone.[6] These types of treatment result in early and late

Tesis publicada con autorización del autor
No olvide citar esta tesis

side effects, with early side effects occurring during treatment while undergoing radiation therapy, whereas late side effects may occur at any time during the following weeks or years.[7]

At the end of radical cancer surgery, oral rehabilitation becomes a very demanding procedure.[8] Due to the alterations that occur in both bone and soft tissues, note that dental implants can be placed before, immediately after tooth extraction during ablative surgery, or after the completion of radiotherapy.[9] In addition, it is recommended to restrict the radiation dose in the maxillary region to facilitate dental implant placement, which is why radiation dose mapping has become a very useful tool because there are several regions in the oral cavity where the radiation concentration will vary.[10] A recent study found that one of the main causes of loss of dental implants after radiotherapy was receiving a radiation dose greater than 50 Gy.[11] For dental implants placed before radiotherapy during the ablative surgery process, the ideal threshold for radiation reduction was greater than 40 Gy.[12]

Conducting a study based on various bibliometric indicators can reveal which journals are most effective for article dissemination. Bibliometric studies have examined the most cited articles in dentistry and its specialties, including endodontics, orthodontics, periodontics, and implant dentistry.[13]

Thus, the aim of this study was to evaluate the bibliometric characteristics of scientific publications on osseointegration of dental implants in irradiated patients. The results obtained are of great relevance for both researchers and clinicians, as they identify the most influential institutions and authors, as well as the areas of greatest impact. This not only facilitates the identification of potential collaborations and the orientation of future research but also helps clinicians to keep abreast of the latest

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

advances and apply them in clinical practice to improve outcomes in irradiated patients.

II. MATERIALS AND METHODS

Study design

A descriptive, retrospective bibliometric study was performed. As a inclusive criteria, scientific publications in English indexed in Scopus from January 2018 to May 2024 were considered; and as exclusion criteria, abstracts, letters to the editor, book reviews, opinions, and symposium reports.

Data collection

The search began on May 11, 2024, with Scopus as the database of choice, in which the medical terms function (MeSH) of the National Library of Medicine (NLM) was used in conjunction with the Boolean operators "AND," "OR," and "NOT" in order to refine the search, defining the following strategy: TITLE-ABS-KEY ("Osseointegration" OR "biointegration" OR "bone integration" OR "bone-implant integration" OR "bone-to-implant integration" OR "osteointegration" OR "ingrowth" OR "biocompatibility" OR "osteogenesis" OR "resorption" OR "dental implant" OR "artificial teeth" OR "Oral implantology") AND TITLE-ABS-KEY ("irradiated patients" OR "patients with radiation injuries" OR "patients with radiation damage" OR "radiation-exposed patients" OR "patients undergoing irradiation" OR "patients receiving radiation therapy" OR "patients in radiation treatment" OR "irradiation-treated patients" OR "patients receiving irradiated blood components" OR "radiated patients" OR "patients exposed to radiation" OR "patients treated with radiation" OR "radiation therapy patients") AND PUBYEAR

Tesis publicada con autorización del autor
No olvide citar esta tesis

> 2017 AND PUBYEAR < 2025, 25 relevant studies were found, of which 20 were articles and 5 reviews.

Bibliometric parameters

Indicators such as the number of citations, year, author, journal, publications by country, journal quartile, type of publication, h-index, CiteScore, and SCImago Journal Rank (SJR) were used. In the same way, thematic maps were used to analyze the collaboration between countries and the co-occurrence of keywords.

Data analysis

The SciVal program (Elsevier) was used to analyze the metadata, which enabled us to obtain the bibliometric data of the scientific publications in .xls files. This information was processed using Mendeley software to check for duplicates, and the metadata were exported to Bibliometrix 3.0 R version 4.2.3 and VOSviewer version 1.6.20 software.

III. RESULTS

Between 2018 and 2024, 25 documents from 18 sources were analyzed, revealing an annual growth rate of –16.73%. The documents had an average age of 3.32 years and received an average of 9.8 citations each, totaling 846 references. The study included 144 authors, with an average of 6.2 co-authors per document, and featured one single-authored publication. Additionally, 12% of the collaborations were international. The publications consisted of 20 articles and five reviews (Table 1).

The study analyzed the scholarly output and citation impact of various institutions from 2018 to 2024. Leading the way, Hospital General Universitario Gregorio

Tesis publicada con autorización del autor
No olvide citar esta tesis

Marañón in Spain produced three publications, averaging 12 views and 20 citations per publication. German institutions such as the Berlin Institute of Health, Charité-Universitätsmedizin Berlin, Free University of Berlin, and the University of Freiburg each had two publications with 13 views and 10 citations per publication. Santa Catarina Hospital in Brazil stood out with 23.5 views and 37 citations per publication from its two studies. King's College London in the UK and the University of Amsterdam and Vrije Universiteit Amsterdam in the Netherlands each had two publications, with significant citation counts. Amsterdam UMC contributed one publication with 14 views and 17 citations, highlighting a diverse and internationally collaborative research effort (Table 2).

Among the key authors, Raúl Antúnez-Conde from Hospital General Universitario Gregorio Marañón in Spain had three publications, averaging 6.7 citations per publication, and an *h*-index of 4. Brazilian authors Benites Condemn and Anthony Froy from Unisagrado University Center, as well as Camila Lopes Cardoso from Universidade de São Paulo, and Marcos Martins Curi from Santa Catarina Hospital, each had two publications with a high citation impact of 18.5 per publication. Max Heiland from Charité- Universitätsmedizin Berlin had two publications and a remarkable h-index of 39 (Table 3).

From 2018 to 2024, a total of 24 documents were analyzed across various CiteScore quartiles. The majority of the documents (14) were in Q1, with notable peaks in 2021 (5 documents) and a consistent output across other years. In Q2, 6 documents were identified, with 2021 again showing a higher impact with three documents. Q3 had three documents, mostly concentrated in 2020. Finally, Q4 had just one document, published in 2023. The overall distribution highlights a focus on high-impact

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

journals, particularly in 2021 (Table 4).

The study analyzed the scholarly output and citation impact across various Scopus sources. Clinical Oral Investigation and International Journal of Oral and Maxillofacial Surgery each had three publications, with Clinical Oral Investigation averaging 10 citations per publication and an SJR of 0.91. The International Journal of Oral and Maxillofacial Surgery led with 13.7 citations per publication and an SJR of 0.884. Other notable sources include the British Journal of Oral and Maxillofacial Surgery and Frontiers in Oncology, each with two publications and significant citation counts. Clinica Terapeutica and Clinical Oral Implant Research stood out for their high citations per publication, with Clinica Terapeutica reaching 18 citations and Clinical Oral Implant Research achieving an SJR of 1.691 (Table 5).

These maps of international collaboration illustrate a few instances of international contributions, particularly partnerships, including one between the Netherlands and China, Spain, and Chile, and the United States and Italy (Fig. 1). The collaborative networks presented a clear vision of the world of scientific cooperation amongst countries.

In Fig. 2, a collaborative network was identified as having seven nodes representing subjects with terms that were related most frequently within the database with 255 keywords. By a detailed survey of the network made, it could be stated that the first node (blue color) was primarily organized around the term “dental implants,” the second node (red color) was associated with the term “adult,” whose boundaries extended to “middle-aged,” “osteolysis,” “fibula graft,” among others, while in the case of the third node (brown color), the term “head and neck neoplasm” was clustered. The clustered set at the center of the map underlined strong connections of

Tesis publicada con autorización del autor
No olvide citar esta tesis

keywords, while the least number of connections of nodes was at the extremes of the map.

IV. DISCUSSION

Over time, various analyses have been conducted, including literature reviews, systematic reviews, and clinical case reports, to examine the interaction or effects of radiation on bone tissue and its relationship with oral implantology in cancer patients. However, few studies have addressed the scientific production and impact of publications on this topic. Therefore, the present analysis aimed to quantify the scholarly output on osseointegration of dental implants in irradiated patients from 2018 to 2024.

This was achieved through a keyword search in the Scopus database, classifying the results by author name, journal, institution, and international collaboration.

According to research by Gupta et al.[14] the survival rates of dental implants placed in non-irradiated areas were higher (93.9%) compared to those placed in irradiated areas (85.8%). Similarly, Toneatti et al.[15] observed a survival rate of 97% after a follow-up period of 37.7 months.

Our study highlighted the high scientific production of both German authors and institutions, without leaving aside the contribution made by authors from Brazil, of which the researcher Curi Marcos Martins stands out, with an average of 18.5 citations per publication and an *h*-index of 17; the Hospital General Universitario Gregorio Marañón of Spain was the institution with the highest number of publications, with an average of three articles on the osseointegration of dental implants in irradiated patients. Impact is an important measure that ranks journals

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

according to their number of citations and generally designates their reputation. Among the journals selected from the top 10 with the highest impact are Clinical Oral Implants Research (1.691), Frontiers in Oncology (1.138), Journal of Clinical Medicine (0.935), Clinical Oral Investigations (0.91), and International Journal of Oral and Maxillofacial Surgery (0.884). Following the same line, we highlight that most of the publications were made in the year 2021, grouping them within the first quartile (Q1) and second quartile (Q2).

In our analysis, it was observed that collaboration between countries had international contributions, but only on one occasion between the United States and Italy, the Netherlands and China, and Spain and Chile, unlike what was found in the study by Yang et al.[16] who analyzed trends in oral cancer, showing that the United States had the highest scholarly output with 35 publications. Similarly, in the work of Singh et al.[17] on trends and current topics in oral cancer research, it was shown that the countries with the highest number of publications were the United States, India, and China, with 465, 279, and 228 articles, respectively.[17]

In our analysis, it was observed that international collaboration occurred, but only in isolated instances, such as between the United States and Italy, the Netherlands and China, and Spain and Chile. This contrasts with the findings of Yang et al.,[16] who analyzed trends in oral cancer and found that the United States had the highest number of documents with 35 publications. Similarly, Singh et al.[17] reported that the countries with the highest number of publications in oral cancer research were the United States, India, and China, with 465, 279, and 228 articles, respectively. The limited international collaboration in our study period could be attributed to several factors, including the specialized nature of research on osseointegration in irradiated

Tesis publicada con autorización del autor
No olvide citar esta tesis

patients, which may require specific expertise and resources that are not widely available. Additionally, geopolitical and economic barriers, as well as differences in research priorities and funding availability, may have hindered broader international cooperation.[16,17]

One of the topics of greatest interest for researchers in the development of bibliometric studies on oral cancer was the risk factors and composition of the microbiota, which could lead to oral squamous cell carcinoma.[18,19] The most important journal in the field of research was "Oral Oncology", with 10 publications and 428 citations, making it the most productive scientific journal.[19] On the other hand, in the research conducted by Liu et al.,[20] the journals with the highest number of publications of articles related to the use of radiotherapy in cancer were "The International Journal of Radiation Oncology, Biology, and Physics" with 42 articles, followed by the "Journal for Immunotherapy of Cancer and Frontiers in Oncology" with 39 and 35 articles, respectively.

According to the bibliometric study by Qiu et al.[21] on mucosal lesions caused by cancer therapies, the most productive institutions were based in the USA, with the University of Adelaide, the University of Texas, and the Memorial Sloan Kettering Cancer Center leading in research output. Similarly, Escoto et al.[22] found that the University of California had the highest number of publications, averaging seven articles with 2,827 citations, followed by the American Cancer Society, which published five articles with 32,982 citations.

The strength of the present one lies in offering a full and quantitative view of the process of osseointegration of dental implants among irradiated patients. This study aimed at keeping track of key trends in the field, collaboration among countries, and

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

the evolution of research in this topic via bibliometric methodology and leading tools such as SciVal, Mendeley, Bibliometrix, and VOSviewer.[23] Additionally, the selection of articles indexed in the Scopus indexing standard assures a decent quality and relevancy of articles included, providing a sound basis for future research investigations and extending their search into other databases.

During the research, certain limitations were discovered; it is worth mentioning that a bibliometric study will depend on the availability of the articles retrieved using the search strategy; for this reason, we must first consider that the data collection was based on Scopus; therefore, future research could include bibliographic citations from the Embase, Medline, and Web of Science databases. Second, designing a search strategy to distinguish relevant from irrelevant publications was highly complex. Third, there was a linguistic bias because the search was limited to articles published in English related to osseointegration, implants, and periodontics.[24,25] Finally, the automatic software algorithms may introduce bias because not all publications could be exported to SciVal due to metadata incompatibility.

V. CONCLUSIONS

The growing number of published articles pointed to an evident rise in interest in identifying the most prolific and cited countries, institutions, journals, and authors. Our analysis revealed Germany and Brazil produced the highest number of publications, with Brazilian authors exhibiting the maximum impact of citation. Notably, Antúnez- Conde Raúl from Spain was the biggest contributor. Such findings can be very helpful to clinicians and researchers in improving treatment modalities and prognoses for irradiated patients for whom dental implants may be

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

useful. Being aware of trends and key contributor's enables clinicians to maintain current advancements and promote collaborative efforts favorable for patient care.

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

COPIA DE CARTA DE RESPUESTA A LAS OBSERVACIONES DE LOS REVISORES

AUTHOR REPLY FORM JOURNAL NAME JCDP

Manuscript ID-JCDP_25_35

Reply to the reviewers´ comments

Reviewer Number	Comments of the reviewer	Reply by the author(s)	
EXAMPLE: Reviewer 1	**1. Abstract:** **a. Most publications were within the first (Q1) and second (Q2) quartiles, with 2021 standing out.. kindly specify the no: of articles** **b. Collaboration maps highlighted international cooperation between several countries.… kindly enumerate few countries** **Manuscript** **1. It is mentioned that- Conducting a study based on various bibliometric indicators can reveal which journals are most effective for article dissemination. Bibliometric studies have examined the most cited articles in dentistry and its specialties, including endodontics, orthodontics, periodontics, and implant dentistry.13… kindly comment on former. Kindly mention the reason for the need of the study in relation to the objectives**	Dear Reviewers Thank you for your valuable feedback. We have addressed all the points raised and made the necessary revisions to our manuscript. Please find our detailed responses below: 1. **Abstract:** a. We have specified the number of articles within the first (Q1) and second (Q2) quartiles b. We have enumerated a few countries involved in international cooperation: China, the United States, and the China. 2. **Manuscript:** 1. Regarding the statement on bibliometric studies in dentistry and its specialties, we have provided a commentary on the importance of identifying effective journals for article dissemination. Additionally, we have	

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

	2. The study highlighted the high scientific production of both German authors and institutions, without leaving aside the contribution made by authors from Brazil, of which… **a. Kindly note if the present study observations are addressed, kindly state present/ current study in specific** **b. Kindly note detailed enumeration of the present study results needs to be addressed in results subheading instead. Zest of the observation of the present study suffices in the discussion. kindly verify and revise the narration accordingly** **3. Kindly note studies cited needs to be addressed in further detail. kindly consider** **4. Kindly mention the strengths of the present study prior to the limitations at the end of the discussion** **5. Kindly note while the limitations of the present study are addressed, they are reference cited. Kindly comment** **6. Kindly condense the conclusion to a**	mentioned the need for our study in relation to the objectives, focusing on the growing interest in osseointegration of dental implants in irradiated patients. 2. a. We have clearly stated that the present study observations are specific to the current research. b. We have revised the manuscript to ensure that the detailed enumeration of the present study results is addressed in the results subheading, while the discussion section provides a concise summary of the observations. 3. We have addressed the studies cited in further detail, providing additional context and relevance to the discussion. 4. We have mentioned the strengths of the present study prior to the limitations at the end of the discussion. 5. While addressing the limitations of the present study, we have ensured they are properly referenced and cited. 6. We have condensed the conclusion to a maximum of 4-5 sentences to provide a concise summary.	

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

	maximum of 4-5 sentences alone	We hope these revisions meet the requirements and improve the quality of our manuscript. Please let us know if any further information is needed.	

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

VERSIÓN EN ESPAÑOL

The Journal of Contemporary Dental Practice

I. INTRODUCCIÓN

El cáncer continúa siendo el mayor problema de salud pública, económico, social, y que a nivel mundial es el responsable de al menos una de cada seis muertes (16.8%) y una en cuatro muertes (22.8%) de las enfermedades no transmisibles. En la actualización estadística proporcionada por el observatorio global del cáncer del 2022 se dio a conocer que 20 millones de personas serán diagnosticadas, y casi 10 millones morirán.[1]

El cáncer oral es una neoplasia maligna que tiene un impacto en los tejidos y las estructuras de la cavidad bucal, el cual puede originarse como una lesión primaria en la boca, una metástasis desde un sitio distante, o por la extensión de una zona contigua.[2] El tratamiento está basado en realizar procedimientos quirúrgicos con o sin radioterapia o quimioterapia.[3] En ocasiones es necesario realizar extracciones dentales cuando la ubicación está cercana al tumor o como parte del examen de detección previo a la radioterapia.[3] La opción del tratamiento dependerá de diversos factores como el tipo, estadio del tumor y la salud general del paciente. La resección quirúrgica es el procedimiento ideal establecido para el tratamiento inicial en la mayoría de los pacientes con cáncer oral.[4] Este manejo quirúrgico implica procedimientos mórbidos en los que se incluyen mandibulectomías y maxilotomías con disección del cuello.[5-6]

Tesis publicada con autorización del autor
No olvide citar esta tesis

Cabe mencionar que los pacientes que reciben radioterapia después del tratamiento quirúrgico presentarán alteraciones en la estructura ósea a nivel vascular, celular y metabólico. Inicialmente se observa hiperemia en los tejidos, y posteriormente una disminución en la vascularidad que puede concluir con la osteoradionecrosis del hueso.[6]

Estos tipos de tratamiento tienen como consecuencia efectos secundarios tempranos y tardíos, siendo los efectos secundarios tempranos, los que se presentarán en el transcurso del tratamiento mientras se recibe la radioterapia; en cambio los efectos tardíos podrán ocurrir en cualquier momento durante las siguientes semanas o años posteriores.[7]

Al finalizar una cirugía radical contra el cáncer, la rehabilitación oral del paciente se convierte en un procedimiento muy exigente.[8] Debido a las alteraciones que se presentan tanto en tejidos óseos y blandos; cabe resaltar que, los implantes dentales se pueden colocar antes, inmediatamente después de la extracción dental durante la cirugía ablativa, o después de completar la radioterapia.[9] Además, se recomienda restringir la dosis de radiación en la región del maxilar para facilitar la colocación del implante dental; es por ello que el mapeo de la dosis de radiación a aplicar se ha vuelto una herramienta muy útil debido a que existen diversas regiones en la cavidad bucal donde variará la concentración de radiación. Un estudio reciente encontró que una de las principales causas de pérdida de implantes dentales después de la radioterapia, fue recibir una dosis de radiación superior a los 50 Gy.[11] Por su parte, los implantes dentales colocados antes de la radioterapia durante el proceso de la cirugía ablativa, el umbral ideal para la reducción de radiación fue mayor a los 40 Gy.[12]

El desarrollo de un estudio basado en la evaluación de una variedad de indicadores

Tesis publicada con autorización del autor
No olvide citar esta tesis

bibliométricos puede proporcionar información sobre las revistas que generan más resultados para la divulgación de los artículos. Los estudios bibliométricos han analizado los artículos más citados en odontología y en sus especialidades como endodoncia, ortodoncia, periodoncia e implantología.[13]

El presente estudio bibliométrico tuvo como objetivo evaluar la producción científica de la osteointegración en los implantes dentales en pacientes irradiados.

II. MATERIALES Y MÉTODOS

Diseño de estudio

Se realizó un estudio bibliométrico descriptivo y retrospectivo, como criterios inclusivos se tomó en consideración publicaciones científicas en inglés y que se encuentren indexadas en Scopus en el periodo de 2018 a 2024; y como criterios de exclusión resúmenes, cartas al editor, revisiones de libros, opiniones y reportes de simposios.

Recopilación de datos

El inicio de la búsqueda se desarrolló el 11 de mayo del 2024, siendo Scopus la base de datos elegida, en la cual se utilizó la función de términos médicos (MeSH) de la Biblioteca Nacional de Medicina (NLM) en conjunto de los operadores booleanos “AND”, “OR” y “NOT” con la finalidad de precisar la búsqueda definiéndose la siguiente estrategia: TITLE-ABS-KEY ("Osseointegration" OR "biointegration" OR "bone integration" OR "bone-implant integration" OR "bone-to-implant integration" OR "osteointegration" OR "ingrowth" OR "biocompatibility" OR "osteogenesis" OR "resorption" OR "dental implant*" OR "artificial teeth" OR "Oral implantology") AND TITLE-ABS-KEY ("irradiated patients" OR "patients with radiation injuries"

Tesis publicada con autorización del autor
No olvide citar esta tesis

OR "patients with radiation damage" OR "radiation-exposed patients" OR "patients undergoing irradiation" OR "patients receiving radiation therapy" OR "patients in radiation treatment" OR "irradiation-treated patients" OR "patients receiving irradiated blood components" OR "radiated patients" OR "patients exposed to radiation" OR "patients treated with radiation" OR "radiation therapy patients") AND PUBYEAR > 2017 AND PUBYEAR < 2025, hallándose 25 estudios relevantes, de los cuales 20 fueron artículos y 5 revisiones.

Parámetros bibliométricos

Se utilizaron indicadores como el número de citaciones, publicaciones realizadas por país, año, autor, revista, cuartil de la revista, tipo de publicación, el índice H, CiteScore y el SCImago Journal Rank (SJR). De la misma manera se utilizaron mapas temáticos para analizar la colaboración entre países y la co-ocurrencia de palabras clave.

Análisis de datos

Se utilizó el programa SciVal (Elsevier) para analizar los metadatos, lo cual permitió obtener los datos bibliométricos de las publicaciones científicas en archivos con extensión .xls, a su vez esta información se procesó con el software Mendeley para comprobar la existencia de duplicados y la metadata se exportó al software Bibliometrix 3.0 R versión 4.2.3 y VOSviewer versión 1.6.20.

III. RESULTADOS

En la Tabla 1, se evidenció que durante el periodo de 2018-2024 hubo un total de 25 documentos con una tasa de crecimiento anual de -16.73%, cada documento recibió un promedio de 9.8 citaciones, y un total de 846 referencias. El número total de

Tesis publicada con autorización del autor
No olvide citar esta tesis

autores fue de 144, con un promedio 6.2 co-autores por artículo. Entre los 25 documentos, el mayor número lo obtuvo la categoría de artículos.

Dentro del top 10 de las instituciones con más investigaciones científicas, la mayoría fueron de Alemania con un promedio de 8 artículos en total, donde Berlin Institute of Health, Free University of Berlin, Charité – Universitätsmedizin Berlin y University of Freiburg obtuvieron la mayor producción científica con 2 artículos y un promedio de 13 citas por publicación respectivamente; cabe denotar que el Hospital Santa Catarina de Brasil consiguió el mayor impacto con 23.5 citaciones por publicación (Tabla 2).

Los autores con mayor producción científica pertenecieron a instituciones alemanas, sin embargo, el mayor impacto con un promedio 18.5 de citaciones por artículo lo consiguieron los autores brasileños: Benites Condezo Anthony Froy, Cardoso Camila Lopes, y Curi Marcos Martins; adicionalmente, se debe resaltar que el autor Heiland Max del Charité – Universitätsmedizin Berlin obtuvo el mayor h-index con 39 citas (Tabla 3).

En la Tabla 4, se denotó que la mayor producción científica se encuentra dentro del primer cuartil (Q1) y segundo cuartil (Q2), con 14 y 6 artículos respectivamente, destacándose el año 2021 con el mayor índice de impacto agrupando la cantidad de 5 artículos en el primer cuartil (Q1). Por otra parte, la mayor cantidad de citaciones por publicación se obtuvo de las revistas Clinica Terapeutica, Clinical Oral Investigations e International Journal of Oral and Maxillofacial Surgery con 18, 13.7, 10 citas respectivamente; además se evidenció que las últimas dos en mención tuvieron la más alta producción científica con un promedio de 3 artículos cada una; en cambio, la revista Clinical Oral Implants Research consiguió el mayor CiteScore

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

con un promedio de 7.3 citas por artículo publicado y un SCImago Journal Rank de 1.691 concluyendo que fue la mejor revista frente al promedio global (Tabla 5).

El mapa de colaboración entre los países destacó diversos casos de aportes internacionales, incluyendo la cooperación en una ocasión entre Países Bajos con China, así como España con Chile y Estados Unidos con Italia (Figura 1). Esta visualización de redes de colaboración proporcionó una clara descripción del panorama de la cooperación científica entre diferentes países.

En la Figura 2, se identificó dentro de la base de datos de 255 palabras clave una red colaborativa formada por 7 nodos que representaron los temas donde los términos se encuentran relacionados con mayor frecuencia. A través de un análisis detallado de la red creada, se pudo notar que el primer nodo (color azul) se organizó principalmente sobre el concepto “dental implants”, el segundo nodo (color rojo) asoció al concepto “adult” en la cual destacan términos como “middle aged”, “osteolysis”, “fibula graft”, entre otros, y en el caso del tercer nodo (color marrón) se agrupó el concepto “head and neck neoplasm”. El conjunto agrupado en el centro del mapa destacó una fuerte conexión de las palabras clave, mientras que la menor conexión de los nodos estuvo a los extremos del mapa.

IV. DISCUSIÓN

Con el tiempo se han venido realizando diversos análisis como revisiones de literatura, revisiones sistemáticas e incluso reportes de casos clínicos sobre la interacción o efectos que puede ocasionar la radiación sobre el tejido óseo y su relación con la implantología oral en pacientes con cáncer; pero pocos son los estudios que engloban la producción científica y el impacto que tienen las

Tesis publicada con autorización del autor
No olvide citar esta tesis

publicaciones sobre el tema en cuestión; motivo por el cual, el presente análisis buscó cuantificar la producción científica de la osteointegración en los implantes dentales en pacientes irradiados en el periodo 2018-2024, basándose en una búsqueda de palabras clave realizada en la base de datos Scopus, clasificando los resultados según el nombre del autor, revista, institución y colaboración entre países. En base a investigaciones desarrolladas por Gupta et al., se encontró que las tasas de supervivencia de los implantes dentales colocados en áreas no irradiadas eran más altas (93.9 %) que los colocados en zonas irradiadas (85.8 %).[14] De la misma manera Toneatti et al., después de realizar un seguimiento de 37,7 meses observaron tasas de supervivencia del 97 %.[15]

En el estudio se resaltó la alta producción científica tanto de autores como instituciones alemanas, sin dejar de lado el aporte realizado por autores de procedencia brasileña de la que sobresalen el investigador Curi Marcos Martins que tuvo promedio de 18.5 citaciones por publicación y un h-index de 17; el Hospital General Universitario Gregorio Marañon de España fue la institución con mayor número de publicaciones con un promedio de 3 artículos acerca de la osteointegración de implantes dentales en pacientes irradiados. El impacto es una medida muy importante que cataloga a las revistas de acuerdo con la cantidad de citaciones y que, por lo general, designa su reputación. Entre las revistas seleccionadas del top 10 con el mayor impacto se encuentran Clinical Oral Implants Research (1.691), Frontiers in Oncology (1.138), Journal of Clinical Medicine (0.935), Clinical Oral Investigations (0.91), e International Journal of Oral and Maxillofacial Surgery (0.884), siguiendo la misma línea, debemos resaltar que la mayoría de las publicaciones se realizaron en el año 2021 agrupándose dentro del primer cuartil (Q1) y segundo cuartil (Q2).

Tesis publicada con autorización del autor
No olvide citar esta tesis

En nuestro análisis se observó que la colaboración entre países tuvo aportes internacionales, pero solo en una ocasión entre Estados Unidos con Italia, Países Bajos con China y España con Chile, a diferencia de lo encontrado en el estudio de Yang X et al., que analizó las tendencias en cáncer oral evidenciando que Estados Unidos fue el país con mayor producción científica con 35 publicaciones.[16] De forma similar en el trabajo realizado por Singh A et al., en tendencias y temas actuales de la investigación del cáncer oral, se mostró que los países con el mayor número de publicaciones fueron Estados Unidos, India y China con 465, 279, 228 artículos respectivamente.[17]

Uno de los temas de mayor interés por parte de los investigadores en el desarrollo de estudios bibliométricos asociados a cáncer oral fueron los factores de riesgo y la composición de la microbiota, que podrían conllevar a padecer de carcinoma oral de células escamosas.[18-19] En donde la revista más importante dentro del campo de investigación fue Oral Oncology, con un total de 10 publicaciones y 428 citaciones posicionándola como la revista científica más productiva.[19] Por otra parte en la investigación realizada por Liu Y et al., las revistas con mayor número de publicaciones de artículos en relación del uso de radioterapia en cáncer fueron The International Journal of Radiation Oncology, Biology, Physics con 42 artículos, seguido por the Journal for Immunotherapy of Cancer y Frontiers in Oncology con 39 y 35 artículos respectivamente.[20]

Con respecto a los datos obtenidos del estudio bibliométrico de Qiu L et al., en lesiones mucosas inducidas por terapias de cáncer, las instituciones más productivas fueron de Estados Unidos dentro de las que destacaron la University of Adelaide, University of Texas MD Anderson Cancer Center, y el Memorial Sloan Kettering

Tesis publicada con autorización del autor
No olvide citar esta tesis

Cancer Center.[21] De la misma manera, el trabajo realizado por Escoto L et al., mostró que la University of California-Los Ángeles (UCLA) obtuvo la mayor cantidad de publicaciones, con una contribución promedio de 7 artículos con 2.827 citaciones, seguida por la American Cancer Society, con 5 artículos y 32.982 citaciones.[22]

En el transcurso de la investigación se descubrieron ciertas limitaciones, cabe mencionar que un estudio bibliométrico dependerá de la disponibilidad de los artículos recuperados con la estrategia de búsqueda; motivo por el cual en primer lugar debemos considerar que la recopilación de datos se basó en Scopus; es por ello, que en futuras investigaciones se podrían incluir citas bibliográficas de las bases de datos Embase, MEDLINE y Web of Science. En segundo lugar, fue muy complejo diseñar una estrategia de búsqueda que pudiera identificar y excluir las publicaciones relevantes de las irrelevantes; en tercer lugar, hubo un sesgo lingüístico puesto que los artículos recuperados solo se limitaron a publicaciones en inglés. Por último, los algoritmos automáticos del software pueden introducir sesgos debido a que no todas las publicaciones se pudieron exportar a SciVal por incompatibilidad en los metadatos.

V. CONCLUSIONES

En términos generales, este estudio se centró en proporcionar a los investigadores una visión global de la producción científica que existe al respecto de la osteointegración de implantes dentales en pacientes irradiados. El creciente número de artículos en esta área mostró el interés, cada vez mayor por parte de los investigadores por conocer que países, instituciones, revistas y autores son los que producen más publicaciones y refieren más citaciones por artículo. En nuestro

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

análisis se denotó que los países que aportaron más publicaciones fueron Alemania y Brasil; que a su vez tuvieron el mayor número de autores con más citaciones por publicación; pero el autor más productivo fue Antúnez-Conde Raúl, de nacionalidad española. Estos hallazgos pueden ser muy útiles para clínicos e investigadores a la hora de mejorar las modalidades de tratamiento y el pronóstico de los implantes dentales en los pacientes tratados con radioterapia.

VI. REFERENCIAS BIBLIOGRÁFICAS

1. Bray F, Laversanne M, Sung H, et al. Global cancer statistics 2022: Globocan estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin 2024;74:229–263.

2. Tandon P, Dadhich A, Saluja H, et al. The prevalence of squamous cell carcinoma in different sites of oral cavity at our rural health care centre in Loni, Maharashtra: A retrospective 10-year study. Contemp Oncol 2017;21(2):178–183.

3. Spijkervet F, Schuurhuis J, Stokman M, et al. Should oral foci of infection be removed before the onset of radiotherapy or chemotherapy? Oral Dis 2021;27(1):7–13.

4. Mattila V, Wilkman T, Avellán N, et al. Survival of dental implants and occurrence of mucosal overgrowth in patients with head and neck cancer treated with/without radiotherapy and mucosal graft: 2-year follow-up. Clin Oral Investig 2024;28(1):111–117.

5. Almangush A, Mäkitie A, Triantafyllou A, et al. Staging and grading of oral

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

squamous cell carcinoma: An update. Oral Oncol 2020;107:104799.

6. Kende P, Ranganath S, Landge J, et al. Survival of dental implants on irradiated jaws: A systematic review and meta-analysis. J Maxillofac Oral Surg 2022;21(3):787–795.

7. Brook I. Late side effects of radiation treatment for head and neck cancer. Radiat Oncol J 2020;38(2):84–92.

8. Di Carlo S, De Angelis F, Ciolfi A, et al. Timing for implant placement in patients treated with radiotherapy of head and neck. Clin Ter 2019;170(5):345–351.

9. In 'T Veld M, Schulten E, Leusink F. Immediate dental implant placement and restoration in the edentulous mandible in head and neck cancer patients: A systematic review and meta-analysis. Curr Opin Otolaryngol Head Neck Surg 2021;29:126–137.

10. Tsai C, Verna N, Owosho A, et al. Predicting radiation dosimetric distribution in different regions of the jaw in patients receiving radiotherapy for squamous cell carcinoma of the tonsil. Head Neck 2019;41(10):3604–3611.

11. Wolf F, Spoerl S, Gottsauner M, et al. Significance of site-specific radiation dose and technique for success of implant-based prosthetic rehabilitation in irradiated head and neck cancer patients: A cohort study. Clin Implant Dent Relat Res 2021;23(3):444–455.

12. Li J, Feng K, Ye L, et al. Influence of radiotherapy on dental implants placed in individuals before diagnosed with head and neck cancer: Focus on implant-bed-specific radiation dosage. Clin Oral Investig 2022;26(9):5915–5922.

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

13. López A, Tarazona B, Vidal A, et al. The 100 most cited articles in peri-implant diseases. A bibliometric study of the web of science. J Clin Exp Dent 2022;14(11):920–925.

14. Gupta S, Mortellaro C, Panda S, et al. Dental implant survival rate in irradiated and non-radiated patients: A systematic review and meta-analysis. J Biol Regul Homeost Agents 2021;35(2):53–65.

15. Toneatti DJ, Graf RR, Burkhard JP, et al. Survival of dental implants and occurrence of osteoradionecrosis in irradiated head and neck cancer patients: A systematic review and meta-analysis. Clin Oral Investig 2021;25(10):5579–5593.

16. Yang X, Yang X, Ji T, et al. A bibliometric analysis of the papers on oral potentially malignant disorder in oral oncology. Oral Oncol 2022;132:1–3.

17. Singh A, Singh R, Sapkota D. Current trends and themes of oral cancer research: A bibliometric analysis of publications from 2011 to 2022 in prominent oral pathology related journals. Oral Oncol Rep 2023;6:1–8.

18. Gu Z, Liu Y. A bibliometric and visualized in oral microbiota and cancer research from 2013 to 2022. Discov Oncol 2024;15(1):1–24.

19. Pérez O, Millones P, Valencia A, et al. Risk factors for oral cancer: Thematic trends and research agenda. J Pharm Pharmacogn Res 2023;11(5):887–901.

20. Liu Y, Jiang X, Wu Y, et al. Global research landscape and trends of cancer radiotherapy plus immunotherapy: A bibliometric analysis. Heliyon 2024;10(5):1–25.

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

21. Qiu L, Zhang D, Ou Z, et al. Cancer therapy induced mucosal injury from 2001 to 2021: A bibliometric analysis. J Oral Pathol Med 2023;52(5):410–417.

22. Escoto L, Delgadillo L, Ternovoy S, et al. Top 100 most cited papers on diagnostic aids for oral cancer: A bibliometric analysis. J Stomatol Oral Maxillofac Surg 2024;125(6):1–9.

23. Mayta-Tovalino F, Diaz-Barrera ME, Runzer-Colmenares FM, et al. RAMIBS: Reporting and measurement of items for bibliometric or scientometric studies in health sciences. J Int Oral Health 2024;16:253– 256.

24. Mendoza-Azpur G, Gallo P, Mayta-Tovalino F, et al. A case series of vertical ridge augmentation using a nonresorbable membrane: A multicenter study. Int J Periodontics Restorative Dent 2018;38(6): 811–816.

25. Perez E, Salinas L, Mendoza R, et al. Osseointegration of dental implants in patients with congenital and degenerative bone disorders: A literature review. J Int Soc Prev Community Dent 2023;13(3):167–172.

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

VII. ANEXOS

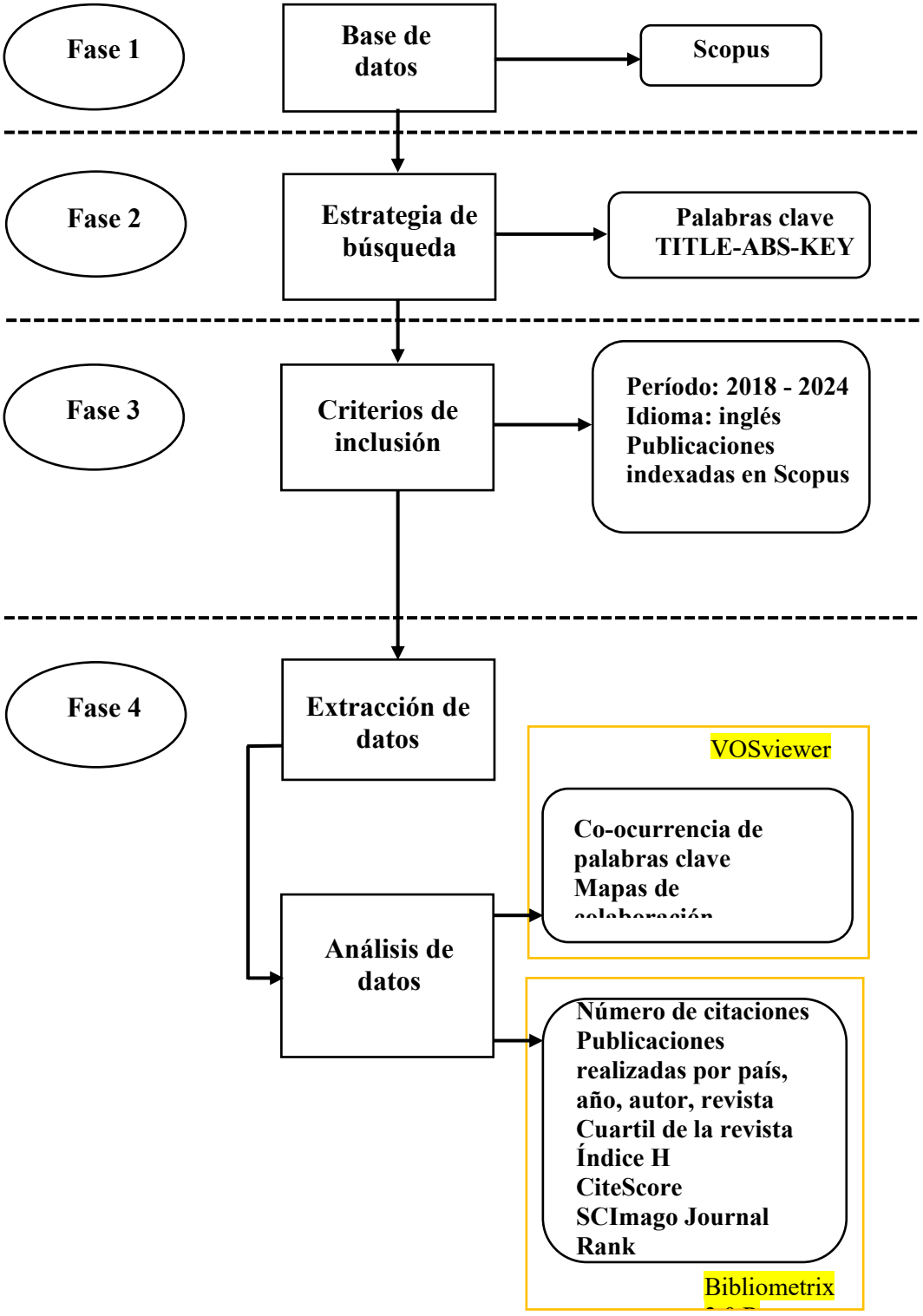
Anexo 1. Estrategia de búsqueda

Scopus (11/05/2024)
TITLE-ABS-KEY (“Osseointegration” OR “biointegration” OR “bone integration” OR “bone-implant integration” OR “bone-to-implant integration” OR “osteointegration” OR “ingrowth” OR “biocompatibility” OR “osteogenesis” OR “resorption” OR “dental implant” OR “artificial teeth” OR “Oral implantology”) AND TITLE-ABS-KEY (“irradiated patients” OR “patients with radiation injuries” OR “patients with radiation damage” OR “radiation-exposed patients” OR “patients undergoing irradiation” OR “patients receiving radiation therapy” OR “patients in radiation treatment” OR “irradiation-treated patients” OR “patients receiving irradiated blood components” OR “radiated patients” OR “patients exposed to radiation” OR “patients treated with radiation” OR “radiation therapy patients”) AND PUBYEAR > 2017 AND PUBYEAR < 2025.

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

Anexo 2. Diagrama de flujo



Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

Anexo 3. Table 1: Main information tall

Description	Results
MAIN INFORMATION DATA	
Timespan	2018:2024
Sources (Journals, Books, etc)	18
Documents	25
Annual Growth Rate %	-16.73
Document Average Age	3.32
Average citations per doc	9.8
References	846
DOCUMENT CONTENTS	
Keywords Plus (ID)	255
Author's Keywords (DE)	89
AUTHORS	
Authors	144
Authors of single-authored docs	1
AUTHORS COLLABORATION	
Single-authored docs	1
Co-Authors per Doc	6.2
International co-authorships %	12
DOCUMENT TYPES	
Article	20
Review	5

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS UNIVERSIDAD CIENTÍFICA DEL SUR

Anexo 4. Table 2: Top-10 Institutions, by Scholarly Output

Institution	Country/Region	Scholarly Output	Views per Publication	Citation Count
Hospital General Universitario Gregorio Marañon	Spain	3	12	20
Berlin Institute of Health	Germany	2	13	10
Charité – Universitätsmedizin Berlin	Germany	2	13	10
Free University of Berlin	Germany	2	13	10
Hospital Santa Catarina	Brazil	2	23.5	37
King's College London	United Kingdom	2	11	23
University of Amsterdam	Netherlands	2	13	25
University of Freiburg	Germany	2	13	10
Vrije Universiteit Amsterdam	Netherlands	2	13	25
Amsterdam UMC	Netherlands	1	14	17

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS UNIVERSIDAD CIENTÍFICA DEL SUR

Anexo 5. Table 3: Top-10 Authors, by Scholarly Output

Author	Affiliation	Country/Region	Scholarly Output	Citations per Publication	H-index
Antúnez-Conde, Raúl	Hospital General Universitario Gregorio Marañón	Spain	3	6.7	4
Benites Condezo, Anthony Froy	Unisagrado University Center	Brazil	2	18.5	3
Cardoso, Camila Lopes	Universidade de São Paulo	Brazil	2	18.5	15
Curi, Marcos Martins	Hospital Santa Catarina	Brazil	2	18.5	17
Heiland, Max	Charité – Universitätsmedizin Berlin	Germany	2	5	39
Nahles, Susanne	Charité – Universitätsmedizin Berlin	Germany	2	5	16
Navarro Cuéllar, Ignacio	Hospital General Universitario Gregorio Marañon	Spain	2	7	7
Navarro-Cuéllar, Carlos	Hospital General Universitario Gregorio Marañon	Spain	2	7	10
Nelson, Katja	University of Freiburg	Germany	2	5	29
Preissner, Saskia	Charité – Universitätsmedizin Berlin	Germany	2	5	18

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

Anexo 6. Table 4: Publications by CiteScore quartile

CiteScore quartile	Overall	2018	2019	2020	2021	2022	2023	2024
Q1	14	3	1	2	5	1	1	1
Q2	6	0	1	0	3	1	1	0
Q3	3	0	1	0	2	0	0	0
Q4	1	0	0	0	0	0	1	0
Total	24	3	3	2	10	2	3	1

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

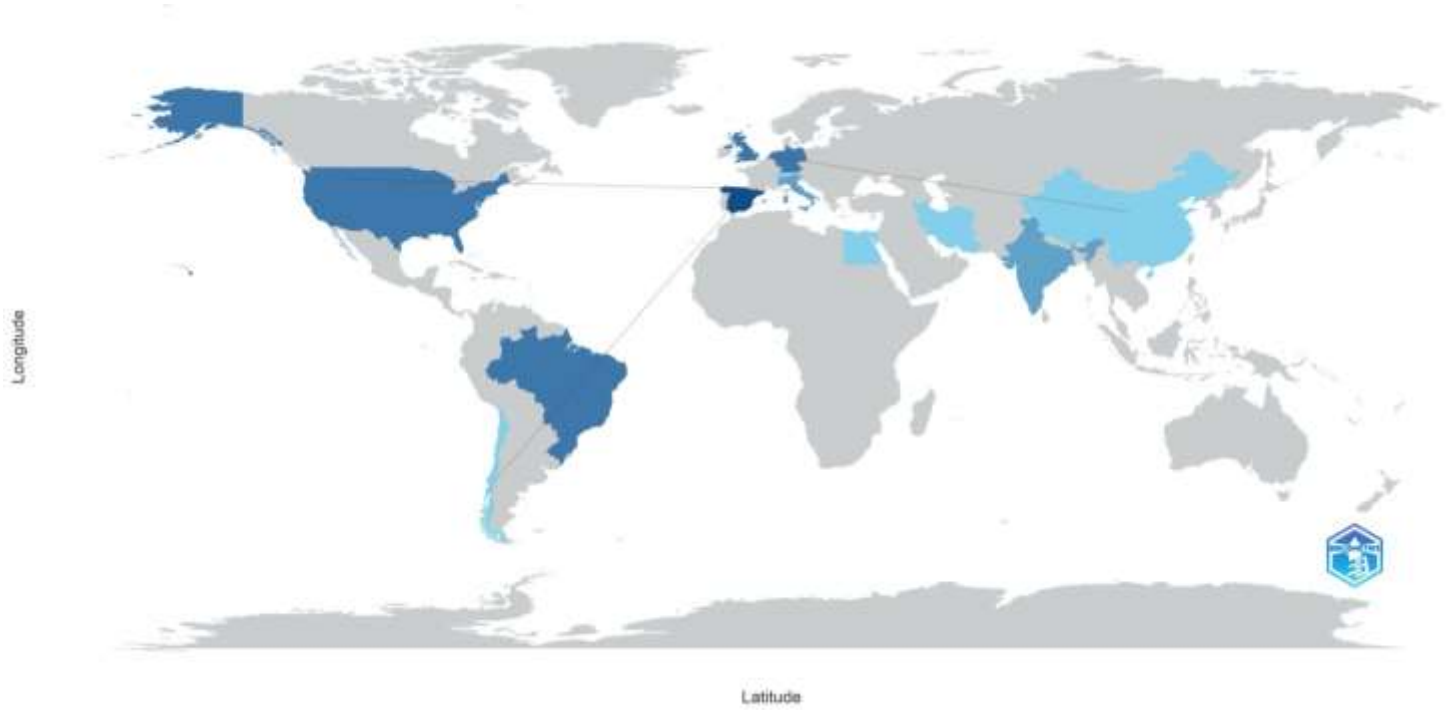
Anexo 7. Table 5: Top-10 Scopus sources, by Scholarly Output

Scopus Source	Scholarly Output	Citations per Publication	SJR 2022	CiteScore 2022
Clinical Oral Investigations	3	10	0.91	6.3
International Journal of Oral and Maxillofacial Surgery	3	13.7	0.884	5
British Journal of Oral and Maxillofacial Surgery	2	9	0.553	2.8
Frontiers in Oncology	2	8.5	1.138	5.2
Journal of Clinical Medicine	2	5	0.935	5.4
Clinica Terapeutica	1	18	0.408	3.3
Clinical Oral Implants Research	1	8	1.691	7.3
Frontiers in Dentistry	1	1	0.268	1.5
International Journal of Prosthodontics and Restorative Dentistry	1	0	-	0.1
Journal of Biological Regulators and Homeostatic Agents	1	4	0.285	3.1

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

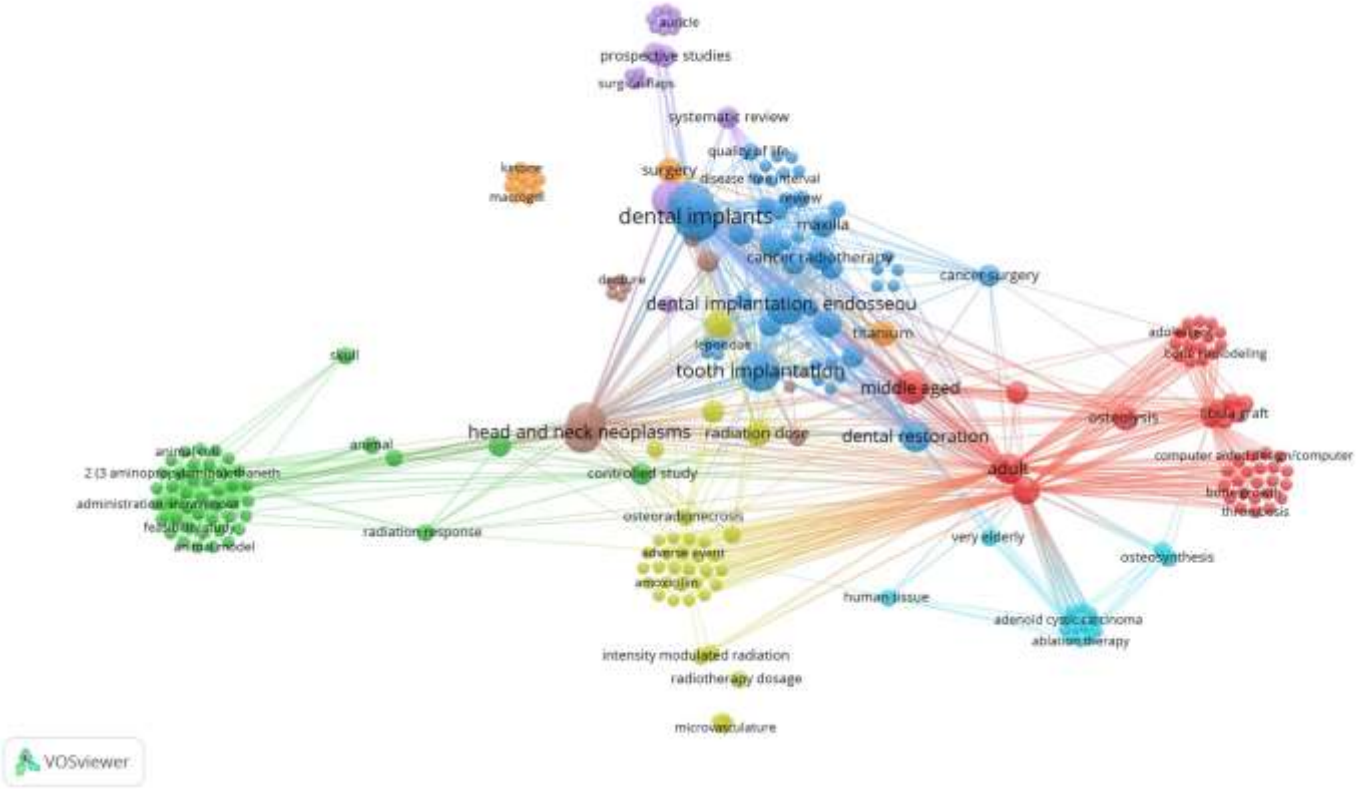
Anexo 8. Figure 1: Country Collaboration Map



Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

Anexo 9. Figure 2: Co-occurrence by keyword



Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

Anexo 10. Carta de respuesta de revisores y Prueba de imprenta de artículo

The Journal of Contemporary Dental Practice

Osseointegration of dental implants in irradiated patients: A bibliometric study

Journal:	*The Journal of Contemporary Dental Practice*
Manuscript ID:	JCDP_25_35_R2
Manuscript Type:	Original Research
Submission Date:	2025-02-12 21:30:00.0
Authors:	▪ Montoya-Mercado, Jean; ▪ Garcia-Herencia, Rosabelle; ▪ Tinedo-Lpez, Pedro; ▪ Espinoza-Carhuancho, Fran; ▪ Pacheco-Mendoza, Josmel; ▪ Mayta Tovalino, Frank; School of Estomatology, Universidad Cientfica del Sur
Keywords:	Dental implant, osseointegration, Radiated patients, Radiation therapy

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

Original Article

Osseointegration of dental implants in irradiated patients: A bibliometric study

Running title: Osseointegration and irradiation

Abstract

Aim: To analyze the osseointegration of dental implants in irradiated patients through a bibliometric study.

Materials and Methods: A descriptive and retrospective bibliometric study was conducted, focusing on English-language scientific publications indexed in Scopus from January 2018 to May 2024. To maintain quality and relevance, the study excluded abstracts, letters to the editor, book reviews, opinions, and symposium reports. The search, conducted on May 11, 2024, utilized the MeSH terms from the National Library of Medicine along with Boolean operators to refine the search. Relevant indicators such as citation count, publications by country, year, author, journal quartile, and more were examined. The data were analyzed using SciVal, Mendeley, Bibliometrix, and VOSviewer software.

Results: The research identified 25 relevant papers, with an annual growth rate of 16.73%. The average number of citations per paper was 9.8, with a total of 846 references and 144 authors. German institutions led in scientific production, with the highest impact seen at Hospital Santa Catarina of Brazil. Brazilian authors showed the highest citation impact, while Heiland Max attained the highest h-index. Most publications were within the first (Q1, n=14) and second (Q2, n= 6) quartiles, with 2021 standing out as the year with the highest impact. Collaboration maps highlighted international cooperation between several countries such as USA, Spain, China and Chile.

Conclusion: The study provides a comprehensive bibliometric analysis of osseointegration of dental implants in irradiated patients, highlighting key trends and collaborations in the field.

Clinical signifance: This study underscores the clinical importance of osseointegration of dental implants in patients who have undergone radiation therapy. By providing insights into trends and collaborative networks, it enhances our understanding of these patterns, which can improve treatment strategies, patient outcomes, and guide future research. Ultimately, this advances the field of dental implantology for irradiated patients.

Keywords: Dental implant, osseointegration, radiated patients, radiation therapy.

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

INTRODUCCIÓN

Cancer is a major global health issue, responsible for 16.8% of all deaths worldwide and nearly 23% of deaths from non-communicable diseases. According to the Global Cancer Observatory's 2022 report, around 20 million people were expected to be diagnosed with cancer that year, with nearly 10 million losing their lives to the disease.[1]

Oral cancer is a malignant neoplasm affecting the tissues and structures of the oral cavity. It can originate as a primary lesion in the mouth, metastasize from a distant site, or spread from a contiguous area.[2] Treatment typically involves surgical procedures, with or without radiotherapy or chemotherapy.[3] Dental extractions may be necessary if they are located near a tumor or during pre-radiation screening. Treatment choices depend on various factors, including the tumor type and stage, as well as the patient's overall health.[4] Surgical resection is the preferred initial treatment for most patients with oral cancer and often involves complex procedures, such as mandibulectomies, maxillotomies, and neck dissection.[5,6]

Patients who undergo radiotherapy after surgery experience changes in bone structure at vascular, cellular, and metabolic levels. Initially, there is increased blood flow to the tissue (hyperemia), but over time, reduced vascularity can occur, potentially leading to osteoradionecrosis.[6] These treatments result in early and late side effects, with early side effects occurring during radiation therapy and late side effects potentially arising weeks or years after treatment.[7]

Oral rehabilitation following radical cancer surgery is a demanding procedure.[8] Because of changes in bone and soft tissues, dental implants can be placed at different stages: before treatment, immediately after tooth extraction during ablative surgery, or after completing radiotherapy.[9] It is suggested that the radiation dose in the maxilla be limited to assist in dental implant placement.[9] Radiation dose mapping is a useful tool, as different sites in the oral cavity receive varying doses of radiation.[10] A recent study found that one of the main causes of dental implant loss after radiotherapy was exposure to a radiation dose greater than 50 Gy.[11] For implants placed before radiotherapy during ablative surgery, the ideal threshold for radiation reduction was found to be greater than 40 Gy.[12]

Conducting a study based on various bibliometric indicators can reveal which journals are most effective for article dissemination. Bibliometric studies have examined the most cited articles in dentistry and its specialties, including endodontics, orthodontics, periodontics, and implant dentistry.[13] Hence, the increasing number of patients requiring dental implants after radiation therapy serves as the basis for this study. Radiation therapy may negatively affect the osseointegration of implants and compromise their long-term success. With this study, the existing literature will be critically analyzed to identify patterns and trends and crucial collaborations in the field, resulting in better treatment outcomes and strategies for irradiated patients. The results are highly relevant for both researchers and clinicians, identifying the most influential institutions and authors and highlighting areas of greatest impact. This facilitates potential collaborations, guides future research, and helps clinicians stay abreast of the latest advancements to improve outcomes in irradiated patients.

For Peer Review

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

Thus, the aim of this study was to evaluate the bibliometric characteristics of scientific publications on osseointegration of dental implants in irradiated patients.

MATERIALS AND METHODS

Study design

A descriptive, retrospective bibliometric study was conducted. The inclusion criteria considered scientific publications in English indexed in Scopus from January 2018 to May 2024, while abstracts, letters to the editor, book reviews, opinions, and symposium reports were excluded.

Data collection

The search began on May 11, 2024, with Scopus as the database of choice, in which the medical terms function (MeSH) of the National Library of Medicine (NLM) was used in conjunction with the Boolean operators "AND", "OR" and "NOT" in order to refine the search, defining the following strategy: TITLE-ABS-KEY ("Osseointegration" OR "biointegration" OR "bone integration" OR "bone-implant integration" OR "bone-to-implant integration" OR "osteointegration" OR "ingrowth" OR "biocompatibility" OR "osteogenesis" OR "resorption" OR "dental implant*" OR "artificial teeth" OR "Oral implantology") AND TITLE-ABS-KEY ("irradiated patients" OR "patients with radiation injuries" OR "patients with radiation damage" OR "radiation-exposed patients" OR "patients undergoing irradiation" OR "patients receiving radiation therapy" OR "patients in radiation treatment" OR "irradiation-treated patients" OR "patients receiving irradiated blood components" OR "radiated patients" OR "patients exposed to radiation" OR "patients treated with radiation" OR "radiation therapy patients") AND PUBYEAR > 2017 AND PUBYEAR < 2025.

Bibliometric parameters

Indicators such as the number of citations, year, author, journal, publications by country, journal quartile, type of publication, h-index, CiteScore, and SCImago Journal Rank (SJR) were used. In the same way, thematic maps were used to analyze the collaboration between countries and the co-occurrence of keywords.

Data analysis

The SciVal program (Elsevier) was used to analyze the metadata, which enabled us to obtain the bibliometric data of the scientific publications in .xls files. This information was processed using Mendeley software to check for duplicates, and the metadata were exported to Bibliometrix 3.0 R version 4.2.3 and VOSviewer version 1.6.20 software.

RESULTS

Between 2018 and 2024, 25 documents from 18 sources were analyzed, revealing an annual growth rate of -16.73%. The documents had an average age of 3.32 years and received an average of 9.8 citations each, totaling 846 references. The study included 144 authors, with an average of 6.2 co-authors per document, and featured one single-authored publication. Additionally, 12% of the collaborations were international. The publications consisted of 20 articles and 5 reviews (Table 1).

The study analyzed the scholarly output and citation impact of various institutions from 2018 to 2024. Leading the way, Hospital General Universitario Gregorio Marañon in

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

Spain produced three publications, averaging 12 views and 20 citations per publication. German institutions such as Berlin Institute of Health, Charité-Universitätsmedizin Berlin, Free University of Berlin, and University of Freiburg each had two publications with 13 views and 10 citations per publication. Santa Catarina Hospital in Brazil stood out with 23.5 views and 37 citations per publication from its two studies. King's College London in the UK and the University of Amsterdam and Vrije Universiteit Amsterdam in the Netherlands each had two publications, with significant citation counts. Amsterdam UMC contributed one publication with 14 views and 17 citations, highlighting a diverse and internationally collaborative research effort (Table 2).

Among the key authors, Raúl Antúnez-Conde from Hospital General Universitario Gregorio Marañón in Spain had three publications, averaging 6.7 citations per publication, and an h-index of 4. Brazilian authors Benites Condemn and Anthony Froy from Unisagrado University Center, as well as Camila Lopes Cardoso from Universidade de São Paulo, and Marcos Martins Curi from Santa Catarina Hospital, each had two publications with a high citation impact of 18.5 per publication. Max Heiland from Charité-Universitätsmedizin Berlin had two publications and a remarkable h-index of 39. (Table 3).

From 2018 to 2024, a total of 24 documents were analyzed across various CiteScore quartiles. The majority of the documents (14) were in Q1, with notable peaks in 2021 (5 documents) and a consistent output across other years. In Q2, 6 documents were identified, with 2021 again showing a higher impact with 3 documents. Q3 had 3 documents, mostly concentrated in 2020. Finally, Q4 had just one document, published in 2023. The overall distribution highlights a focus on high-impact journals, particularly in 2021 (Table 4).

The study analyzed the scholarly output and citation impact across various Scopus sources. Clinical Oral Investigation and International Journal of Oral and Maxillofacial Surgery each had three publications, with Clinical Oral Investigation averaging 10 citations per publication and an SJR of 0.91. The International Journal of Oral and Maxillofacial Surgery led with 13.7 citations per publication and an SJR of 0.884. Other notable sources include the British Journal of Oral and Maxillofacial Surgery and Frontiers in Oncology, each with two publications and significant citation counts. Clinica Terapeutica and Clinical Oral Implant Research stood out for their high citations per publication, with Clinica Terapeutica reaching 18 citations and Clinical Oral Implant Research achieving an SJR of 1.691 (Table 5).

These maps of international collaboration illustrate a few instances of international contributions, particularly partnerships, including one between the Netherlands and China, Spain and Chile, and the United States and Italy (Figure 1). The collaborative networks presented a clear vision of the world of scientific cooperation amongst countries.

In Figure 2, a collaborative network was identified as having seven nodes representing subjects with terms that were related most frequently within the database with 255 keywords. By a detailed survey of the network made out, it could be stated that the first node (blue color) was primarily organized around the term "dental implants", the second

For Peer Review

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

node (red color) associated with the term "adult", whose boundaries extended to "middle aged", "osteolysis", "fibula graft", among others, while in the case of the third node (brown color), the term "head and neck neoplasm" was clustered. The clustered set at the center of the map underlined strong connections of keywords, while the least number of connections of nodes was at the extremes of the map.

DISCUSSION

Over time, various analyses have been conducted, including literature reviews, systematic reviews, and clinical case reports, to examine the interaction or effects of radiation on bone tissue and its relationship with oral implantology in cancer patients. However, few studies have addressed the scientific production and impact of publications on this topic. Therefore, the present analysis aimed to quantify the scholarly output on osseointegration of dental implants in irradiated patients from 2018 to 2024.

This was achieved through a keyword search in the Scopus database, classifying the results by author name, journal, institution, and international collaboration. According to research by Gupta et al.,[14] the survival rates of dental implants placed in non-irradiated areas were higher (93.9%) compared to those placed in irradiated areas (85.8%). Similarly, Toneatti et al. observed a survival rate of 97% after a follow-up period of 37.7 months.[15]

Our study highlighted the high scientific production of both German authors and institutions, without leaving aside the contribution made by authors from Brazil, of which the researcher Curi Marcos Martins stands out, with an average of 18.5 citations per publication and an h-index of 17; the Hospital General Universitario Gregorio Marañon of Spain was the institution with the highest number of publications, with an average of 3 articles on the osseointegration of dental implants in irradiated patients. Impact is an important measure that ranks journals according to their number of citations and generally designates their reputation. Among the journals selected from the top 10 with the highest impact are Clinical Oral Implants Research (1.691), Frontiers in Oncology (1.138), Journal of Clinical Medicine (0.935), Clinical Oral Investigations (0.91), and International Journal of Oral and Maxillofacial Surgery (0.884). Following the same line, we highlight that most of the publications were made in the year 2021, grouping them within the first quartile (Q1) and second quartile (Q2).

In our analysis, it was observed that collaboration between countries had international contributions, but only on one occasion between the United States and Italy, the Netherlands and China, and Spain and Chile, unlike what was found in the study by Yang et al.[16] who analyzed trends in oral cancer, showing that the United States had the highest scholarly output with 35 publications. Similarly, in the work of Singh et al.[17] on trends and current topics in oral cancer research, it was shown that the countries with the highest number of publications were the United States, India, and China, with 465, 279, and 228 articles, respectively.[17]

In our analysis, it was observed that international collaboration occurred, but only in isolated instances, such as between the United States and Italy, the Netherlands and China, and Spain and Chile. This contrasts with the findings of Yang et al.[16], who analyzed trends in oral cancer and found that the United States had the highest number of documents with 35 publications. Similarly, Singh et al.[17] reported that the countries with

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

the highest number of publications in oral cancer research were the United States, India, and China, with 465, 279, and 228 articles, respectively. The limited international collaboration in our study period could be attributed to several factors, including the specialized nature of research on osseointegration in irradiated patients, which may require specific expertise and resources that are not widely available. Additionally, geopolitical and economic barriers, as well as differences in research priorities and funding availability, may have hindered broader international cooperation.[16,17]

One of the topics of greatest interest for researchers in the development of bibliometric studies on oral cancer was the risk factors and composition of the microbiota, which could lead to oral squamous cell carcinoma.[18,19] The most important journal in the field of research was "Oral Oncology", with 10 publications and 428 citations, making it the most productive scientific journal.[19] On the other hand, in the research conducted by Liu et al.[20], the journals with the highest number of publications of articles related to the use of radiotherapy in cancer were "The International Journal of Radiation Oncology, Biology, and Physics" with 42 articles, followed by the "Journal for Immunotherapy of Cancer and Frontiers in Oncology" with 39 and 35 articles, respectively.

According to the bibliometric study by Qiu et al.[21] on mucosal lesions caused by cancer therapies, the most productive institutions were based in the USA, with the University of Adelaide, the University of Texas, and the Memorial Sloan Kettering Cancer Center leading in research output. Similarly, Escoto et al.[22] found that the University of California had the highest number of publications, averaging seven articles with 2,827 citations, followed by the American Cancer Society, which published five articles with 32,982 citations.

The strength of the present one lies in offering a full and quantitative view about the process of osseointegration of dental implants among irradiated patients. This study aimed at keeping track of key trends in the field, collaboration among countries, and the evolution of research in this topic via bibliometric methodology[23] and leading tools such as SciVal, Mendeley, Bibliometrix and VOSviewer. Additionally, the selection of articles indexed in the Scopus indexing standard assures a decent quality and relevancy of articles included, providing a sound basis for future research investigations extending their search into other databases.

During the research, certain limitations were discovered; it is worth mentioning that a bibliometric study will depend on the availability of the articles retrieved using the search strategy; for this reason, we must first consider that the data collection was based on Scopus; therefore, future research could include bibliographic citations from the Embase, Medline, and Web of Science databases. Second, designing a search strategy to distinguish relevant from irrelevant publications was highly complex. Third, there was a linguistic bias because the search was limited to articles published in English related to osseointegration, implants and periodontics.[24,25] Finally, the automatic software algorithms may introduce bias because not all publications could be exported to SciVal due to metadata incompatibility.

CONCLUSION

The growing number of published articles pointed to an evident rise in interest in identifying the most prolific and cited countries, institutions, journals, and authors. Our

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

analysis revealed Germany and Brazil produced the highest number of publications, with Brazilian authors exhibiting the maximum impact of citation. Notably, Antúnez-Conde Raúl from Spain was the biggest contributor. Such findings can be very helpful to clinicians and researchers to improve treatment modalities and prognoses for irradiated patients for whom dental implants may be useful. Being aware of trends and key contributors enables clinicians to maintain current on advancements and promote collaborative efforts favorable for patient care.

Acknowledgements
The authors wish to thank the Postgraduate Program in Stomatology of the Universidad Cientifica del Sur lima, Peru.

REFERENCES

1. Bray F, Laversanne M, Sung H, Ferlay J, Siegel R, Soerjomataram I, et al. Global cancer statistics 2022: Globocan estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin. 2024;1-35.
2. Tandon P, Dadhich A, Saluja H, Bawane S, Sachdeva S. The prevalence of squamous cell carcinoma in different sites of oral cavity at our rural health care centre in Loni, Maharashtra: a retrospective 10-year study. Contemp Oncol. 2017;21(2):178-183.
3. Spijkervet F, Schuurhuis J, Stokman M, Witjes M, Vissink A. Should oral foci of infection be removed before the onset of radiotherapy or chemotherapy?. Oral Dis. 2021;27(1):7-13.
4. Mattila V, Wilkman T, Avellán N, Mesimäki K, Furuholm J, Roukonen H, et al. Survival of dental implants and occurrence of mucosal overgrowth in patients with head and neck cancer treated with/without radiotherapy and mucosal graft: 2-year follow-up. Clin Oral Investig. 2024;28(1):111-117.
5. Almangush A, Mäkitie A, Triantafyllou A, De Bree R, Strojan P, Rinaldo A, et al. Staging and grading of oral squamous cell carcinoma: an update. Oral Oncol. 2020;107:1-6.
6. Kende P, Ranganath S, Landge J, Sarda A, Wadewale M, Patil A, et al. Survival of dental implants on irradiated jaws: a systematic review and meta-analysis. J Maxillofac Oral Surg. 2022;21(3):787-795.
7. Brook I. Late side effects of radiation treatment for head and neck cancer. Radiat Oncol J. 2020;38(2):84-92.
8. Di Carlo S, De Angelis F, Ciolfi A, Quarato A, Piccoli L, Pompa G, et al. Timing for implant placement in patients treated with radiotherapy of head and neck. Clin Ter. 2019;170(5):345-351.
9. In 'T Veld M, Schulten E, Leusink F. Immediate dental implant placement and restoration in the edentulous mandible in head and neck cancer patients: a systematic review and meta-analysis. Curr Opin Otolaryngol Head Neck Surg. 2021;29:126-137.
10. Tsai C, Verma N, Owosho A, Hilden P, Leeman J, Yom S, et al. Predicting radiation dosimetric distribution in different regions of the jaw in patients receiving radiotherapy for squamous cell carcinoma of the tonsil. Head Neck. 2019;41(10):3604-3611.
11. Wolf F, Spoerl S, Gottsauner M, Klingelhöffer C. Significance of site-specific radiation dose and technique for success of implant-based prosthetic rehabilitation in irradiated head and neck cancer patients: a cohort study. Clin Implant Dent Relat Res. 2021;23(3):444-455.

For Peer Review

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

12. Li J, Feng K, Ye L, Liu Y, Sun Y, Wu Y. Influence of radiotherapy on dental implants placed in individuals before diagnosed with head and neck cancer: focus on implant-bed-specific radiation dosage. Clin Oral Investig. 2022;26(9):5915-5922.
13. López A, Tarazona B, Vidal A, Alonso A. The 100 most cited articles in peri-implant diseases. A bibliometric study of the web of science. J Clin Exp Dent. 2022;14(11):920-925.
14. Gupta S, Mortellaro C, Panda S, Rovati M, Giacomello M.S, Colletti L, et al. Dental implant survival rate in irradiated and non-radiated patients: a systematic review and meta-analysis. J Biol Regul Homeost Agents. 2021;35(2):53-65.
15. Toneatti D.J, Graf R.R, Burkhard J.P, Schaller B. Survival of dental implants and occurrence of osteoradionecrosis in irradiated head and neck cancer patients: a systematic review and meta-analysis. Clin Oral Investig. 2021;25(10):5579-5593.
16. Yang X, Yang X, Ji T, Zhou Q, Liu W. A bibliometric analysis of the papers on oral potentially malignant disorder in oral oncology. Oral Oncol. 2022;132:1-3.
17. Singh A, Singh R, Sapkota D. Current trends and themes of oral cancer research: a bibliometric analysis of publications from 2011 to 2022 in prominent oral pathology related journals. Oral Oncol Rep. 2023;6:1-8.
18. Gu Z, Liu Y. A bibliometric and visualized in oral microbiota and cancer research from 2013 to 2022. Discov Oncol. 2024;15(1):1-24.
19. Pérez O, Millones P, Valencia A, Rodríguez D. Risk factors for oral cancer: thematic trends and research agenda. J Pharm Pharmacogn Res. 2023;11(5):887-901.
20. Liu Y, Jiang X, Wu Y, Yu H. Global research landscape and trends of cancer radiotherapy plus immunotherapy: a bibliometric analysis. Heliyon. 2024;10(5):1-25.
21. Qiu L, Zhang D, Ou Z, Ren S, Rong H, Wu F, et al. Cancer therapy induced mucosal injury from 2001 to 2021: a bibliometric analysis. J Oral Pathol Med. 2023;52(5):410-417.
22. Escoto L, Delgadillo L, Ternovoy S, Roldan E. Top 100 most cited papers on diagnostic aids for oral cancer: a bibliometric analysis. J Stomatol Oral Maxillofac Surg. 2024;125(6):1-9.
23. Mayta-Tovalino F, Diaz-Barrera ME, Runzer-Colmenares FM, Pacheco-Mendoza J. RAMIBS: Reporting and Measurement of Items for Bibliometric or Scientometric Studies in health sciences. J Int Oral Health 2024;16:253-6.
24. Mendoza-Azpur G, Gallo P, Mayta-Tovalino F, Alva R, Valdivia E. A Case Series of Vertical Ridge Augmentation Using a Nonresorbable Membrane: A Multicenter Study. Int J Periodontics Restorative Dent. 2018;38(6):811-816.
25. Perez E, Salinas L, Mendoza R, Guerrero ME, Oliva J, Mayta-Tovalino F. Osseointegration of Dental Implants in Patients with Congenital and Degenerative Bone Disorders: A Literature Review. J Int Soc Prev Community Dent. 2023;13(3):167-172.

For Peer Review

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

Table 1: Main information

Description	Total
Period	2018:2024
Sources	18
Documents	25
Annual Growth %	-16.73
Document Average Age	3.32
Average citations per doc	9.8
References	846
Author's Keywords	89
Authors	144
Authors of single-authored docs	1
Single-authored docs	1
Co-Authors per Doc	6.2
International co-authorships %	12
Article	20
Review	5

For Peer Review

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

Table 2: Top 10 Institutions by Scholarly Output

Institution	Country	Scholarly Output	Views per Publication	Citation Count
Hospital General Universitario Gregorio Marañon	Spain	3	12	20
Berlin Institute of Health,	Germany	2	13	10
Charité, Universitätsmedizin Berlin	Germany	2	13	10
Free University of Berlin	Germany	2	13	10
Santa Catarina Hospital	Brazil	2	23.5	37
King's College London	United Kingdom	2	11	23
University of Amsterdam	Netherlands	2	13	25
University of Freiburg	Germany	2	13	10
Vrije Universität Amsterdam,	Netherlands	2	13	25
Amsterdam UMC	Netherlands	1	14	17

For Peer Review

Table 3: Top 10 authors by academic output

Author	Affiliation	Country	Scholarly Output	Citations per Publication	H-index
Antúnez-Conde, Raúl	Hospital General Universitario Gregorio Marañón	Spain	3	6.7	4
Benites Condemn and Anthony Froy	Unisagrado University Center,	Brazil	2	18.5	3
Cardoso, Camila Lopes	Universidade de São Paulo, Brazil	Brazil	2	18.5	15
Curi, Marcos Martins.	Santa Catarina Hospital	Brazil	2	18.5	17
Heiland, Max	Charité, Universitätsmedizin Berlin	Germany	2	5	39
Nahles, Susanne	Charité, Universitätsmedizin Berlin	Germany	2	5	16
Navarro Cuéllar, Ignacio	Hospital General Universitario Gregorio Marañon	Spain	2	7	7
Navarro-Cuéllar, Carlos	Hospital General Universitario Gregorio Marañon	Spain	2	7	10
Nelson, Katja	University of Freiburg	Germany	2	5	29
Preissner, Saskia	Charité, Universitätsmedizin Berlin	Germany	2	5	18

For Peer Review

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

Table 4: Publications by CiteScore quartile

CiteScore quartile	Overall	2018	2019	2020	2021	2022	2023	2024
Q1	14	3	1	2	5	1	1	1
Q2	6	0	1	0	3	1	1	0
Q3	3	0	1	0	2	0	0	0
Q4	1	0	0	0	0	0	1	0
Total	24	3	3	2	10	2	3	1

For Peer Review

Table 5: Top-10 Scopus sources by academic output

Scopus Source	Scholarly Output	Citations per Publication	SJR 2022	CiteScore 2022
Clinical Oral Investigation	3	10	0.91	6.3
International Journal of Oral and Maxillofacial Surgery	3	13.7	0.884	5
British Journal of Oral and Maxillofacial Surgery	2	9	0.553	2.8
Frontiers in Oncology	2	8.5	1.138	5.2
Journal of Clinical Medicine	2	5	0.935	5.4
Clinica Terapeutica	1	18	0.408	3.3
Clinical Oral Implant Research	1	8	1.691	7.3
Frontiers in Dentistry	1	1	0.268	1.5
International Journal of Prosthodontics and Restorative Dentistry	1	0	-	0.1
Journal of Biological Regulators and Homeostatic Agents	1	4	0.285	3.1

For Peer Review

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

Figure 1: Country Collaboration Map

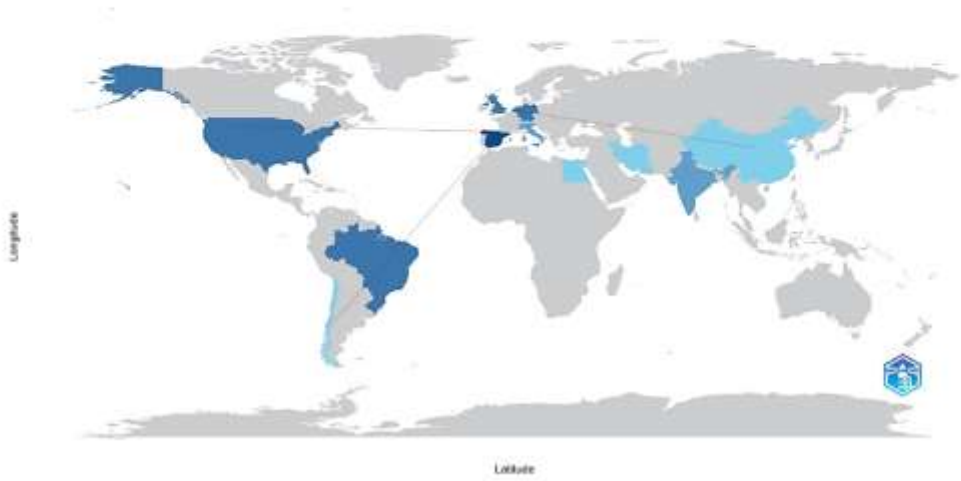
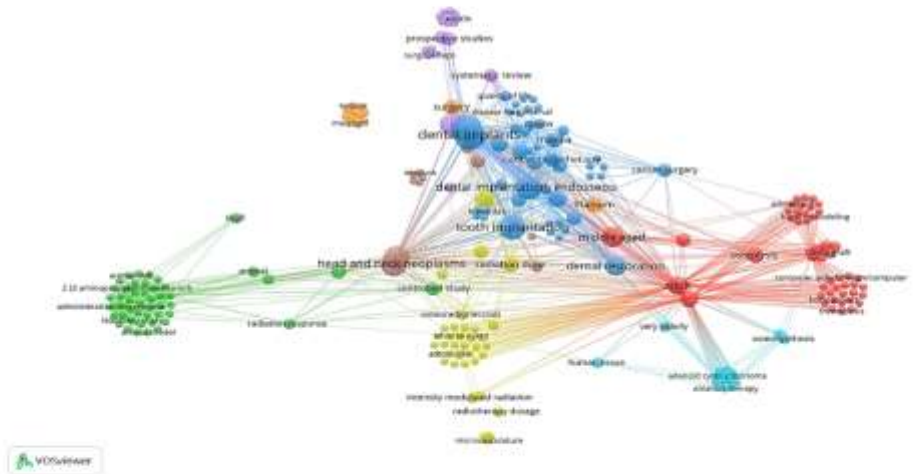


Figure 2: Co-occurrence by keyword.



Tesis publicada con autorización del autor
No olvide citar esta tesis

Anexo 11. Copia de resolución directoral de aprobación de proyecto de Tesis

UNIVERSIDAD CIENTÍFICA DEL SUR

RESOLUCIÓN DIRECTORAL DE ACEPTACIÓN DEL PROYECTO DE TESIS Y NOMBRAMIENTO DEL ASESOR

RESOLUCIÓN DIRECTORAL DE LA CARRERA DE ESTOMATOLOGÍA

N° 032-POSG-DACE-DAFCS-U-CIENTÍFICA-2025

Lima, 19 de mayo del 2025

VISTO:

La solicitud de los tesistas, asesor y la evaluación del Responsable de Investigación de la Carrera de Estomatología y de acuerdo con la RESOLUCIÓN DIRECTORAL No. 008-DGIDI-CIENTIFICA-2023 sobre Normas de precisiones de exoneración del Comité de Ética, el presente proyecto de investigación es eximido de ser enviado a evaluación de alguno de los CIEI en mención al numeral: **4. Estudios bibliométricos**. Se aprueba el registro N° **POS-84-2024-00624** del proyecto de Tesis Titulado: **"OSTEOINTEGRACIÓN DE IMPLANTES DENTALES EN PACIENTES IRRADIADOS: ESTUDIO BIBLIOMÉTRICO"** presentado por **MONTOYA MERCADO, JEAN PAUL; GARCIA HERENCIA, ROSABELLE**.

CONSIDERANDO:

Que, de acuerdo con el Reglamento General de la Universidad Científica del Sur y los reglamentos de posgrado para obtener el Título Profesional de **IMPLANTOLOGÍA ORAL** en la Carrera de Estomatología de la Universidad Científica del Sur, se debe desarrollar un trabajo de investigación.

Que, de acuerdo con la normativa vigente de la Universidad Científica del Sur, en uso de las atribuciones conferidas al Decano Académico de Carrera.

SE RESUELVE:

ART. 1°: APROBAR E INSCRIBIR el Proyecto de Tesis titulado: **"OSTEOINTEGRACIÓN DE IMPLANTES DENTALES EN PACIENTES IRRADIADOS: ESTUDIO BIBLIOMÉTRICO"** de la **CD. MONTOYA MERCADO, JEAN PAUL; GARCIA HERENCIA, ROSABELLE** con registro: **N° POS-84-2024-00624** y establecer la vigencia de aprobación de este documento de dieciocho (18) meses (hasta el 19 de septiembre del 2026), periodo en el que puede desarrollarse el proyecto de investigación.

ART. 2°: NOMBRAR Asesor del trabajo de tesis señalado, al **Dr. Esp. FRANK ROGER MAYTA TOVALINO.**

Regístrese, comuníquese y archívese.

DIRECCIÓN ACADÉMICA

Dr. Claudio Peña Soto

Decano de la Carrera de Estomatología

T// (511) 610 6738
informes@cientifica.edu.pe
cientifica.edu.pe

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

Anexo 12. Carta de evidencia de envío a revista

Cover letter

January 2025

Dear Editor,

I/We wish to submit a new manuscript entitled:

Osseointegration of dental implants in irradiated patients: a bibliometric study

Running title: Osseointegration and irradiated patients

Jean Montoya-Mercado[1], Rosabelle García-Herencia[1], Pedro Luis Tinedo-López[1], Fran Espinoza-Carhuancho[2], Josmel Pacheco-Mendoza[2], Frank Mayta-Tovalino[2]

[1]Oral Implantology Department, School of Dentistry, Universidad Científica del Sur, Lima, Perú

[2]Academic Department, Grupo de Bibliometría, Evaluación de evidencia y Revisiones Sistemáticas (BEERS), Human Medicine Career, Universidad Científica del Sur, Lima, Perú

***Corresponding Author:** PhD. Frank Mayta-Tovalino, Faculty of Medicine, Universidad Científica del Sur, Phone: +51 1 317 1023, e-mail: fmaytat@cientifica.edu.pe

E-mail addresses: fmaytat@cientifica.edu.pe

We confirm that this work is original and has not been published elsewhere nor is it currently under consideration for publication elsewhere.

We do not have any prior intercourse with the journal and we suggest that the reviewers be from the area of dentistry. Finally, we have no opposed to this research.

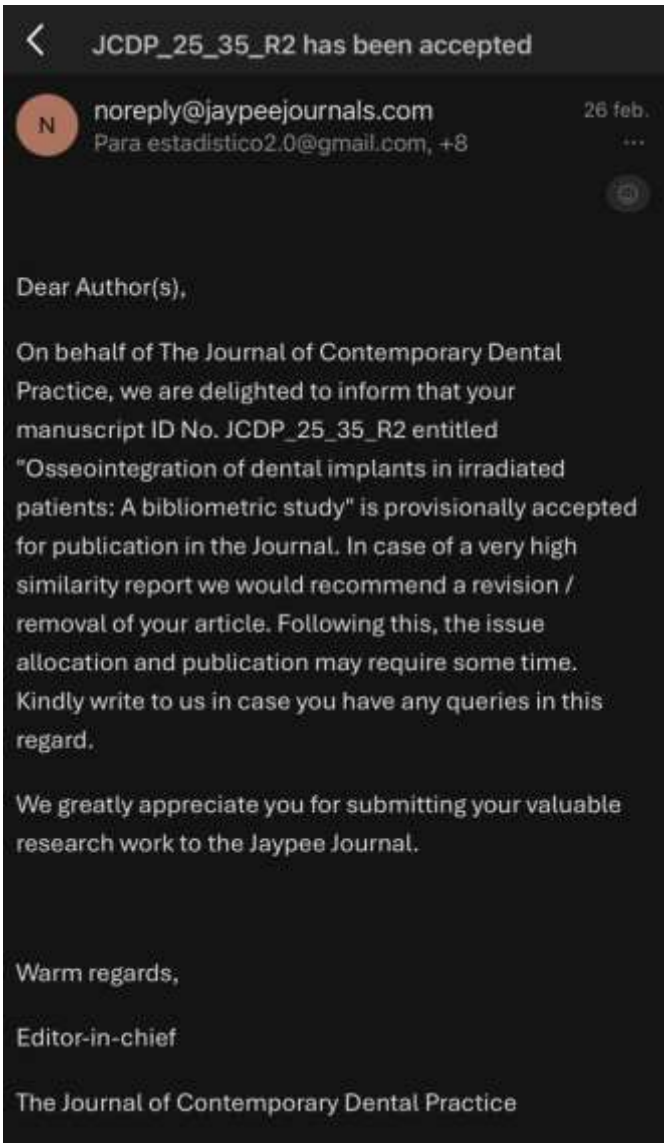
Thank you for your consideration of this manuscript.

Sincerely,

PhD. MSc. DDS Frank Mayta-Tovalino

Tesis publicada con autorización del autor
No olvide citar esta tesis

Anexo 13. Carta de respuesta y aceptación para publicación



JCDP_25_35_R2 has been accepted

noreply@jaypeejournals.com
Para estadistico2.0@gmail.com, +8
26 feb.

Dear Author(s),

On behalf of The Journal of Contemporary Dental Practice, we are delighted to inform that your manuscript ID No. JCDP_25_35_R2 entitled "Osseointegration of dental implants in irradiated patients: A bibliometric study" is provisionally accepted for publication in the Journal. In case of a very high similarity report we would recommend a revision / removal of your article. Following this, the issue allocation and publication may require some time. Kindly write to us in case you have any queries in this regard.

We greatly appreciate you for submitting your valuable research work to the Jaypee Journal.

Warm regards,

Editor-in-chief

The Journal of Contemporary Dental Practice

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

REVIEW ARTICLE

Osseointegration of Dental Implants in Irradiated Patients: A Bibliometric Study

Jean Montoya-Mercado[1], Rosabelle García-Herencia[2], Pedro L Tinedo-López[3], Fran Espinoza-Carhuancho[4], Josmel Pacheco-Mendoza[5], Frank Mayta-Tovalino[6]

Received on: 14 February 2025; *Accepted on:* 13 March 2025; *Published on:* 28 April 2025

ABSTRACT

Background: To analyze the osseointegration of dental implants in irradiated patients through a bibliometric study.

Materials and methods: A descriptive and retrospective bibliometric study was conducted, focusing on English-language scientific publications indexed in Scopus from January 2018 to May 2024. To maintain quality and relevance, the study excluded abstracts, letters to the editor, book reviews, opinions, and symposium reports. The search, conducted on May 11, 2024, utilized the MeSH terms from the National Library of Medicine along with Boolean operators to refine the search. Relevant indicators such as citation count, publications by country, year, author, journal quartile, and more were examined. The data were analyzed using SciVal, Mendeley, Bibliometrix, and VOSviewer software.

Results: The research identified 25 relevant papers, with an annual growth rate of 16.73%. The average number of citations per paper was 9.8, with a total of 846 references and 144 authors. German institutions led in scientific production, with the highest impact seen at Hospital Santa Catarina of Brazil. Brazilian authors showed the highest citation impact, while Heiland Max attained the highest h-index. Most publications were within the first (Q1, $n = 14$) and second (Q2, $n = 6$) quartiles, with 2021 standing out as the year with the highest impact. Collaboration maps highlighted international cooperation between several countries such as the USA, Spain, China, and Chile.

Conclusion: The study provides a comprehensive bibliometric analysis of osseointegration of dental implants in irradiated patients, highlighting key trends and collaborations in the field.

Clinical significance: This study underscores the clinical importance of osseointegration of dental implants in patients who have undergone radiation therapy. By providing insights into trends and collaborative networks, enhances our understanding of these patterns, which can improve treatment strategies, and patient outcomes, and guide future research. Ultimately, this advances the field of dental implantology for irradiated patients.

Keywords: Dental implant, Osseointegration, Radiated patients, Radiation therapy

The Journal of Contemporary Dental Practice (2025): 10.5005/jp-journals-10024-3823

Introduction

Cancer is a major global health issue, responsible for 16.8% of all deaths worldwide and nearly 23% of deaths from non-communicable diseases. According to the Global Cancer Observatory's 2022 report, around 20 million people were expected to be diagnosed with cancer that year, with nearly 10 million losing their lives to the disease.[1]

Oral cancer is a malignant neoplasm affecting the tissues and structures of the oral cavity. It can originate as a primary lesion in the mouth, metastasize from a distant site, or spread from a contiguous area.[2] Treatment typically involves surgical procedures, with or without radiotherapy or chemotherapy.[3] Dental extractions may be necessary if located near a tumor or during pre-radiation screening. Treatment choices depend on various factors, including the tumor type and stage and the patient's overall health.[4] Surgical resection is the preferred initial treatment for most patients with oral cancer and often involves complex procedures, such as mandibulectomies, maxillotomies, and neck dissection.[5,6]

Patients who undergo radiotherapy after surgery experience changes in bone structure at vascular, cellular, and metabolic levels. Initially, there is increased blood flow to the tissue (hyperemia), but over time, reduced vascularity can occur, potentially leading to osteoradionecrosis.[6] These treatments result in early and late side effects, with early side effects occurring during radiation therapy and late side effects potentially arising weeks or years after treatment.[7]

Oral rehabilitation following radical cancer surgery is a demanding procedure.[8] Because of changes in bone and soft tissues, dental implants can be placed at different stages: before treatment, immediately after tooth extraction during ablative surgery, or after

[1–3]Department of Oral Implantology, School of Dentistry, Universidad Científica del Sur, Lima, Peru

[4–6]Department of Academic, Grupo de Bibliometría, Evaluación de evidencia y Revisiones Sistemáticas (BEERS), Human Medicine Career, Universidad Científica del Sur, Lima, Peru

Corresponding Author: Frank Mayta-Tovalino, Department of Academic, Grupo de Bibliometría, Evaluación de evidencia y Revisiones Sistemáticas (BEERS), Human Medicine Career, Universidad Científica del Sur, Lima, Peru, Phone: +51 13171023, e-mail: fmaytat@cientifica.edu.pe

How to cite this article: Montoya-Mercado J, García-Herencia R, Tinedo-López PL, *et al.* Osseointegration of Dental Implants in Irradiated Patients: A Bibliometric Study. J Contemp Dent Pract 2025;26(2):217–222.

Source of support: Nil

Conflict of interest: None

© The Author(s). 2025 Open Access. This article is distributed under the terms of the Creative Commons Attribution 4.0 International License (https://creativecommons.org/licenses/by-nc/4.0/), which permits unrestricted use, distribution, and non-commercial reproduction in any medium, provided you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made. The Creative Commons Public Domain Dedication waiver (http://creativecommons.org/publicdomain/zero/1.0/) applies to the data made available in this article, unless otherwise stated.

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

completing radiotherapy.[9] It is suggested that the radiation dose in the maxilla be limited to assist in dental implant placement.[9] Radiation dose mapping is a useful tool, as different sites in the oral cavity receive varying doses of radiation.[10] A recent study found that one of the main causes of dental implant loss after radiotherapy was exposure to a radiation dose greater than 50 Gy.[11] For implants placed before radiotherapy during ablative surgery, the ideal threshold for radiation reduction was found to be greater than 40 Gy.[12]

Conducting a study based on various bibliometric indicators can reveal which journals are most effective for article dissemination. Bibliometric studies have examined the most cited articles in dentistry and its specialties, including endodontics, orthodontics, periodontics, and implant dentistry.[13] Hence, the increasing number of patients requiring dental implants after radiation therapy serves as the basis for this study. Radiation therapy may negatively affect the osseointegration of implants and compromise their long-term success. With this study, the existing literature will be critically analyzed to identify patterns trends and crucial collaborations in the field, resulting in better treatment outcomes and strategies for irradiated patients. The results are highly relevant for both researchers and clinicians, identifying the most influential institutions and authors and highlighting areas of greatest impact. This facilitates potential collaborations, guides future research, and helps clinicians stay abreast of the latest advancements to improve outcomes in irradiated patients.

Thus, the aim of this study was to evaluate the bibliometric characteristics of scientific publications on osseointegration of dental implants in irradiated patients.

Materials and Methods

Study Design

A descriptive, retrospective bibliometric study was conducted. The inclusion criteria considered scientific publications in English indexed in Scopus from January 2018 to May 2024, while abstracts, letters to the editor, book reviews, opinions, and symposium reports were excluded.

Data Collection

The search began on May 11, 2024, with Scopus as the database of choice, in which the medical terms function (MeSH) of the National Library of Medicine (NLM) was used in conjunction with the Boolean operators "AND," "OR," and "NOT" in order to refine the search, defining the following strategy: TITLE-ABS-KEY ("Osseointegration" OR "biointegration" OR "bone integration" OR "bone-implant integration" OR "bone-to-implant integration" OR "osteointegration" OR "ingrowth" OR "biocompatibility" OR "osteogenesis" OR "resorption" OR "dental implant" OR "artificial teeth" OR "Oral implantology") AND TITLE-ABS-KEY ("Irradiated patients" OR "patients with radiation injuries" OR "patients with radiation damage" OR "radiation-exposed patients" OR "patients undergoing irradiation" OR "patients receiving radiation therapy" OR "patients in radiation treatment" OR "irradiation-treated patients" OR "patients receiving irradiated blood components" OR "radiated patients" OR "patients exposed to radiation" OR "patients treated with radiation" OR "radiation therapy patients") AND PUBYEAR > 2017 AND PUBYEAR < 2025.

Bibliometric Parameters

Indicators such as the number of citations, year, author, journal, publications by country, journal quartile, type of publication, h-Index, CiteScore, and SCImago Journal Rank (SJR) were used. In the same way, thematic maps were used to analyze the collaboration between countries and the co-occurrence of keywords.

Table 1: Main information

Description	*Total*
Period	2018:2024
Sources	18
Documents	25
Annual growth%	−16.73
Document average age	3.32
Average citations per doc	9.8
References	846
Author's keywords	89
Authors	144
Authors of single-authored docs	1
Single-authored docs	1
Co-authors per doc	6.2
International co-authorships%	12
Article	20
Review	5

Data Analysis

The SciVal program (Elsevier) was used to analyze the metadata, which enabled us to obtain the bibliometric data of the scientific publications in .xls files. This information was processed using Mendeley software to check for duplicates, and the metadata were exported to Bibliometrix 3.0 R version 4.2.3 and VOSviewer version 1.6.20 software.

Results

Between 2018 and 2024, 25 documents from 18 sources were analyzed, revealing an annual growth rate of −16.73%. The documents had an average age of 3.32 years and received an average of 9.8 citations each, totaling 846 references. The study included 144 authors, with an average of 6.2 co-authors per document, and featured one single-authored publication. Additionally, 12% of the collaborations were international. The publications consisted of 20 articles and five reviews (Table 1).

The study analyzed the scholarly output and citation impact of various institutions from 2018 to 2024. Leading the way, Hospital General Universitario Gregorio Marañón in Spain produced three publications, averaging 12 views and 20 citations per publication. German institutions such as the Berlin Institute of Health, Charité-Universitätsmedizin Berlin, Free University of Berlin, and the University of Freiburg each had two publications with 13 views and 10 citations per publication. Santa Catarina Hospital in Brazil stood out with 23.5 views and 37 citations per publication from its two studies. King's College London in the UK and the University of Amsterdam and Vrije Universiteit Amsterdam in the Netherlands each had two publications, with significant citation counts. Amsterdam UMC contributed one publication with 14 views and 17 citations, highlighting a diverse and internationally collaborative research effort (Table 2).

Among the key authors, Raúl Antúnez-Conde from Hospital General Universitario Gregorio Marañón in Spain had three publications, averaging 6.7 citations per publication, and an

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

Table 2: Top 10 institutions by scholarly output

Institution	*Country*	*Scholarly output*	*Views per publication*	*Citation count*
Hospital General Universitario Gregorio Marañón	Spain	3	12	20
Berlin Institute of Health,	Germany	2	13	10
Charité, Universitätsmedizin Berlin	Germany	2	13	10
Free University of Berlin	Germany	2	13	10
Santa Catarina Hospital	Brazil	2	23.5	37
King's College London	United Kingdom	2	11	23
University of Amsterdam	Netherlands	2	13	25
University of Freiburg	Germany	2	13	10
Vrije Universität Amsterdam,	Netherlands	2	13	25
Amsterdam UMC	Netherlands	1	14	17

Table 3: Top 10 authors by academic output

Author	*Affiliations*	*Country*	*Scholarly output*	*Citations per publication*	*h-index*
Antúnez-Conde, Raúl	Hospital General Universitario Gregorio Marañón	Spain	3	6.7	4
Benites Condemn and Anthony Froy	Unisagrado University Center,	Brazil	2	18.5	3
Cardoso, Camila Lopes	Universidade de São Paulo, Brazil	Brazil	2	18.5	15
Curi, Marcos Martins.	Santa Catarina Hospital	Brazil	2	18.5	17
Heiland, Max	Charité, Universitätsmedizin Berlin	Germany	2	5	39
Nahles, Susanne	Charité, Universitätsmedizin Berlin	Germany	2	5	16
Navarro Cuéllar, Ignacio	Hospital General Universitario Gregorio Marañón	Spain	2	7	7
Navarro-Cuéllar, Carlos	Hospital General Universitario Gregorio Marañón	Spain	2	7	10
Nelson, Katja	University of Freiburg	Germany	2	5	29
Preissner, Saskia	Charité, Universitätsmedizin Berlin	Germany	2	5	18

Table 4: Publications by CiteScore quartile

CiteScore quartile	*Overall*	*2018*	*2019*	*2020*	*2021*	*2022*	*2023*	*2024*
Q1	14	3	1	2	5	1	1	1
Q2	6	0	1	0	3	1	1	0
Q3	3	0	1	0	2	0	0	0
Q4	1	0	0	0	0	0	1	0
Total	24	3	3	2	10	2	3	1

h-index of 4. Brazilian authors Benites Condemn and Anthony Froy from Unisagrado University Center, as well as Camila Lopes Cardoso from Universidade de São Paulo, and Marcos Martins Curi from Santa Catarina Hospital, each had two publications with a high citation impact of 18.5 per publication. Max Heiland from Charité-Universitätsmedizin Berlin had two publications and a remarkable h-index of 39 (Table 3).

From 2018 to 2024, a total of 24 documents were analyzed across various CiteScore quartiles. The majority of the documents (14) were in Q1, with notable peaks in 2021 (five documents) and a consistent output across other years. In Q2, six documents were identified, with 2021 again showing a higher impact with three documents. Q3 had three documents, mostly concentrated in 2020. Finally, Q4 had just one document, published in 2023. The overall distribution highlights a focus on high-impact journals, particularly in 2021 (Table 4).

The study analyzed the scholarly output and citation impact across various Scopus sources. Clinical Oral Investigation and International Journal of Oral and Maxillofacial Surgery each had three publications, with Clinical Oral Investigation averaging 10 citations per publication and an SJR of 0.91. The International Journal of Oral and Maxillofacial Surgery led with 13.7 citations per publication and an SJR of 0.884. Other notable sources include the British Journal of Oral and Maxillofacial Surgery and Frontiers in Oncology, each with two publications and significant citation counts. Clinica Terapeutica and Clinical Oral Implant Research stood out for their high citations per publication, with Clinica Terapeutica reaching 18 citations and Clinical Oral Implant Research achieving an SJR of 1.691 (Table 5).

These maps of international collaboration illustrate a few instances of international contributions, particularly partnerships, including one between the Netherlands and China, Spain, and Chile, and the United States and Italy (Fig. 1). The collaborative networks presented a clear vision of the world of scientific cooperation amongst countries.

In Fig. 2, a collaborative network was identified as having seven nodes representing subjects with terms that were related most frequently within the database with 255 keywords. By a detailed survey of the network made, it could be stated that the first node (blue color) was primarily organized around the term "dental implants," the second node (red color) was associated with the term "adult," whose boundaries extended to "middle-aged," "osteolysis," "fibula graft," among others, while in the case of the third node (brown color), the term "head and neck neoplasm" was clustered. The clustered set at the center of the map underlined strong connections of keywords, while the least number of connections of nodes was at the extremes of the map.

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

Table 5: Top 10 Scopus sources by academic output

Scopus Source	*Scholarly output*	*Citations per publication*	*SJR 2022*	*CiteScore 2022*
Clinical Oral Investigation	3	10	0.91	6.3
International Journal of Oral and Maxillofacial Surgery	3	13.7	0.884	5
British Journal of Oral and Maxillofacial Surgery	2	9	0.553	2.8
Frontiers in Oncology	2	8.5	1.138	5.2
Journal of Clinical Medicine	2	5	0.935	5.4
Clinica Terapeutica	1	18	0.408	3.3
Clinical Oral Implant Research	1	8	1.691	7.3
Frontiers in Dentistry	1	1	0.268	1.5
International Journal of Prosthodontics and Restorative Dentistry	1	0	–	0.1
Journal of Biological Regulators and Homeostatic Agents	1	4	0.285	3.1



Fig. 1: Country collaboration map

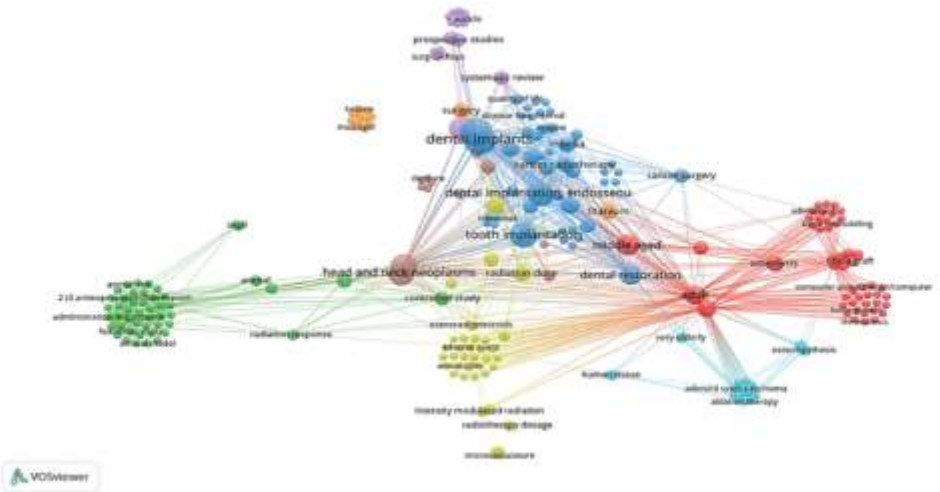


Fig. 2: Co-occurrence by keywords

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

Discussion

Over time, various analyses have been conducted, including literature reviews, systematic reviews, and clinical case reports, to examine the interaction or effects of radiation on bone tissue and its relationship with oral implantology in cancer patients. However, few studies have addressed the scientific production and impact of publications on this topic. Therefore, the present analysis aimed to quantify the scholarly output on osseointegration of dental implants in irradiated patients from 2018 to 2024.

This was achieved through a keyword search in the Scopus database, classifying the results by author name, journal, institution, and international collaboration.

According to research by Gupta et al.[14] the survival rates of dental implants placed in non-irradiated areas were higher (93.9%) compared to those placed in irradiated areas (85.8%). Similarly, Toneatti et al.[15] observed a survival rate of 97% after a follow-up period of 37.7 months.

Our study highlighted the high scientific production of both German authors and institutions, without leaving aside the contribution made by authors from Brazil, of which the researcher Curi Marcos Martins stands out, with an average of 18.5 citations per publication and an *h*-index of 17; the Hospital General Universitario Gregorio Marañón of Spain was the institution with the highest number of publications, with an average of three articles on the osseointegration of dental implants in irradiated patients. Impact is an important measure that ranks journals according to their number of citations and generally designates their reputation. Among the journals selected from the top 10 with the highest impact are Clinical Oral Implants Research (1.691), Frontiers in Oncology (1.138), Journal of Clinical Medicine (0.935), Clinical Oral Investigations (0.91), and International Journal of Oral and Maxillofacial Surgery (0.884). Following the same line, we highlight that most of the publications were made in the year 2021, grouping them within the first quartile (Q1) and second quartile (Q2).

In our analysis, it was observed that collaboration between countries had international contributions, but only on one occasion between the United States and Italy, the Netherlands and China, and Spain and Chile, unlike what was found in the study by Yang et al.[16] who analyzed trends in oral cancer, showing that the United States had the highest scholarly output with 35 publications. Similarly, in the work of Singh et al.[17] on trends and current topics in oral cancer research, it was shown that the countries with the highest number of publications were the United States, India, and China, with 465, 279, and 228 articles, respectively.[17]

In our analysis, it was observed that international collaboration occurred, but only in isolated instances, such as between the United States and Italy, the Netherlands and China, and Spain and Chile. This contrasts with the findings of Yang et al.,[16] who analyzed trends in oral cancer and found that the United States had the highest number of documents with 35 publications. Similarly, Singh et al[17] reported that the countries with the highest number of publications in oral cancer research were the United States, India, and China, with 465, 279, and 228 articles, respectively. The limited international collaboration in our study period could be attributed to several factors, including the specialized nature of research on osseointegration in irradiated patients, which may require specific expertise and resources that are not widely available. Additionally, geopolitical and economic barriers, as well as differences in research priorities and funding availability, may have hindered broader international cooperation.[16,17]

One of the topics of greatest interest for researchers in the development of bibliometric studies on oral cancer was the risk factors and composition of the microbiota, which could lead to oral squamous cell carcinoma.[18,19] The most important journal in the field of research was "Oral Oncology", with 10 publications and 428 citations, making it the most productive scientific journal.[19] On the other hand, in the research conducted by Liu et al.,[20] the journals with the highest number of publications of articles related to the use of radiotherapy in cancer were "The International Journal of Radiation Oncology, Biology, and Physics" with 42 articles, followed by the "Journal for Immunotherapy of Cancer and Frontiers in Oncology" with 39 and 35 articles, respectively.

According to the bibliometric study by Qiu et al.[21] on mucosal lesions caused by cancer therapies, the most productive institutions were based in the USA, with the University of Adelaide, the University of Texas, and the Memorial Sloan Kettering Cancer Center leading in research output. Similarly, Escoto et al.[22] found that the University of California had the highest number of publications, averaging seven articles with 2,827 citations, followed by the American Cancer Society, which published five articles with 32,982 citations.

The strength of the present one lies in offering a full and quantitative view of the process of osseointegration of dental implants among irradiated patients. This study aimed at keeping track of key trends in the field, collaboration among countries, and the evolution of research in this topic via bibliometric methodology and leading tools such as SciVal, Mendeley, Bibliometrix, and VOSviewer.[23] Additionally, the selection of articles indexed in the Scopus indexing standard assures a decent quality and relevancy of articles included, providing a sound basis for future research investigations and extending their search into other databases.

During the research, certain limitations were discovered; it is worth mentioning that a bibliometric study will depend on the availability of the articles retrieved using the search strategy; for this reason, we must first consider that the data collection was based on Scopus; therefore, future research could include bibliographic citations from the Embase, Medline, and Web of Science databases. Second, designing a search strategy to distinguish relevant from irrelevant publications was highly complex. Third, there was a linguistic bias because the search was limited to articles published in English related to osseointegration, implants, and periodontics.[24,25] Finally, the automatic software algorithms may introduce bias because not all publications could be exported to SciVal due to metadata incompatibility.

Conclusion

The growing number of published articles pointed to an evident rise in interest in identifying the most prolific and cited countries, institutions, journals, and authors. Our analysis revealed Germany and Brazil produced the highest number of publications, with Brazilian authors exhibiting the maximum impact of citation. Notably, Antúnez-Conde Raúl from Spain was the biggest contributor. Such findings can be very helpful to clinicians and researchers in improving treatment modalities and prognoses for irradiated patients for whom dental implants may be useful. Being aware of trends and key contributors enables clinicians to maintain current advancements and promote collaborative efforts favorable for patient care.

Acknowledgments

The authors wish to thank the Postgraduate Program in Stomatology of the Universidad Científica del Sur Lima, Peru.

Tesis publicada con autorización del autor
No olvide citar esta tesis

TESIS
UNIVERSIDAD CIENTÍFICA DEL SUR

References

1. Bray F, Laversanne M, Sung H, et al. Global cancer statistics 2022: Globocan estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin 2024;74:229–263. DOI: 10.3322/caac.21834.
2. Tandon P, Dadhich A, Saluja H, et al. The prevalence of squamous cell carcinoma in different sites of oral cavity at our rural health care centre in Loni, Maharashtra: A retrospective 10-year study. Contemp Oncol 2017;21(2):178–183. DOI: 10.5114/wo.2017.68628.
3. Spijkervet F, Schuurhuis J, Stokman M, et al. Should oral foci of infection be removed before the onset of radiotherapy or chemotherapy? Oral Dis 2021;27(1):7–13. DOI: 10.1111/odi.13329.
4. Mattila V, Wilkman T, Avellán N, et al. Survival of dental implants and occurrence of mucosal overgrowth in patients with head and neck cancer treated with/without radiotherapy and mucosal graft: 2-year follow-up. Clin Oral Investig 2024;28(1):111–117. DOI: 10.1007/s00784-023-05479-0.
5. Almangush A, Mäkitie A, Triantafyllou A, et al. Staging and grading of oral squamous cell carcinoma: An update. Oral Oncol 2020;107:104799. DOI: 10.1016/j.oraloncology.2020.104799.
6. Kende P, Ranganath S, Landge J, et al. Survival of dental implants on irradiated jaws: A systematic review and meta-analysis. J Maxillofac Oral Surg 2022;21(3):787–795. DOI: 10.1007/s12663-022-01686-6.
7. Brook I. Late side effects of radiation treatment for head and neck cancer. Radiat Oncol J 2020;38(2):84–92. DOI: 10.3857/roj.2020.00213.
8. Di Carlo S, De Angelis F, Ciolfi A, et al. Timing for implant placement in patients treated with radiotherapy of head and neck. Clin Ter 2019;170(5):345–351. DOI: 10.7417/CT.2019.2153.
9. In 'T Veld M, Schulten E, Leusink F. Immediate dental implant placement and restoration in the edentulous mandible in head and neck cancer patients: A systematic review and meta-analysis. Curr Opin Otolaryngol Head Neck Surg 2021;29:126–137. DOI: 10.1097/MOO.0000000000000685.
10. Tsai C, Verma N, Owosho A, et al. Predicting radiation dosimetric distribution in different regions of the jaw in patients receiving radiotherapy for squamous cell carcinoma of the tonsil. Head Neck 2019;41(10):3604–3611. DOI: 10.1002/hed.25883.
11. Wolf F, Spoerl S, Gottsauner M, et al. Significance of site-specific radiation dose and technique for success of implant-based prosthetic rehabilitation in irradiated head and neck cancer patients: A cohort study. Clin Implant Dent Relat Res 2021;23(3):444–455. DOI: 10.1111/cid.13005.
12. Li J, Feng K, Ye L, et al. Influence of radiotherapy on dental implants placed in individuals before diagnosed with head and neck cancer: Focus on implant-bed-specific radiation dosage. Clin Oral Investig 2022;26(9):5915–5922. DOI: 10.1007/s00784-022-04549-z.
13. López A, Tarazona B, Vidal A, et al. The 100 most cited articles in peri-implant diseases. A bibliometric study of the web of science. J Clin Exp Dent 2022;14(11):920–925. DOI: 10.4317/jced.59786.
14. Gupta S, Mortellaro C, Panda S, et al. Dental implant survival rate in irradiated and non-radiated patients: A systematic review and meta-analysis. J Biol Regul Homeost Agents 2021;35(2):53–65. DOI: 10.23812/21-2suppl-5.
15. Toneatti DJ, Graf RR, Burkhard JP, et al. Survival of dental implants and occurrence of osteoradionecrosis in irradiated head and neck cancer patients: A systematic review and meta-analysis. Clin Oral Investig 2021;25(10):5579–5593. DOI: 10.1007/s00784-021-04065-6.
16. Yang X, Yang X, Ji T, et al. A bibliometric analysis of the papers on oral potentially malignant disorder in oral oncology. Oral Oncol 2022;132:1–3. DOI: 10.1016/j.oraloncology.2022.105996.
17. Singh A, Singh R, Sapkota D. Current trends and themes of oral cancer research: A bibliometric analysis of publications from 2011 to 2022 in prominent oral pathology related journals. Oral Oncol Rep 2023;6:1–8. DOI: 10.1016/j.oor.2023.100037.
18. Gu Z, Liu Y. A bibliometric and visualized in oral microbiota and cancer research from 2013 to 2022. Discov Oncol 2024;15(1):1–24. DOI: 10.1007/s12672-024-00878-5.
19. Pérez O, Millones P, Valencia A, et al. Risk factors for oral cancer. Thematic trends and research agenda. J Pharm Pharmacogn Res 2023;11(5):887–901. DOI: 10.56499/jppres23.1712_11.5.887.
20. Liu Y, Jiang X, Wu Y, et al. Global research landscape and trends of cancer radiotherapy plus immunotherapy: A bibliometric analysis. Heliyon 2024;10(5):1–25. DOI: 10.1016/j.heliyon.2024.e27103.
21. Qiu L, Zhang D, Ou Z, et al. Cancer therapy induced mucosal injury from 2001 to 2021: A bibliometric analysis. J Oral Pathol Med 2023;52(5):410–417. DOI: 10.1111/jop.13363.
22. Escoto L, Delgadillo L, Ternovoy S, et al. Top 100 most cited papers on diagnostic aids for oral cancer: A bibliometric analysis. J Stomatol Oral Maxillofac Surg 2024;125(6):1–9. DOI: 10.1016/j.jormas.2024.101793.
23. Mayta-Tovalino F, Diaz-Barrera ME, Runzer-Colmenares FM, et al. RAMIBS: Reporting and measurement of items for bibliometric or scientometric studies in health sciences. J Int Oral Health 2024;16:253–256. DOI: 10.4103/jioh.jioh_23_24.
24. Mendoza-Azpur G, Gallo P, Mayta-Tovalino F, et al. A case series of vertical ridge augmentation using a nonresorbable membrane: A multicenter study. Int J Periodontics Restorative Dent 2018;38(6):811–816. DOI: 10.11607/prd.3538.
25. Perez E, Salinas L, Mendoza R, et al. Osseointegration of dental implants in patients with congenital and degenerative bone disorders: A literature review. J Int Soc Prev Community Dent 2023;13(3):167–172. DOI: 10.4103/jispcd.JISPCD_51_22.

Tesis publicada con autorización del autor
No olvide citar esta tesis