



UNIVERSIDADE FEDERAL DE SANTA CATARINA
CENTRO DE CIÊNCIA DA SAÚDE
PROGRAMA DE PÓS-GRADUAÇÃO EM ODONTOLOGIA

MELISSA SANTOS DA SILVA SIMÕES RAMOS

**ANÁLISE BIBLIOMÉTRICA DOS 100 ARTIGOS MAIS CITADOS SOBRE
SELANTE DENTÁRIO**

FLORIANÓPOLIS

2023

MELISSA SANTOS DA SILVA SIMÕES RAMOS

**ANÁLISE BIBLIOMÉTRICA DOS 100 ARTIGOS MAIS CITADOS SOBRE
SELANTE DENTÁRIO**

Dissertação submetida ao Programa de Pós-Graduação
em Odontologia, Departamento de Odontologia da
Universidade Federal de Santa Catarina para a obtenção
do título de Mestre em Odontologia.

Orientadora: Prof.^a Dr.^a Mariane Cardoso.

Coorientadora: Prof.^a Dr.^a Carla Miranda Santana.

FLORIANÓPOLIS

2023

Ficha de identificação da obra

Ramos, Melissa Santos da Silva Simões

Análise bibliométrica dos 100 artigos mais citados sobre selante dentário / Melissa Santos da Silva Simões Ramos ; orientadora, Mariane Cardoso, coorientador, Carla Miranda Santana, 2023.

76 p.

Dissertação (mestrado) - Universidade Federal de Santa Catarina, Centro de Ciências da Saúde, Programa de Pós-Graduação em Odontologia, Florianópolis, 2023.

Inclui referências.

1. Odontologia. 2. Selante dentário. 3. Cárie dentária. 4. Selante de fósulas e fissuras. 5. Análise bibliométrica. I. Cardoso, Mariane. II. Santana, Carla Miranda. III. Universidade Federal de Santa Catarina. Programa de Pós-Graduação em Odontologia. IV. Título.

Melissa Santos da Silva Simões Ramos

**ANÁLISE BIBLIOMÉTRICA DOS 100 ARTIGOS MAIS CITADOS SOBRE
SELANTE DENTÁRIO**

O presente trabalho em nível de mestrado foi avaliado e aprovado por banca examinadora composta pelos seguintes membros:

Prof.^a Dr.^a Mariane Cardoso
Universidade Federal de Santa Catarina

Prof.^o Dr.^o Paulo Antônio Martins Júnior
Universidade Federal de Minas Gerais

Prof.^a Dr.^a Ana Flávia Granville-Garcia
Universidade Estadual da Paraíba

Certificamos que esta é a **versão original e final** do trabalho de conclusão que foi julgado adequado para obtenção do título de Mestre em Odontologia.

Coordenação do Programa de Pós-Graduação

Prof.(a) Dr.(a) Mariane Cardoso
Orientador(a)

FLORIANÓPOLIS

2023

Dedico este trabalho aos meus queridos pais, marido, familiares e amigos que tanto me incentivam durante a minha caminhada.

AGRADECIMENTOS

Primeiramente, gostaria de expressar minha gratidão a **Deus**, que constantemente me confirma que tudo ocorre no momento adequado, ao lado das pessoas certas. Agradeço por me conceder a oportunidade de vivenciar experiências que jamais poderia imaginar e por proporcionar uma história repleta de significado e aprendizado até este momento. Sou grata por cada instante e por sempre colocar anjos tão especiais em minha vida.

Ao meu marido **Yuri Ramos**, pelo companheirismo, amor, incentivo, apoio, compreensão, paciência e por sempre acreditar no meu potencial.

Aos meus pais **Flávio Simões** e **Renata Simões**, e ao meu irmão **Flavinho Simões**, que mesmo morando em estados diferentes foram meu apoio, incentivo a cada telefonema, trocas de mensagens e chamadas de vídeo. Não chegaria tão longe sem o amor e a base forte que me foi ensinado pela minha família.

Aos meus **familiares**, em especial aos meus **avós** que sempre acompanharam a minha criação, educação e torceram fervorosamente por cada degrau que conseguia ir alcançado durante toda minha trajetória. A fé e oração da minha avó me protegeram e me impulsionaram a seguir caminhando por onde quer que eu passe.

À minha orientadora Prof^ª. Dr^ª. **Mariane Cardoso**, pela oportunidade de fazer parte da equipe, pela paciência, pelos ensinamentos diários e o apoio durante todo mestrado. Agradeço as oportunidades e professores que colocou no meu caminho nesse período, engrandecendo ainda mais o meu aprendizado.

À minha coorientadora Prof^ª. Dr^ª. **Carla Miranda Santana**, pela paciência e apoio que me foram de fundamental importância para meu desenvolvimento acadêmico científico.

Ao nosso Grupo de pesquisa da Odontopediatria, **Mari, Pablo, Dani, Bárbara, Pedro, Karina, Bruna e todas as graduandas** que nos auxiliaram durante nossas pesquisas. Obrigada pela acolhida. Todos contribuíram para dias mais alegres.

Ao meu amigo **Aurélio Rocha**, meu conterrâneo não soltou a minha mão em nenhum momento. Compartilhou toda sua bagagem científica e me incentivou em tudo. Foi colo nos dias de tristeza, pulso firme quando foi preciso, companheiro de lazer, além de compartilhar as boas lembranças e tradições do nosso Nordeste amado.

Ao meu amigo **Lucas Anjos**, que também é meu conterrâneo e veio de presente junto com o Aurélio. Compartilhou todo seu conhecimento científico, dividiu sua fé, foi abrigo, incentivo, afeto e que também nunca soltou a minha mão para que eu pudesse alcançar meus objetivos.

À minha amiga **Fernanda Zatt (Fê)**, aquela que sem sobra de dúvidas foi fundamental em um dos momentos mais difíceis durante o mestrado. Dividimos a moradia em Florianópolis, nossas tristezas, alegrias, conhecimentos e me provou que irmandade pode ser escolhida. E sem esquecer do nosso chimarrão, sentirei saudades.

À **Thalia**, por ter aceitado dividir a moradia em Florianópolis comigo e a Fê. Sentirei saudades dos nossos dias juntas, das boas conversas trocadas.

Aos meus **amigos** ao longo de todos esses anos que sempre confiaram no meu potencial e crescimento, foram incentivo e apoio sempre. Sejam aqueles da época da minha infância no Sertão de Pernambuco (Afogados da Ingazeira), como também do período que vivi em Recife (sejam os do colégio, cursinho ou da Universidade Federal de Pernambuco), daqueles que conheci no período que morei no Rio de Janeiro (amigos de vários estados do Brasil, de outros países, os que a Marinha proporcionou, os que conquistei na especialização de Dentística e Ortodontia na PUC-RJ, no trabalho em clínicas odontológicas). Além de todos que conheci em Florianópolis. Cada pessoa que passou pelo meu caminho me ensinou a ser alguém melhor.

Aos **professores** que ministraram aulas e que convivi no período do estágio de docência, fica o meu muito obrigada pelos ensinamentos transmitidos nesse período e pela vivência. Aos **funcionários** da limpeza e segurança que estavam ali, diariamente, nos cumprimentando e permitindo que o nosso trabalho fosse realizado.

À **Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES)**, pelo incentivo financeiro que foi de suma importância para o meu desenvolvimento acadêmico e científico.

À banca examinadora, Prof. Dr. **Paulo Antônio Martins Júnior**, Prof.^a Dr.^a **Ana Flávia Granville-Garcia** e Prof.^a Dr.^a **Bárbara S. Moccelini**, fica aqui o meu muito obrigada desde já, por aceitarem o convite e disponibilizarem tempo do dia de vocês para ler o meu trabalho e fazer parte desse momento de extrema importância para mim. Com certeza será uma contribuição muito enriquecedora para essa dissertação.

E claro, não posso deixar de agradecer aos meus **pacientes** e seus **responsáveis**, que muitas vezes se deslocaram de longe até a nossa clínica, confiando no nosso trabalho e nos permitindo fazer ciência. Sem vocês não teríamos nada. Obrigada por nos permitirem praticar e aprimorar a nossa profissão.

“Ninguém escapa do sonho de voar, de ultrapassar limites do espaço onde nasceu, de ver novos lugares e novas gentes. Mas saber ver em cada coisa, em cada pessoa, aquele algo que a define como especial, um objeto singular, um amigo é fundamental. Navegar é preciso, reconhecer o valor das coisas e das Pessoas, é mais preciso ainda!”
Antoine de Saint-Exupéry.

RESUMO

Este estudo identificou e analisou as características dos 100 artigos mais citados sobre selante dental (SD) na odontologia. Em setembro de 2022, foi realizada uma pesquisa na Web of Science Core Collection (WoS-CC). As seguintes informações foram extraídas de cada artigo: número e densidade de citações, ano de publicação, autoria, revista, fator de impacto, palavras-chave, desenho do estudo, tema, continente, país e instituição. As citações da WoS-CC foram comparadas com as bases de dados Scopus e Google Acadêmico. O software VOSviewer foi utilizado para gerar redes colaborativas. O Google Trends foi usado para investigar a popularidade global da pesquisa do SD. O número de citações variou de 33 a 200. Os artigos foram publicados entre 1961 e 2016. Buonocore MG (7%), Meyer-lueckel H (6%) e Paris S (6%) se destacaram entre os autores. Os artigos foram publicados principalmente no The Journal of the American Dental Association (26%). A maioria dos estudos teve desenho intervencionista (41%) e laboratorial (31%), abordando principalmente a eficácia do DS na prevenção e controle da cárie dentária (86%). Houve predominância de publicações da América do Norte (46%). Os Estados Unidos da América (EUA) foi o país com mais artigos (44%). As instituições mais frequentes foram os Centers for Disease Control and Prevention (EUA) e a Universidade de Rochester (EUA) (6% cada). O VOSviewer demonstrou a colaboração entre os autores. Para o Google Trends, os Estados Unidos foram o país que mais buscou SD. Esta revisão bibliométrica destacou principalmente estudos de intervenção sobre a retenção e eficácia do SD, publicados principalmente nos EUA. Assim, há necessidade de estudos observacionais e revisões sistemáticas, além de incentivar mais publicações sobre DS na África, Oceania e América do Sul.

Palavras-chave: Selante dentário; Cárie dentária; Selante de fósulas e fissuras; Materiais dentários; Análise bibliométrica.

ABSTRACT

This study identified and analyzed the characteristics of the 100 most cited articles on dental sealant (DS) in dentistry. In September 2022, a search was performed on the Web of Science Core Collection (WoS-CC). The following information was extracted from each article: number and density of citations, year of publication, authorship, journal, impact factor, keywords, study design, theme, continent, country and institution. The citations of the WoS-CC were compared with the Scopus and Google Scholar databases. The VOSviewer software was used to generate collaborative networks. Google Trends was used to investigate the global popularity of DS search. The number of citations ranged from 33 to 200. The articles were published between 1961 and 2016. Buonocore MG (7%), Meyer-lueckel H (6%), and Paris S (6%) stood out among the authors. The articles were published mainly in The Journal of the American Dental Association (26%). Most studies had an interventional (41%) and laboratory (31%) design, mainly addressing the effectiveness of DS in the prevention and control of dental caries (86%). There was a predominance of publications from North America (46%). The United States of America (USA) was the country with the most articles (44%). The most frequent institutions were the Centers for Disease Control and Prevention (USA) and the University of Rochester (USA) (6% each). VOSviewer demonstrated collaboration between authors. For Google Trends, the United States was the country that most searched for DS. This bibliometric review mainly highlighted intervention studies on the retention and efficacy of DS, primarily published in the USA. Thus, there is a need for observational studies and systematic reviews, as well as encouraging more publications on SD in Africa, Oceania and South America.

Keywords: Dental sealant; Dental caries; Pit and fissure sealant; Dental Materials; Bibliometric analysis.

LISTA DE FIGURAS

Figura A - Superfície oclusal do molar sadia.....	15
Figura B - Selamento das fósulas e fissuras do molar com selante resinoso (A,B,C) e com o selante ionomérico (E,F,G).....	16
Figura 1 - Gráfico com a distribuição dos anos de publicação e número de artigos entre os 100 mais citados.....	34
Figura 2 - Mapa de países e continentes presentes entre os 100 artigos mais citados.....	34
Figura 3 - Mapa de densidade de palavras-chave mais utilizadas entre os 100 artigos mais citados.....	34
Figura 4 - Mapa de densidade entre os autores e coautoria mais frequentes presente entre os 100 artigos mais citados.....	34

ARTIGO SUPLEMENTAR

Figura 1 - Distribuição do número de publicações em cada ano.....	73
Figura 2 - Mapa de países e continentes de origem de artigos que relacionavam YouTube e odontologia.....	73
Figura 3 - Rede bibliométrica das palavras-chave mais utilizadas entre os artigos mais citados.....	74
Figura 4 - Rede bibliométrica de autores e coautoria colaborativa entre eles para os artigos mais citados.....	74

LISTA DE TABELAS

Tabela 1. Top 100 dos artigos mais citados sobre Selante Dentário.....	37
Tabela 2. Top 10 das revistas com maior número de artigos da lista dos 100 mais citados....	43
Tabela 3. Top 10 das instituições com o maior número de artigos entre os 100 mais citados.	44
Tabela 4. Top 10 dos autores com o maior número de artigos entre os 100 mais citados.....	44

ARTIGO SUPLEMENTAR

Tabela 1. Artigos publicados relacionados aos vídeos do YouTube e Odontologia.....	63
Tabela 2. Revistas que mais publicaram sobre vídeos do YouTube e Odontologia.....	72
Tabela 3. Principais instituições associadas à pesquisa sobre vídeos do YouTube e Odontologia.....	72
Table 4. Autores com maior destaque na elaboração de estudos sobre vídeos do YouTube e Odontologia.....	72

LISTA DE ABREVIATURAS E SIGLAS

BPA bisfenol-A

EUA Estados Unidos da América

OMS Organização Mundial de Saúde

SD Selante Dentário

VoSviewer Visualizing Scientific Landscapes

WoS-CC Web of Science Core Collection

SUMÁRIO

1	CONTEXTUALIZAÇÃO	15
1.1	SELANTE DENTÁRIO	15
1.2	REVISÃO BIBLIOMÉTRICA.....	17
2	OBJETIVOS	20
2.1	OBJETIVO GERAL	20
2.2	OBJETIVOS ESPECÍFICOS	20
3	ARTIGO	21
4	CONSIDERAÇÕES FINAIS.....	45
	REFERÊNCIAS.....	46
	APÊNDICE – Artigo suplementar	53

1 CONTEXTUALIZAÇÃO

1.1 SELANTE DENTÁRIO

De acordo com a Organização Mundial de Saúde (OMS) a cárie dentária afeta entre 60% e 90% das crianças em fase educacional, principalmente nos países em desenvolvimento (WHO, 2022). O diagnóstico precoce dessa condição é de extrema importância, a fim de facilitar o tratamento e minimizar a ocorrência de danos dentais que podem afetar a qualidade de vida do paciente (TONIAL et al., 2015; OMS, 2022). Uma área muito suscetível a presença de cárie é a superfície oclusal dos dentes posteriores, devido a presença de fóssulas e fissuras profundas com características retentivas, que favorecem o acúmulo de biofilme bacteriano e dificultam a higienização (LASCALA, 1997; PARDI et al., 2003; MCDONALD, 2004; BROMO et al., 2011).

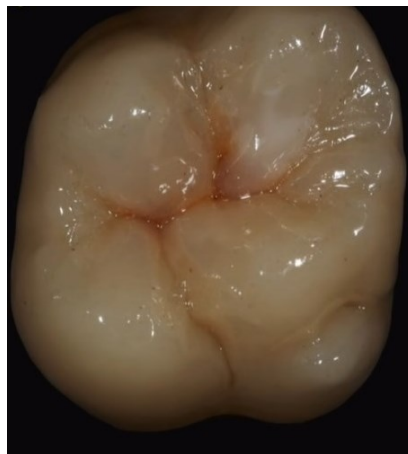


Figura A - Superfície oclusal do molar sadia.

Diante disso, é importante adotar uma abordagem ampla na prevenção da cárie, por meio da utilização de materiais que previnam ou paralise essas lesões em fases iniciais. Nesse contexto, destacam-se os selantes dentários, que atuam de maneira localizada, formando uma barreira física entre a cavidade bucal e a microflora presente nas fóssulas e fissuras dentárias, impedindo, assim, a troca de substâncias metabólicas (RAMESH et al., 2020). O selamento de fóssulas e fissuras se caracterizam como uma abordagem não invasiva, sendo eficaz na prevenção de cárie em crianças e adolescentes (DESAI et al., 2021).

Os selantes podem ser divididos em duas categorias, que são os selantes resinosos e ionoméricos, ambos apresentam propriedades e indicações distintas (COLOMBO et al., 2018). A indicação para o selante ionomérico aplica-se nos casos em que não tem a possibilidade de

realizar o isolamento absoluto, comum em molares e pré-molares em fase de irrupção, onde o material corre o risco de entrar em contato com a saliva do paciente; já para os dentes com cicatrículas e fissuras de anatomia complexa com viabilidade de realizar isolamento, o mais indicado são os selantes resinosos (SARTI, 2015; OLIVEIRA, 2015).

Para obter uma maior retenção ao aplicar selantes resinosos, é importante a realização de um ataque ácido nas superfícies e a manutenção de um campo seco até que o selante seja aplicado (BEAUCHAMP et al., 2008). Após a aplicação dos selantes, é imprescindível realizar uma avaliação minuciosa da retenção do selante utilizando uma sonda exploradora, garantindo assim que todas as fôssulas e fissuras estejam realmente seladas (COLOMBO et al., 2018).

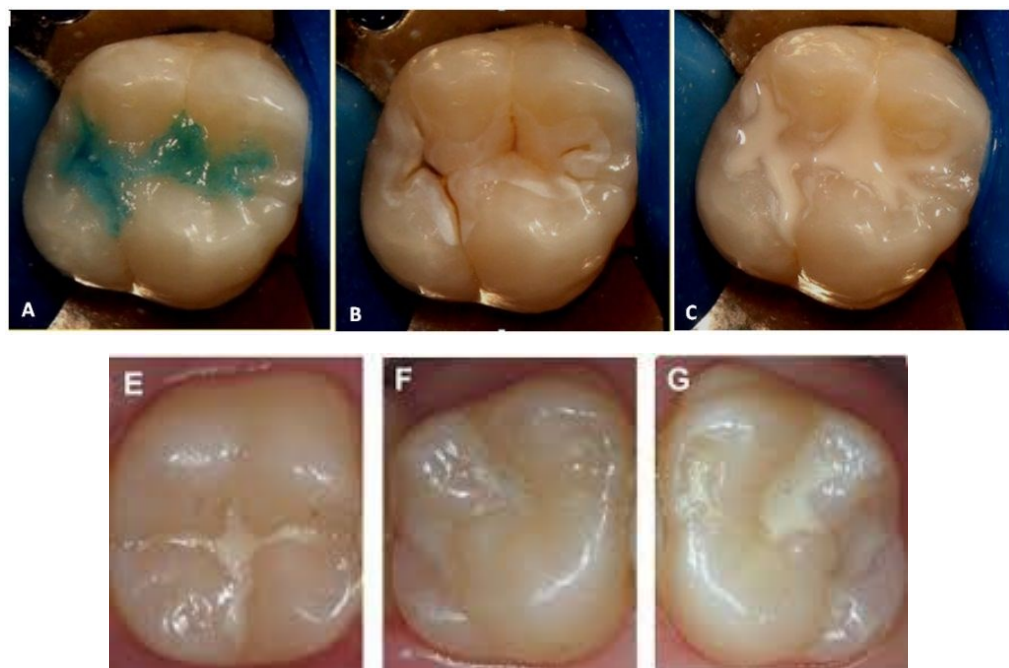


Figura B – Selamento das fôssulas e fissuras do molar com selante resinoso (A,B,C) e com o selante ionomérico (E,F,G). <https://www.odontoexcelencia.com.br/aplicacao-de-selante>. <https://www.foa.unesp.br/Home/ensino/departamentos/odontologiainfantilesocial/selante-de-fossulas-e-fissuras-apostila1.pdf>.

Os selantes ionoméricos, por sua vez, estabelecem uma união entre o esmalte e a dentina por meio de uma reação química, eliminando a necessidade de pré-tratamento do dente antes da sua aplicação (WHIGHT et al., 2016). Além disso, esse material demonstra uma boa compatibilidade com a umidade e oferece uma liberação contínua de flúor, o que contribui para a prevenção efetiva e de longo prazo da cárie (COLOMBO et al., 2018).

Os estudos intervencionais ao longo dos anos foram realizados na intenção de comparar diferentes tipos de selantes, destacando assim a eficácia do selamento, a indicação correta e se há efeito preventivo de cárie de longa duração. Foram comparados selantes à base de resina versus ionômero de vidro, verniz fluoretado versus selante à base de resina e ionômero de vidro, que foram aplicados em dentes decíduos e permanentes sadios quando o paciente apresentava alto risco a doença cárie, tendo destaque para selante à base de resina e o ionômero de vidro comparado ao verniz fluoretado, sendo assim justificável a maior indicação desses materiais na mínima intervenção como tratamento precoce (BRAVO et al., 1997; BRAVO et al., 2005; HILGERT et al., 2017).

Uma revisão sistemática, realizada por Ahovuo-Saloranta e colaboradores (2017), comparou os efeitos da utilização de selante à base de resina e selante de ionômero de vidro na prevenção de cárie em superfícies oclusais de dentes permanentes em crianças e adolescentes. Concluíram que os selantes à base de resina reduziram a cárie entre 11% e 51% em comparação com nenhum selante, quando medidos aos 24 meses. Os selantes possuem indicação para pacientes que apresentam alta prevalência de cárie (SCHWIMMER et al., 2020).

Considerando as importantes vantagens desse material, diversas pesquisas científicas foram desenvolvidas ao longo do tempo (SIMONSEN, 1991). Dessa forma, surge a necessidade de um estudo que analise quali-quantitativamente as principais características e o perfil científico dos estudos relacionados ao selante dentário. Assim, uma revisão bibliométrica com essa temática torna-se essencial.

1.2 REVISÃO BIBLIOMÉTRICA

A revisão bibliométrica se concentra na análise quantitativa e qualitativa de publicações científicas e acadêmicas relevantes para uma determinada área de estudo. Nessa revisão, são utilizadas técnicas e métodos bibliométricos para identificar, coletar e analisar dados bibliográficos, como o número de citações, frequência de publicações, autores mais produtivos, periódicos mais influentes e padrões de colaboração entre pesquisadores (SHEHANI et al., 2023).

O objetivo principal da revisão bibliométrica é apresentar uma visão panorâmica da produção científica em uma área específica, permitindo que pesquisadores, instituições e tomadores de decisão avaliem a evolução do conhecimento em determinado campo, identifiquem tendências, lacunas e áreas de interesse crescente. Além disso, pode ajudar a identificar redes de colaboração e a visualizar a influência de um determinado trabalho ou autor

dentro da comunidade científica (AHMAD et al., 2019). Para realizar esta revisão, é necessário utilizar bases de dados bibliográficas, como Web of Science, Scopus, PubMed ou Google Scholar, e aplicar técnicas e métricas bibliométricas adequadas, como índices de citação (como o índice h ou o fator de impacto), análises de cocitação e coocorrência de palavras-chave (KOLAHİ & KHAZAEI, 2016).

A análise de citações é uma análise básica em que se contabiliza o número de vezes que um artigo, autor ou periódico foi citado em outras publicações, podendo ajudar a identificar trabalhos ou autores altamente influentes dentro de um campo de estudo (KUMAR, 2016). Já os índices de citação, são métricas que buscam quantificar o impacto de um artigo, autor ou periódico com base no número de citações recebidas (TANG et al., 2014). O índice h (índice Hirsch) é um exemplo comum, serve para quantificar a produtividade e o impacto de pesquisadores baseando-se nos seus artigos mais citados, apesar de ter dificuldade de analisar aqueles em início de carreira ou com baixa produção (CAMACHO et al., 2023).

O fator de impacto de periódicos é uma medida que avalia a importância relativa de um periódico em função do número médio de citações recebidas pelos artigos publicados nesse periódico em um determinado período (GÓRSKI et al., 2021). Enquanto a análise de citação é uma forma de análise bibliométrica que se concentra na investigação das citações presentes em artigos científicos ou outras publicações acadêmicas, visando entender como os trabalhos acadêmicos estão interconectados por meio de referências e citações cruzadas (CHIANG et al., 2020).

O avanço na construção de pesquisas científicas em uma determinada temática pode ser analisada através de um conjunto de métodos bibliométricos como a análise do número de citações (DONTHU et al., 2021). É considerado influente no avanço do conhecimento científico artigos que possuem alto número de citações (GARFIELD et al., 2019). Artigos que somam 100 citações ou mais, podem ser considerados “clássicos” em um campo específico da ciência (FEIJOO et al., 2014).

A análise bibliométrica auxilia os pesquisadores a identificar tendências de pesquisa, instituições, países, autores e periódicos mais prevalentes (CELESTE et al., 2016). Uma parcela dos artigos de revisão bibliométrica excluem artigos de editoriais e resumos de congresso por não serem estudos que passaram por uma revisão crítica por pares, o que pode comprometer a confiabilidade dos resultados (AHMAD et al., 2020; ARAKERI et al., 2021).

Estudos bibliométricos vem sendo realizados para as diversas especialidades odontológicas, como a odontopediatria, ortodontia, periodontia, endodontia e cirurgia oral

(PERAZZO et al., 2019; BUTERA et al., 2020; RIBEIRO-LAGES et al., 2021; GRILLO, 2021; VITALI et al., 2022; ALMOTAIRY et al., 2023). Contudo, até o momento, nenhuma análise bibliométrica analisou o perfil científico dos SD.

2 OBJETIVOS

2.1 OBJETIVO GERAL

Identificar e analisar as principais características dos 100 artigos mais citados sobre selante dentário na odontologia.

2.2 OBJETIVOS ESPECÍFICOS

- Verificar em cada artigo os seguintes parâmetros bibliométricos: título, número e densidade de citações, ano de publicação, autoria, país, periódico, temática e desenho do estudo;
- Comparar o número e densidade de citações entre os bancos de dados Web of Science, Scopus e Google Scholar para verificar se há discrepância entre os valores encontrados;
- Criar e analisar as redes bibliométricas através do software VOSviewer comparando palavras-chave mais usadas, autores que mais publicaram.

3 ARTIGO

O presente artigo foi submetido para a revista Brazilian Oral Research e encontra-se em fase de revisão.

Research interest on dental sealant in dentistry based on the 100 most cited articles: bibliometric analysis

Short Title: Bibliometric analysis on dental sealant

Melissa Santos da Silva Simões¹, Aurélio de Oliveira Rocha¹, Mariana Perini Zendron¹, Pablo Silveira Santos¹, Michele Bolan², Carla Miranda Santana², Mariane Cardoso²

1 Postgraduate Program of Dentistry, Federal University of Santa Catarina, Florianopolis (Santa Catarina), Brazil. ORCID (Melissa Santos da Silva Simões): <https://orcid.org/0000-0002-5159-2136> /ORCID (Aurélio de Oliveira Rocha): <https://orcid.org/0000-0002-9308-2118> / ORCID (Mariana Perini Zendron): <https://orcid.org/0009-0005-7621-1562> /ORCID (Pablo Silveira Santos): <https://orcid.org/0000-0001-9310-5642>.

2 Department of Dentistry, Federal University of Santa Catarina, Florianopolis (Santa Catarina), Brazil. ORCID (Michele Bolan): <https://orcid.org/0000-0002-2835-9061> /ORCID (Carla Miranda Santana): <https://orcid.org/0000-0002-6369-9600> /ORCID (Mariane Cardoso): <https://orcid.org/0000-0001-9936-7942>.

Corresponding Author

Melissa Santos da Silva Simões

ORCID: <https://orcid.org/0000-0002-5159-2136>

Postgraduate Program of Dentistry

Federal University of Santa Catarina

Campus Universitário - Bloco H - Trindade

Florianopolis, Santa Catarina, 88040-900, Brazil

E-mail: melissasimoesramos@gmail.com

Author Contributions

Melissa Santos da Silva Simões: determined the ideas, selection of articles, data analysis and final writing.

Aurélio de Oliveira Rocha: determined the ideas, selection of articles, data analysis and final writing.

Mariana Perini Zendron: determined the ideas, selection of articles, data analysis and final writing.

Pablo Silveira Santos: determined the ideas, data analysis and final writing.

Michele Bolan: data analysis and final writing.

Carla Miranda Santana: data analysis and final writing.

Mariane Cardoso: determined the ideas, selection of articles, data analysis and final writing.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Acknowledgments

This study was financed in part by the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior – Brazil (CAPES).

Conflict of Interest Disclosure

The authors have no conflicts of interest to declare.

Research interest on dental sealant in dentistry based on the 100 most cited articles: bibliometric analysis

ABSTRACT

To identify and analyze the characteristics of the 100 most cited articles on dental sealant (DS) in dentistry. In September 2022, a search was performed on the Web of Science Core Collection (WoS-CC). The following information was extracted from each article: number and density of citations, year of publication, authorship, journal, impact factor, keywords, study design, theme, continent, country, and institution. The citations of the WoS-CC were compared with the Scopus and Google Scholar databases. The VOSviewer software was used to generate collaborative networks. Google Trends was used to investigate the global popularity of DS search. The number of citations ranged from 33 to 200. The articles were published between 1961 and 2016. Buonocore MG (7%), Meyer-lueckel H (6%), and Paris S (6%) stood out among the authors. The articles were published mainly in The Journal of the American Dental Association (26%). Most studies had an interventional (41%) and laboratory (31%) design, mainly addressing the effectiveness of DS in the prevention and control of dental caries (86%). There was a predominance of publications from North America (46%). The United States of America (USA) was the country with the most articles (44%). The most frequent institutions were the Centers for Disease Control and Prevention (USA) and the University of Rochester (USA) (6% each). VOSviewer demonstrated collaboration between authors. Thus, there is a need for observational studies and systematic reviews, as well as encouraging more publications on SD in Africa, Oceania and South America.

Keywords: Dental sealant; Dental caries; Pit and fissure sealant; Dental Materials; Bibliometric analysis.

Introduction

A comprehensive review of the global epidemiology of dental caries showed a high prevalence of this condition, with untreated oral disease being more common.¹ According to Kassebaum et al. (2015),² cavitated carious lesions in permanent teeth remained the most prevalent health condition worldwide in 2010, affecting 2.4 billion people. In addition, untreated cavitated carious lesions in the dentin of primary teeth constituted the 10th most prevalent health condition, affecting 621 million children worldwide. Also, the surface most affected by the disease is the occlusal of the first permanent molars, which, due to their location, have more affected visibility, making cleaning difficult and increasing the risk of developing carious lesions.³

The use of dental sealants (DS) is an alternative for preventing and controlling initial carious lesions.⁴ These sealants were developed to be applied to the occlusal surface of teeth at risk of developing carious lesions, preventing plaque stagnation in these areas.⁵ The presence of pits and fissures on the occlusal surfaces of the posterior teeth makes this face highly susceptible to biofilm accumulation and challenging to sanitize.⁶ In addition, the position of the teeth in the posterior region presents the greater difficulty in access, especially during the eruption.⁷ DS act as a physical barrier, forming a protective layer that prevents food retention and bacterial proliferation in areas vulnerable to dental caries.⁸ DS also comprises an efficient alternative to paralyze non-cavitated carious lesions without destroying intact dental structures, this material can be mainly based on resin or glass ionomer.^{9,10}

Systematic reviews have shown that despite recommendations to prevent or control the development of carious lesions, clinically diverse data are available on the application of DS and the types of material used.^{11,12} Thus, due to the relatively extensive number of published studies on DS and specific information, mapping the scientific evidence through a bibliometric analysis is essential to identify trends in research and the existence of knowledge gaps on the subject, as already reported in other areas of dentistry.^{13,14,15} Such a study can help researchers identify the development and scientific status of publications on DS to stimulate new investigations. Thus, the present study aims to analyze the 100 most cited articles in the literature on DS through a bibliometric analysis.

Methodology

The primary search was conducted in September 2022. The database selected was the Thompson Reuters Web of Science Core Collection (WoS-CC). The filter “Dentistry, oral

surgery and medicine” was used to identify publications related to dentistry. No restrictions were applied regarding the language of the studies and the year of publication. The following search strategy was used: [TS= ((“Pit and Fissure Sealants” OR “Fissure Sealant” OR “Dental Sealant” OR “Teeth Sealants” OR “Dental Sealants” OR “Pit Fissure Sealants” OR “Sealant, Pit Fissure” OR “Fissure Sealant, Pit” OR “Sealants, Tooth” OR “Sealants, Dental” OR “Glass Ionomer Sealant” OR “Resin Sealant” OR “Sealing of Pits and Fissures” OR “Pit and Fissure Sealing” OR “Pit and Fissure Surfaces” OR “Pits and Fissures Sealed” OR “Adhesive Sealing of Pits and Fissures” OR “Sealing of Pits and Fissures and Adhesive Resin” OR “Pits and Fissures in Human Molars”))].

The list of articles obtained in WoS-CC was organized in descending order according to the number of citations. After analyzing the title, abstract, and full text of the documents when necessary, articles that did not address topics related to dental sealants and editorial articles were excluded, according to the type of document identified by the publisher and WoS-CC. Two reviewers (MSSS and AOR) selected the 100 most cited articles. A third reviewer (MC) was consulted for the resolution of doubts. In case of a tie between the number of citations, the position of an article in the list was based on the highest citation density of the WoS-CC (average number of citations received per year). Subsequently, the number of citations of the WoS-CC was compared with the Scopus and Google Scholar databases.

The following items were extracted from each study: title, authors, number of authors, number of citations, citation density, institution, country, and continent (based on the corresponding author's affiliation), year of publication, journal title, journal impact factor, keywords, study design, and theme. The study designs were classified as follows: systematic reviews, literature reviews, laboratory studies, observational studies, intervention studies, and case reports. All articles were grouped according to the most prevalent themes: retention and effectiveness of sealant against caries, the release of bisphenol-A, sealant application technique, and others. Topics that appeared only once were classified as “other”.

The Visualization of Similarities Viewer (VOSviewer) software was used to generate a graphical representation of collaborative networks between keywords and between authors (both with at least three occurrences). The most important terms for the keyword map had larger circles, and the strongly related terms were interconnected and represented by similar coloring. For the author's map, the names that are present in the same cluster indicate collaboration between the authors, and the author's relevance is indicated by color; the closer to red, the more frequent this author was, and the closer to yellow the lower the frequency of this author in the

100 most cited articles.¹⁶ Additionally, Google Trends was used to investigate the global popularity of the search query “Dental Sealant”.¹⁷

Statistical analysis was performed by comparing the number of citations among the three databases. The statistical software SPSS for Windows (SPSS, version 21.0; IBM Corp, Armonk, N.Y., USA) was used. The Kolmogorov-Smirnov test was used to verify the data distribution normality. Spearman's correlation coefficient was used since the data had no normal distribution. Significance level was set at 5%.

Results

We retrieved 1,097 documents, listed in descending order of the number of citations. Subsequently, the 100 most cited articles on DS were selected (Suppl. Table 1). The 100 articles were cited 6,270 times in the WoS-CC, including 379 self-citations (6.04%). The number of citations ranged from 33 to 200, with 12% of articles cited at least 100 times. In the other databases, a higher number of citations was observed, 6,986 (ranging from 19 to 261) in Scopus and 13,378 (ranging from 43 to 473) in Google Scholar. There was a strong positive correlation between the number of citations in WoS-CC and Google Scholar ($\rho=0.861$) and between Google Scholar and Scopus ($\rho=0.888$), and a very strong positive correlation between WoS-CC and Scopus ($\rho=0.930$).¹⁸

The most cited article in WoS-CC (200 citations) was entitled “Retention and effectiveness of dental sealant after 15 years”, an intervention study written by Simonsen RJ, published in 1991, accumulating an average of 6.45 citations per year, being also the most cited in Scopus (261 citations) and Google Scholar (473 citations). The earliest paper was published in 1961, "Thickness of enamel at base of pits and fissures in human molars and bicuspid", written by Gillings B and Buonocore MG. Among the 100 most cited articles on DS, the most significant number of publications were concentrated from 2001 to 2010 (36%), followed by 1991 to 2000 (31%) (Figure 1).

The minimally invasive intervention approach aims to preserve as much dental tissue as possible, focusing on remineralization and performing minimally invasive restorations.¹⁹ This strategy aims to prevent dental caries and intervene conservatively to minimize tissue loss.²⁰ Thus, the use of DS was included as one of the preventive strategies, justifying the importance of this material to this day.²¹

The Journal of the American Dental Association appears as the most prominent journal in several publications and citations in this top 100 (26%; 2,143 citations), followed by Community Dentistry and Oral Epidemiology (12%; 683 citations) (Suppl. Table 2). According

to the Journal Citation Reports 2021, the journal with the highest impact factor in this study was the Journal of Dental Research, with 8,924, while the most frequent journal has an impact factor of 3,681.

Most studies presented an interventional design (41%; 2,592 citations), followed by laboratory studies (31%; 1,629 citations), literature reviews (13%; 945 citations), systematic reviews (9%; 770 citations), observational studies (5%; 260 citations), and case reports (1%; 41 citations). Most of the studies addressed the theme retention and efficacy against caries (86%; 5,305 citations), followed by the release of Bisphenol-A (7%; 556 citations), dental sealant application technique (5%; 271 citations), and other themes (2%; 105 citations).

Among the continents with the most articles, Figure 2 highlights North America (44%), which has the highest number of citations in WoS-CC (3,339 citations), Scopus (3,640 citations), and Google Scholar (7,388 citations); followed by Europe (37%; Wos-CC 2,036 citations), Scopus (2,432), and Google Scholar (4,481). Considering the number of publications by country, the United States leads with 44 articles (44%; citations) that together add up to 3,219 citations in the WoS-CC, followed by Germany (9%; 621 citations). A total of 66 institutions were associated with the studies. Suppl. Table 3 presents the ten institutions with the highest number of publications and citations. We highlight the Center for Disease Control and Prevention of the University of Rochester with six publications each (614 and 576 citations, respectively).

Regarding the keywords present in the 100 most cited DS articles, 341 different terms appeared, with emphasis on “Retention” (25 occurrences), followed by “Pit” and “Pit and Fissure Sealants” (22 occurrences each). Figure 3, generated in VOSviewer, presents the most frequent keywords and their relationship. The words that correspond to the largest circles are those that obtained the highest occurrence. In contrast, the words that appear in the smallest circles presented a lower occurrence. The words that were used in the same document and are connected by bibliometric networks, showed some kind of relationship between the studies. The words related by color represent the period of greatest occurrence for the terms. The dark blue color represents the period close to the year 2000, and the yellow color the period close to the year 2010.

Three-hundred fifty-four authors were identified among the 100 most cited DS articles. The frequency they appear and the co-authorship relationship between them is represented in Figure 4. The names corresponding to the red/orange coloration are associated with the authors with the highest occurrence, highlighting the authors Buonocore MG, Meyer-lueckel H, and

Paris S. In contrast, the names associated with yellow correspond to authors with a lower occurrence. In addition, we can observe the interrelation between the groups of authors who collaborate when associated with the same cluster. Suppl. Table 4 shows the top 10 authors with the highest number of publications among the 100 most cited articles on DS. Buonocore MG, with seven articles, was the author with the highest number of publications, adding 613 citations, followed by Meyer-lueckel H and Paris S, with six articles and 434 citations each.

In addition, based on the data from Google Trends, the search popularity of “DS” has increased significantly since 2004. The United States showed a high search interest, followed by Philippines, Canada, Australia, and United Kingdom. The most common related search topics included “dentistry”, “fissure”, “dental caries”, “cost”, and “dentist”. Users searching for “DS” also searched for related queries. The most popular search queries were “Sealant teeth”, “sealants dental”, “sealant tooth”, “tooth sealant”, and “fissure sealant”.

Discussion

This is the first bibliometric study to identify and discuss the 100 most cited articles related to DS through a qualitative-quantitative approach. It can be stated that the high citation rates of these studies have been significantly associated with scientific development in the field of DS in dentistry, predominantly addressing the clinical implication of the use of DS against dental caries.

Articles that exceed 100 citations in a given area can be considered classics.¹⁸ Thus, the most cited paper of this study stands out with 200 citations.¹⁹ Although published 31 years ago, this research presented a 15-year follow-up with a sample of 200 patients. In another article,²⁰ an extended follow-up was also conducted between 15 and 20 years, but with a sample of 70 patients and published ten years after the most cited article. The extended follow-up period may justify the large number of citations in the most cited article. Among the most cited articles, 35% had follow-up periods. However, most of these studies were followed for one to three years. For many years, it has been discussed whether the use of DS is necessary and effective. Therefore, many studies have been conducted addressing this theme. Currently, WHO considers sealing the occlusal surface as a primary preventive measure, and one of the most effective and least invasive means available to ensure the protection of this surface against tooth decay.²¹

The oldest article was published by Gillings B and Buonocore M in 1961²² and mainly addressed the anatomy of the occlusal surface and the pits and fissures so that they could indicate an ideal material for the correct filling of these structures during dental sealing.

According to Liu BY et al. (2012),²³ the anatomy, often deep and sinuous, of pits and fissures are considered the areas of most significant risk for dental caries since the control of accumulation and removal of dental biofilm in these areas is often difficult or even unsatisfactory. To Beslot-Neveu A et al. (2012),²⁴ the DS must have a high degree of wettability and a degree of viscosity that allows its penetration into microcracks of the tooth enamel, ensuring a complete seal and better adhesion of the material. In addition, it is essential to consider the dental structure's surface tension to reduce it and increase the degree of wettability of the DS was proposed by Buonocore MG (1955),²⁵ preconditioning of the structure before the placement of this material to improve its adhesion. Two materials used can be highlighted: resin-based sealant and glass ionomer cement. The American Dental Association recommends using resin sealants as a more effective alternative for sealing pits and fissures because of their superior retentive properties compared to glass ionomer sealants. However, the latter can be considered an excellent alternative when adequate isolation of the dental unit is unfeasible.²⁶

The most prominent author in this review was Buonocore MG, with the highest number of publications and citations. Was an essential and notable researcher in the scientific development of DS. A literature review published in 1996 entitled “Michael Buonocore and the Eastman Dental Center: a historical perspective on sealants” demonstrates the great contributions of this author to this theme. Buonocore was responsible for developing innovative research in the preparation of the enamel surface with a weak acid to increase the adhesion of an organic plastic chemical sealant and polymerization of a sealant with ultraviolet light, as well as innovative in relation to reducing the removal of enamel and dentin in the preparations. In addition, it has been demonstrated that dental sealants are economical and have excellent retention rates.²⁷ This information is in line with the data of this top 100, where Buonocore's articles mainly addressed clinical studies on the effectiveness and retention of this material. Other prominent authors in this review were Mayer-Lueckel and Paris S, mainly addressing laboratory studies on DS efficacy and retention. With many citations, Gooch BF and Griffin SO developed five studies together, mainly literature reviews on the efficacy and retention of DS.

The Journal of the American Dental Association and Community Dentistry and Oral Epidemiology were identified as the scientific journals with the highest number of articles in the 100 most cited list. The Journal of the American Dental Association was founded in 1913 to promote research through clinical information in areas such as disease diagnosis and management, biomaterials, pharmacology, aesthetic and aesthetic dentistry, and general dental

practice on related dental, oral, and craniofacial health. *Community Dentistry and Oral Epidemiology* is one of the leading international journals in the field of epidemiological dentistry. One of the primary goals is to influence dental practice. Both journals comprise studies of high relevance in DS, presenting a high number of citations, thus being understood and used as references to assist clinicians in making clinical decisions and for researchers in interpreting data and conducting research.

The study design with the greatest predominance among the most cited were intervention studies and laboratory studies, which mainly addressed the theme of DS retention and effectiveness in controlling the paralysis of carious lesions. These studies mainly address the good performance of sealed teeth for preventing and stopping dental caries when compared with unsealed teeth.^{27,28} Unlike other bibliometric analyses published in the literature,^{14,29} this bibliometric review highlighted intervention studies. Dental caries can justify this fact, still considered one of the most prevalent diseases in dentistry, facilitating the obtaining of samples for this type of study.¹ In addition to the term retention being associated with the most frequent theme, this word stood out for having been the keyword most used by the 100 most cited studies on dental sealant.

The second theme most addressed in this study was associated with the release of Bisphenol A (BPA). DS consists mainly of BPA-containing monomers.³¹ BPA was recognized in the 1930 as an endocrine-disrupting chemical that alters hormonal function. However, F et al. (2000)³² showed that BPA released orally from a DS might not be absorbed or be present in undetectable amounts in the systemic circulation. This fact explains several types of research involving this dental material in other areas. This decision explains the fact that the most addressed theme was the DS effectiveness and retention against dental caries. Still, the theme associated with BPA exposure was associated with the top 100 DS published in dental research journals and dental materials.

North America was the most prevalent continent in this bibliometric analysis. This fact is due to the USA, the country that obtained the highest number of articles among the 100 most cited, being located in this continent. This information can be justified by this country's large government investments in universities and research centers. Among these centers, the Center for Disease Control and Prevention stands out, having obtained merit in this study for being one of the institutions with more articles among the most cited. Such information is associated with prominent authors of this center (Griffin SO and Gooch BF). The University of Rochester, also

located in the USA, was highlighted in this study. This fact is justified by Buonocore MG (most frequent author) being associated with this institution.

Among the strengths of this top 100, we can mention the detailed analysis of the main characteristics of the most cited articles on dental sealant without restricting the year of publication or language. With this, the countries, continents, and institutions that must explore scientific research on this topic are evident, providing future global scientific progress in this category. The use of only the WoS-CC database can be cited as a limitation of this study, as there are other bibliometric databases such as Scopus and Google Scholar. Based on other important dentistry bibliometric analyses,^{13,14} it was decided to use only the WoS-CC since this base is widely recommended and used for this type of study.³²

Conclusion

Thus, it is concluded that the 100 most cited articles related to DS were published mainly in North American countries, with an interventional study design addressing issues related to retention and effectiveness against dental caries. Thus, there is a need for observational studies and systematic reviews, as well as encouraging more publications on SD in Africa, Oceania and South America.

Acknowledgments

This study was financed in part by XXX.

References

1. Frencken JE, Sharma P, Stenhouse L, Green D, Lavery D, Dietrich T. Global epidemiology of dental caries and severe periodontitis - a comprehensive review. *J Clin Periodontol*. 2017 Mar;44.
2. Kassebaum NJ, Bernabé E, Dahiya M, Bhandari B, Murray CJ, Marcenes W. Global burden of untreated caries: a systematic review and metaregression. *J Dent Res*. 2015 May;94(5):650-8.
3. Noronha JC, Massara Mde L, Souki BQ, Nogueira AP. First permanent molar: first indicator of dental caries activity in initial mixed dentition. *Braz Dent J*. 1999;10(2):99-104.
4. Ying Lam PP, Sardana D, Luo W, Ekambaram M, Man Lee GH, Man Lo EC, Yung Yiu CK. Glass Ionomer Sealant versus Fluoride Varnish Application to Prevent Occlusal Caries in Primary Second Molars among Preschool Children: A Randomized Controlled Trial. *Caries Res*. 2021;55(4):322-332.

5. Ahovuo-Saloranta A, Forss H, Walsh T, Nordblad A, Mäkelä M, Worthington HV. Pit and fissure sealants for preventing dental decay in permanent teeth. *Cochrane Database Syst Rev*. 2017 Jul31;7(7).
6. Beauchamp J, Caufield PW, Crall JJ, Donly KJ, Feigal R, Gooch B, Ismail A, Kohn W, Siegal M, Simonsen R. Evidence-based clinical recommendations for the use of pit-and-fissure sealants: a report of the American Dental Association Council on Scientific Affairs. *Dent Clin North Am*. 2009 Jan;53(1):131-47.
7. Kolbow H, Kiess W, Hirsch C, Vogel M, Schrock A, Elger W. The Influence of Coordinative Skills on the Oral Health of Children and Adolescents in Permanent Dentition. *J Clin Med*. 2022 Oct31;11(21):6472.
8. Colombo S, Paglia L. Dental Sealants. Part 1: Prevention First. *Eur J Paediatr Dent*. 2018 Mar;19(1):80-82.
9. Holmgren C, Gaucher C, Decerle N, Doméjean S. Minimal intervention dentistry II: part 3. Management of non-cavitated (initial) occlusal caries lesions--non-invasive approaches through remineralisation and therapeutic sealants. *Br Dent J*. 2014 Mar;216(5):237-43.
10. Griffin SO, Oong E, Kohn W, Vidakovic B, Gooch BF; CDC Dental Sealant Systematic Review Work Group; Bader J, Clarkson J, Fontana MR, Meyer DM, Rozier RG, Weintraub JA, Zero DT. The effectiveness of sealants in managing caries lesions. *J Dent Res*. 2008 Feb;87(2):169-74.
11. Ahovuo-Saloranta A, Forss H, Hiiri A, Nordblad A, Mäkelä M. Pit and fissure sealants versus fluoride varnishes for preventing dental decay in the permanent teeth of children and adolescents. *Cochrane Database Syst Rev*. 2016 Jan18;2016(1).
12. Ahovuo-Saloranta A, Forss H, Walsh T, Hiiri A, Nordblad A, Mäkelä M, Worthington HV. Sealants for preventing dental decay in the permanent teeth. *Cochrane Database Syst Rev*. 2013 Mar 28;(3):CD001830.
13. Baldiotti ALP, Amaral-Freitas G, Barcelos JF, Freire-Maia J, Perazzo MF, Freire-Maia FB, Paiva SM, Ferreira FM, Martins-Júnior PA. The Top 100 Most-Cited Papers in Cariology: A Bibliometric Analysis. *Caries Res*. 2021;55(1):32-40.
14. Kammer PV, Moro JS, Martins-Júnior PA, Cardoso M, Bolan M, Santana CM. The 100 most-cited papers in dentistry for individuals with neurodevelopmental disorders: Bibliometric profile of scientific research. *Spec Care Dentist*. 2022 Jul;42(4):369-375.

15. Rocha AO, Santos PS, Machado BA, Bolan M, Cardoso M, Martins-Júnior PA, Santana CM. The Top 100 Most-Cited Papers in Erosive Tooth Wear: A Bibliometric Analysis. *Caries Res.* 2022;56(1):29-35.
16. Van Eck NJ, Waltman L. Citation-based clustering of publications using CitNetExplorer and VOSviewer. *Scientometrics.* 2017 111:1053–70.
17. Jiang CM, Duangthip D, Chan AKY, Tamrakar M, Lo ECM, Chu CH. Global research interest regarding silver diamine fluoride in dentistry: A bibliometric analysis. *J Dent.* 2021 Oct;113:103778.
18. Feijoo JF, Limeres J, Fernández-Varela M, Ramos I, Diz P. The 100 most cited articles in dentistry. *Clin Oral Investig.* 2014 Apr;18(3):699-706.
19. Simonsen RJ. Retention and effectiveness of dental sealant after 15 years. *J Am Dent Assoc.* 1991 Oct;122(10):34-42.
20. Wendt LK, Koch G, Birkhed D. On the retention and effectiveness of fissure sealant in permanent molars after 15-20 years: a cohort study. *Community Dent Oral Epidemiol.* 2001 Aug;29(4):302-7.
21. Beslot-Neveu A, Courson F, Ruse ND. Physico-chemical approach to pit and fissure sealant infiltration and spreading mechanisms. *Pediatr Dent.* 2012 May-Jun;34(3):57-61.
22. Gillings B, Buonocore M. Thickness of enamel at the base of pits and fissures in human molars and bicuspid. *J Dent Res.* 1961 Jan-Feb;40:119-33.
23. Liu BY, Lo EC, Chu CH, Lin HC. Randomized trial on fluorides and sealants for fissure caries prevention. *J Dent Res.* 2012 Aug;91(8):753-8.
24. Beslot-Neveu A, Courson F, Ruse ND. Physico-chemical approach to pit and fissure sealant infiltration and spreading mechanisms. *Pediatr Dent.* 2012 May-Jun;34(3):57-61.
25. Buonocore MG. A simple method of increasing the adhesion of acrylic filling materials to enamel surfaces. *J Dent Res.* 1955 Dec;34(6):849-53.
26. Simonsen RJ, Neal RC. A review of the clinical application and performance of pit and fissure sealants. *Aust Dent J.* 2011 Jun;56 Suppl 1:45-58.
27. Handelman SL, Shey Z. Michael Buonocore and the Eastman Dental Center: a historic perspective on sealants. *J Dent Res.* 1996 Jan;75(1):529-34.
28. Kaga M, Kakuda S, Ida Y, Toshima H, Hashimoto M, Endo K, Sano H. Inhibition of enamel demineralization by buffering effect of S-PRG filler-containing dental sealant. *Eur J Oral Sci.* 2014 Feb;122(1):78-83.

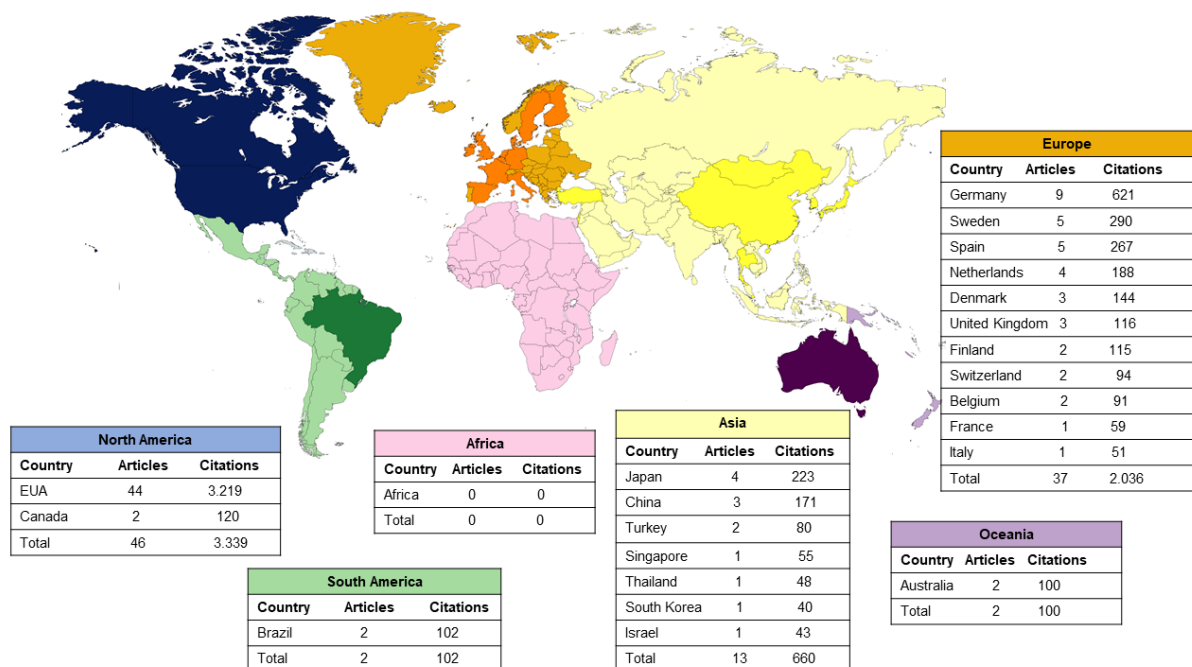
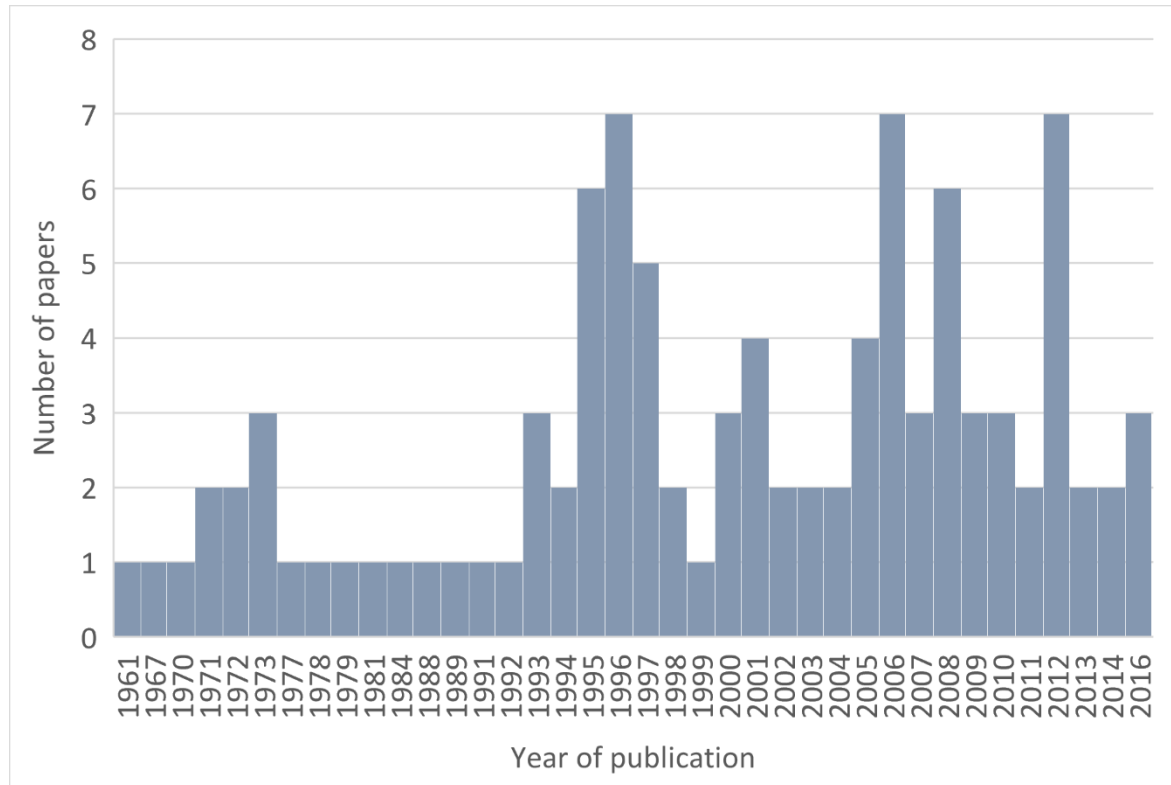
29. Zhou SL, Zhou J, Watanabe S, Watanabe K, Wen LY, Xuan K. In vitro study of the effects of fluoride-releasing dental materials on remineralization in an enamel erosion model. *J Dent.* 2012 Mar;40(3):255-63.
30. Perazzo MF, Otoni ALC, Costa MS, Granville-Granville AF, Paiva SM, Martins-Júnior PA. The top 100 most-cited papers in Paediatric Dentistry journals: A bibliometric analysis. *Int J Paediatr Dent.* 2019 Nov;29(6):692-711.
31. Schafer TE, Lapp CA, Hanes CM, Lewis JB, Wataha JC, Schuster GS. Estrogenicity of bisphenol A and bisphenol A dimethacrylate in vitro. *J Biomed Mater Res.* 1999 Jun 5;45(3):192-7.
32. Fung EY, Ewoldsen NO, St Germain HA Jr, Marx DB, Miaw CL, Siew C, Chou HN, Gruninger SE, Meyer DM. Pharmacokinetics of bisphenol A released from a dental sealant. *J Am Dent Assoc.* 2000 Jan;131(1):51-8.
33. Ionescu S, Madge OL, Robu I, Brătucu E, Daha C. Surgical Oncology in Romania: An Analysis of Research and Impact Based on Literature Search in PubMed and Web of Science. *Biomed Res Int.* 2021.

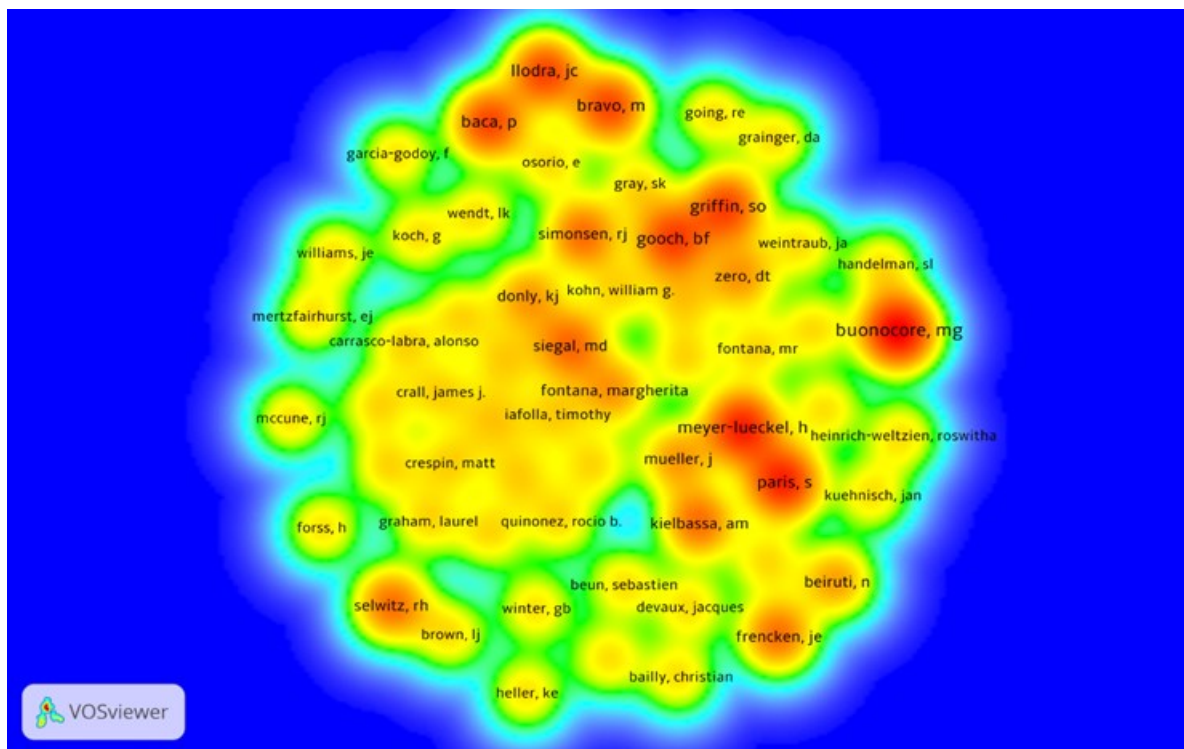
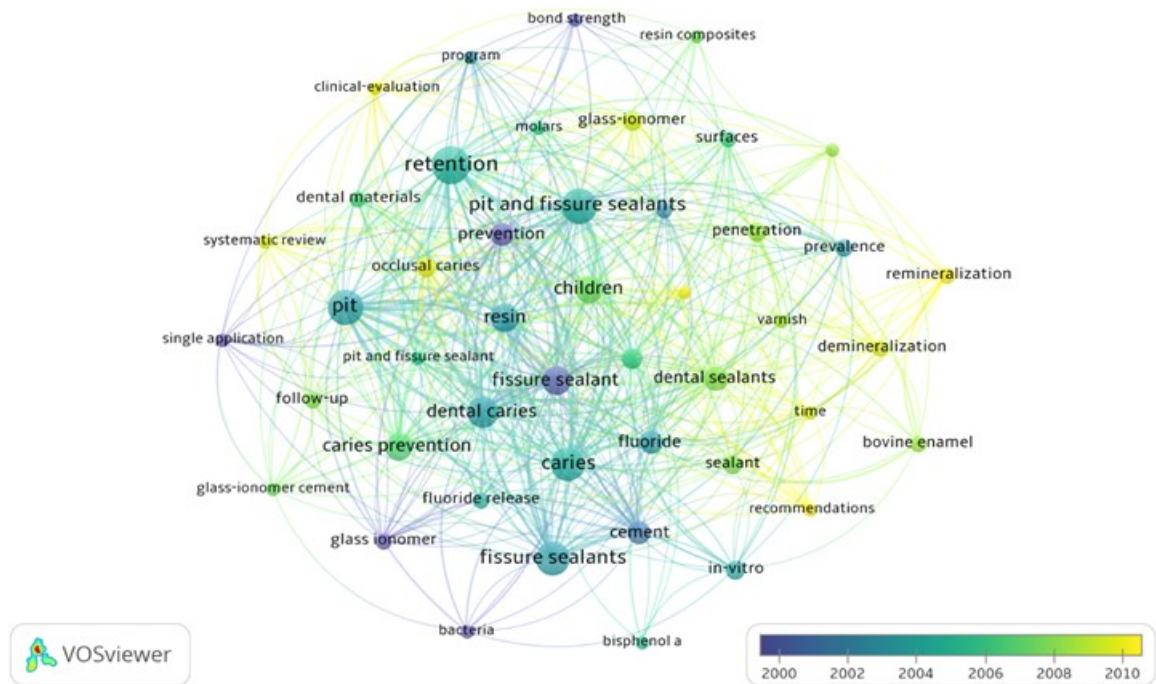
Figure 1. Distribution of the number of publications among the years.

Figure 2. Map of countries and continents present among the top 100 most cited articles.

Figure 3. Density map of most used keywords among the 100 most cited articles.

Figure 4. Density map of authors and collaborative co-authorship among them for the 100 most cited articles.





Tables

Table 1. Top 100 most cited articles on Dental Sealant.

Position	Article	Number of citations (citation density)		
		WoS Core Collection	Scopus	Google Scholar
1	Simonsen RJ. Retention and effectiveness of dental sealant after 15 years. J Am Dent Assoc. 1991 Oct;122(10):34-42.	200 (6.45)	261 (8.42)	473 (15.26)
2	Griffin SO, Oong E, Kohn W, Vidakovic B, Gooch BF; CDC Dental Sealant Systematic Review Work Group, Bader J, Clarkson J, Fontana MR, Meyer DM, Rozier RG, Weintraub JA, Zero DT. The effectiveness of sealants in managing caries lesions. J Dent Res. 2008 Feb;87(2):169-74.	186 (13.29)	225 (16.07)	422 (30.14)
3	Cueto EI, Buonocore MG. Sealing of pits and fissures with an adhesive resin: its use in caries prevention. J Am Dent Assoc. 1967 Jul;75(1):121-8.	170 (3.09)	156 (2.84)	363 (6.60)
4	Ripa LW. Sealants revisited: an update of the effectiveness of pit-and-fissure sealants. Caries Res. 1993;27 Suppl 1:77-82.	150 (5.17)	180 (6.21)	225 (7.76)
5	Buonocore M. Adhesive sealing of pits and fissures for caries prevention, with use of ultraviolet light. J Am Dent Assoc. 1970 Feb;80(2):324-30.	144 (2.77)	108 (2.08)	282 (5.42)
6	Joskow R, Barr DB, Barr JR, Calafat AM, Needham LL, Rubin C. Exposure to bisphenol A from bis-glycidyl dimethacrylate-based dental sealants. J Am Dent Assoc. 2006 Mar;137(3):353-62.	144 (9.00)	148 (9.25)	267 (16.69)
7	Buonocore MG. Caries prevention in pits and fissures sealed with an adhesive resin polymerized by ultraviolet light: a two-year study of a single adhesive application. J Am Dent Assoc. 1971 May;82(5):1090-3.	139 (2.73)	105 (2.06)	296 (5.80)
8	Mejäre I, Lingström P, Petersson LG, Holm AK, Twetman S, Källestål C, Nordenram G, Lagerlöf F, Söder B, Norlund A, Axelsson S, Dahlgren H. Caries-preventive effect of fissure sealants: a systematic review. Acta Odontol Scand. 2003 Dec;61(6):321-30.	106 (5.58)	127 (6.68)	233 (12.26)
9	Oong EM, Griffin SO, Kohn WG, Gooch BF, Caufield PW. The effect of dental sealants on bacteria levels in caries lesions: a review of the evidence. J Am Dent Assoc. 2008 Mar;139(3):271-8; quiz 357-8.	105 (7.50)	135 (9.94)	204 (14.57)
10	Gooch BF, Griffin SO, Gray SK, Kohn WG, Rozier RG, Siegal M, Fontana M, Brunson D, Carter N, Curtis DK, Donly KJ, Haering H, Hill LF, Hinson HP, Kumar J, Lampiris L, Mallatt M, Meyer DM, Miller WR, Sanzi-Schaedel SM, Simonsen R, Truman BI, Zero DT; Centers for Disease Control and Prevention. Preventing dental caries through school-based sealant programs: updated recommendations and reviews of evidence. J Am Dent Assoc. 2009 Nov;140(11):1356-65.	102 (7.85)	124 (9.54)	239 (18.38)
11	Fung EY, Ewoldsen NO, St Germain HA Jr, Marx DB, Miaw CL, Siew C, Chou HN, Gruninger SE, Meyer DM. Pharmacokinetics of bisphenol A released from a dental sealant. J Am Dent Assoc. 2000 Jan;131(1):51-8.	101 (4.59)	109 (4.95)	246 (11.18)

12	Paris S, Meyer-Lueckel H. Inhibition of caries progression by resin infiltration in situ. <i>Caries Res.</i> 2010;44(1):47-54.	101 (8.42)	116 (9.67)	248 (20.67)
13	Llodra JC, Bravo M, Delgado-Rodriguez M, Baca P, Galvez R. Factors influencing the effectiveness of sealants--a meta-analysis. <i>Community Dent Oral Epidemiol.</i> 1993 Oct;21(5):261-8.	95 (3.28)	116 (4.00)	192 (6.62)
14	Going RE, Loesche WJ, Grainger DA, Syed SA. The viability of microorganisms in carious lesions five years after covering with a fissure sealant. <i>J Am Dent Assoc.</i> 1978 Sep;97(3):455-62.	92 (2.09)	98 (2.23)	265 (6.02)
15	Wright JT, Crall JJ, Fontana M, Gillette EJ, Nový BB, Dhar V, Donly K, Hewlett ER, Quinonez RB, Chaffin J, Crespín M, Iafolla T, Siegal MD, Tampi MP, Graham L, Estrich C, Carrasco-Labra A. Evidence-based clinical practice guideline for the use of pit-and-fissure sealants: A report of the American Dental Association and the American Academy of Pediatric Dentistry. <i>J Am Dent Assoc.</i> 2016 Aug;147(8):672-682.e12.	90 (15.00)	116 (19.33)	197 (32.83)
16	Paris S, Meyer-Lueckel H, Cölfen H, Kielbassa AM. Penetration coefficients of commercially available and experimental composites intended to infiltrate enamel carious lesions. <i>Dent Mater.</i> 2007 Jun;23(6):742-8.	87 (5.80)	94 (6.27)	148 (9.87)
17	Waggoner WF, Siegal M. Pit and fissure sealant application: updating the technique. <i>J Am Dent Assoc.</i> 1996 Mar;127(3):351-61, quiz 391-2.	83 (3.19)	125 (4.81)	153 (5.88)
18	Nathanson D, Lertpitayakun P, Lamkin MS, Edalatpour M, Chou LL. In vitro elution of leachable components from dental sealants. <i>J Am Dent Assoc.</i> 1997 Nov;128(11):1517-23.	79 (3.16)	90 (3.60)	242 (9.68)
19	Kühnisch J, Mansmann U, Heinrich-Weltzien R, Hickel R. Longevity of materials for pit and fissure sealing--results from a meta-analysis. <i>Dent Mater.</i> 2012 Mar;28(3):298-303.	77 (7.70)	92 (9.20)	170 (17.00)
20	Azarpazhooh A, Main PA. Pit and fissure sealants in the prevention of dental caries in children and adolescents: a systematic review. <i>J Can Dent Assoc.</i> 2008 Mar;74(2):171-7.	76 (5.43)	89 (6.36)	168 (12.00)
21	Hamid A, Hume WR. A study of component release from resin pit and fissure sealants in vitro. <i>Dent Mater.</i> 1997 Mar;13(2):98-102.	75 (3.00)	81 (3.24)	139 (5.56)
22	Liu BY, Lo EC, Chu CH, Lin HC. Randomized trial on fluorides and sealants for fissure caries prevention. <i>J Dent Res.</i> 2012 Aug;91(8):753-8.	74 (7.40)	84 (8.40)	145 (14.50)
23	Kühnisch J, Berger S, Goddon I, Senkel H, Pitts N, Heinrich-Weltzien R. Occlusal caries detection in permanent molars according to WHO basic methods, ICDAS II and laser fluorescence measurements. <i>Community Dent Oral Epidemiol.</i> 2008 Dec;36(6):475-84.	72 (5.14)	86 (6.14)	133 (9.50)
24	Forss H, Saarni UM, Seppä L. Comparison of glass-ionomer and resin-based fissure sealants: a 2-year clinical trial. <i>Community Dent Oral Epidemiol.</i> 1994 Feb;22(1):21-4.	70 (2.50)	79 (2.82)	138 (4.93)
25	Weintraub JA. The effectiveness of pit and fissure sealants. <i>J Public Health Dent.</i> 1989;49(5 Spec No):317-30.	70 (2.12)	78 (2.36)	177 (5.36)
26	Brown LJ, Kaste LM, Selwitz RH, Furman LJ. Dental caries and sealant usage in U.S. children, 1988-1991: selected findings from the Third National Health and Nutrition Examination Survey. <i>J Am Dent Assoc.</i> 1996 Mar;127(3):335-43.	69 (2.65)	79 (3.04)	185 (7.12)
27	Cury JA, de Oliveira BH, dos Santos AP, Tenuta LM. Are fluoride releasing dental materials clinically effective on caries control? <i>Dent Mater.</i> 2016 Mar;32(3):323-33.	68 (11.30)	76 (12.67)	132 (22.00)
28	Mertz-Fairhurst EJ, Fairhurst CW, Williams JE, Della-Giustina VE, Brooks JD. A comparative clinical study of two pit and	68 (1.79)	69 (1.82)	128 (3.37)

	fissure sealants: 7-year results in Augusta, GA. J Am Dent Assoc. 1984 Aug;109(2):252-5.			
29	Meyer-Lueckel H, Paris S, Mueller J, Cölfen H, Kielbassa AM. Influence of the application time on the penetration of different dental adhesives and a fissure sealant into artificial subsurface lesions in bovine enamel. Dent Mater. 2006 Jan;22(1):22-8.	68 (4.25)	74 (4.63)	115 (7.19)
30	Kaga M, Kakuda S, Ida Y, Toshima H, Hashimoto M, Endo K, Sano H. Inhibition of enamel demineralization by buffering effect of S-PRG filler-containing dental sealant. Eur J Oral Sci. 2014 Feb;122(1):78-83.	67 (8.38)	66 (8.25)	132 (16.50)
31	Wright JT, Tampi MP, Graham L, Estrich C, Crall JJ, Fontana M, Gillette EJ, Nový BB, Dhar V, Donly K, Hewlett ER, Quinonez RB, Chaffin J, Crespín M, Iafolla T, Siegal MD, Carrasco-Labra A. Sealants for preventing and arresting pit-and-fissure occlusal caries in primary and permanent molars: A systematic review of randomized controlled trials-a report of the American Dental Association and the American Academy of Pediatric Dentistry. J Am Dent Assoc. 2016 Aug;147(8):631-645.e18.	67 (11.17)	82 (13.67)	153 (25.50)
32	Shimazu K, Ogata K, Karibe H. Evaluation of the ion-releasing and recharging abilities of a resin-based fissure sealant containing S-PRG filler. Dent Mater J. 2011;30(6):923-7.	65 (5.91)	65 (5.91)	95 (8.64)
33	Poulsen S, Beiruti N, Sadat N. A comparison of retention and the effect on caries of fissure sealing with a glass-ionomer and a resin-based sealant. Community Dent Oral Epidemiol. 2001 Aug;29(4):298-301.	63 (3.00)	78 (3.71)	123 (5.86)
34	Splieth CH, Ekstrand KR, Alkilzy M, Clarkson J, Meyer-Lueckel H, Martignon S, Paris S, Pitts NB, Ricketts DN, van Loveren C. Sealants in dentistry: outcomes of the ORCA Saturday Afternoon Symposium 2007. Caries Res. 2010;44(1):3-13.	63 (5.25)	71 (5.92)	93 (7.75)
35	Bravo M, Montero J, Bravo JJ, Baca P, Llodra JC. Sealant and fluoride varnish in caries: a randomized trial. J Dent Res. 2005 Dec;84(12):1138-43.	60 (3.53)	62 (3.65)	157 (9.24)
36	Arrow P, Riordan PJ. Retention and caries preventive effects of a GIC and a resin-based fissure sealant. Community Dent Oral Epidemiol. 1995 Oct;23(5):282-5.	59 (2.19)	74 (2.74)	136 (5.04)
37	Atkinson JC, Diamond F, Eichmiller F, Selwitz R, Jones G. Stability of bisphenol A, triethylene-glycol dimethacrylate, and bisphenol A dimethacrylate in whole saliva. Dent Mater. 2002 Mar;18(2):128-35.	59 (2.95)	57 (2.85)	141 (7.05)
38	Heller KE, Reed SG, Bruner FW, Eklund SA, Burt BA. Longitudinal evaluation of sealing molars with and without incipient dental caries in a public health program. J Public Health Dent. 1995 Summer;55(3):148-53.	59 (2.19)	79 (2.93)	123 (4.56)
39	Muller-Bolla M, Lupi-Pégurier L, Tardieu C, Velly AM, Antomarchi C. Retention of resin-based pit and fissure sealants: A systematic review. Community Dent Oral Epidemiol. 2006 Oct;34(5):321-36.	59 (3.69)	59 (3.69)	155 (9.69)
40	Paris S, Meyer-Lueckel H, Mueller J, Hummel M, Kielbassa AM. Progression of sealed initial bovine enamel lesions under demineralizing conditions in vitro. Caries Res. 2006;40(2):124-9.	58 (3.63)	65 (4.06)	91 (5.69)
41	Brown LJ, Selwitz RH. The impact of recent changes in the epidemiology of dental caries on guidelines for the use of dental sealants. J Public Health Dent. 1995;55(5 Spec No):274-91.	57 (2.11)	65 (2.41)	153 (5.67)

42	Chow LC, Brown WE. Phosphoric acid conditioning of teeth for pit and fissure sealants. <i>J Dent Res.</i> 1973 Sep-Oct;52(5):1158.	57 (1.16)	53 (1.08)	148 (3.02)
43	Mueller J, Meyer-Lueckel H, Paris S, Hopfenmuller W, Kielbassa AM. Inhibition of lesion progression by the penetration of resins in vitro: influence of the application procedure. <i>Oper Dent.</i> 2006 May-Jun;31(3):338-45.	57 (3.56)	67 (4.19)	98 (6.13)
44	Zhou SL, Zhou J, Watanabe S, Watanabe K, Wen LY, Xuan K. In vitro study of the effects of fluoride-releasing dental materials on remineralization in an enamel erosion model. <i>J Dent.</i> 2012 Mar;40(3):255-63.	57 (5.70)	64 (6.40)	107 (10.70)
45	Going RE, Haugh LD, Grainger DA, Conti AJ. Four-year clinical evaluation of a pit and fissure sealant. <i>J Am Dent Assoc.</i> 1977 Nov;95(5):972-81.	55 (1.22)	41 (0.91)	98 (2.18)
46	Mertz-Fairhurst EJ, Adair SM, Sams DR, Curtis JW Jr, Ergle JW, Hawkins KI, Mackert JR, O'Dell NL, Richards EE, Rueggeberg F, et al. Cariostatic and ultraconservative sealed restorations: nine-year results among children and adults. <i>ASDC J Dent Child.</i> 1995 Mar-Apr;62(2):97-107.	55 (2.04)	61 (2.26)	150 (5.56)
47	Tarumi H, Imazato S, Narimatsu M, Matsuo M, Ebisu S. Estrogenicity of fissure sealants and adhesive resins determined by reporter gene assay. <i>J Dent Res.</i> 2000 Nov;79(11):1838-43.	55 (2.50)	57 (2.59)	91 (4.14)
48	Beirut N, Frencken JE, van't Hof MA, Taifour D, van Palenstein Helderma WH. Caries-preventive effect of a one-time application of composite resin and glass ionomer sealants after 5 years. <i>Caries Res.</i> 2006;40(1):52-9.	54 (3.38)	64 (4.00)	125 (7.81)
49	Antonson SA, Antonson DE, Brener S, Crutchfield J, Larumbe J, Michaud C, Yazici AR, Hardigan PC, Alempour S, Evans D, Ocanto R. Twenty-four month clinical evaluation of fissure sealants on partially erupted permanent first molars: glass ionomer versus resin-based sealant. <i>J Am Dent Assoc.</i> 2012 Feb;143(2):115-22.	53 (5.30)	65 (6.50)	107 (10.70)
50	Beirut N, Frencken JE, van 't Hof MA, van Palenstein Helderma WH. Caries-preventive effect of resin-based and glass ionomer sealants over time: a systematic review. <i>Community Dent Oral Epidemiol.</i> 2006 Dec;34(6):403-9.	52 (3.25)	55 (3.44)	97 (6.06)
51	Celiberti P, Lussi A. Use of a self-etching adhesive on previously etched intact enamel and its effect on sealant microleakage and tag formation. <i>J Dent.</i> 2005 Feb;33(2):163-71.	51 (3.00)	50 (2.94)	129 (7.59)
52	Papacchini F, Goracci C, Sadek FT, Monticelli F, Garcia-Godoy F, Ferrari M. Microtensile bond strength to ground enamel by glass-ionomers, resin-modified glass-ionomers, and resin composites used as pit and fissure sealants. <i>J Dent.</i> 2005 Jul;33(6):459-67.	51 (3.00)	61 (3.59)	162 (9.53)
53	Wendt LK, Koch G. Fissure sealant in permanent first molars after 10 years. <i>Swed Dent J.</i> 1988;12(5):181-5.	51 (1.50)	62 (1.82)	97 (2.85)
54	Simonsen RJ, Neal RC. A review of the clinical application and performance of pit and fissure sealants. <i>Aust Dent J.</i> 2011 Jun;56 Suppl 1:45-58.	50 (4.55)	60 (5.45)	147 (13.36)
55	Wendt LK, Koch G, Birkhed D. On the retention and effectiveness of fissure sealant in permanent molars after 15-20 years: a cohort study. <i>Community Dent Oral Epidemiol.</i> 2001 Aug;29(4):302-7.	50 (2.38)	69 (3.29)	104 (4.95)
56	Songpaisan Y, Bratthall D, Phantumvanit P, Somridhivej Y. Effects of glass ionomer cement, resin-based pit and fissure	48 (1.78)	61 (2.26)	97 (3.59)

	sealant and HF applications on occlusal caries in a developing country field trial. <i>Community Dent Oral Epidemiol.</i> 1995 Feb;23(1):25-9.			
57	Handelman SL, Buonocore MG, Heseck DJ. A preliminary report on the effect of fissure sealant on bacteria in dental caries. <i>J Prosthet Dent.</i> 1972 Apr;27(4):390-2.	47 (0.94)	33 (0.66)	130 (2.60)
58	Beun S, Bailly C, Devaux J, Leloup G. Rheological properties of flowable resin composites and pit and fissure sealants. <i>Dent Mater.</i> 2008 Apr;24(4):548-55.	46 (3.29)	48 (3.43)	109 (7.79)
59	Williams B, Laxton L, Holt RD, Winter GB. Fissure sealants: a 4-year clinical trial comparing an experimental glass polyalkenoate cement with a bis glycidyl methacrylate resin used as fissure sealants. <i>Br Dent J.</i> 1996 Feb 10;180(3):104-8.	46 (1.77)	56 (2.15)	107 (4.12)
60	Beun S, Bailly C, Devaux J, Leloup G. Physical, mechanical and rheological characterization of resin-based pit and fissure sealants compared to flowable resin composites. <i>Dent Mater.</i> 2012 Apr;28(4):349-59.	45 (4.50)	50 (5.00)	96 (9.60)
61	Forss H, Halme E. Retention of a glass ionomer cement and a resin-based fissure sealant and effect on carious outcome after 7 years. <i>Community Dent Oral Epidemiol.</i> 1998 Feb;26(1):21-5.	45 (1.88)	62 (2.58)	174 (7.25)
62	Frazier MC, Southard TE, Doster PM. Prevention of enamel demineralization during orthodontic treatment: an in vitro study using pit and fissure sealants. <i>Am J Orthod Dentofacial Orthop.</i> 1996 Nov;110(5):459-65.	45 (1.73)	46 (1.77)	124 (4.77)
63	Tulunoğlu O, Bodur H, Uçtaşı M, Alaçam A. The effect of bonding agents on the microleakage and bond strength of sealant in primary teeth. <i>J Oral Rehabil.</i> 1999 May;26(5):436-41.	45 (1.96)	61 (2.65)	91 (3.96)
64	Bakhshandeh A, Qvist V, Ekstrand KR. Sealing occlusal caries lesions in adults referred for restorative treatment: 2-3 years of follow-up. <i>Clin Oral Investig.</i> 2012 Apr;16(2):521-9.	44 (4.40)	61 (6.10)	84 (8.90)
65	Buren JL, Staley RN, Wefel J, Qian F. Inhibition of enamel demineralization by an enamel sealant, Pro Seal: an in-vitro study. <i>Am J Orthod Dentofacial Orthop.</i> 2008 Apr;133(4 Suppl):S88-94.	44 (3.14)	51 (3.64)	128 (9.14)
66	Locker D, Jokovic A, Kay EJ. Prevention. Part 8: The use of pit and fissure sealants in preventing caries in the permanent dentition of children. <i>Br Dent J.</i> 2003 Oct 11;195(7):375-8.	44 (2.32)	55 (2.89)	77 (4.05)
67	Weerheijm KL, de Soet JJ, van Amerongen WE, de Graaff J. Sealing of occlusal hidden caries lesions: an alternative for curative treatment? <i>ASDC J Dent Child.</i> 1992 Jul-Aug;59(4):263-8.	44 (1.47)	59 (1.97)	118 (3.93)
68	Geiger SB, Gulayev S, Weiss EI. Improving fissure sealant quality: mechanical preparation and filling level. <i>J Dent.</i> 2000 Aug;28(6):407-12.	43 (1.95)	53 (2.41)	84 (3.82)
69	Handelman SL, Buonocore MG, Schoute PC. Progress report on the effect of a fissure sealant on bacteria in dental caries. <i>J Am Dent Assoc.</i> 1973 Nov;87(6):1189-91.	43 (0.88)	29 (0.59)	79 (1.61)
70	Kloukos D, Pandis N, Eliades T. In vivo bisphenol-a release from dental pit and fissure sealants: a systematic review. <i>J Dent.</i> 2013 Aug;41(8):659-67.	43 (4.78)	45 (5.00)	102 (11.33)
71	Primosch RE, Barr ES. Sealant use and placement techniques among pediatric dentists. <i>J Am Dent Assoc.</i> 2001 Oct;132(10):1442-51; quiz 1461.	43 (2.05)	42 (2.00)	112 (5.33)
72	Benham AW, Campbell PM, Buschang PH. Effectiveness of pit and fissure sealants in reducing white spot lesions during	42 (3.23)	41 (3.15)	85 (6.54)

	orthodontic treatment. A pilot study. Angle Orthod. 2009 Mar;79(2):338-45.			
73	Bravo M, Baca P, Llodra JC, Osorio E. A 24-month study comparing sealant and fluoride varnish in caries reduction on different permanent first molar surfaces. J Public Health Dent. 1997 Summer;57(3):184-6.	42 (1.68)	50 (2.00)	102 (4.08)
74	Karlzén-Reuterving G, van Dijken JW. A three-year follow-up of glass ionomer cement and resin fissure sealants. ASDC J Dent Child. 1995 Mar-Apr;62(2):108-10.	42 (1.56)	78 (2.89)	63 (2.33)
75	Hallström U. Adverse reaction to a fissure sealant: report of case. ASDC J Dent Child. 1993 Mar-Apr;60(2):143-6.	41 (1.41)	42 (1.45)	71 (2.45)
76	Messer LB, Calache H, Morgan MV. The retention of pit and fissure sealants placed in primary school children by Dental Health Services, Victoria. Aust Dent J. 1997 Aug;42(4):233-9.	41 (1.64)	52 (2.08)	56 (2.24)
77	Chen X, Du M, Fan M, Mulder J, Huysmans MC, Frencken JE. Effectiveness of two new types of sealants: retention after 2 years. Clin Oral Investig. 2012 Oct;16(5):1443-50.	40 (4.00)	44 (4.40)	64 (6.40)
78	Fontana M, Platt JA, Eckert GJ, González-Cabezas C, Yoder K, Zero DT, Ando M, Soto-Rojas AE, Peters MC. Monitoring of sound and carious surfaces under sealants over 44 months. J Dent Res. 2014 Nov;93(11):1070-5.	40 (5.00)	52 (6.50)	120 (15.00)
79	Griffin SO, Griffin PM, Gooch BF, Barker LK. Comparing the costs of three sealant delivery strategies. J Dent Res. 2002 Sep;81(9):641-5.	40 (3.08)	52 (4.00)	101 (7.77)
80	Yang SY, Piao YZ, Kim SM, Lee YK, Kim KN, Kim KM. Acid neutralizing, mechanical and physical properties of pit and fissure sealants containing melt-derived 45S5 bioactive glass. Dent Mater. 2013 Dec;29(12):1228-35.	40 (4.44)	40 (4.78)	86 (9.56)
81	Frencken JE, Wolke J. Clinical and SEM assessment of ART high-viscosity glass-ionomer sealants after 8-13 years in 4 teeth. J Dent. 2010 Jan;38(1):59-64.	38 (3.17)	45 (3.75)	88 (7.33)
82	Hannig M, Gräfe A, Atalay S, Bott B. Microleakage and SEM evaluation of fissure sealants placed by use of self-etching priming agents. J Dent. 2004 Jan;32(1):75-81.	38 (2.11)	48 (2.67)	91 (5.06)
83	Simonsen RJ. Retention and effectiveness of dental sealant after 15 years. J Am Dent Assoc. 1991 Oct;122(10):34-42.	38 (1.23)	34 (1.10)	46 (1.48)
84	Griffin SO, Griffin PM, Gooch BF, Barker LK. Comparing the costs of three sealant delivery strategies. J Dent Res. 2002 Sep;81(9):641-5.	37 (1.85)	39 (1.95)	43 (2.15)
85	Gwinnett AJ, Buonocore MG. A scanning electron microscope study of pit and fissure surfaces conditioned for adhesive sealing. Arch Oral Biol. 1972 Mar;17(3):415-23.	37 (0.74)	30 (0.60)	76 (1.52)
86	Peutzfeldt A, Nielsen LA. Bond strength of a sealant to primary and permanent enamel: phosphoric acid versus self-etching adhesive. Pediatr Dent. 2004 May-Jun;26(3):240-4.	37 (2.06)	44 (2.44)	59 (3.28)
87	Bravo M, Garcia-Anllo I, Baca P, Llodra JC. A 48-month survival analysis comparing sealant (Delton) with fluoride varnish (Duraphat) in 6- to 8-year-old children. Community Dent Oral Epidemiol. 1997 Jun;25(3):247-50.	36 (1.44)	40 (1.60)	53 (2.12)
88	Komatsu H, Shimokobe H, Kawakami S, Yoshimura M. Caries-preventive effect of glass ionomer sealant reapplication: study presents three-year results. J Am Dent Assoc. 1994 May;125(5):543-9.	36 (1.29)	42 (1.50)	60 (2.14)
89	McCune RJ, Bojanini J, Abodeely RA. Effectiveness of a pit and fissure sealant in the prevention of caries: three-year clinical results. J Am Dent Assoc. 1979 Oct;99(4):619-23.	36 (0.84)	32 (0.74)	74 (1.72)
90	McCune RJ, Horowitz HS, Heifetz SB, Cvar J. Pit and fissure sealants: one-year results from a study in Kalispell, Montana. J Am Dent Assoc. 1973 Nov;87(6):1177-80.	36 (0.73)	19 (0.39)	62 (1.27)

91	Parkhouse RC, Winter GB. A fissure sealant containing methyl-2-cyanoacrylate as a caries preventive agent. A clinical evaluation. <i>Br Dent J.</i> 1971 Jan 5;130(1):16-9.	36 (0.71)	26 (0.51)	76 (1.49)
92	Komurcuoglu E, Olmez S, Vural N. Evaluation of residual monomer elimination methods in three different fissure sealants in vitro. <i>J Oral Rehabil.</i> 2005 Feb;32(2):116-21.	35 (2.06)	36 (2.12)	44 (2.59)
93	Bhuridej P, Kuthy RA, Flach SD, Heller KE, Dawson DV, Kanellis MJ, Damiano PC. Four-year cost-utility analyses of sealed and nonsealed first permanent molars in Iowa Medicaid-enrolled children. <i>J Public Health Dent.</i> 2007 Fall;67(4):191-8.	34 (2.27)	35 (2.33)	60 (4.00)
94	Bravo M, Llodra JC, Baca P, Osorio E. Effectiveness of visible light fissure sealant (Delton) versus fluoride varnish (Duraphat): 24-month clinical trial. <i>Community Dent Oral Epidemiol.</i> 1996 Feb;24(1):42-6.	34 (1.31)	40 (1.54)	118 (4.54)
95	Flório FM, Pereira AC, Meneghim Mde C, Ramacciato JC. Evaluation of non-invasive treatment applied to occlusal surfaces. <i>ASDC J Dent Child.</i> 2001 Sep-Dec;68(5-6):326-31, 301.	34 (1.62)	39 (1.86)	108 (5.14)
96	Rock WP, Foulkes EE, Perry H, Smith AJ. A comparative study of fluoride-releasing composite resin and glass ionomer materials used as fissure sealants. <i>J Dent.</i> 1996 Jul;24(4):275-80.	34 (1.31)	48 (1.85)	95 (3.65)
97	Salar DV, García-Godoy F, Flaitz CM, Hicks MJ. Potential inhibition of demineralization in vitro by fluoride-releasing sealants. <i>J Am Dent Assoc.</i> 2007 Apr;138(4):502-6.	34 (2.27)	37 (2.47)	52 (3.47)
98	Dewji HR, Drummond JL, Fadavi S, Punwani I. Bond strength of Bis-GMA and glass ionomer pit and fissure sealants using cyclic fatigue. <i>Eur J Oral Sci.</i> 1998 Feb;106(1):594-9.	33 (1.38)	34 (1.42)	47 (1.96)
99	Gillings B, Buonocore M. Thickness of enamel at the base of pits and fissures in human molars and bicuspid. <i>J Dent Res.</i> 1961 Jan-Feb;40:119-33.	33 (0.54)	42 (0.69)	60 (0.98)
100	Selwitz RH, Winn DM, Kingman A, Zion GR. The prevalence of dental sealants in the US population: findings from NHANES III, 1988-1991. <i>J Dent Res.</i> 1996 Feb;75 Spec No:652-60.	33 (1.27)	38 (1.46)	64 (2.46)

Table 2. Top 10 journals with the highest number of articles in the list of the 100 most cited.

Source Title	Number of articles	Number of citations	Impact factor
Journal of the American Dental Association	26	2.143	3.681
Community Dentistry and Oral Epidemiology	12	683	2.489
Journal of Dental Research	9	575	8.924
Dental Materials	9	565	5.687
Journal of Dentistry	5	355	4.991
Journal of Public Health Dentistry	5	262	2.258
Journal of Dentistry for Children	5	216	0.24
Caries Research	4	426	3.918
British Dental Journal	3	126	2.727
European Journal of Oral Sciences	2	100	2.160

Table 3. Top 10 institutions with the highest number of articles among the 100 most cited.

Institution	Country	Number of articles	Number of citations
Centers for Disease Control and Prevention	USA	6	614
University of Rochester	USA	6	576
University Granada	Spain	5	267
University Med Berlin	Germany	4	270
University of Iowa	USA	3	145
Radboud University Nijmegen	Netherlands	3	144
University Munich	Germany	2	149
National Institute of Dental Research	USA	2	126
University Toronto	Canada	2	120
University Kuopio	Finland	2	115

Table 4. Top 10 authors with the highest number of articles among the 100 most cited.

Authors	Number of articles among the 100 most cited	Number of citations among the 100 most cited	Number of articles in WoS-CC	Number of citations in WoS-CC	H-Index
Buonocore, MG	7	613	38	1,223	22
Meyer-lueckel, H	6	434	132	1,793	34
Paris, S	6	434	143	2,532	39
Gooch, BF	5	470	51	1,323	21
Griffin, SO	5	470	75	1,516	21
Baca, P	5	267	70	1,017	24
Bravo, M	5	267	127	2,344	30
Llodra, JC	5	267	35	742	16
Siegal, MD	4	342	34	674	12
Kielbassa, AM	4	270	175	3,444	40

4 CONSIDERAÇÕES FINAIS

Deste modo, conclui-se que os 100 artigos mais citados relacionados à SD foram publicados principalmente por países da América do Norte, com desenhos de estudos intervencional, abordando principalmente temas relacionados à retenção e eficácia contra a cárie dental. Ainda assim, podem ser realizados mais estudos de revisões sistemáticas e meta-análises, garantindo estudos com alto nível de evidência científica e achados clínicos relevantes. O presente estudo oferece uma perspectiva histórica da evolução científica dos estudos realizados sobre SD e relata as principais tendências da pesquisa na prática clínica.

REFERÊNCIAS

AHMAD, P., VINCENT ABBOTT, P., KHURSHEED ALAM, M., & AHMED ASIF, J. (2020). A bibliometric analysis of the top 50 most cited articles published in the Dental Traumatology. *Dental traumatology : official publication of International Association for Dental Traumatology*, 36(2), 89–99. <https://doi.org/10.1111/edt.12534>.

AHMAD P, DUMMER PMH, NOORANI TY, ASIF JA (2019). Os 50 artigos mais citados publicados no *International Endodontic Journal*. *Revista Internacional de Endodontia* 52, 803–18.

AHOVUO-SALORANTA, A., FORSS, H., WALSH, T., NORDBLAD, A., MÄKELÄ, M., & WORTHINGTON, H. V. (2017). Pit and fissure sealants for preventing dental decay in permanent teeth. *The Cochrane database of systematic reviews*, 7(7), CD001830. <https://doi.org/10.1002/14651858.CD001830.pub5>.

ALMOTAIRY, N. (2023). International trends of orthodontic publications: A bibliometric observational study of the last decade (2011-2020). *Dental press journal of orthodontics*, 28(1), e2321175. <https://doi.org/10.1590/2177-6709.28.1.e2321175.oar>.

BEAUCHAMP, J., CAUFIELD, P. W., CRALL, J. J., DONLY, K., FEIGAL, R., GOOCH, B., ISMAIL, A., KOHN, W., SIEGAL, M., SIMONSEN, R., & AMERICAN DENTAL ASSOCIATION COUNCIL ON SCIENTIFIC AFFAIRS (2008). Evidence-based clinical recommendations for the use of pit-and-fissure sealants: a report of the American Dental Association Council on Scientific Affairs. *Journal of the American Dental Association* (1939), 139(3), 257–268. <https://doi.org/10.14219/jada.archive.2008.0155>.

BUTERA, A., MAIORANI, C., NATOLI, V., BRUNI, A., COSCIONE, C., MAGLIANO, G., GIACOBBO, G., MORELLI, A., MORESSA, S., & SCRIBANTE, A. (2020). Bio-Inspired Systems in Nonsurgical Periodontal Therapy to Reduce Contaminated Aerosol during COVID-19: A Comprehensive and Bibliometric Review. *Journal of clinical medicine*, 9(12), 3914. <https://doi.org/10.3390/jcm9123914>.

BROMO, F., GUIDA, A., SANTORO, G., PECIAROLO, M. R., & ERAMO, S. (2011). Pit and fissure sealants: review of literature and application technique. *Minerva stomatologica*, 60(10), 529–541.

BRAVO, M., GARCIA-ANLLO, I., BACA, P., LLODRA, J.C. (1997). A 48-month survival analysis comparing sealant (Delton) with fluoride varnish (Duraphat) in 6- to 8-year-old children. *Community Dent Oral Epidemiol*, 25(3):247-250. doi:10.1111/j.1600-0528.1997.tb00935.x.

BRAVO, M., MONTERO, J., BRAVO, J.J., BACA, P., LLODRA, J.C. (2005) Sealant and fluoride varnish in caries: a randomized trial. *J Dent Res*, 84(12):1138-1143. doi:10.1177/154405910508401209.

CAMACHO, E., DRAGOTAKES, Q., HARTSHORN, I., CASADEVALL, A., BUCCINO, D.L. (2023). Civilidade científica e desempenho acadêmico. *bioRxiv* [Preprint], 27:2023.01.26.525747. DOI: 10.1101/2023.01.26.525747. PMID: 36747626; PMCID: PMC9900961.

CELESTE, R.K., BROADBENT, J.M., MOYSES, S.J. (2016). Half-century of Dental Public Health research: bibliometric analysis of world scientific trends. *Community Dent Oral Epidemiology*, 44:557-563.

COLOMBO, S., & BERETTA, M. (2018). Dental Sealants Part 3: Which material? Efficiency and effectiveness. *European journal of paediatric dentistry*, 19(3), 247–249. <https://doi.org/10.23804/ejpd.2018.19.03.15>.

CHIANG, H. S., TSAI, Y. C., HUANG, R. Y., WENG, P. W., MAU, L. P., NGUYEN, T. T., COCHRAN, D. L., SUNG, C. E., CHUNG, C. H., SHIEH, Y. S., & CHENG, W. C. (2020). Características de citação de artigos H-Classics em implantodontia: uma análise de citações usando o método H-Classics. *Revista Internacional de Implantes Bucomaxilofaciais*, 35(5), 900–909. <https://doi.org/10.11607/jomi.8129>.

CHEN X, DU MQ, FAN MW, MULDER J, HUYSMANS MC, FRENCKEN JE (2012). Caries-preventive effect of sealants produced with altered glass-ionomer materials, after 2

years. *Dent Mater*, 28(5):554-60. <http://dx.doi.org/10.1016/j.dental.2012.01.001>. PMID:22300651.

CHOUDHRI, A. F., SIDDIQUI, A., KHAN, N. R., & COHEN, H. L. (2015). Understanding bibliometric parameters and analysis. *Radiographics : a review publication of the Radiological Society of North America, Inc*, 35(3), 736–746. <https://doi.org/10.1148/rg.2015140036>.

DONTHU, N., KUMAR, S., & PATTNAIK, D. (2020). Forty-five years of *Journal of Business Research*: A bibliometric analysis. *Journal of business research*, 109, 1-14.

DESAI H, STEWART CA, FINER Y. (2021) Minimally Invasive Therapies for the Management of Dental Caries-A Literature Review. *Dent J (Basel)*, 7;9(12):147. Doi: 10.3390/dj9120147. PMID: 34940044; PMCID: PMC8700643.

DONTHU, N., KUMAR, S., PANDEY, N., & LIM, W. M. (2021a). Research constituents, intellectual structure, and collaboration patterns in *Journal of International Marketing*: An analytical retrospective. *Journal of International Marketing*. Available at doi: 10.1177/1069031X211004234 (in press).

FARDI A, KODONAS K, GOGOS C, ECONOMIDES N. (2011) Top-cited articles in endodontic journals. *J Endod*, 37(9):1183-90. doi: 10.1016/j.joen.2011.05.037. Epub 2011 Jul 20. PMID: 21846531.

FEIJOO, J. F., LIMERES, J., FERNÁNDEZ-VARELA, M., RAMOS, I., & DIZ, P. (2014). The 100 most cited articles in dentistry. *Clinical oral investigations*, 18(3), 699–706. <https://doi.org/10.1007/s00784-013-1017-0>.

GARFIELD, E. (2019) What is a citation classic? <http://garfield.library.upenn.edu/classics.html>. Accessed October 11.

GRILLO R. (2021). Orthognathic Surgery: A Bibliometric Analysis of the Top 100 Cited Articles. *Journal of oral and maxillofacial surgery : official journal of the American Association of Oral and Maxillofacial Surgeons*, 79(11), 2339–2349. <https://doi.org/10.1016/j.joms.2021.06.004>.

GOEBEL, M. C., ROCHA, A. O., SANTOS, P. S., BOLAN, M., MARTINS-JÚNIOR, P. A., SANTANA, C. M., & CARDOSO, M. (2023). A bibliometric analysis of the top 100 most-cited papers concerning dental fluorosis. *Caries research*, 10.1159/000530831. Advance online publication. <https://doi.org/10.1159/000530831>.

GÓRSKI, A., ZIMECKI, M., & KROTKIEWSKI, H. (2021). Journal Impact Factor and Self-Citations. *Archivum immunologiae et therapiae experimentalis*, 69(1), 21. <https://doi.org/10.1007/s00005-021-00621-w>.

HILGERT, L.A., LEAL, S.C., FREIRE, G.M.L., MULDER, J., FRENCKEN, J.E. (2017) 3-year survival rates of retained composite resin and ART sealants using two assessment criteria. *Braz Oral Res*, 31:e35. Published 2017 May 4. doi:10.1590/1807-3107BOR-2017.vol31.0035. KAMMER PV, MORO JS, MARTINS-JÚNIOR PA, CARDOSO M, BOLAN M, SANTANA CM. (2021). The 100 most-cited papers in dentistry for individuals with neurodevelopmental disorders: Bibliometric profile of scientific research. *Spec Care Dentist*,1. doi: 10.1111/scd.12684. Epub ahead of print. PMID: 34856008.

KHAN AS, SEU REHMAN S, AHMAD S, ALMAIMOUNI YK, ALZAMIL MAS, DUMMER PMH. (2021). Cinco décadas do International Endodontic Journal: panorama bibliométrico 1967-2020. *Int Endod J*, 54(10):1819-1839. DOI: 10.1111/iej.13595. Epub 2021 26 jul. PMID: 34196006.

KOLAH J, KHAZAEI S (2016) Altmetric: top 50 artigos odontológicos em 2014. *Jornal Odontológico Britânico* 220, 569–74.

KUMAR S (2016). Structure and Dynamics of Signed Citation Networks. In: *Proceedings of the 25th International Conference Companion on World Wide Web—WWW '16 Companion*. ACM Press.

KULKARNI AV, AZIZ B, SHAMS I, BUSSE JW. (2009). Comparisons of citations in Web of Science, Scopus, and Google Scholar for articles published in general medical journals. *JAMA*, 302(10):1092–6. [https://doi.org/10.1001/jama.2009.1307\[PubMed\]0098-7484](https://doi.org/10.1001/jama.2009.1307[PubMed]0098-7484).

LASCALA NT. (1997). *Prevenção na Clínica Odontológica – Promoção da Saúde Bucal*, Artes Médicas, São Paulo: 93.

MCDONALD RE, AVERY DR, DEAN JA. (2004). *Dentistry for the Child and Adolescent*. 8th ed., Mosby, St.Louis: 214.

MICKENAUTSCH S, YENGOPAL V (2011). Caries-preventive effect of glass ionomer and resin-based fissure sealants on permanent teeth: An update of systematic review evidence. *BMC Res Notes*, 4(1):22. <http://dx.doi.org/10.1186/1756-0500-4-22>. PMID:21276215.

OLIVEIRA, DC (2015). *Métodos Preventivos em primeiro molar permanente de crianças com experiência de cárie dentária: estudo clínico comparativo / Preventivemethods in permanente firstmolarsofchildrenwith caries experience: clinicalcomparativestudy* [Tese em Doutorado]. Araçatuba: Faculdade de Odontologia de Araçatuba, da Universidade Estadual Paulista.

ORGANIZACAO MUNDIAL DA SAÚDE (OMS). (2022). *Dia Mundial da Saúde oral*. Genebra: OMS, Disponível em: www.afro.who.int/pt/regional. Acessado em: jun.2022.

PARDI V, PEREIRA AC. Selantes de fissuras. *In: Pereira AC. (2003) Odontologia em Saúde Coletiva: planejando ações e promovendo saúde*, Artmed, Porto Alegre: 287-299.

RAMESH, H., ASHOK, R., RAJAN, M., BALAJI, L., & GANESH, A. (2020). Retention of pit and fissure sealants versus flowable composites in permanent teeth: A systematic review. *Heliyon*, 6(9), e04964. <https://doi.org/10.1016/j.heliyon.2020.e04964>.

RIBEIRO-LAGES, M. B., JURAL, L. A., MAGNO, M. B., VICENTE-GOMILA, J., FERREIRA, D. M., FONSECA-GONÇALVES, A., & MAIA, L. C. (2021). A world panorama of bruxism in children and adolescents with emphasis on associated sleep features: A bibliometric analysis. *Journal of oral rehabilitation*, 48(11), 1271–1282. <https://doi.org/10.1111/joor.13249>.

SARTI CS (2015). *Selamento de lesões cariosas proximais em molares decíduos com infiltrante resinoso: estudo clínico controlado de boca dividida / Sealingof proximal carious lesions in*

primary molars with resin infiltrating: controlled clinical study of split-mouth [Dissertação de Mestrado]. Porto Alegre: Faculdade Federal do Rio Grande do Sul.

SHADGAN, B., ROIG, M., HAJGHANBARI, B., & REID, W. D. (2010). Artigos mais citados em reabilitação. *Arquivos de medicina física e reabilitação*, 91(5), 806–815. <https://doi.org/10.1016/j.apmr.2010.01.011>.

SHEHANI A F, PONRAJ S, RAMAR K, A VS, S R, J G (2023). Non-pharmacological Behavior Management Techniques in Pediatric Dentistry: A Bibliometric Analysis. *Cureus*, 3;15(7):e41329. doi: 10.7759/cureus.41329. PMID: 37539414; PMCID: PMC10396316.

SCHWIMMER, Y., BEYTH, N., RAM, D., MIJIRITSKY, E., & DAVIDOVICH, E. (2020). Laser Tooth Preparation for Pit and Fissure Sealing. *International journal of environmental research and public health*, 17(21), 7813. <https://doi.org/10.3390/ijerph17217813>.

SIMONSEN, R.J. (1991). Retention and effectiveness of dental sealant after 15 years. *J Am Dent Assoc*, 122(10):34-42.

TANNER, L., CRAIG, D., HOLMES, R., CATINELLA, L., MOYNIHAN, P. (2022). A cárie dentária aumenta o risco de desnutrição em crianças? *JDR Pesquisa Clínica e Translacional*, 7(2):104–117. DOI: 10.1177/23800844211003529.

TANG, KY., TSAI, CC. & LIN, TC (2014). Contemporary intellectual structure of CSCL research (2006–2013): a co-citation network analysis with an education focus. *Intern. J. Comput.-Support. Collab. Learn.* 9, 335–363.

TONIAL, F.G., MAGNABOSCO C, PAVINATO LCB, BERVIAN J, ORLANDO F. (2015). Impacto da doença cárie na qualidade de vida de pré-escolares atendidos na clínica da Universidade de Passo Fundo (UPF/RS). *Arq Odontol*, 1(51):247-253.

VITALI, F. C., PIRES, K. M., CARDOSO, I. V., OLIVEIRA, E. V., BOLAN, M., MARTINS JÚNIOR, P. A., & CARDOSO, M. (2022). Endodontic therapy in primary teeth: a bibliometric

analysis of the 100 most-cited papers. *Brazilian oral research*, 36, e049.
<https://doi.org/10.1590/1807-3107bor-2022.vol36.0049>.

WRIGHT, J. T., CRALL, J. J., FONTANA, M., GILLETTE, E. J., NOVÝ, B. B., DHAR, V., DONLY, K., HEWLETT, E. R., QUINONEZ, R. B., CHAFFIN, J., CRESPI, M., IAFOLLA, T., SIEGAL, M. D., TAMPI, M. P., GRAHAM, L., ESTRICH, C., & CARRASCO-LABRA, A. (2016). Evidence-based clinical practice guideline for the use of pit-and-fissure sealants: A report of the American Dental Association and the American Academy of Pediatric Dentistry. *Journal of the American Dental Association* (1939), 147(8), 672–682.e12.
<https://doi.org/10.1016/j.adaj.2016.06.001>.

WHO. The World Oral Health report 2022. Disponível em:
<https://www.who.int/team/noncommunicable-diseases/global-status-report-on-oral-health-2022> Date accessed: November 28, 2022.

ZHAO, Q., & FENG, X. (2022). Utilizing citation network structure to predict paper citation counts: A deep learning approach. *Journal of Informetrics*, 16(1), 101235.

APÊNDICE – Artigo suplementar

Este manuscrito foi submetido para a revista Oral Diseases.

Trends of publications that analyze YouTube™ content related to dentistry:

Bibliometric review

Running title: Posting trend on YouTube in Dentistry

Keywords: YouTube, dentistry, dental science, oral medicine

Melissa Santos da Silva Simões Ramos¹, Aurélio de Oliveira Rocha¹, Lucas Menezes dos Anjos¹, Carla Miranda Santana², Mariane Cardoso²

1 Postgraduate Program of Dentistry, Federal University of Santa Catarina, Florianopolis (Santa Catarina), Brazil.

2 Department of Dentistry, Federal University of Santa Catarina, Florianopolis (Santa Catarina), Brazil.

Corresponding Author

Melissa Santos da Silva Simões Ramos

ORCID: <https://orcid.org/0000-0002-5159-2136>

Postgraduate Program of Dentistry

Federal University of Santa Catarina

Campus Universitário - Bloco H - Trindade

Florianopolis, Santa Catarina, 88040-900, Brazil

Phone: +55 21 9 8124-6772

E-mail: melissasimoesramos@gmail.com

Date of submission: 07.26.2023

ABSTRACT

Objective: Was to analyze the main characteristics of articles related to YouTube videos about dentistry. **Materials and Methods:** The research was performed in April of 2023 on the Web of Science. Articles related to YouTube videos and dentistry were included and editorials were excluded. Two researchers selected the articles and extracted: number of citations; year and journal of publication; study design and theme; authorship and institutions; country and continent. Bibliometric maps were generated with VOSviewer. **Results:** The search resulted in 191 articles, of which 130 were included. Articles were published between 2011 and 2023. The most common study design was observational (n=124). The most prevalent theme was orthodontics (n=22). Buyuk SK was the author with the most articles (n=6). University of Hong Kong stood out (n=8). The country with the most articles was Turkey (n=48) and the continent was Asia (n=88). VOSviewer demonstrated collaboration between authors. **Conclusions:** This trend analysis demonstrated with orthodontics being the predominant theme with most of the studies published in Turkey. Thus, there is a need for systematic reviews and clinical trials, in addition to encouraging more publications on this topic in Africa, Oceania, and South America. **Keywords:** YouTube, dentistry, dental science, oral medicine

Introduction

Currently, with the advancement and popularization of social media, the world's population enjoys easy access to these various types of information via internet (Kirik et al., 2015). Within this vast variety of subjects, one also finds a large amount of health-related content (Simsek et al., 2020). In the past, information about Dentistry was mainly obtained through face-to-face consultations with qualified specialists in the field (Joseph et al., 2021). However, nowadays, with the widespread use of the internet in all spheres of life in developed countries, it has become increasingly common for people to appeal to online resources to gain access to information (Cesur et al., 2020).

Although the frequency in which people look for health-related information on the internet may vary according to factors such as age, habits and location, reports indicate that up to 75% of people appeal to the internet for this purpose (Nason et al., 2015). Health-related content made available on social media is often used not only to inform patients but also to educate students (Green et al., 2010). It has been found that various educational approaches, especially through social media platforms such as Wikipedia, YouTube™ and Facebook, are frequently used by dentists and healthcare professionals as sources of information (Vance et al., 2009). However,

this content should be viewed with caution, since its development is not limited to professionals and can be done by everyone and may contain information without scientific evidence (Leong et al., 2018).

YouTube™ is the largest and most popular video hosting platform, it is a free sharing service that is currently the second largest search engine after Google (Cesur et al., 2020). YouTube™ offers all users the opportunity to upload, watch and share videos, and the website often includes content such as video clips, television content, music videos, vlogs (video blogs), short original videos and educational videos (Basch et al. al., 2020). On this platform, both amateurs and professionals can produce content, have their own channel and communicate with each other through comments (Mutlu et al., 2017).

Although this subject is being widely studied, to the best of our knowledge, no bibliometric analysis on YouTube™ and dentistry has been published so far (Agarwal et al., 2016). Bibliometric analysis is part of scientific mapping. It extracts quantitative data from the publication, involving measurements of articles, countries, authors, journals and, mainly, the text, extracting characteristics of selected studies related to the subject (Reuters et al., 2008). The results can be used to examine the history and trends of research on YouTube™ and Dentistry and contribute with the direction of future research for the subject (Shamszadeh et al., 2019). This approach will help researchers to direct the development of under-investigated areas and allow advances in knowledge on the subject to make more efficient decisions related to the use of videos on YouTube™ related to Dentistry. Therefore, the present bibliometric study aimed to present a global overview of works from journals on YouTube™ videos and Dentistry.

Methodology

Electronic research was performed on April 8th, 2023, in the Web of Science Core Collection (WoS-CC) database (<https://www.webofscience.com>). To select the articles, the following search strategy was applied: [ALL= ((YouTube AND odontolog*) OR (YouTube AND dentistry) OR (YouTube AND “dental science”) OR (YouTube AND “oral medicine”))]. To delimit the search strategy, Medical Subject Headings (MeSH), synonyms and relevant terms on YouTube and dentistry were considered. In addition, a librarian was consulted to define a complete and reliable strategy. No filters, date or language restrictions were applied.

The articles were selected by three independent researchers (MSSSR, LMA and AOR) by reading the title, abstract and, when necessary, full text. Disagreements were resolved by

contacting a fourth researcher (MC). Conference papers, editorials and studies in which YouTube™ was not associated with research in dentistry were excluded.

The following bibliometric data were extracted from each article: title; contributing authors; year and journal of publication; journal impact factor in 2021 (Journal Citation Reports from Clarivate Analytics™), number and density of citations; institution, country, and continent of origin (based on corresponding author affiliation); key words; study design and subject. The study design was classified as follows: systematic reviews, literature reviews, observational and interventional. Considering the subject of the study, the works were grouped according to the most prevalent subjects related to dental specialties and the main objective of the study. Objectives little addressed or studies that were not associated with a dental specialty were classified as “other”. All data included were transferred to a spreadsheet in Microsoft Excel® 2010 (Microsoft, Redmond, WA, USA) to perform the categorization.

The Visualization of Similarities Viewer software (VOSviewer, version 1.6.17.0, The Netherlands) was used to create an illustrative representation of bibliometric networks, identifying connections between authors, as well as the most frequent keywords (only keywords with at least three occurrences were included). In the network analysis, the terms corresponding to the biggest focus and sources showed a higher occurrence or correlation between the terms. On the other hand, how much smaller is the focus, smaller is the occurrence of the associated terms. Additionally, Google Trends was used to investigate the global popularity of the dentistry query in the YouTube™ video category.

For data analysis, the statistical software SPSS for Windows (SPSS, version 24.0; IBM, Armonk USA Corp) was used. The Kolmogorov-Smirnov test was used to check the normality of data distribution, which showed non-normal distribution. Thus, the Spearman correlation coefficient test was used. Spearman's correlation was applied to determine whether there was a correlation between the number of citations and the year of publication.

Results

Search results

The main search, carried out in WoS-CC, retrieved 191 documents. Of these documents, four conferences, two editorials and 61 that did not address the proposed objective were excluded. Thus, 130 documents were included in this bibliometric analysis, which are listed in Supplementary table 1.

Citation analysis

The selected articles received a total of 1,379 citations in WoS-CC. Self-citations represented 41.54% (n=575). Written by Hassona Y and collaborators, the most cited article (106 citations) in WoS-CC was “YouTube as a source of information on mouth (oral) cancer”, a cross-sectional study, published in the journal Oral Diseases.

Publication year

The oldest article was published in May 2011, entitled “Informational value and bias of videos related to orthodontics screened on a video-sharing Web site”, by Knosel M, published in Angle Orthodontist. Published in March 2023, the most recent article was: “YouTube as an information source in pediatric dentistry education: Reliability and quality analysis”, authored by Uzel I and collaborators, published in Plos one. The largest number of articles (88%) were published between 2020-2022. The description of the number of publications each year can be seen in Supplementary Figure 1. According to Spearman's correlation, there was a strong negative correlation between citation number and year of publication ($\rho=-771$)

Journals and impact factors

The main journals and respective impact factors (2021) in which articles on YouTube™ and Dentistry were published are shown in Supplementary table 2. The Journal of Dental Education, with eight articles (6.15%), was the journal that most published studies related to YouTube™ and Dentistry, followed by the American Journal of Orthodontics and Dentofacial Orthopedics (3.84%) and International Journal of Dental Hygiene (3.84%). According to the Journal Citation Reports, the journals with the highest impact factors (IF) in 2021 linked to this study were: Journal of Medical Internet Research (IF 7077) with an article “Dental Fear and Anxiety in Children and Adolescents: Qualitative Study Using YouTube” and Clinical Oral Implants Research (IF 5.021) with an article “Social media patient testimonials in implant dentistry: information or misinformation?”.

Study design and theme

Most articles dealt with observational studies (96.92%), followed by systematic review (1.5%), randomized clinical trial (1.5%) and literature review (0.8%). Most studies addressed the theme “quality of video content” (93.84%), followed by “teaching tool for students” (2.3%), “patient-centered outcome” (2.3%), and “others” (1.53%). Regarding the most discussed specialties, they were about “Orthodontics” (16.92%), “Pediatric Dentistry” (11.53%), “Oral Surgery” (9.23%), “Stomatology” (6.15%), “ Implant Dentistry” (5.38%) "Dentistry" (4.61%), "Oral Pathology" (4.61%), "Periodontics" (4.61%), "Radiology" (3.07%), " Collective Health" (3.07%) “Facial Harmonization” (1.53%), “Patients with special needs” (1.53%), “Sports

Dentistry” (0.77%), “Oral and maxillofacial prosthesis ” (0.77%), “Dental prosthesis” (0.77%), the others (25.45%) were not associated with a specialty.

countries and continents

A total of 30 countries contributed to articles related to YouTube™ and Dentistry. Considering the number of publications per country, the top five were: Turkey with 48 articles (36.92%); Saudi Arabia with 9 articles (6.92%); United Kingdom with 8 articles (6.15%); United States with 7 articles (5.38%) and Italy with 5 articles (3.84%). Among the continents with the most articles (Figure 1), Asia (67.69%) (For the location of Turkey, the Asian continent was considered, due to the territorial range it is on that continent), followed by Europe (18.46%), followed by North America (6.9%), South America (3 .07%), Oceania (0.77%) and Africa (0.77%).

Contributing Institutions

A total of 86 institutions contributed to articles related to YouTube™ and Dentistry. The Supplementary table 3 shows the 10 institutions with the highest number of publications. The first three positions belong to the University of Hong Kong (China) with 8 articles (6.15%), the University of Beykent (Turkey) with 6 articles (4.61%) and the University of Ege (Turkey) with 5 articles (3.84%).

Key words

A total of 406 keywords were identified. The most prevalent was “YouTube” (51 occurrences), followed by “social media” (41 occurrences), “information” (37 occurrences) and “internet” (29 occurrences). Figure 2 shows the most prevalent keywords and the relationship between them. The keywords that correspond to the biggest focuses and that appear written with highlighted font are the words that had the highest occurrence, on the other hand, the words that appear in the smallest focuses had less occurrence. The keywords that are connected by the bibliometric networks are terms that showed a relationship between the studies.

Contributing Authors

A total of 446 authors contributed to articles on YouTube™ and Dentistry. Table 1 shows the top 10 authors with the highest number of publications. With 6 articles Buyuk SK was the author with the highest number of publications (4.61%), followed by Gas S and Romano AN with 5 and 4 articles each (3.84%; 3.07%). The frequency with which they appear and the co-authorship relationship between them is represented in supplementary

Figure 2. The most frequent authors are represented by larger circles and authors with less frequency are represented by smaller circles. The interrelation between authors and groups of

authors are represented by the union of lines, demonstrating collaboration networks, with authors with older publications represented in blue and authors with more up-to-date publications represented by coloring in yellow.

Discussion

This trend analysis, to the best of our knowledge, is the first bibliometric study to identify and discuss articles related to YouTube™ videos and Dentistry, through a quali-quantitative approach. These studies were published mainly by the Asian continent, originating mainly in Türkiye. The most discussed subject in these studies found was about the quality of YouTube videos through observational studies.

The database used for the main research in the present study was the WoS-CC. This choice was made due to its quality, with important, peer-reviewed and internationally published journals. In comparison, Google Scholar has a broader coverage of documents, including non-peer-reviewed studies such as books, book chapters, and monographs. This may compromise the search for relevant studies. On the other hand, although Scopus has the largest number of indexed journals, its retrieval of studies is limited from 1996 onwards (Jafarzadeh et al., 2015). Articles that reach more than 100 citations in a specific area can be recognized as classics (Feijoo et al., 2014). Thus, with 106 citations, the most cited article in this study stands out (Hassona et al., 2016). This research examined the content of YouTube™ videos about oral (oral) cancer and evaluated their usefulness in promoting early detection of oral cancer. This fact can be explained because oral cancer is the sixth most common malignant neoplasm in the world. Despite recent advances in cancer diagnostics and therapies, the 5-year survival rate of patients with oral cancer has remained at 50% in recent decades (Kumar et al., 2016). Therefore, due to its high prevalence and risk to the population, this subject is the subject of intense scientific research, making studies with this theme highly cited.

Among the articles included in this bibliometric analysis, 93.84% evaluated the quality of the video content. According to Mangan et al. (2020) the information available on YouTube™, are extremely divergent from each other considering the scientific quality, as they are disseminated without any quality control over the content. Most of these studies were related to orthodontics. This fact may be associated with the high worldwide prevalence of malocclusion, of 56%, in addition to the high aesthetic perspective of individuals seeking orthodontic treatment, exponentially increasing the number of the population wearing orthodontic apparatus (Lena et al, 2018; Lombardo et al., 2020). According to most views of YouTube™ videos are people who do not have higher education and past information is not

reviewed or validated (Uzel et al., 2023). In this way, patients may find it difficult to determine which videos are reliable and which videos would bring true information about the researched subjects.

The oldest article was published by Knosel et al. (2011) and mainly addressed the informational value, intention, source and bias of videos related to Orthodontics displayed by YouTube. According to Nason et al. (2015), many patients seek additional information about their orthodontic treatments and turn to YouTube as a reference source. On YouTube, visual content is prioritized, unlike scientific platforms aimed at professionals. However, it is important to question the validity of the information available on YouTube due to the ease of sharing videos and the lack of standardization of the content of these videos.

The most prominent author in this review was Buyuk SK, with the highest number of publications and citations. In fact, Buyuk SK stood out in the research on YouTube™ and Dentistry, presenting topics related to orthodontics, dentistry, surgery and periodontics, in addition to addressing the quality of the content of the videos. The second featured author in this review was Gas S, addressing mainly cross-sectional studies on content quality of YouTube™ videos and Dentistry.

The journal with the highest number of contributions in this bibliometric analysis was The Journal of Dental Education, a peer-reviewed monthly journal that publishes a wide range of educational and scientific research in dentistry and advanced dental education. The second most relevant journal was the American Journal of Orthodontics and Dentofacial Orthopedics, considered one of the main international journals in the field of Orthodontics. Both journals comprise highly relevant studies on YouTube™ and Dentistry, with a high number of citations, thus being understood and used as references to alert clinicians about the reliability of the content covered in the videos and for researchers in the interpretation of data and conducting research.

The study design with the highest prevalence among the most cited were cross-sectional studies, followed by systematic review and randomized clinical trial, being addressed. Unlike other bibliometric analyzes already published in the literature (Goebel et al., 2022; Rocha et al., 2023), this trend analysis highlighted cross-sectional studies. This fact can be justified due to the relatively simple analysis performed on the content of videos on YouTube™ about dentistry, facilitating the performance of this type of study (Jung et al., 2022).

According to Romano A et al. (2022), a systematic review tries to gather evidence to answer a specific research question. Because they summarize the outcomes of all original studies on a

given topic, systematic reviews are usually considered high-quality evidence. However, only two systematic reviews were identified. That said, systematic reviews on YouTube™ and Dentistry addressed the reliability of Youtube™ in relation to content related to social media and Orthodontics from the patient's perspective and on oral pathology items to highlight all the pros and cons related to this medium of scientific dissemination.

Asia was the most prevalent continent in this trend analysis, with Turkey being the most prevalent country. Great changes in the history of modern Turkey began in 1923 with the founding of the Turkish Republic. In 1935, approximately 81.5% of the adult population was illiterate. Over the years and the development of the country, the literacy rate has increased dramatically to almost 96%. Turkey has also made substantial developments in research and development (R&D) in recent years. Regarding the number of scientific publications, Turkey's position in the world ranking increased from 20th in 2006 to 18th in 2015. Likewise, R&D expenditure increased from 2.3 billion USD in 2006 to 6.3 billion USD in 2015 (Abbott et al., 2016).

Among the institutions, Beykent University stands out, which obtained merit in this study for being one of the institutions with the most articles among the most cited, such information is associated with prominent authors who are part of this center (Knoesel M and Burns L). Beykent University, also located in Turkey, was highlighted in this study, this fact can be justified because Gas S (one of the most frequent authors) is associated with this institution.

Among the strengths of this trend analysis, we can mention the thorough analysis of the main characteristics of all YouTube™ videos with content on Dentistry without restriction of year, publication or language. With this, the countries, continents and institutions that have driven scientific research on this subject are evident, thus providing scientific progress in this category. As a limitation of this study, the only use of the WoS-CC database can be cited, as there are other bibliometric databases available such as Scopus and Google Scholar. Based on other important bibliometric analyzes in dentistry (Perazzo et al., 2019; Mattos et al., 2021; Rocha et al., 2023), it was decided to use only WoS-CC, as this database is widely recommended and used for this type of study (Vélez-Estevez et al., 2023).

Therefore, it is concluded that articles related to YouTube™ videos and dentistry in WoS-CC were published mainly by countries in Asia, with emphasis on Turkey, with a predominance of observational study design, addressing topics related to content quality of the videos, mainly in the Orthodontics specialty. Thus, there is a need for systematic reviews and randomized clinical

trials, in addition to encouraging more publications on this topic in Africa, Oceania, South America and North America.

ACKNOWLEDGEMENTS

This study was financed in part by the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior – Brazil (CAPES), grant number 001.

References

- Agarwal, A., Durairajanayagam, D., Tatagari, S., Esteves, S.C., Harlev, A., Henkel, R., Roychoudhury, S., Homa S., Puchalt N.G., Ramasamy, R., Majzoub A., Ly, K.D., Tvrda, E., Assidi M., Kesari K., Sharma, R., Banihani S., Ko, E., Abu-Elmagd, M., Gosalvez, J., Bashiri, A. (2016). Bibliometrics: tracking research impact by selecting the appropriate metrics. *Asiático J Androl*, 18(2):296-309. DOI: 10.4103/1008-682X.171582. PMID: 26806079; PMCID: PMC4770502.
- Basch, C.E., Basch, C.H., Hillyer, G.C., Jaime, C. (2020). The Role of YouTube and the Entertainment Industry in Saving Lives by Educating and Mobilizing the Public to Adopt Behaviors for Community Mitigation of COVID-19: Successive Sampling Design Study. *JMIR Public Health Surveill*, 21;6(2):e19145.
- Cesur, A.K., Gunec, H.G. (2020). Quality of information on YouTube about artificial intelligence in dental radiology. *J Dent Educ*, 84(10):1166–1172.
- Green B, Hope A. (2010). Promoting clinical competence using social media. *Nurse Educ*, 35(3):127-129. doi:10.1097/NNE.0b013e3181d9502b.
- Goebel, M.C., Rocha, A.O., Santos, P.S., Bolan, M., Martins-Júnior, P.A., Santana, C.M., Cardoso, M. (2023). A bibliometric analysis of the top 100 most-cited papers concerning dental fluorosis. *Caries Res*, 26. doi: 10.1159/000530831. Epub ahead of print. PMID: 37100040.
- Hassona, Y., Taimeh, D., Marahleh, A., Scully, C. (2016). YouTube as a source of information on mouth (oral) cancer. *Oral Dis*, 22(3):202-8. doi: 10.1111/odi.12434. Epub 2016 Jan 21. PMID: 26718020.
- Jafarzadeh, H., Sarraf, S.A., Andersson, L. (2015). The most-cited articles in dental, oral, and maxillofacial traumatology during 64 years. *Dent Traumatol*, 31(5):350-60.
- Joseph, J., Dao, D., Hwang, S.M., Dotzler, S.M., Chesak, S.S., Weiskittel, T.M., Lang, M.E., Melo, V.D., Anderson, J.B., Vega, B., Englund, M., Boruch, P.M., Bhagra, A. (2021). Perceptions of Barriers and Facilitators to Becoming a Medical Professional Among

- Underrepresented Undergraduate and Postbaccalaureate Learners. *Mayo Clin Proc Innov Qual Outcomes*, 23;5(2):347-358. doi: 10.1016/j.mayocpiqo.2021.01.003. PMID: 33997634; PMCID: PMC8105502.
- Jung, M.J., Seo, M.S. (2022). Assessment of reliability and information quality of YouTube videos about root canal treatment after 2016. *BMC Oral Health*, 16;22(1):494. doi: 10.1186/s12903-022-02540-4. PMID: 36384745; PMCID: PMC9670470.
- Feijoo, J.F., Limeres, J., Fernández-Varela, M., Ramos, I., Diz, P. (2014). The 100 most cited articles in dentistry. *Clin Oral Investig*, 18(3):699-706.
- Kirik, A., Arslan, A., Çetinkaya, A., & Mehmet, GÜL. (2015). A quantitative research on the level of social media addiction among young people in Turkey. *International Journal of Sport Culture and Science*, 3(3):108-122.
- Knösel, M., Jung, K., Bleckmann, A. (2011). YouTube, dentistry, and dental education. *J Dent Educ*, 75(12):1558–1568. PMID:22184594.
- Kumar, M., Nanavati, R., Modi, T.G., Dobariya, C. (2016). Oral cancer: Etiology and risk factors: A review. *J Cancer Res Ther*, 12(2):458-63. doi: 10.4103/0973-1482.186696. PMID: 27461593.
- Leong, A.Y., Sanghera, R., Jhaggi, J., Desai, N., Jammu, B.S., Makowsky, M.J. (2018). Is YouTube Useful as a Source of Health Information for Adults With Type 2 Diabetes? A South Asian Perspective, 42(4):395–403.e4. doi:10.1016/j.jcjd.2017.10.056.
- Lombardo, G., Vena, F., Negri, P., Pagano, S., Barilotti, C., Paglia, L., Colombo, S., Orso, M., Cianetti, S. (2020). Worldwide prevalence of malocclusion in the different stages of dentition: A systematic review and meta-analysis. *Eur J Paediatr Dent*, 21(2):115-122. doi: 10.23804/ejpd.2020.21.02.05. PMID: 32567942.
- Mattos, F.F., Perazzo, M.F., Vargas-Ferreira, F., Martins-Júnior, P.A., Paiva, S.M. (2021). Top 100 most-cited papers in core dental public health journals: bibliometric analysis. *Community Dent Oral Epidemiol*, 49(1):40-46. doi: 10.1111/cdoe.12572. Epub 2020 Sep 15. PMID: 32935344.
- Mangan, M.S., Cakir, A., Yurttaser, O.S., Tekcan, H., Balci, S., Ozcelik, K.A. (2020). Analysis of the quality, reliability, and popularity of information on strabismus on YouTube. *Strabismus*, 28(4):175–180. doi: 10.1080/09273972.2020.1836002
- Mutlu, B., Bazarcı, S. (2017). Marka İşbirlikleri İçin Yeni Bir Alan: Youtube İçerik Üreticileri ve Kanal Toplulukları Üzerine Netnografik Bir Araştırma. *J Akdeniz Uni Fac Commun*, 28–45.

- Nason, K., Donnelly, A., Duncan, H.F. (2016). YouTube as a patient-information source for root canal treatment. *Int Endod J*, 49(12):1194-1200. doi: 10.1111/iej.12575. Epub 2015 Dec 8. PMID: 26551481.
- Nason, G.J., Kelly, P., Kelly, M.E., Burke, M.J., Aslam, A., Giri, S.K., & Flood, H.D. (2015) YouTube as an educational tool regarding male urethral catheterization. *Scandinavian journal of urology*, 49(2), 189-192.
- Nagpal, S.J., Karimianpour, A., Mukhija, D., Mohan, D., Brateanu, A (2015). YouTube videos as a source of medical information during the Ebola hemorrhagic fever epidemic. *Springerplus* 28: 457.
- Perazzo, M.F., Otoni, A.L.C, Costa, M.S., Granville-Granville, A.F., Paiva, S.M., Martins-Júnior, P.A. (2019). The top 100 most-cited papers in Paediatric Dentistry journals: A bibliometric analysis. *Int J Paediatr Dent*, 29(6):692-711.
- Reuters, T., (2008). Using bibliometrics: A guide to evaluating research performance with citation data (Retrieved).
- Rocha, A.O., Anjos, L.M.D., Vitali, F.C., Santos, P.S., Bolan, M., Santana, C.M., Cardoso, M. (2023). Tooth Bleaching: A bibliometric analysis of the top 100 most-cited papers. *Braz Dent J*, 34(2):41-55. doi: 10.1590/0103-6440202305290. PMID: 37194856; PMCID: PMC10208287.
- Romano, A., Fiori, F., Petruzzi, M., Della, V.F., Serpico, R. (2022). Youtube™ Content Analysis as a Means of Information in Oral Medicine: A Systematic Review of the Literature. *Int J Environ Res Public Health*, 29;19(9):5451. doi: 10.3390/ijerph19095451. PMID: 35564845; PMCID: PMC9104467.
- Simsek, H., Buyuk, S. K., & Cetinkaya, E. (2020). YouTube™ as a source of information on oral habits. *Journal of the Indian Society of Pedodontics and Preventive Dentistry*, 38(2), 115–118. https://doi.org/10.4103/JISPPD.JISPPD_357_19.
- Stellefson, M., Chaney, B., Ochipa, K., Chaney, D., Haider, Z., Hanik, B., Chavarria, E., & Bernhardt, J. M. (2014). YouTube™ as a source of chronic obstructive pulmonary disease patient education: a social media content analysis. *Chronic respiratory disease*, 11(2), 61–71. <https://doi.org/10.1177/1479972314525058>.
- Uzel, İ., Ghabchi, B., Akalın, A., Eden, E. (2023). YouTube™ as an information source in paediatric dentistry education: Reliability and quality analysis. *PLoS One*, 18(3):e0283300. doi: 10.1371/journal.pone.0283300. PMID: 36961800; PMCID: PMC10038246.

Vance, K., Howe, W., Dellavalle, R.P. (2009). Social internet sites as a source of public health information. *Clin Dermatol*, 27(2):133–136. pmid:19254656.

Vélez-Estevez, A., Perez, J.I., García-Sánchez, P., Moral-Muñoz, J.A., Cobo, M.J. (2023). New trends in bibliometric APIs: A comparative analysis. *Information Processing and Management*, 60(4):103385. <https://doi.org/10.1016/j.ipm.2023.103385>.

Figure Legends

Figure 1 - Map of countries and continents of origin of articles that related YouTube and dentistry.

Figure 2 - Bibliometric network of the most used keywords among the most cited articles.

Supplementary Figure 1 - Distribution of the number of publications in each year.

Supplementary Figure 2 - Bibliometric network of authors and collaborative co-authorship among them for the most cited articles.

Table 1: Published articles related to YouTube and Dentistry.

Position	Papers	Number of citations
1	Hassona Y, Taimeh D, Marahleh A, Scully C. YouTube as a source of information on mouth (oral) cancer. <i>Oral Dis</i> . 2016 Apr;22(3):202-8. doi: 10.1111/odi.12434. Epub 2016 Jan 21. PMID: 26718020.	106
2	Delli K, Livas C, Vissink A, Spijkervet FK. Is YouTube useful as a source of information for Sjögren's syndrome? <i>Oral Dis</i> . 2016 Apr;22(3):196-201. doi: 10.1111/odi.12404. Epub 2016 Jan 11. PMID: 26602325.	96
3	Knösel M, Jung K, & Bleckmann A. YouTube, dentistry, and Dental Education. <i>Journal of Dental Education</i> . 2011 Dec;75(12):1558-1568. https://doi.org/10.1002/j.0022-0337.2011.75.12.tb05215.x	80
4	Lena Y, & Dindaroğlu F. Lingual orthodontic treatment: a YouTube™ video analysis. <i>Angle Orthodontist</i> . 2018 Mar;88(2):208-214. DOI10.2319/090717-602.1.	68
5	Al-Silwadi FM, Gill DS, Petrie A, Cunningham SJ. Effect of social media in improving knowledge among patients having fixed appliance orthodontic treatment: A single-center randomized controlled trial. <i>Am J Orthod Dentofacial Orthop</i> . 2015 Aug;148(2):231-7. doi: 10.1016/j.ajodo.2015.03.029. PMID: 26232831.	56
6	Gao X, Hamzah SH, Yiu CK, McGrath C, King NM. Dental fear and anxiety in children and adolescents: qualitative study using YouTube. <i>J Med Internet Res</i> . 2013 Feb 22;15(2):e29. doi: 10.2196/jmir.2290. PMID: 23435094; PMCID: PMC3636260.	53
7	Knösel M, Jung K. Informational value and bias of videos related to orthodontics screened on a video-sharing Web site. <i>Angle Orthod</i> . 2011 May;81(3):532-9. doi: 10.2319/091710-541.1. Epub 2011 Jan 24. PMID: 21261492; PMCID: PMC8923562.	53
8	Abukaraky A, Hamdan AA, Ameera MN, Nasief M, Hassona Y. Quality of YouTube TM videos on dental implants. <i>Med Oral Patol Oral Cir Bucal</i> . 2018 Jul	40

	1;23(4):e463-e468. doi: 10.4317/medoral.22447. PMID: 29924766; PMCID: PMC6051691.	
9	ElKarmi R, Hassona Y, Taimeh D, Scully C. YouTube as a source for parents' education on early childhood caries. <i>Int J Paediatr Dent</i> . 2017 Nov;27(6):437-443. doi: 10.1111/ipd.12277. Epub 2016 Nov 24. PMID: 27882621.	40
10	Kolahi J, Khazaei S. Altmetric: Top 50 dental articles in 2014. <i>Br Dent J</i> . 2016 Jun 10;220(11):569-74. doi: 10.1038/sj.bdj.2016.411. PMID: 27283563.	36
11	Gaş S, Zincir ÖÖ, Bozkurt AP. Are YouTube Videos Useful for Patients Interested in Botulinum Toxin for Bruxism? <i>J Oral Maxillofac Surg</i> . 2019 Sep;77(9):1776-1783. doi: 10.1016/j.joms.2019.04.004. Epub 2019 Apr 12. PMID: 31077674.	36
12	Ustidal G, Guney AU. YouTube as a source of information about orthodontic clear aligners. <i>Angle Orthod</i> . 2020 May 1;90(3):419-424. doi: 10.2319/072419-491.1. PMID: 33378436; PMCID: PMC8032314.	35
13	Ho A, McGrath C, Mattheos N. Social media patient testimonials in implant dentistry: information or misinformation? <i>Clin Oral Implants Res</i> . 2017 Jul;28(7):791-800. doi: 10.1111/clr.12883. Epub 2016 Jun 8. PMID: 27279455.	32
14	Di Stasio D, Romano A, Paparella RS, Gentile C, Serpico R, Minervini G, Candotto V, Laino L. How social media meet patients questions: YouTube review for mouth sores in children. <i>J Biol Regul Homeost Agents</i> . 2018 Jan-Feb;32(2 Suppl. 1):117-121. PMID: 29460528.	28
15	Papadimitriou A, Kakali L, Pazera P, Doulis I, Kloukos D. Social media and orthodontic treatment from the patient's perspective: a systematic review. <i>Eur J Orthod</i> . 2020 Jun 23;42(3):231-241. doi: 10.1093/ejo/cjz029. PMID: 31107943.	25
16	Di Stasio D, Romano AN, Paparella RS, Gentile C, Minervini G, Serpico R, Candotto V, Laino L. How social media meet patients questions: YouTube review for children oral thrush. <i>J Biol Regul Homeost Agents</i> . 2018 Jan-Feb;32(2 Suppl. 1):101-106. PMID: 29460525.	25
17	Kılınç DD, Sayar G. Assessment of Reliability of YouTube Videos on Orthodontics. <i>Turk J Orthod</i> . 2019 Sep;32(3):145-150. doi: 10.5152/TurkJOrthod.2019.18064. Epub 2019 Sep 1. PMID: 31565689; PMCID: PMC6756568.	25
18	Livas C, Delli K, Pandis N. "My Invisalign experience": content, metrics and comment sentiment analysis of the most popular patient testimonials on YouTube. <i>Prog Orthod</i> . 2018 Jan 22;19(1):3. doi: 10.1186/s40510-017-0201-1. PMID: 29354889; PMCID: PMC5776075.	22
19	Korkmaz YN, Buyuk SK. YouTube as a Patient-Information Source for Cleft Lip and Palate. <i>Cleft Palate Craniofac J</i> . 2020 Mar;57(3):327-332. doi: 10.1177/1055665619866349. Epub 2019 Jul 30. PMID: 31362515.	20
20	Fortuna G, Schiavo JH, Aria M, Mignogna MD, Klasser GD. The usefulness of YouTube™ videos as a source of information on burning mouth syndrome. <i>J Oral Rehabil</i> . 2019 Jul;46(7):657-665. doi: 10.1111/joor.12796. Epub 2019 Apr 11. PMID: 30919986.	18
21	Pons-Fuster E, Ruiz Roca J, Tvarijonaviciute A, López-Jornet P. YouTube information about diabetes and oral healthcare. <i>Odontology</i> . 2020 Jan;108(1):84-90. doi: 10.1007/s10266-019-00445-3. Epub 2019 Aug 8. PMID: 31396751.	18
22	Yüce MÖ, Adalı E, Kanmaz B. An analysis of YouTube videos as educational resources for dental practitioners to prevent the spread of COVID-19. <i>Ir J Med Sci</i> . 2021 Feb;190(1):19-26. doi: 10.1007/s11845-020-02312-5. Epub 2020 Jul 23. PMID: 32700083; PMCID: PMC7375839.	17
23	Burns LE, Abbassi E, Qian X, Mecham A, Simetey P, Mays KA. YouTube use among dental students for learning clinical procedures: A multi-institutional study. <i>J Dent Educ</i> . 2020 Oct;84(10):1151-1158. doi: 10.1002/jdd.12240. Epub 2020 Jun 15. PMID: 32542817.	17
24	Passos KK, Leonel AC, Bonan PR, Castro JF, Pontual ML, Ramos-Perez FM, Perez DE. Quality of information about oral cancer in Brazilian Portuguese available on Google, Youtube, and Instagram. <i>Med Oral Patol Oral Cir Bucal</i> . 2020 May 1;25(3):e346-e352. doi: 10.4317/medoral.23374. PMID: 32040464; PMCID: PMC7211369.	16

25	Aldallal SN, Yates JM, Ajrash M. Use of YouTube™ as a self-directed learning resource in oral surgery among undergraduate dental students: a cross-sectional descriptive study. <i>Br J Oral Maxillofac Surg.</i> 2019 Dec;57(10):1049-1052. doi: 10.1016/j.bjoms.2019.09.010. Epub 2019 Nov 4. PMID: 31699466.	15
26	Duman C. YouTube™ quality as a source for parent education about the oral hygiene of children. <i>Int J Dent Hyg.</i> 2020 Aug;18(3):261-267. doi: 10.1111/idh.12445. Epub 2020 Jun 1. PMID: 32416034.	15
27	Meade MJ, Sooriakumaran P, Dreyer CW. Orthodontic retention and retainers: Quality of information provided by dental professionals on YouTube. <i>Am J Orthod Dentofacial Orthop.</i> 2020 Aug;158(2):229-236. doi: 10.1016/j.ajodo.2019.08.013. Epub 2020 Jun 29. PMID: 32616322.	14
28	Ayranci F, Buyuk SK, Kahveci K. Are YouTube™ videos a reliable source of information about genioplasty? <i>J Stomatol Oral Maxillofac Surg.</i> 2021 Feb;122(1):39-42. doi: 10.1016/j.jormas.2020.04.009. Epub 2020 Apr 30. PMID: 32360751.	14
29	Hatipoğlu Ş, Gaş S. Is Information for Surgically Assisted Rapid Palatal Expansion Available on YouTube Reliable? <i>J Oral Maxillofac Surg.</i> 2020 Jun;78(6):1017.e1-1017.e10. doi: 10.1016/j.joms.2020.01.013. Epub 2020 Jan 27. PMID: 32087120.	13
30	Yavuz MC, Buyuk SK, Genc E. Does YouTube™ offer high quality information? Evaluation of accelerated orthodontics videos. <i>Ir J Med Sci.</i> 2020 May;189(2):505-509. doi: 10.1007/s11845-019-02119-z. Epub 2019 Oct 24. PMID: 31650452.	13
31	Romano A, Lauritano D, Fiori F, Di Petrillo M, Hasan I, Lucchese A, Serpico R, Di Stasio D. Cross-sectional study on the quality of oral lichen planus videos on YouTube™. <i>J Oral Pathol Med.</i> 2021 Feb;50(2):220-228. doi: 10.1111/jop.13128. Epub 2021 Jan 8. PMID: 33188715.	12
32	Eksi Ozsoy H. Evaluation of YouTube videos about smile design using the DISCERN tool and Journal of the American Medical Association benchmarks. <i>J Prosthet Dent.</i> 2021 Jan;125(1):151-154. doi: 10.1016/j.prosdent.2019.12.016. Epub 2020 Feb 19. PMID: 32085870.	12
33	Sharif MO, Siddiqui NR, Hodges SJ. Patient awareness of orthodontic mobile phone apps. <i>J Orthod.</i> 2019 Mar;46(1):51-55. doi: 10.1177/1465312518821361. Epub 2019 Jan 29. PMID: 31056066.	12
34	Lotto M, Aguirre PEA, Strieder AP, Cruvinel AFP, Cruvinel T. Levels of toothache-related interests of Google and YouTube users from developed and developing countries over time. <i>PeerJ.</i> 2019 Oct 10;7:e7706. doi: 10.7717/peerj.7706. PMID: 31616582; PMCID: PMC6790224.	11
35	Seo CW, Cho AR, Park JC, Cho HY, Kim S. Dental students' learning attitudes and perceptions of YouTube as a lecture video hosting platform in a flipped classroom in Korea. <i>J Educ Eval Health Prof.</i> 2018;15:24. doi: 10.3352/jeehp.2018.15.24. Epub 2018 Oct 11. PMID: 30317831; PMCID: PMC6249142.	11
36	Guo J, Yan X, Li S, Van der Walt J, Guan G, Mei L. Quantitative and qualitative analyses of orthodontic-related videos on YouTube. <i>Angle Orthod.</i> 2020 May 1;90(3):411-418. doi: 10.2319/082019-542.1. PMID: 33378439; PMCID: PMC8032311.	11
37	Hutchison CM, Cave V, Walshaw EG, Burns B, Park C. YouTube™ as a source for patient education about the management of dental avulsion injuries. <i>Dent Traumatol.</i> 2020 Apr;36(2):207-211. doi: 10.1111/edt.12517. Epub 2019 Nov 6. PMID: 31606932.	11
38	Altan Şallı G, Egil E. Are YouTube videos useful as a source of information for oral care of leukemia patients? <i>Quintessence Int.</i> 2020;51(1):78-85. doi: 10.3290/j.qi.a43665. PMID: 31781693.	10
39	Özdal Zincir Ö, Bozkurt AP, Gaş S. Potential Patient Education of YouTube Videos Related to Wisdom Tooth Surgical Removal. <i>J Craniofac Surg.</i> 2019 Jul;30(5):e481-e484. doi: 10.1097/SCS.0000000000005573. PMID: 31299822.	10
40	Simsek H, Buyuk SK, Cetinkaya E, Tural M, Koseoglu MS. "How I whiten my teeth": YouTube™ as a patient information resource for teeth whitening. <i>BMC</i>	10

	Oral Health. 2020 Jul 1;20(1):183. doi: 10.1186/s12903-020-01172-w. PMID: 32611420; PMCID: PMC7327459.	
41	Dias da Silva MA, Pereira AC, Walmsley AD. Who is providing dental education content via YouTube? Br Dent J. 2019 Mar;226(6):437-440. doi: 10.1038/s41415-019-0046-8. PMID: 30903071.	10
42	Bozkurt AP, Aras I. Cleft Lip and Palate YouTube Videos: Content Usefulness and Sentiment Analysis. Cleft Palate Craniofac J. 2021 Mar;58(3):362-368. doi: 10.1177/1055665620948722. Epub 2020 Aug 19. PMID: 32812449.	9
43	Menziletoglu D, Guler AY, Isik BK. Are YouTube videos related to dental implant useful for patient education? J Stomatol Oral Maxillofac Surg. 2020 Dec;121(6):661-664. doi: 10.1016/j.jormas.2019.12.022. Epub 2020 Feb 8. PMID: 32045688.	9
44	Hamdan AA, Shaqman M, Abu Karaky A, Hassona Y, Bouchard P. Medical reliability of a video-sharing website: The gingival recession model. Eur J Dent Educ. 2019 May;23(2):175-183. doi: 10.1111/eje.12417. Epub 2019 Jan 25. PMID: 30633844.	8
45	Pasaoglu Bozkurt A, Gaş S, Özdal Zincir Ö. YouTube video analysis as a source of information for patients on impacted canine. Int Orthod. 2019 Dec;17(4):769-775. doi: 10.1016/j.ortho.2019.08.014. Epub 2019 Aug 27. PMID: 31471240.	8
46	Helmi M, Spinella MK, Seymour B. Community water fluoridation online: an analysis of the digital media ecosystem. J Public Health Dent. 2018 Sep;78(4):296-305. doi: 10.1111/jphd.12268. Epub 2018 Mar 30. PMID: 29603251.	8
47	Dias da Silva MA, Walmsley AD. Fake news and dental education. Br Dent J. 2019 Mar;226(6):397-399. doi: 10.1038/s41415-019-0079-z. PMID: 30903059.	8
48	Park JC, Kwon HE, Chung CW. Innovative digital tools for new trends in teaching and assessment methods in medical and dental education. J Educ Eval Health Prof. 2021;18:13. doi: 10.3352/jeehp.2021.18.13. Epub 2021 Jun 29. PMID: 34182619; PMCID: PMC8376582.	7
49	Sezici YL, Gediz M, Dindaroğlu F. Is YouTube an adequate patient resource about orthodontic retention? A cross-sectional analysis of content and quality. Am J Orthod Dentofacial Orthop. 2022 Jan;161(1):e72-e79. doi: 10.1016/j.ajodo.2020.12.023. Epub 2021 Sep 9. PMID: 34509330.	7
50	Smyth RSD, Amlani M, Fulton A, Sharif MO. The availability and characteristics of patient-focused YouTube videos related to oral hygiene instruction. Br Dent J. 2020 May;228(10):773-781. doi: 10.1038/s41415-020-1527-5. PMID: 32444751.	7
51	Fu MW, Kalaichelvan A, Liebman LS, Burns LE. Exploring predoctoral dental student use of YouTube as a learning tool for clinical endodontic procedures. J Dent Educ. 2022 Jun;86(6):726-735. doi: 10.1002/jdd.12853. Epub 2021 Dec 28. PMID: 34962294.	6
52	El Tantawi MM, El Kashlan MK, Saeed YM. Assessment of the efficacy of second life, a virtual learning environment, in dental education. J Dent Educ. 2013 Dec;77(12):1639-52. PMID: 24319136.	6
53	Ruiz-Roca JA, Martínez-Izquierdo A, Mengual-Pujante D, López EP, López-Jornet P. Is YouTube a useful tool for oral care in patients with Parkinson's disease? Spec Care Dentist. 2020 Sep;40(5):464-469. doi: 10.1111/scd.12489. Epub 2020 Jul 6. PMID: 32628790.	6
54	Kaval ME, Kandemir Demirci G, Atesci AA, Sarsar F, Dindaroğlu F, Güneri P, Caliskan MK. YouTube™ as an information source for regenerative endodontic treatment procedures: Quality and content analysis. Int J Med Inform. 2022 May;161:104732. doi: 10.1016/j.ijmedinf.2022.104732. Epub 2022 Feb 26. PMID: 35240558.	6
55	Cesur Aydin K, Gunec HG. Quality of information on YouTube about artificial intelligence in dental radiology. J Dent Educ. 2020 Oct;84(10):1166-1172. doi: 10.1002/jdd.12362. Epub 2020 Aug 19. PMID: 32813894.	6
56	Hamzah HS, Gao X, Yung Yiu CK, McGrath C, King NM. Managing dental fear and anxiety in pediatric patients: A qualitative study from the public's perspective. Pediatr Dent. 2014 Jan-Feb;36(1):29-33. PMID: 24717706.	5
57	Abbasi H, Saqib M, Jouhar R, Lal A, Ahmed N, Ahmed MA, Alam MK. The Efficacy of Little Lovely Dentist, Dental Song, and Tell-Show-Do Techniques in	5

	Alleviating Dental Anxiety in Paediatric Patients: A Clinical Trial. <i>Biomed Res Int.</i> 2021 May 23;2021:1119710. doi: 10.1155/2021/1119710. PMID: 34124238; PMCID: PMC8166486.	
58	Yavan MA, Gökçe G. YouTube as a source of information on adult orthodontics: a video analysis study. <i>J World Fed Orthod.</i> 2022 Feb;11(1):41-46. doi: 10.1016/j.ejwf.2021.09.001. Epub 2021 Oct 29. PMID: 34756709.	5
59	Buyuk, S. K., & Alpaydin, M. T. Quality of information on YouTube™ about rapid maxillary expansion. <i>Turk J Orthod.</i> 2021 March; 34(2):116-121. DOI: 10.5152/TurkJOrthod.2021.20069	5
60	He K, Breitman L, Lee J, Van Doren E, Li A, Donoff RB. How US dental schools can better prepare their students to perform operative procedures. <i>J Dent Educ.</i> 2021 Apr;85(4):531-538. doi: 10.1002/jdd.12485. Epub 2020 Nov 16. PMID: 33197062.	4
61	Knösel M, Engelke W, Helms HJ, Bleckmann A. An appraisal of the current and potential value of web 2.0 contributions to continuing education in oral implantology. <i>Eur J Dent Educ.</i> 2012 Aug;16(3):131-7. doi: 10.1111/j.1600-0579.2011.00732.x. Epub 2012 Jan 12. PMID: 22783839.	4
62	Çapan BŞ. YouTube as a source of information on space maintainers for parents and patients. <i>PLoS One.</i> 2021 Feb 11;16(2):e0246431. doi: 10.1371/journal.pone.0246431. PMID: 33571208; PMCID: PMC7877623.	4
63	Egil E, & Altan ŞG. Youtube as a source of information on fluoride therapy. <i>Fluoride.</i> 2020 April-June; 53(2 Pt 2):292-301.	4
64	Uma E, Nieminen P, Mani SA, John J, Haapanen E, Laitala ML, Lappalainen OP, Varghese E, Arora A, Kaur K. Social Media Usage among Dental Undergraduate Students-A Comparative Study. <i>Healthcare (Basel).</i> 2021 Oct 20;9(11):1408. doi: 10.3390/healthcare9111408. PMID: 34828454; PMCID: PMC8625251.	3
65	Grillon M, Yeung AWK. Content Analysis of YouTube Videos That Demonstrate Panoramic Radiography. <i>Healthcare (Basel).</i> 2022 Jun 13;10(6):1093. doi: 10.3390/healthcare10061093. PMID: 35742144; PMCID: PMC9222663.	3
66	Gulve ND, Tripathi PR, Dahivelkar SD, Gulve MN, Gulve RN, Kolhe SJ. Evaluation of YouTube Videos as a Source of Information About Oral Self-examination to Detect Oral Cancer and Precancerous Lesions. <i>J Int Soc Prev Community Dent.</i> 2022 Apr 8;12(2):226-234. doi: 10.4103/jispcd.JISPCD_277_21. PMID: 35462738; PMCID: PMC9022386.	3
67	Ramadhani A, Zettira Z, Rachmawati YL, Hariyani N, Maharani DA. Quality and Reliability of Halitosis Videos on YouTube as a Source of Information. <i>Dent J (Basel).</i> 2021 Oct 15;9(10):120. doi: 10.3390/dj9100120. PMID: 34677182; PMCID: PMC8534361.	3
68	Rajeh, M. T., Aboalshamat, K. T., Nassar, A. A., Sembawa, S. N., Al Hebshi, S. A., & Badri, M. K. Insights on using social media in dental education: a cross-sectional study in Saudi Arabia. <i>The Open Dentistry Journal.</i> 2020 Dec; 14(1):717-723. DOI: 10.2174/1874210602014010717	3
69	Coban G, Buyuk SK. YouTube as a Source of Information for Craniofacial Distraction Osteogenesis. <i>J Craniofac Surg.</i> 2021 Sep 1;32(6):2005-2007. doi: 10.1097/SCS.00000000000007478. PMID: 33534330.	3
70	Topsakal KG, Duran GS, Görgülü S, Eser Misir S. Is YouTube™ an adequate source of oral hygiene education for orthodontic patients? <i>Int J Dent Hyg.</i> 2022 Aug;20(3):504-511. doi: 10.1111/idh.12557. Epub 2021 Oct 29. PMID: 34687593.	3
71	Kurian N, Varghese IA, Cherian JM, Varghese VS, Sabu AM, Sharma P, Varghese MG. Influence of social media platforms in dental education and clinical practice: A cross-sectional survey among dental trainees and professionals. <i>J Dent Educ.</i> 2022 Aug;86(8):1036-1042. doi: 10.1002/jdd.12914. Epub 2022 Mar 7. PMID: 35257384.	2
72	Delgado-Castillo SM, Miguel-Soto S, Atoche-Socola KJ, Arriola-Guillén LE. Revolution in modern teaching in dentistry since the appearance of the COVID-19 pandemic: A review. <i>Dent Med Probl.</i> 2022 Jan-Mar;59(1):137-141. doi: 10.17219/dmp/141522. PMID: 35385228.	2

73	Tozar KN, & Yapıcı YG. Reliability of information on YouTube™ regarding pediatric dental trauma. <i>Dental traumatology</i> . 2021 July;37(6):772-778. https://doi.org/10.1111/edt.12708 .	2
74	Paksoy T, & Gaş S. Quality and content of YouTube™ videos related to sinus lift surgery. <i>Journal of Oral and Maxillofacial Surgery, Medicine, and Pathology</i> . 2021 April; 33(1):48-52. https://doi.org/10.1016/j.ajoms.2020.08.015	2
75	Yagiz O, Yavuz GY, Keskinruzgar A, Acibadem E. Analyses of Youtube Videos on Botox Treatment of Gummy Smile. <i>J Craniofac Surg</i> . 2022 Jun 1;33(4):e433-e438. doi: 10.1097/SCS.00000000000008375. Epub 2021 Nov 12. PMID: 34775444.	2
76	Al-Gunaid TH, Aljohani AA, Alhazmi KM, Ibrahim AM. Determining the impact of orthodontic patients' characteristics on their usage and preferences of social media. <i>J Taibah Univ Med Sci</i> . 2020 Oct 16;16(1):16-21. doi: 10.1016/j.jtumed.2020.08.010. PMID: 33603627; PMCID: PMC7858013.	1
77	Hunsaker RJ, Shroff B, Carrico C, Alford B, Lindauer SJ. A comparison of patient testimonials on YouTube of the most common orthodontic treatment modalities: Braces, in-office aligners, and direct-to-consumer aligners. <i>Am J Orthod Dentofacial Orthop</i> . 2022 Mar;161(3):355-363.e3. doi: 10.1016/j.ajodo.2020.09.036. Epub 2021 Nov 11. PMID: 34776320.	1
78	Yeung AWK. Content Analysis of YouTube Videos on Radiographic Anatomy on Dental Panoramic Images. <i>Healthcare (Basel)</i> . 2022 Jul 25;10(8):1382. doi: 10.3390/healthcare10081382. PMID: 35893204; PMCID: PMC9332186.	1
79	Wong NSM, Yeung AWK, McGrath CP, Leung YY. Qualitative Evaluation of YouTube Videos on Dental Fear, Anxiety and Phobia. <i>Int J Environ Res Public Health</i> . 2022 Dec 31;20(1):750. doi: 10.3390/ijerph20010750. PMID: 36613071; PMCID: PMC9819845.	1
80	Yan IG, Zheng FM, Gao SS, Duangthip D, Lo ECM, Chu CH. A Review of the Protocol of SDF Therapy for Arresting Caries. <i>Int Dent J</i> . 2022 Oct;72(5):579-588. doi: 10.1016/j.identj.2022.06.006. Epub 2022 Jul 14. PMID: 35843730; PMCID: PMC9485517.	1
81	Lara JS, Braga MM, Zagatto CG, Wen CL, Mendes FM, Murisi PU, Haddad AE. A Virtual 3D Dynamic Model of Caries Lesion Progression as a Learning Object for Caries Detection Training and Teaching: Video Development Study. <i>JMIR Med Educ</i> . 2020 May 22;6(1):e14140. doi: 10.2196/14140. PMID: 32441661; PMCID: PMC7275258.	1
82	Nahidh M, Al-Khawaja NFK, Jasim HM, Cervino G, Cicciù M, Minervini G. The Role of Social Media in Communication and Learning at the Time of COVID-19 Lockdown-An Online Survey. <i>Dent J (Basel)</i> . 2023 Feb 10;11(2):48. doi: 10.3390/dj11020048. PMID: 36826193; PMCID: PMC9954815.	1
83	Maganur PC, Hakami Z, Raghunath RG, Vundavalli S, Jeevanandan G, Almgula YM, Khanagar SB, Vishwanathaiah S. Reliability of Educational Content Videos in YouTube™ about Stainless Steel Crowns. <i>Children (Basel)</i> . 2022 Apr 17;9(4):571. doi: 10.3390/children9040571. PMID: 35455615; PMCID: PMC9031524.	1
84	Jamleh A, Nassar M, Alissa H, Alfadley A. Evaluation of YouTube videos for patients' education on periradicular surgery. <i>PLoS One</i> . 2021 Dec 10;16(12):e0261309. doi: 10.1371/journal.pone.0261309. PMID: 34890439; PMCID: PMC8664221.	1
85	Bayazit S, Ege B, Koparal M. Is the YouTube™ a useful resource of information about orthognathic surgery?: A cross-sectional study. <i>J Stomatol Oral Maxillofac Surg</i> . 2022 Nov;123(6):e981-e987. doi: 10.1016/j.jormas.2022.09.001. Epub 2022 Sep 5. PMID: 36067932.	1
86	Rachmawati YL, Putri DW, Hariyani N, Bahar A, Maharani DA. Analysis of Quality, Usefulness, Reliability, Visibility, and Popularity of Videos about Dental Caries on YouTube: A Cross-sectional Analysis. <i>J Int Soc Prev Community Dent</i> . 2022 Apr 8;12(2):245-251. doi: 10.4103/jispcd.JISPCD_246_21. PMID: 35462746; PMCID: PMC9022385.	1

87	Göller Bulut D, Paksoy T, Ustaoglu G. Is Online Video a Suitable Source to Obtain Sufficient and Useful Information About Peri-Implantitis? <i>J Oral Maxillofac Surg.</i> 2023 Jan;81(1):56-64. doi: 10.1016/j.joms.2022.10.001. Epub 2022 Oct 12. PMID: 36356635.	1
88	Ozturk T, Gumus H. YouTube as an information and education source for early orthodontic treatment. <i>Am J Orthod Dentofacial Orthop.</i> 2022 Sep;162(3):e123-e132. doi: 10.1016/j.ajodo.2022.06.013. Epub 2022 Jul 11. PMID: 35835702.	1
89	Özkan E, Acar AH. YouTube™ as a Source of Information for Patients Regarding Dental Implant Failure: A Content Analysis. <i>J Craniofac Surg.</i> 2022 Oct 1;33(7):2100-2103. doi: 10.1097/SCS.00000000000008609. Epub 2022 Mar 8. PMID: 35258014.	1
90	Aksoy M, Topsakal KG. YouTube™ for information on paediatric oral health instructions. <i>Int J Dent Hyg.</i> 2022 Aug;20(3):496-503. doi: 10.1111/idh.12580. Epub 2022 Jan 26. PMID: 35030292.	1
91	Arsilan C, Aksahin EC, Nur Yilmaz RB, Germec Cakan D. Does YouTube™ Offer High-Quality Information About Nasoalveolar Molding? <i>Cleft Palate Craniofac J.</i> 2022 Jul 21:10556656221115025. doi: 10.1177/10556656221115025. Epub ahead of print. PMID: 35861787.	1
92	Romano A, Fiori F, Petrucci M, Della Vella F, Serpico R. Youtube™ Content Analysis as a Means of Information in Oral Medicine: A Systematic Review of the Literature. <i>Int J Environ Res Public Health.</i> 2022 Apr 29;19(9):5451. doi: 10.3390/ijerph19095451. PMID: 35564845; PMCID: PMC9104467.	1
93	Collins, M., Luc, D., Karadeniz, E., Petocz, P., Flores-Mir, C., & Karadeniz, C. The appeal of 'Do It Yourself' orthodontic aligners: A YouTube analysis. <i>Australasian Orthodontic Journal.</i> 2021 Oct; 37(2):321-332.	1
94	Silva PGB, Dias CC, Machado LC, Carlos ACAM, Dantas TS, Ximenes J, Sousa RMRB, Sousa FB. Distance education in dentistry in Brazil: a critical STROBE-based analysis. <i>Braz Oral Res.</i> 2021 Nov 19;35:e109. doi: 10.1590/1807-3107bor-2021.vol35.0109. PMID: 34816897.	0
95	Grillon M, Yeung AWK. Content Analysis of YouTube Videos That Demonstrate Panoramic Radiography. <i>Healthcare (Basel).</i> 2022 Jun 13;10(6):1093. doi: 10.3390/healthcare10061093. PMID: 35742144; PMCID: PMC9222663.	0
96	Chen S, Xing X, Li Z, Zhang W. Scoping review on the role of social media in oral health promotion. <i>Eur Rev Med Pharmacol Sci.</i> 2022 Nov;26(22):8256-8264. doi: 10.26355/eurev_202211_30357. PMID: 36459009.	0
97	Awasthi, R., Manohar, B., Vinay, S., & Kumar, S. (2022). Social media as a learning tool for the budding periodontist: A questionnaire survey. <i>Advances in Human Biology.</i> 2022 Sep-Dec; 12(3):286-291. DOI: 10.4103/aih.b.aih.b_9_22	0
98	Jung MJ, Seo MS. Assessment of reliability and information quality of YouTube videos about root canal treatment after 2016. <i>BMC Oral Health.</i> 2022 Nov 16;22(1):494. doi: 10.1186/s12903-022-02540-4. PMID: 36384745; PMCID: PMC9670470.	0
90	Srivastav S, Tewari N, Antonarakis GS, Upadhyaya AD, Duggal R, Goel S. How Informative Is YouTube Regarding Feeding in Infants with Cleft Lip and Palate? <i>Cleft Palate Craniofac J.</i> 2022 Dec 14:10556656221142194. doi: 10.1177/10556656221142194. Epub ahead of print. PMID: 36517967.	0
100	Ganesh S, Sinduja P, Priyadarshini, R. Role of Video Aids in Learning among Higher Education Students: An Observational Study. <i>Journal of Research in Medical and Dental Science.</i> 2022 May; 10(1):359-365.	0
101	Varshney, S., Menon, I., Gupta, R., Sharma, A., Arora, V., & Bashir, S. Addiction and usage of social media among dental students studying in dental institute of Ghaziabad, Uttar Pradesh. <i>Journal of Indian Association of Public Health Dentistry.</i> 2022 Jan-Mar; 20(1):86-94. DOI: 10.4103/jiaphd.jiaphd_3_21.	0
102	Rachmawati YL, Naibaho LVC, & Aulia, NR. Quality of Tooth-Whitening Videos Available on YouTube. <i>Pesquisa Brasileira em Odontopediatria e Clínica Integrada.</i> 2023 april; 23, e210232. https://doi.org/10.1590/pboci.2023.011 .	0
103	Khairina S, Maharani DA, Yavuz Y, & Setiawati F. Use of Internet Platforms for Information About Sensitive Teeth Among Indonesian Adults: A Cross-Sectional	0

	Study. Makara Journal of Health Research. 2021Aug; 25(2): 6. https://scholarhub.ui.ac.id/mjhr .	
104	Alhamdani F, Talib A, Rashad M. Oral Surgery Learning Outcome during Covid-19 Lockdown A Student-Based Evaluation. Journal of Research in Medical and Dental Science. 2021 May; 9(4):307-311.	0
105	Hamid NFA, & Jaafar, A. Use of social media in Dental Education: A single institutional study. Archives Of Orofacial Science. 2021 Aug; 16(2):141-152. DOI: 10.21315/aos2021.16.2.5	0
106	Dascalu CG, Antohe ME, Zegan G, Burlea SL, Carausu EM, Ciubara A, & Purcarea VL. Blended Learning-The Efficiency of Video Resources and YouTube in the Modern Dental Education. Revista de Cercetare si Interventie Sociala. 2021; 72(23):288-310. https://doi.org/10.33788/rcis.72.18 .	0
107	Barakat A, Alshehri M, Koppolu P, Alhelees A, Swapna LA. Minimal Invasive Technique for the Esthetic Management of Dental Fluorosis. J Pharm Bioallied Sci. 2022 Jul;14(Suppl 1):S1050-S1053. doi: 10.4103/jpbs.jpbs_54_22. Epub 2022 Jul 13. PMID: 36110737; PMCID: PMC9469439.	0
108	Alshaer N, Bakhaider R, Elias AY, Yamany I, Alshouibi E, Elias W. Dental Misconceptions in Social Media Accounts: YouTube and Instagram Applications Among Fluoride Toxicity, Bleaching and, Waterjet. 2022 July; 10(2):19-24. DOI:10.51847/I8IgYWD2vD	0
109	Khanagar SB, Alolayan LS, Alobaid TA, Alharbi AA, Alazaz NN, & Alanazi MH. Use of YouTube as a Learning Modality for Clinical Procedures among Dental Students in Riyadh, Saudi Arabia—A Cross-Sectional Study. Applied Sciences. 2022 Nov; 12(23):11977. https://doi.org/10.3390/app122311977	0
110	Habib SR, Khan AS, Ali M, Abutheraa EA, Alkhayef AK, Aljibrin FJ, Almutairi NS. An Evaluation of the Usefulness of YouTube® Videos on Crown Preparation. Biomed Res Int. 2022 Jan 22;2022:1897705. doi: 10.1155/2022/1897705. PMID: 35103235; PMCID: PMC8800628.	0
111	Vázquez-Rodríguez I, Rodríguez-López M, Blanco-Hortas A, Santana-Mora UA. Online audiovisual resources for learning the disinfection protocol for dental impressions: A critical analysis. J Prosthet Dent. 2020 Nov;124(5):559-564. doi: 10.1016/j.prosdent.2019.10.026. Epub 2020 Jan 15. PMID: 31952861.	0
112	Panhwar M, Rajpar SP, Talpur N, Baig QA, Kumar K, Banglani MA. Information technology application and challenges faced by medical and dental undergraduate students. Rawal Medical Journal. 2021 Apr; 46(2):438-441.	0
113	Yildirim G, Kocaelli HA. Assessment of the content and quality of YouTube videos related zygomatic implants: A content-quality analysis. Clin Implant Dent Relat Res. 2023 Feb 20. doi: 10.1111/cid.13194. Epub ahead of print. PMID: 36808698.	0
114	Özişçi Ö. Assessing the quality of YouTube™ videos on fixed dental implant home-care and maintenance protocols. Int J Dent Hyg. 2022 Dec 20. doi: 10.1111/idh.12660. Epub ahead of print. PMID: 36540951.	0
115	Buldur M, Bal FA. Analyzing Content and Quality of YouTube (TM) Videos on Removal of Amalgam Fillings. Clinical and Experimental Health Sciences. 2022 Jun; 12(2):423-430. DOI:10.33808/clinexphealthsci.960426	0
116	Uzel İ, Ghabchi B, Akalın A, Eden E. YouTube as an information source in paediatric dentistry education: Reliability and quality analysis. PLoS One. 2023 Mar 24;18(3):e0283300. doi: 10.1371/journal.pone.0283300. PMID: 36961800; PMCID: PMC10038246.	0
117	Ozturk T, Sheydayev E, & Yagci A. Do YouTube Videos Provide Enough Reliable Information to Patients about White Spot Lesions? A Video Content and Quality Analysis. Journal of Consumer Health on the Internet. 2022 Dec; 26(4):357-372. https://doi.org/10.1080/15398285.2022.2115704 .	0
118	Meseli SE, Sadry S, & Efe N. How reliable are YouTube videos on laser-assisted surgical treatment of the gummy smile?. 2022 Dec;9(2):1-8. DOI: 10.25259/APOS_155_2022	0

119	Erlan GN, Onder ME. Is YouTube (R) Adequate as a Source of Patient Information for Intravenous Sedation in Dentistry? <i>Journal of Consumer Health on the internet</i> . 2022 July 3; 26(3):274-282. DOI: 10.1080/15398285.2022.2097430.	0
120	Durmazpinar PM, Kanmaz B, Adali E. Is Youtube Qualified as an Information Source for Regenerative Endodontics? <i>Meandros Medical and Dental Journal</i> . 2022 Jun 20; 23(2):188-193. DOI:10.4274/meandros.galenos.2021.02693.	0
121	Barakat A, Alshehri M, Koppolu P, Alhelees A, Swapna LA. Minimal Invasive Technique for the Esthetic Management of Dental Fluorosis. <i>J Pharm Bioallied Sci</i> . 2022 Jul;14(Suppl 1):S1050-S1053. doi: 10.4103/jpbs.jpbs_54_22. Epub 2022 Jul 13. PMID: 36110737; PMCID: PMC9469439.	0
122	Erturk-Avunduk AT, Delikan E. Evaluation of the quality of YouTube™ videos about pit and fissure sealant applications. <i>Int J Dent Hyg</i> . 2022 Dec 8. doi: 10.1111/idh.12646. Epub ahead of print. PMID: 36480358.	0
123	Er N, Gülfeşan Çanakçı F. Temporomandibular joint arthrocentesis videos on YouTube: Are they a good source of information? <i>J Stomatol Oral Maxillofac Surg</i> . 2022 Oct;123(5):e310-e315. doi: 10.1016/j.jormas.2022.03.011. Epub 2022 Mar 9. PMID: 35278759.	0
124	Ceylan Şen S, Paksoy T, Göller Bulut D, Ustaoglu G. Does YouTube™ provide reliable information on oral candidiasis? <i>Oral Dis</i> . 2023 Jan;29(1):290-299. doi: 10.1111/odi.14338. Epub 2022 Aug 16. PMID: 35942887.	0
125	Haliloğlu Özkan T, Dursun D. An assessment of the Quality of Information for Patients on YouTube™ Regarding Orthodontic Elastics. <i>Turk J Orthod</i> . 2022 Sep;35(3):192-197. doi: 10.5152/TurkJOrthod.2022.21132. PMID: 36155403; PMCID: PMC9623206.	0
126	Dias da Silva MA, Pereira AC, Vital S, Mariño R, Ghanim A, Skelton-Macedo MC, Kavadella A, Kakaboura A, Uribe SE, Johnson I, Dalessandri D, Walmsley AD. Online videos: The hidden curriculum. <i>Eur J Dent Educ</i> . 2022 Nov;26(4):830-837. doi: 10.1111/eje.12766. Epub 2022 Feb 11. PMID: 34989095; PMCID: PMC9790431.	0
127	McLean S, Cook N, Rovira-Wilde A, Patel S, Kanagasingam S. Evaluating YouTube as a Patient Information Source for the Risks of Root Canal Treatment. <i>J Endod</i> . 2023 Feb;49(2):155-161. doi: 10.1016/j.joen.2022.09.003. Epub 2022 Dec 13. PMID: 36526106.	0
128	Alraqiq HM, Kim J, Edelstein BL. Analysis of YouTube videos related to a child's first dental visit. <i>Int J Paediatr Dent</i> . 2022 May;32(3):409-417. doi: 10.1111/ipd.12920. Epub 2021 Oct 31. PMID: 34558748.	0
129	Nanji A, Nanji N, Eidelman AS. Students' perceptions on shadowing during COVID-19 and an exploration of innovative solutions for clinical exposure. <i>J Dent Educ</i> . 2023 Apr;87(4):540-547. doi: 10.1002/jdd.13141. Epub 2022 Nov 19. PMID: 36403078.	0
130	Hakami Z, Maganur PC, Khanagar SB, Naik S, Alhakami K, Bawazeer OA, Alassiry AM, Vishwanathaiah S. Thumb-Sucking Habits and Oral Health: An Analysis of YouTube Content. <i>Children (Basel)</i> . 2022 Feb 8;9(2):225. doi: 10.3390/children9020225. PMID: 35204945; PMCID: PMC8870630.	0

Table 2. Journals that published the most about YouTube and Dentistry

Source Title	Number of papers	Impact factor
Journal of Dental Education	8	2.313
American Journal of Orthodontics and Dentofacial Orthopedics	5	2.711
International Journal of Dental Hygiene	5	2.725
Oral Diseases	4	4.068
Journal of Stomatology Oral and Maxillofacial Surgery	4	2.480
British Dental Journal	4	2.727
Angle Orthodontist	4	2.684
Cleft Palate-Craniofacial Journal	4	1.915
Journal of Craniofacial Surgery	4	1.172

Table 3. Main institutions associated with research on YouTube and Dentistry

Institution	Country	Number of papers
University of Hong Kong	China	8
Beykent University	Turquia	6
Ege University	Turquia	5
The University of Jordan	Jordânia	4
University of Campania Luigi Vanvitelli	Itália	4
Harvard School of Dental Medicine	Estados Unidos	3
University of Birmingham	Reino Unido	3
Atlas University	Turquia	3
Erciyes University	Turquia	3
Adiyaman University	Turquia	3

Table 4. Authors with the highest performance in the elaboration of studies on YouTube and dentistry.

Authors	Number of papers	Number of citations in WoS-CC	H-Index
Buyuk SK	6	65	15
Gas S	5	69	5
Romano AN	4	66	32
Serpico R	4	66	55
Mcgrath C	4	92	41
Bozkurt AP	4	63	4
Yeung AWK	4	5	26
Minervini G	3	54	23
Khanagar SB	3	1	6
Zincir OO	3	54	4

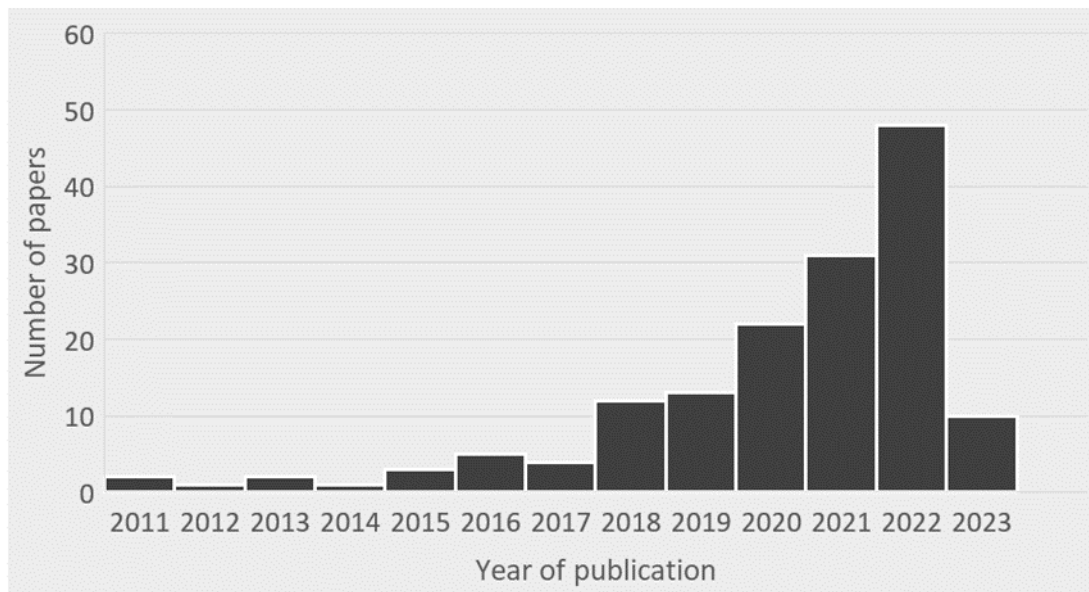


Fig 1 - Distribution of the number of publications in each year.

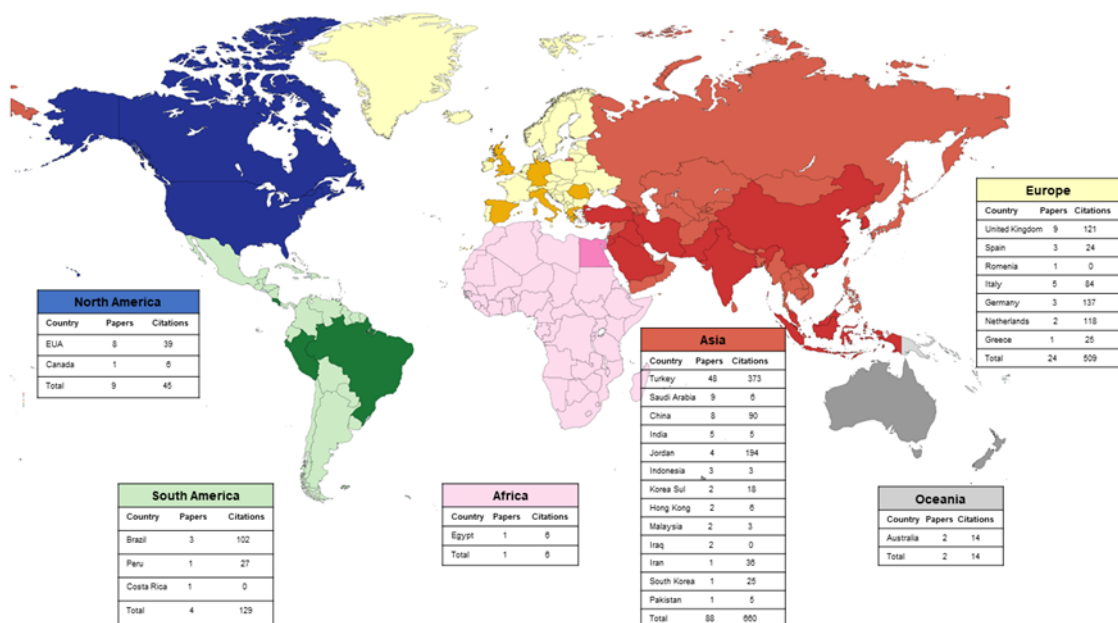


Fig 2 - Map of countries and continents of origin of articles that related YouTube and dentistry.

