



UNIVERSIDADE FEDERAL DE SANTA CATARINA
CENTRO DE CIÊNCIAS DA SAÚDE
PROGRAMA DE PÓS-GRADUAÇÃO EM ODONTOLOGIA
ÁREA DE CONCENTRAÇÃO CLÍNICA ODONTOLÓGICA

Mariana Perini Zendron Prochnow

Verniz de flúor na odontologia: Uma análise bibliométrica dos 100 artigos mais citados

Florianópolis

2023

Mariana Perini Zendron Prochnow

Verniz de flúor na odontologia: Uma análise bibliométrica dos 100 artigos mais citados

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

Orientadora: Prof^a. Mariane Cardoso, Dra.

Coorientadora: Prof^a. Carla Miranda Santana, Dra.

Florianópolis

2023

Ficha de Identificação

Prochnow, Mariana Perini Zendron

Verniz de flúor na odontologia: Uma análise bibliométrica dos 100 artigos mais citados / Mariana Perini Zendron Prochnow ; orientadora, Mariane Cardoso, coorientadora, Carla Miranda Santana, 2023.

36 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. Bibliométrica. 3. Verniz de Flúor. 4. Remineralização. 5. Prevenção à Carie Dentária. I. Cardoso, Mariane. II. Santana, Carla Miranda. III. Universidade Federal de Santa Catarina. Programa de Pós-Graduação em Odontologia. IV. Título.

Mariana Perini Zendron Prochnow

Verniz de flúor na odontologia: Uma análise bibliométrica dos 100 artigos mais citados

O presente trabalho em nível de mestrado foi avaliado e aprovado, em 13 de julho de 2023, pela banca examinadora composta pelos seguintes membros:

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

Prof. Marco Aurelio Benini Paschoal, Dr.
Universidade Federal de Minas Gerais

Prof.^a Carla Massignan, Dr.^a
Universidade de Brasília

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

Insira neste espaço a
assinatura digital

Prof.^a Ana Lucia Schaefer Ferreira de Mello, Dr.^a
Subcoordenadora do Programa

Insira neste espaço a
assinatura digital

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

Florianópolis, 2023

Dedico este trabalho aos meus pais, **Ana Maria** e **Lourival**, e ao meu marido, **Fernando** cujo amor e apoio foram essenciais para conclusão deste trabalho.

AGRADECIMENTOS

Agradeço imensamente a **Deus e Meishu-Sama**, por me guiarem e por me manterem constante, fiel e saudável ao longo dessa jornada. Somente Eles sabem o quão desafiador foi equilibrar a vida pessoal, o trabalho e o mestrado nos últimos dois anos.

Aos meus queridos pais, **Ana Maria e Lourival**, por todo o amor, carinho e dedicação em minha formação pessoal e profissional. Agradeço imensamente e amo vocês!

Ao meu marido, **Fernando**, por todo o amor que me dedica e por ser sempre meu companheiro, amigo e incentivador em todos os momentos, suportando todas as minhas tensões durante esse processo. Sem ele ao meu lado, os resultados não seriam os mesmos. Agradeço por sua compreensão e por estar presente em minha vida. Amo você infinitamente!

Às minhas melhores amigas, **Júlia e Fernanda**, não há palavras suficientes para expressar a gratidão que sinto por ter vocês em minha vida. Vocês estiveram sempre ao meu lado, compartilhando risos, lágrimas, segredos e perrengues. Obrigada por serem minha família escolhida, por me amarem incondicionalmente e por tornarem minha jornada mais colorida e significativa. Amo vocês de todo o meu coração!

À minha mentora **Catherine**, por ser a primeira incentivadora de realizar o mestrado, pelas experiências durante a Especialização e no Hospital Infantil. Obrigada pela sua amizade, por sempre me ouvir e incentivar, além de ter os melhores conselhos!

À minha orientadora **Mariane Cardoso**, pelo seu acolhimento, ensinamentos e paciência. Tenho um grande carinho e admiração pela pessoa e profissional que você é. Agradeço por sua orientação valiosa!

À minha coorientadora **Carla Miranda Santana**, obrigada por todo cuidado e motivação. Apesar de não estar muito presente agora nessa reta final, sempre me incentivou e estendeu seu carinho e sorriso quando precisei. Muito obrigada!

A professora **Michele Bolan**, agradeço pela experiência e conhecimentos compartilhados.

Aos meus colegas e amigos do mestrado e da graduação, **Mel, Karina, Elisa, Michelly, Pablo, Lucas, Bruna**, agradeço por toda a amizade e convívios, com

certeza foram momentos únicos vividos nesses dois anos de mestrado. Agradeço especialmente ao **Aurélio**, pessoa incrível, sempre prestativo e não pestanejava em me auxiliar em todos os projetos, muito obrigada!

A toda a **equipe do team odontopediatria**, incluindo os professores, pós-graduandos e graduandos, agradeço a convivência, troca de conhecimentos e gentileza sempre oferecida. Aprendi muito com todos vocês!

Ao **Programa de Pós-graduação em Odontologia da UFSC**, incluindo funcionários e professores, principalmente a secretária **Débora**, grata por sempre me tratarem tão bem em todos os momentos.

À **Universidade Federal de Santa Catarina**, lugar onde vivi grande parte da minha vida, onde pude crescer, amadurecer e aprender minha profissão!

Aos professores da banca examinadora, **Prof. Dr. Marco Aurelio Benini Paschoal**, **Profª. Drª. Carla Massignan** e **Drª. Bárbara Moccelini**, que aceitaram fazer parte deste trabalho. Agradeço imensamente pela disponibilidade e pelo tempo dedicado à leitura do meu trabalho. Tenho certeza de que as contribuições de vocês enriquecerão muito o nosso trabalho. Muito obrigada a todos!

“Aprender é a única coisa que a mente nunca se cansa, nunca tem medo e nunca se arrepende.” (DA VINCI)

RESUMO

A saúde bucal desempenha um papel crucial na qualidade de vida e no bem-estar geral. A prevenção de doenças bucais, como cárie dentária e hipersensibilidade dentinária, é fundamental nesse contexto, e o verniz de flúor tem se mostrado uma ferramenta valiosa nesse aspecto. Este estudo analisou as características dos 100 artigos mais citados sobre verniz de flúor na odontologia. Em julho de 2022 uma pesquisa na plataforma de pesquisa Web of Science Core Collection (WoS-CC) foi realizada com uma estratégia de busca relacionada a temática. Os artigos selecionados foram organizados em número decrescente de citações. Dois pesquisadores extraíram os seguintes parâmetros bibliométricos: título, número e densidade de citação, ano, periódico, temática, desenho do estudo, autoria, instituições e países. Comparações do número de citações foram realizadas com Scopus e Google Scholar. Software VOSviewer criou redes bibliométricas e o teste do coeficiente de correlação de Spearman foi utilizado. O número de citações variou de 36 a 351, sendo que treze artigos foram citados mais de 100 vezes. Os artigos foram publicados entre 1977 e 2018, sendo a maioria deles publicada após 2008 (48%). A revista mais prevalente foi Caries Research (17%). Os estudos de intervenção foram o tipo de estudo mais comum (41%). Os tópicos mais discutidos foram a prevenção de cáries dentárias (48%) e a remineralização dental (31%). A Europa foi o continente com o maior número de publicações (46%), principalmente da Suécia (14%). Os Estados Unidos da América tiveram 30% dos artigos na lista dos 100 mais citados. Quanto às universidades, a Universidade de Umea teve o maior número de estudos (8%), seguida pela Universidade da Carolina do Norte (6%). Petersson LG foi o autor com mais artigos no top 100 (6%). As palavras-chave mais utilizadas foram "cárie dentária" (34%) e "verniz de flúor" (31%). Além disso, as imagens do VOSviewer revelaram agrupamento bibliométrico entre palavras-chave e autores. Pode-se concluir que os 100 artigos mais citados sobre verniz de flúor são principalmente da Europa e dos Estados Unidos da América, sendo a maioria estudos de intervenção que focam na utilização do verniz de flúor para a prevenção de cáries dentárias.

Palavras-chave: Bibliométrica; Verniz de Flúor; Remineralização.

ABSTRACT

The present study analyzed the 100 most-cited papers on fluoride varnishes in dentistry. A search was performed on July 20, 2022, on the Web of Science Core Collection. Two independent researchers extracted the following data: number and citation density; year and journal of publication; study design; main topic; authors; institutions; keywords; countries and continents. Scopus and Google Scholar were consulted to compare the number of citations. Bibliometric networks were generated in the VOSviewer. The number of citations ranged from 36 to 351, and thirteen papers were cited more than 100 times. The papers were published between 1977 and 2018, most of which were published after 2008 (48%). The most prevalent journal was *Caries Research* (17%). Intervention studies were the most common design (41%). The most discussed topics were dental caries prevention (48%) and dental remineralization (31%). Europe was the continent with the highest number of publications (46%), mainly from Sweden (14%). United States of America had 30% of the papers in the 100 most-cited list. As for the universities, Umea University had the most substantial number of studies (8%), followed by University of North Carolina (6%). Petersson LG was the author with more papers in the top 100 (6%). The most used keywords were “dental caries” (34%) and “fluoride varnish” (31%). Also, the VOSviewer images revealed bibliometric clustering between keywords and authors. It can be concluded that the top 100 cited papers on fluoride varnish primarily originated from Europe and United States of America, with the majority consisting of intervention studies focusing on the utilization of fluoride varnish for the prevention of dental caries.

Keywords: Bibliometrics; Fluor Varnish; Remineralization.

RESUMO EXPANDIDO

Introdução

A saúde bucal desempenha um papel crucial na qualidade de vida e no bem-estar geral. A cárie dentária é uma das condições de saúde bucal que afeta de 3 a 12% da população mundial. A prevenção de doenças bucais, como cárie dentária e hipersensibilidade dentinária, é fundamental nesse contexto, e o verniz de flúor tem se mostrado uma ferramenta valiosa nesse aspecto.

Objetivos

Este estudo analisou as características dos 100 artigos mais citados sobre verniz de flúor na odontologia. Além disso, esse estudo tem como objetivo avaliar se o delineamento do estudo e as áreas de interesse influenciam na quantidade de citações recebidas e investigar a possível relação entre o ano de publicação e o número de citações recebidas.

Metodologia

A pesquisa foi realizada em 20 de julho de 2022, seguindo abordagem quantitativa, na base de dados Web of Science Core Collection (WoS-CC). As palavras-chave selecionadas para a estratégia de busca foram previamente identificadas em termos MeSH e relacionadas a outros artigos sobre verniz fluoretado. A estratégia de busca utilizou os operadores booleanos [TS= (“fluoride vernizes” OR “vernizes, fluoreto” OR “verniz fluor” OR “verniz fluoretado” OR “verniz fluoretado dental” OR “verniz dental” OR “verniz dentina” OR “esmalte verniz”)]. Foi utilizado o filtro de categorias WoS-CC - Dentistry Oral Surgery Medicine, que possibilitou a seleção apenas de periódicos da área odontológica devido ao grande número de estudos envolvendo outras áreas da ciência. Os artigos foram exibidos em ordem decrescente de acordo com o número de citações. A busca limitou-se a artigos de pesquisa e revisão que estivessem relacionados ao verniz fluoretado, seja como tema principal ou secundário. Nenhum filtro de idioma, geográfico ou ano de publicação foi aplicado. Foram excluídos editoriais, artigos de conferências, livros e capítulos de livros. Os dados extraídos dos artigos foram título, autoria, número de citações, densidade de citações, instituição, países e continente (com base na afiliação do autor correspondente), ano de publicação, título do periódico, desenho do estudo, tema e palavras-chave. Os dados foram verificados duas vezes para evitar erros. Os artigos foram comparados com suas contagens de citações usando os bancos de dados Scopus e Google Scholar. Em caso de empate, a ordem dos artigos na lista foi determinada pela densidade de citações do WoS-CC, sendo que o artigo com maior densidade de citações do WoS-CC (divisão entre o número de citações e o período de publicação em anos) recebeu a posição mais alta. Persistindo o empate, teria prioridade o artigo com maior número de citações na Scopus. Os desenhos dos estudos foram classificados em revisões sistemáticas, laboratoriais (estudos in vitro ou em animais), observacionais (estudos transversais ou longitudinais), estudos intervencionistas (estudos clínicos com intervenção de pacientes), revisão de literatura e relatos de casos. Independentemente do desenho do estudo, todos os artigos foram agrupados de acordo com os temas mais gerais: prevenção de cárie dentária, remineralização dentária, dessensibilização, eficácia e uso de verniz fluoretado para controle do desgaste dentário erosivo. Os temas que menos apareceram foram classificados como “outros”. O software VOSviewer foi utilizado para gerar mapas de densidade

colaborativos entre autores (apenas autores conectados são apresentados) e entre palavras-chave (apenas palavras-chave com pelo menos três ocorrências foram incluídas usando a opção "Todas as palavras-chave"). Cada ponto no mapa de densidade possui uma cor que indica a densidade dos itens naquele ponto. As cores variam do azul ao amarelo e ao vermelho. A cor vermelha aparece quando há alta ocorrência dos itens avaliados e seus associados. Por outro lado, a cor azul representa menor ocorrência e correlação entre os itens [Jan van Eck e Waltman, 2017]. A análise dos dados foi realizada com o pacote estatístico SPSS for Windows (SPSS, versão 24.0; IBM Corp) para determinar correlações do número de citações entre as bases de dados. O teste de Kolmogorov-Smirnov foi utilizado para verificar a normalidade da distribuição dos dados. O teste do coeficiente de correlação de postos de Spearman foi utilizado, uma vez que os dados não apresentavam distribuição normal.

Resultados e Discussão

O número de citações variou de 36 a 351, sendo que treze artigos foram citados mais de 100 vezes. Os artigos foram publicados entre 1977 e 2018, sendo a maioria deles publicada após 2008 (48%). A revista mais prevalente foi Caries Research (17%). Os estudos de intervenção foram o tipo de estudo mais comum (41%). Os tópicos mais discutidos foram a prevenção de cáries dentárias (48%) e a remineralização dental (31%). A Europa foi o continente com o maior número de publicações (46%), principalmente da Suécia (14%). Os Estados Unidos da América tiveram 30% dos artigos na lista dos 100 mais citados. Quanto às universidades, a Universidade de Umea teve o maior número de estudos (8%), seguida pela Universidade da Carolina do Norte (6%). Petersson LG foi o autor com mais artigos no top 100 (6%). As palavras-chave mais utilizadas foram "cárie dentária" (34%) e "verniz de flúor" (31%). Além disso, as imagens do VOSviewer revelaram agrupamento bibliométrico entre palavras-chave e autores.

Considerações Finais

Esta análise bibliométrica proporciona informações significativas acerca dos 100 artigos mais citados no uso de verniz de flúor na odontologia e pode ser utilizada para compreender de que forma essa seleção de artigos influenciou as comunidades científica e clínica. Em suma, demonstrou-se que houve uma inclinação global para o aumento da publicação relacionada ao tópico, com um crescimento significativo no número de publicações a partir de 2008, sendo os países europeus os líderes nesse âmbito. Os 100 artigos mais citados evidenciaram que estudos de intervenção e revisão da literatura foram os desenhos de estudo mais comuns abordando a prevenção de cárie dentária, remineralização da estrutura dentária e dessensibilização como temáticas principais.

Palavras-chave: Bibliométrica; Verniz de Flúor; Remineralização.

LISTA DE ABREVIATURAS E SIGLAS

CPP-ACP	Caseína Fosfopeptídeo Amorfo Fosfato de Cálcio
DDE	Desgaste Dental Erosivo
NaF	Fluoreto de Sódio
VF	Verniz de Flúor
WoS-CC	Web of Science Core Collection

SUMÁRIO

1	INTRODUÇÃO.....	15
2	REVISÃO DE LITERATURA	17
3	OBJETIVO	20
3.1	OBJETIVO GERAL	20
3.2	OBJETIVOS ESPECÍFICOS	20
4	ARTIGO	21
5	CONSIDERAÇÕES FINAIS.....	30
	REFERÊNCIAS	31

1 INTRODUÇÃO

As doenças bucais representam um desafio para a saúde global, afetando a qualidade de vida e o bem-estar (JIN et al., 2016). A cárie dentária é uma das condições de saúde bucal que afeta de 3 a 12% da população mundial (WEN et al., 2021). Embora seja uma doença comum, é essencial atentar para o tratamento das lesões iniciais, pois elas representam uma oportunidade de interrupção do avanço da doença e preservação da saúde bucal (ALAM et al., 2021). A cárie da primeira infância é uma doença crônica que afeta os dentes decíduos em crianças com menos de 6 anos de idade (PATIL et al., 2020). Essa condição pode ter consequências significativas para a saúde bucal e qualidade de vida das crianças (RAMOS-GOMEZ; KINSLER; ASKARYAR, 2020). Em outras faixas etárias, a cárie dentária pode se apresentar durante o tratamento ortodôntico, devido à presença de braquetes, fios e ligaduras os quais criam nichos e reentrâncias que dificultam a remoção da placa bacteriana durante a escovação (SONESSON et al., 2020). A cárie radicular, a qual afeta mais comumente população geriátrica, definida como uma cavitação abaixo da junção cimento-esmalte, não incluindo o esmalte adjacente (ZHANG et al., 2020). Independente da faixa etária, a cárie dentária está associada a uma série de desfechos negativos, tais como dor, menor qualidade de vida e comprometimento funcional e estético (HAAG et al., 2017).

A dor e piora da qualidade de vida pode ser oriunda de desgastes dentais patológicos, que independem de subprodutos bacterianos (CASTRO et al., 2021). A hipersensibilidade dentinária ocorre quando a dentina perde sua proteção natural, seja por tensão, fricção, desgaste dental erosivo ou recessão gengival, expondo os túbulos dentinários (ABUZINADAH; ALHADDAD, 2021). Os túbulos dentinários contêm fluidos, que são sensíveis a mudanças de temperatura e estímulos externos, resultando em dor aguda e desconforto para o paciente (BRÄNNSTRÖM, 1986). O desgaste dental erosivo (DDE) é uma condição caracterizada pela perda progressiva e irreversível do tecido dental duro devido à ação de ácidos não bacterianos, podendo levar à perda de estrutura dental, hipersensibilidade dentinária, comprometimento estético e piora da qualidade de vida (ALGARNI et al., 2021).

Diante desse cenário, a prevenção efetiva da cárie dentária, desgastes patológicos e controle da hipersensibilidade dentinária é de extrema importância. O verniz de flúor (VF) tem sido amplamente reconhecido como uma opção eficaz de

tratamento e prevenção para essas condições (MARINHO et al., 2013). O mecanismo de ação do VF envolve a formação de uma camada protetora de fluorapatita nos dentes, tornando-o mais resistente à desmineralização (FARHADIAN et al., 2008). O verniz de flúor é geralmente comercializado com a concentração de 22.600 ppm de flúor, equivalente a 5% de fluoreto de sódio (NaF) (FEATHERSTONE, 1999). A viscosidade adequada do VF permite uma distribuição uniforme do material nos dentes e sua adesão ao tecido dental ajuda a prolongar a ação do flúor, permitindo que ele seja liberado gradualmente ao longo do tempo e mantenha contato direto com o esmalte dental (MARINHO et al., 2013).

Considerando a importância do verniz de flúor como uma opção de tratamento e prevenção para lesões de cárie dentária, desgaste dental erosivo e hipersensibilidade dentinária, é necessário realizar uma análise crítica da literatura científica com maior fator de impacto. Essa análise permitirá identificar as tendências de pesquisa, os avanços científicos e as lacunas de conhecimento nesse campo, contribuindo para o desenvolvimento da base de conhecimento e orientando futuras pesquisas e práticas clínicas relacionadas ao verniz de flúor.

Investigações bibliométricas têm sido conduzidas em diferentes campos da medicina e odontologia desde o ano de 1987 (GARFIELD, 1987). A revisão bibliométrica é um método de pesquisa que utiliza técnicas quantitativas para analisar a produção científica em uma determinada área científica, avaliando as características dos estudos publicados e permitindo obter uma visão panorâmica da produção científica (JAFARZADEH; SARRAF SHIRAZI; ANDERSSON, 2015). Além disso, identifica as principais tendências e áreas de pesquisa, gaps do conhecimento e avaliação do impacto dos estudos (JI et al., 2021). Um elevado volume de citações pode evidenciar a capacidade de um artigo em afetar as tomadas de decisão clínicas e investigações futuras (AKHAVAN et al., 2016). Diversas áreas e temas odontológicos têm sido explorados em investigações bibliométricas até o momento (ALAM et al., 2021b; BALDIOTTI et al., 2021; ROCHA et al., 2022), contudo, ainda não foi realizada uma análise bibliométrica de artigos sobre verniz de flúor. Essa análise poderia auxiliar os pesquisadores a reconhecer tendências de estudo associadas ao verniz de flúor, enfatizar as evidências primordiais e identificar lacunas de conhecimento na área, sinalizando, dessa forma, a exigência de novas pesquisas científicas.

2 REVISÃO DE LITERATURA

O verniz de flúor foi originalmente desenvolvido na Suécia na década de 1960, por uma equipe liderada pelo Dr. Svante Twetman (HAWKINS et al., 2003). Twetman foi um pioneiro na pesquisa e no uso clínico como uma medida preventiva para a cárie dentária, contribuindo para o aprimoramento e a popularização dessa forma de tratamento (PETERSSON; PAKHOMOV; TWETMAN, 1997). Na década de 1960, a formulação do verniz de flúor era bastante simples e geralmente consistia em uma solução de fluoreto de sódio (NaF) com concentração em torno de 2,26% a 5%, diluído em água ou álcool (FEATHERSTONE, 1999).

Além do fluoreto de sódio, alguns vernizes de flúor daquela época também podiam conter outros ingredientes adicionais para melhorar sua aderência aos dentes, como resinas ou ceras, permitindo uma liberação mais lenta e prolongada do flúor (FEATHERSTONE, 1999). Atualmente o verniz de flúor contém 5% de fluoreto de sódio e foi desenvolvido para aumentar a retenção de flúor nas superfícies dos dentes (MOHD; EKAMBARAM; YIU, 2017). O mecanismo de ação do verniz de flúor envolve a formação de uma camada protetora de fluorapatita nos dentes, sendo mais resistente e estável que a hidroxiapatita (OGAARD; SEPPÄ; RØLLA, 1994). Com a reação dos íons de flúor com os íons hidroxila, ocorre uma reação de substituição que resulta na formação de fluorapatita (OGAARD; SEPPÄ; RØLLA, 1994). Essa substituição confere propriedades diferenciadas, tal como maior resistência à desmineralização ácida e maior capacidade de remineralização do esmalte dental (FEATHERSTONE, 1999).

No início do desenvolvimento do verniz de flúor, a sua utilização era mais comum em países escandinavos, como Suécia e Dinamarca (BAWDEN, 1998). Contudo, partir dos estudos pioneiros do Dr. Twetman, o verniz de flúor ganhou reconhecimento mundial como uma ferramenta que poderia ser seguramente utilizado em todas as faixas etárias, além de se mostrar eficaz no tratamento de diversos diagnósticos odontológicos (SONESSON et al., 2020). O verniz de flúor pode ser utilizado como medida preventiva contra as lesões de mancha branca em todas as faixas etárias e em pacientes com necessidades especiais (DOPPALAPUDI; BURUGAPALLI, 2020; PATIL et al., 2020). Durante o tratamento ortodôntico, o verniz de flúor desempenha um papel fundamental na remineralização de manchas brancas (SONESSON et al., 2020). Além de auxiliar no tratamento da hipersensibilidade

dentinária, proporcionando alívio aos pacientes que sofrem com esse diagnóstico, o verniz de flúor pode ser aplicado em pacientes com desgaste dental erosivo, e na prevenção da cárie radicular, comum nos pacientes geriátricos devido à retração gengival e exposição da raiz dental (LUSSI et al., 2019; RITTER et al., 2006; SLEIBI; TAPPUNI; BAYSAN, 2021).

As formulações atuais do verniz de flúor geralmente incluem fluoreto de sódio como o ingrediente ativo principal, juntamente com outros componentes para melhorar sua adesão, consistência, sabor e liberação controlada de flúor (MARINHO et al., 2013). O verniz de flúor a base de fosfato de cálcio (caseína) é uma variação do verniz de flúor convencional, o qual ajuda na adesão do verniz aos dentes, permitindo uma liberação mais lenta e prolongada do flúor (SLEIBI; TAPPUNI; BAYSAN, 2021). Além de melhorar a adesão, a caseína também pode proporcionar efeitos benéficos para a remineralização dentária (MEKKY; DOWIDAR; TALAAT, 2021). O fosfopeptídeo caseína se liga ao fosfato de cálcio amorfo, constituindo o complexo CPP-ACP, que têm a capacidade de se ligar ao cálcio e ao fosfato presentes na saliva (SLEIBI; TAPPUNI; BAYSAN, 2021). Essa interação ajuda a estabilizar esses minerais, promovendo a remineralização do esmalte dental e a redução da desmineralização (COCHRANE et al., 2010). Existem várias marcas comerciais de verniz de flúor disponíveis no mercado, sendo algumas das mais conhecidas Duraphat (Colgate-Palmolive (UK) Ltd., Guildford, Surrey, UK) com uma concentração de 5% fluoreto de sódio, MI Varnish™ (GC Corporation, Itabashi-Ku, Tokyo, Japan) com 5% Fluoreto de sódio e caseína fosfopeptídeo-amorfo fosfato de cálcio (CPP-ACP) e Clinpro™ White Varnish (3M ESPE, St Paul, MN, USA) com fluoreto de sódio a 5% e fosfato tricálcico (TCP) (MOHD; EKAMBARAM; YIU, 2017). Apesar de serem considerados materiais promissores, o uso desses materiais à base de fosfato de cálcio é contraindicado em pacientes com alergia à proteína do leite (ENAX et al., 2023).

Diante de um cenário no qual as doenças bucais representam um desafio para a saúde global, afetando a qualidade de vida e o bem-estar, é de prudente que os profissionais de saúde bucal consultem evidências científicas de qualidade (PATIL et al., 2020). A revisão bibliométrica desempenha um papel importante no desenvolvimento do conhecimento científico (YOUNG H., 1985). Por meio dessa abordagem, é possível realizar uma análise qualitativa da produção científica, utilizando métricas e indicadores para avaliar e compreender a evolução, as tendências e as lacunas de pesquisa (ZHAO et al., 2018). Utilizando métricas

bibliométricas, como o número de publicações, citações, índices de impacto e colaboração entre autores e instituições, é possível analisar a produtividade e o impacto dos estudos na área odontológica (AHMAD et al., 2020). Essas métricas oferecem insights sobre a influência dos pesquisadores e das instituições, bem como sobre as tendências de pesquisa mais relevantes (ADNAN; ULLAH, 2018). A revisão bibliométrica também permite identificar colaborações entre autores e instituições, destacando redes de pesquisa e cooperação (ROLDAN-VALADEZ et al., 2019).

A revisão bibliométrica e os artigos mais citados estão intimamente relacionados. O uso do número de citações tem sido amplamente reconhecido como uma medida direta e comumente aceita do reconhecimento que um artigo recebe em sua área de estudo (ASLAM-PERVEZ; LUBEK, 2018). A frequência com que um trabalho é citado ou referenciado por outros é uma métrica importante para avaliar a importância acadêmica e a sua influência no meio científico (ROLDAN-VALADEZ et al., 2019). Alguns acadêmicos consideram um artigo científico com mais de 400 citações como um trabalho “clássico” (AHMAD et al., 2019). No entanto, dentro de domínios específicos da pesquisa científica e clínica, um artigo que receba 100 ou mais citações também pode alcançar o status de “clássico”, exercendo uma influência significativa na pesquisa e na prática clínica (JAFARZADEH; SARRAF SHIRAZI; ANDERSSON, 2015). Numerosos campos e temas da odontologia têm sido explorados em investigações bibliométricas até o momento (ALAM et al., 2021b; BALDIOTTI et al., 2021; ROCHA et al., 2022). No entanto, ainda não foi realizada uma avaliação bibliométrica dos artigos sobre verniz de flúor. Uma investigação desse tipo poderia ajudar os pesquisadores a identificar padrões de pesquisa sobre verniz de flúor, destacar as principais evidências e apontar lacunas de conhecimento, indicando assim a necessidade de novas pesquisas científicas.

3 OBJETIVO

3.1 OBJETIVO GERAL

O objetivo do presente estudo foi identificar e analisar as principais características dos 100 artigos mais citados relacionado ao uso do verniz de flúor na odontologia.

3.2 OBJETIVOS ESPECÍFICOS

- a) Coletar em cada artigo os seguintes parâmetros métricos: título, número de citações, ano de publicação, autoria, país, periódico, temática e desenho do estudo;
- b) Comparar o número e densidade de citações entre os bancos de dados *Web of Science*, *Scopus* e *Google Scholar*, além de realizar análise estatística de correlação para verificar possíveis discrepâncias entre os valores encontrados;
- c) Avaliar se o delineamento do estudo e as áreas de interesse influenciam na quantidade de citações recebidas;
- d) Investigar a possível relação entre o ano de publicação e o número de citações recebidas;
- e) Analisar as redes bibliométricas utilizando o software *VOSviewer*, realizando comparações entre as palavras-chave mais utilizadas, os autores mais citados e os países com maior produção científica.

4 ARTIGO

O presente artigo está de acordo com as normas, foi submetido e está em correção no periódico *Caries Research*.

Review Article

Fluoride varnish in dentistry: A bibliometric analysis of the 100 most-cited papers

Mariana Perini Zendron^a, Aurélio de Oliveira Rocha^a, Melissa Santos da Silva Simões^a, Carla Miranda Santana^a, Michele Bolan^a, Mariane Cardoso^a

^aDepartment of Dentistry, Universidade Federal de Santa Catarina (UFSC), Florianópolis, (Santa Catarina), Brazil.

Short Title: The top 100 most-cited papers concerning fluoride varnishes.

Corresponding Author:

Mariane Cardoso

Department of Dentistry

Universidade Federal de Santa Catarina

Campus Universitário – Bloco H - Trindade

Florianópolis, Santa Catarina, 88040-900, Brazil

Tel: +55 (48) 99113-3362

E-mail: mariane_cardoso@ufsc.br

Number of Tables: Five tables (two in the main text and three supplementary).

Number of Figures: Three figures (two in the main text and one supplementary).

Word count: 3,775

Keywords: Bibliometrics, Fluoride Varnish, Remineralization, Dental Caries Prevention.

Abstract

The present study analyzed the 100 most-cited papers on fluoride varnishes in dentistry. A search was performed on July 20, 2022, on the Web of Science Core Collection. Two independent researchers extracted the following data: number and citation density; year and journal of publication; study design; main topic; authors; institutions; keywords; countries and continents. Scopus and Google Scholar were consulted to compare the number of citations. Bibliometric networks were generated in the VOSviewer. The number of citations ranged from 36 to 351, and thirteen papers were cited more than 100 times. The papers were published between 1977 and 2018, most of which were published after 2008 (48%). The most prevalent journal was *Caries Research* (17%). Intervention studies were the most common design (41%). The most discussed topics were dental caries prevention (48%) and dental remineralization (31%). Europe was the continent with the highest number of publications (46%), mainly from Sweden (14%). United States of America had 30% of the papers in the 100 most-cited list. As for the universities, Umea University had the most substantial number of studies (8%), followed by University of North Carolina (6%). Petersson LG was the author with more papers in the top 100 (6%). The most used keywords were “dental caries” (34%) and “fluoride varnish” (31%). Also, the VOSviewer images revealed bibliographic clustering between keywords and authors. It can be concluded that the top 100 cited papers on fluoride varnish primarily originated from Europe and United States of America, with the majority consisting of intervention studies focusing on the utilization of fluoride varnish for the prevention of dental caries.

Introduction

The treatment philosophy of minimally invasive dentistry prioritizes preserving a healthy tooth structure [Cheng et al., 2022]. As a result, non-invasive preventive techniques are preferred as they are effective and clinically suitable [Alam et al., 2021]. Fluoride varnish has been demonstrated as effective in non-invasive treatments by decreasing demineralization and enhancing enamel remineralization [Marinho et al., 2013]. Its concentration usually is 22,600 ppm (5%), and the active ingredient is sodium fluoride [Ramos-Gomez et al., 2020]. It was originally developed to prolong the contact time between fluoride and dental structure, as it adheres to the tooth surface for longer periods in a thin layer which deposits calcium fluoride on the dental enamel or within the dentin tubules. (OGAARD; SEPPÄ; RØLLA, 1994). In this course, this precipitate may serve as a reservoir of fluoride, which, in turn, facilitates the formation of fluorapatite [Ramos-Gomez et al., 2020].

For the primary dentition, fluoride varnish has been shown to be effective in preventing dental caries and reversing non-cavitated lesions (MARINHO et al., 2013). Likewise, for the permanent dentition, its use has been shown to be effective, mainly in the control of white spot carious lesions resulting from orthodontic treatment, root caries and control of dentin hypersensitivity associated with erosive tooth wear and defective enamel formation [Sonesson et al., 2020; Sleibi et al., 2021]. These conditions, if correctly diagnosed, indicate the application of fluoride varnish [Ritter et al., 2006]. Considering the excellent performance and numerous indications of fluoride varnish for the health of the oral cavity, a significant amount of research has been carried out and published over time all over the world [Marinho et al., 2013; Celeste et al., 2016]. Thus, it becomes necessary to carry out studies that analyze the characteristics of this large collection of scientific evidence.

Bibliometric studies have taken part in numerous fields of medicine and dentistry since 1987 (GARFIELD, 1987). This type of study focuses on measuring distinct aspects of performance, assessing the accomplishment of the main topic through the characteristics of the studies included in the analysis (ROLDAN-VALADEZ et al., 2019). Bibliometric analysis can aid researchers in recognizing research patterns, study methodologies, trending thematic, notable authors, leading scientific journals, and countries with the highest publication performance (PERAZZO et al., 2019). Numerous dentistry fields and thematic have been explored in bibliometric investigations thus far [Alam et al., 2021; Baldiotti et al., 2021; Rocha et al., 2022]. Nonetheless, no bibliometric assessment of papers concerning fluoride varnish has yet been carried out. Such an investigation could help researchers in identifying fluoride varnish research patterns, pinpointing main evidence, and highlighting knowledge gaps in the field, thereby indicating the necessity for fresh scientific inquiries. Therefore, this study aimed to analyze the characteristics of the top 100 most-cited papers on fluoride varnish.

Methods

Information sources and search strategy

The research was performed on July 20, 2022, following a quantitative approach, in the Web of Science Core Collection (WoS-CC) database. The keywords selected for the search strategy were previously identified in MeSH terms and related to other papers regarding fluoride varnish. The search strategy used the Boolean operators [TS= (“fluoride varnishes” OR “varnishes, fluoride” OR “varnish fluor” OR “fluoride varnish” OR “dental fluoride varnish” OR “dental varnish” OR “dentin varnish” OR “enamel varnish”)]. The WoS-CC - Dentistry Oral Surgery Medicine category filter was used, which enabled the selection of only journals in the dental field due to the large number of studies involving other areas of science. Papers were displayed in descending order based on the number of citations.

Eligibility criteria

The search was limited to research and review articles that were related to fluoride varnish, either as a main or secondary theme. No language, geographical, or year of publication filters were applied. However, editorials, conference papers, books, and book chapters were excluded. Two independent researchers (MPZ and AOR) identified the 100 most-cited papers after reading the titles, abstracts, and full texts, when necessary. Any disagreement was resolved through discussion and consensus with a third researcher (MC).

Data selection

Data extracted from papers were title, authorship, number of citations, citation density, institution, countries, and continent (based on the corresponding author’s affiliation), year of publication, journal title, study design, topic, and keywords. Data were double-checked to avoid errors. The papers were crossmatched with their citation counts using Scopus and Google Scholar databases. If there was a tie, the order of the papers in the list was determined by their WoS-CC citation density, with the paper having the highest WoS-CC citation density (division between the number of citations and the publication period in years) receiving the higher position. If the tie persisted, the paper with the highest number of citations at Scopus was given priority.

Study design and topics

Study designs were classified as systematic reviews, laboratory (in vitro or animal study), observational (cross-sectional or longitudinal studies), interventional studies (clinical studies with patient intervention), literature review and case reports. Regardless of the study design all papers were grouped according to the most general topics: dental caries prevention, dental remineralization,

desensitization, effectiveness, and use of fluoride varnish for the control of erosive tooth wear. Topics that appeared less were classified as “others”.

Bibliometric and statistical data analysis

The VOSviewer software was used to generate collaborative density maps between authors (only connected authors are presented) and between keywords (only keywords with at least three occurrences were included using the “All Keywords” option). Each point on the density map has a color indicating the items’ density at that point. Colors range from blue to yellow to red. The red color appears when there is a high occurrence of the evaluated items and their associates. On the other hand, the blue color represents a lower occurrence and correlation between the items [Jan van Eck, and Waltman, 2017]. Data analysis was performed with the statistical software package SPSS for Windows (SPSS, version 24.0; IBM Corp) to determine correlations of the number of citations among the databases. The Kolmogorov-Smirnov test was used to verify the normality of data distribution. Spearman’s rank correlation coefficient test was used since the data were not normally distributed.

Results

Search results

Initially, 1,227 documents were retrieved from WoS-CC. After applying the filter “Dentistry, Oral Surgery & Medicine”, 881 results were obtained and listed in descending order based on the number of citations. For the top 100 most-cited selection (online suppl. Table 1), the 147 first listed papers were scanned, and 47 papers were excluded. Reasons for exclusions were conference papers and studies that did not relate to fluoride varnish.

Citation analysis

Altogether, the top 100 papers were cited 6,933 times in the WoS-CC, including 340 self-citations (4,90%). The number of citations ranged from 36 to 351, and 13 papers were cited at least 100 times. The most-cited paper was “Fluoride varnishes for preventing dental caries in children and adolescents”, written by Marinho VCC, Worthington HV, Walsh T, and Clarkson JE, published in 2013, in Cochrane Database of Systematic Reviews (MARINHO et al., 2013). It was cited 351 times, with an average of 39 citations/year at WoS-CC. It was also the most-cited paper on Google Scholar (1,296 citations), but not on Scopus (240 citations). The number of citations was higher in Google Scholar (17,366 citations, varying from 1.296 to 53) and Scopus (7,784 citations, varying from 273 to 32). There was a strong positive correlation between the number of citations in WoS-CC and Google Scholar (ρ

= 0.850) and a very strong correlation in WoS-CC and Scopus ($\rho = 0.950$) and Google Scholar and Scopus ($\rho = 0.903$).

Year of publication and contributing journals

The oldest paper was published in 1977 [Murray et al., 1977] and the most recent in 2018 (ALKILZY et al., 2018). In Table 1 are shown the 100 most cited papers in fluoride varnish through the decades, and most studies were published most articles were published from 2008 onwards (46 papers; 3,253 citations). Regarding the Journals, Table 2 displays the top 10 Journals with the highest number of papers in the top 100 most-cited list.

Study design and topic

Interventional studies were the most common (41 papers; 2,844 citations), followed by literature reviews (21 papers; 1,219 citations), laboratory studies (18 papers; 1,029 citations), systematic reviews (12 papers; 1,280 citations), observational studies (7 papers; 484 citations), and clinical report (1 paper; 77 citations). In terms of topics, it was observed that dental caries prevention (48 papers; 3,503 citations), dental remineralization (31 papers; 2,184 citations), desensitization (7 papers; 424 citations), use of fluoride varnish for the control of erosive tooth wear (6 papers; 326 citations), and effectiveness (5 papers; 349 citations) were the main topics. The topics that appeared less were cost-effectiveness (2 papers; 105 citations) and non-restorative treatment (1 paper; 42 citations).

Countries and continents

Europe hosted the highest number of papers and citations of the 100 most-cited papers (Fig. 1) (46 papers; 2,875 citations). The papers from North America were mainly from the United States of America (30 papers; 2,788 citations), except from Canada (4 papers; 240 citations). The most meaningful European papers were from Sweden (14 papers, 936 citations). Brazil represented South America (4 papers, 294 citations), and Australia represented Oceania (4 papers; 234 citations). Asia was represented by China (4 papers; 467 citations), Iran (2 papers; 103 citations), and Turkey (2 papers; 80 citations). Africa had no papers in the top 100 list. At a country level, Finland (6 papers; 388 citations), Netherlands (6 papers; 338 citations), and Germany (5 papers; 275 citations) also presented a significant number of papers and citations.

Contribution institutions

A total of 54 institutions participated in the 100 most-cited papers. The University of Umea in Sweden (8 papers; 516 citations), the University of North Carolina in the United States of America

(6 papers; 418 citations), and the University of Washington, also in the United States of America (6 papers; 370 citations) were the leading academic centers (online suppl. Table 2).

Contributing authors

Three-hundred and fifty-four authors were identified in the 100 most-cited papers. A VOSviewer density map was generated to detail the collaborative co-authorship between the authors through the clusters. The online suppl. Fig. 1 shows authors who obtained 4 or more occurrences, where the presence of 12 clusters is observed. The biggest cluster was headed by Petersson LG and included other 8 authors. The online supplementary Table 3 presents bibliometric indicators of the first ten authors with the highest number of papers in the top 100 most cited list. Petersson LG was the author with the highest number of papers and citations (6 papers; 362 citations), followed by Twetman S (5 papers; 351 citations) and Lo ECM (papers; 517 citations). Studies with 2 to 3 (39%) and 4 to 6 (44%) authors were more common than those with more than six (9%) or only one author (8%).

Keywords

A keywords network map was created in VOSviewer to present the most frequent keywords throughout the decades (Figure 2). It can be noticed that the keywords directly relate to fluoride varnish, such as “dental caries” with 34 occurrences, “caries” with 17 occurrences, “fluoride” with 17 occurrences, and “prevention”, “preschool-children”, “children” with 14 occurrences each, were all often observed after 2006 (green color).

Discussion

Even though fluoride varnish might be used for desensitization, dental caries was a highly frequent topic for its use in this bibliometric review among prevention, early detection, and minimally invasive dentistry. This study aimed to identify the top 100 most-cited papers in fluoride varnish, demonstrating their significance in dentistry field, and the scientific progress. The most-cited paper was a systematic review published in 2013, which evaluated how effective fluoride varnish was for the prevention of dental caries in children and adolescents (MARINHO et al., 2013). The high number of citations might be because systematic reviews are a known instrument through which the certainty of the evidence of the various types of studies can be better evaluated [Murad et al., 2016].

In evidence-based dentistry, randomized clinical trials are considered the gold standard for clinical decision-making [Perazzo et al., 2019; Liu et al., 2020]. Most of the 100 most-cited papers were interventional studies (41%). The most prevalent study design was clinical interventions, mainly due to the clinical area of research. Likewise, Jayaratne and Zwahlen [2015] identified a considerable increase in original research papers in dentistry compared to review papers from 2003 to 2012.

The accumulation of citations in older papers has been discussed (AHMAD et al., 2020), which might mislead old knowledge. To minimize this, advances in scientific knowledge introduced new concepts of citation (LUO et al., 2018). The citation density is frequently used as a metric to assess the influence of a certain publication, measuring the number of citations per article divided by the time span between publication and citation, providing a more sensitive measure of research productivity and impact (SANTOS et al., 2021).

In some fields with fewer researchers, an article with 100 citations may be considered a “classic” paper having considerable influence on future research and clinical practice [Jafarzadeh et al., 2015]. In this study, thirteen papers were cited at least 100 times and dated from 1997 to 2018 acknowledging fluoride varnish as a still ascending topic. The same thematic trend was found in bibliometric study of the world’s scientific trends in Dental Public Health; the keyword theme “fluoride/prevention” was used in 1,381 papers from 1995 to 2014 – an increase of 31.65% compared to 1975-1994 (CELESTE; BROADBENT; MOYSES, 2016).

A variation in citation counts was noticeable when other databases were compared. This fluctuation was also found in other bibliometric studies [Perazzo et al., 2019; Patil et al., 2020] and highlighted the importance of selecting a suitable database in Scientometry (AHMAD et al., 2020). It must be appreciated that WoS and Scopus claim more citations from papers of selected peer-reviewed journals (BALDIOTTI et al., 2021). Nonetheless, Google Scholar includes citations from books, conference papers, preprints, dissertations, and technical reports, which can disturb the appraisal of the top citations when the objective is more specific (BAKKALBASI et al., 2006).

The 100 most-cited papers in fluoride varnish were published in a 41-year time course. The oldest paper was published in 1977 [Murray et al., 1977], but the 100 most-cited papers were mainly published in the 2000s (Table 1). Since fluoride varnish is considered a non-invasive treatment especially useful for arresting dental caries [Marinho et al., 2013], reducing the dissolution of dental hard tissue in erosive tooth wear [De et al., 2021], and obliterating dentin tubes in dentin hypersensitivity [Ritter et al., 2006; Alam et al., 2021].

Among the most-cited papers, the main topics of interest were primarily concerned with dental caries prevention and dental remineralization, which might be associated with the search for ways to decrease tooth decay in dental caries and dentin hypersensitivity and its clinical importance. The oldest papers dating from the 1970s were all clinical studies evaluating the efficacy of fluoride varnish as a dental caries prevention substance [Murray et al., 1977; Koch et al., 1979; Holm, 1979]. In the 1980s and 1990s, other topics, such as remineralization, use of fluoride varnish for the control of erosive tooth wear, and cost-effectiveness have emerged in addition to dental caries prevention. The most cited paper of this period was a laboratory study that received 116 citations and emphasized the

remineralizing capacity of different fluoride treatments on bovine enamel bleached with carbamide peroxide (ATTIN et al., 1997). Dental bleaching highlights another use of fluoride varnish and signals a scientific trend in the 1990s – the search for quality of life in dentistry (CELESTE; BROADBENT; MOYSES, 2016). Improving the effectiveness of fluoride therapies (CAREY, 2014) and controlling dentin hypersensitivity (YILMAZ; KURTULMUS-YILMAZ; CENGIZ, 2011) were some of the new thematic addressed in the 2000s and 2010s papers.

Keywords are relevant elements of a bibliographic search as they allow more appropriate results to be acquired (NATARAJAN et al., 2010). In this bibliometric study, the topic “dental caries prevention” was studied in almost half of the selected papers, although the keyword “caries prevention” appeared in only a third of them. In addition, the keyword “fluoride varnish” was used in a third of the selected papers, even though it was addressed in all papers. Since keywords are a search strategy to find papers, it is interesting to notice that other parts of the studies need to be well-detailed (GJERSVIK; GULBRANDSEN E; T AASHEIM, 2013).

Among the 100 most cited, the main three published topics that received most citations were related to dental caries prevention, dental remineralization, and desensitization. During the 1970s, the studies performed by Holm AK, Koch G, and Murray JJ and their respective colleagues focused on the role of Duraphat (Colgate Oral Pharmaceuticals and Varnish, 3M ESPE) in preventing dental caries, mostly in preschool children. From the 1980s to the 1990s, Attin T, Schaeken MJM, and Tweetman S published mainly about remineralization of interproximal and root-surface caries and the effects of the fluoride varnish in surface remineralization after dental bleaching. Still in this time-lapse, Petersson LG and Sorvari R and their corresponding associates published about the cost-effectiveness of elaborating an alternative to conventional topical fluoride application and around erosive tooth wear. From the 2000s onwards, studies conducted by Corona SAM, Ritter AV, and their colleagues advanced in desensitization, suggesting fluoride varnish as a decreasing agent in cervical dentin hypersensitivity.

Europe was the continent with the most papers on the top 100 most-cited list. This result seems to be more related to the quality of the institutions and researchers rather than the number of countries that comprise the continent (BALDIOTTI et al., 2021). This finding agrees with data described in other bibliometric studies in dentistry [Baldiotti et al., 2021; Rocha et al., 2022]. The University of Umea in Sweden was the outstanding institution in the top 100 most-cited papers. Nevertheless, the most-cited author (Petersson LG) in the top 100 list is from Sweden.

The United States of America (USA) was the top country on both papers and citations, which corroborates with other studies in the Dentistry area [Ahmad et al., 2020; Vitali et al., 2022]. This major contribution is due to a large community of active researchers and various funding sources (SHADGAN et al., 2010). In regards to the Asian continent, China has garnered a significant number of citations

compared to the number of articles published (4 papers; 467 citations), which may indicate high scientific impact publications. Nevertheless, Africa had no papers in the 100 most cited. It could be explicit an absence of collaboration among authors from different continents. An alternative to this limitation would be to create academic partnerships between important research centers with less influential ones, committing to forming and strengthening new academic centers.

The journals in which the most-cited papers were published varied in the dentistry field, reflecting the multidisciplinary use of fluoride varnish. *Caries Research*, *Community Dentistry and Oral Epidemiology* and *Journal of the American Dental Association* were the scientific journals with the highest number of articles in the list of the 100 most cited. In this bibliometric study, *Caries Research* was the journal with the most published articles, similarly found in the bibliometric study of erosive tooth wear [Rocha et al., 2022]. The prominence of these journals may be associated with the effort to disseminate knowledge related to dental caries and other conditions that can be controlled through the application of fluoride varnish.

The limitations of this study included using only the WoS-CC database as a search engine, while additional databases might have added more insights into this field. Another limitation of the study is selecting only the most cited articles and excluding the more recent ones because they may not have citations yet. However, the objective of this methodology is to truly evaluate the most cited articles that have laid the foundation for the science on fluorine varnish up to this point. Also, the lack of representation of papers from Africa in the top 100 most cited is a meaningful limitation in the field. It might reveal a deeper issue in funding, incentive, and public policies. Moreover, one identified gap pertained to the limited number of in vitro studies conducted on the novel formulations of fluoride varnish containing CCP-ACP and TCP.

This bibliometric study provides valuable information on the top 100 most-cited papers and can be used by researchers to comprehend how this selection of papers have influenced the scientific and clinical communities. In conclusion, it has shown that there was an overall upward trend in publishing on the topic with a significant increase in the number of publications after 2008, with United States of America and Sweden as leaders in publications. The top 100 most-cited papers revealed interventional studies and literature review as most frequent studies designs addressing dental caries prevention, remineralization of the dental structure, and desensitization as main thematic.

Statements

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Funding Sources

This study was partially supported by the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior – Brazil (CAPES) – Finance Code 001.

Author Contributions

M. P. Zendron participated in data acquisition and interpretation, created the tables, and drafted and critically revised the manuscript. A. O. Rocha participated in data acquisition and interpretation, created VOSviewer maps, and drafted and critically revised the manuscript. M. S. S. Simões participated in data acquisition and interpretation, and drafted and critically revised the manuscript. C.M. Santana, M. Bolan, and M. Cardoso contributed to the conception, design, data interpretation, and drafted and critically revised the manuscript. All authors gave their final approval and agreed to be accountable for all aspects of the work.

References

- Ahmad P, Vincent Abbott P, Khursheed Alam M, Ahmed Asif J. A bibliometric analysis of the top 50 most cited articles published in the Dental Traumatology. *Dental Traumatology* 2020;36:89–99.
- Alam BF, Najmi MA, Qasim S Bin, Almulhim KS, Ali S. A bibliometric analysis of minimally invasive dentistry: A review of the literature from 1994 to 2021. *Journal of Prosthetic Dentistry* 2021;1-8.
- Alkilzy M, Tarabaih A, Santamaria RM, Splieth CH. Self-assembling Peptide P11-4 and Fluoride for Regenerating Enamel. *J Dent Res* 2018;97:148-154.
- Attin T, Kielbassa AM, Schwanenberg M, Hellwig E. Effect of fluoride treatment on remineralization of bleached enamel. *J Oral Rehabil.* 1997 Apr;24(4):282-6.
- Bakkalbasi N, Bauer K, Glover J, Wang L. Three options for citation tracking: Google Scholar, Scopus and Web of Science. *Biomed Digit Libr* 2006;3:3-7
- Baldiotti ALP, Amaral-Freitas G, Barcelos JF, Freire-Maia J, De França Perazzo M, Freire-Maia FB, et al. The Top 100 Most-Cited Papers in Cariology: A Bibliometric Analysis. *Caries Res* 2021;55:32–40.
- Carey CM. Focus on Fluorides: Update on the Use of Fluoride for the Prevention of Dental Caries. *Journal of Evidence Based Dental Practice* 2014;14:95–102.
- Celeste RK, Broadbent JM, Moyses SJ. Half-century of Dental Public Health research: bibliometric analysis of world scientific trends. *Community Dent Oral Epidemiol* 2016;44:557–563.
- Cheng L, Zhang L, Yue L, Ling J, Fan M, Yang D. Expert consensus on dental caries management. *International Journal of Oral Science* 2022;14:17.
- Garfield E. 100 Citation Classics From The Journal of the American Medical Association. *JAMA* 1987;257:52–59.
- Gjersvik P, Gulbrandsen P, Aasheim ET, Nylenna M. Poor title--poor manuscript? *Tidsskr Nor Laegeforen.* 2013 Dec 10;133(23-24):2475-7.
- Holm AK: Effect of a fluoride varnish (Duraphat®) in preschool children. *Community Dent Oral Epidemiol* 1979;7:241–245.
- Jafarzadeh H, Sarraf Shirazi A, Andersson L. The most-cited articles in dental, oral, and maxillofacial traumatology during 64 years. *Dental Traumatology* 2015;31:350–360.
- Jan van Eck N, Waltman L. Citation-based clustering of publications using CitNetExplorer and VOSviewer. *Scientometrics* 2017;111:1053-1070.
- Jayarathne YSN, Zwahlen RA. The evolution of dental journals from 2003 to 2012: A bibliometric analysis. *PLoS One* 2015;10.
- Koch G, Petersson LG, Rydén H. Effect of fluoride varnish (Duraphat) treatment every six months compared with weekly mouthrinses with 0.2 per cent NaF solution on dental caries. *Swed Dent J.* 1979;3(2):39-44.
- Liu F, Wu TT, Lei G, Fadlelseed AFA, Xie N, Wang DY, Guo QY. Worldwide tendency and perspectives in traumatic dental injuries: A bibliometric analysis over two decades (1999-2018). *Dent Traumatol.* 2020;36(5):489-497.
- Luo F, Sun A, Erdt M, Sesagiri Raamkumar A, Theng YL. Exploring prestigious citations sourced from top universities in bibliometrics and altmetrics: a case study in the computer science discipline. *Scientometrics* 2018;114:1–17.
- Marinho VCC, Worthington H v., Walsh T, Clarkson JE. Fluoride varnishes for preventing dental caries in children and adolescents. *Cochrane Database of Systematic Reviews* 2013;7.
- Murad H, Asi N, Alsawas M, Alahdab F: New evidence pyramid. *Evid Based Med* 2016;21:125-127.
- Murray JJ, Winter GB, Hurst CP. Duraphat fluoride varnish. A 2-year clinical trial in 5-year-old children. *British dental journal* 1977;143:11-17.
- Natarajan K, Stein D, Jain S, Elhadad N. An analysis of clinical queries in an electronic health record search utility. *Int J Med Inform* 2010;79:515–522.
- Ogaard B, Seppä L, Rølla G. Professional topical fluoride applications-clinical efficacy and mechanism of action. *Adv Dent Res* 1994;8:190–201.
- Patil SS, Sarode SC, Sarode GS, Gadbaile AR, Gondivkar S, Kontham UR, et al. A bibliometric analysis of the 100 most cited articles on early childhood caries. *Int J Paediatr Dent* 2020;30:527–535.
- 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;29:692–711.
- Ramos-Gomez F, Kinsler J, Askaryar H. Understanding oral health disparities in children as a global public health issue: how dental health professionals can make a difference. *Journal of public health policy* 2020;41:114-124.
- Ritter A, Dias W de, Miguez P, Caplan DC, Swift EJ. Treating cervical dentin hypersensitivity with fluoride varnish. *The Journal of the American Dental Association* 2006;137:1013-1020.
- 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;56:29–35.

- Roldan-Valadez E, Salazar-Ruiz SY, Ibarra-Contreras R, Rios C. Current concepts on bibliometrics: a brief review about impact factor, Eigenfactor score, CiteScore, SCImago Journal Rank, Source-Normalised Impact per Paper, H-index, and alternative metrics. *Ir J Med Sci* 2019;188:939–951.
- Santos P, Santos N Dos, Moccellini BS, Bolan M, Santana CM, Martins-Junior PA, Cardoso M. The top 100 most-cited papers authored by Dr. Jens Ove Andreasen: A bibliometric analysis. *Dental Traumatology* 2021;37:365–382.
- Shadgan B, Roig M, HajGhanbari B, Reid WD. Top-Cited Articles in Rehabilitation. *Arch Phys Med Rehabil* 2010;91:806–815.
- Sleibi A, Tappuni AR, Baysan A. Reversal of Root Caries with Casein Phosphopeptide-Amorphous Calcium Phosphate and Fluoride Varnish in Xerostomia. *Caries Res* 2021;55:475–484.
- Sonesson M, Brechter A, Abdulraheem S, Lindman R, Twetman S. Fluoride varnish for the prevention of white spot lesions during orthodontic treatment with fixed appliances: a randomized controlled trial. *Eur J Orthod* 2020;42:326–330.
- Tavares JP, da Silva CV, Engel Y, de Freitas PM, Rechmann P. In situ Effect of CO2 Laser (9.3 μm) Irradiation Combined with AmF/NaF/SnCl₂ Solution in Prevention and Control of Erosive Tooth Wear in Human Enamel. *Caries Res.* 2021;55:617-628.
- Vitali FC, Pires KM, Cardoso IV, Oliveira EV, Bolan M, Martins Júnior PA, Cardoso M. Endodontic therapy in primary teeth: a bibliometric analysis of the 100 most-cited papers. *Braz Oral Res.* 2022;36:e049.
- White JM, Eakle WS. Rationale and treatment approach in minimally invasive dentistry. *The Journal of the American Dental Association* 2000;131:135-195.
- Yilmaz HG, Kurtulmus-Yilmaz S, Cengiz E. Long-term effect of diode laser irradiation compared to sodium fluoride varnish in the treatment of dentine hypersensitivity in periodontal maintenance patients: A randomized controlled clinical study. *Photomed Laser Surg* 2011;29:721–725.

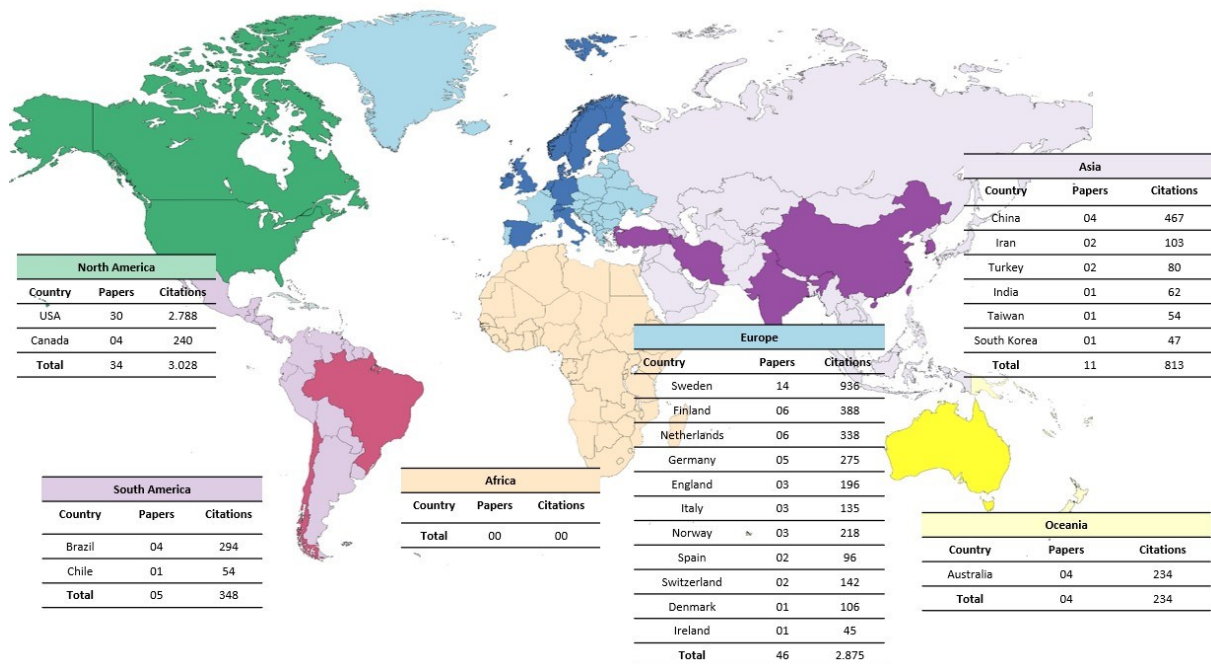


Figure 1. Worldwide distribution of the top 100 most-cited papers concerning fluoride varnish.

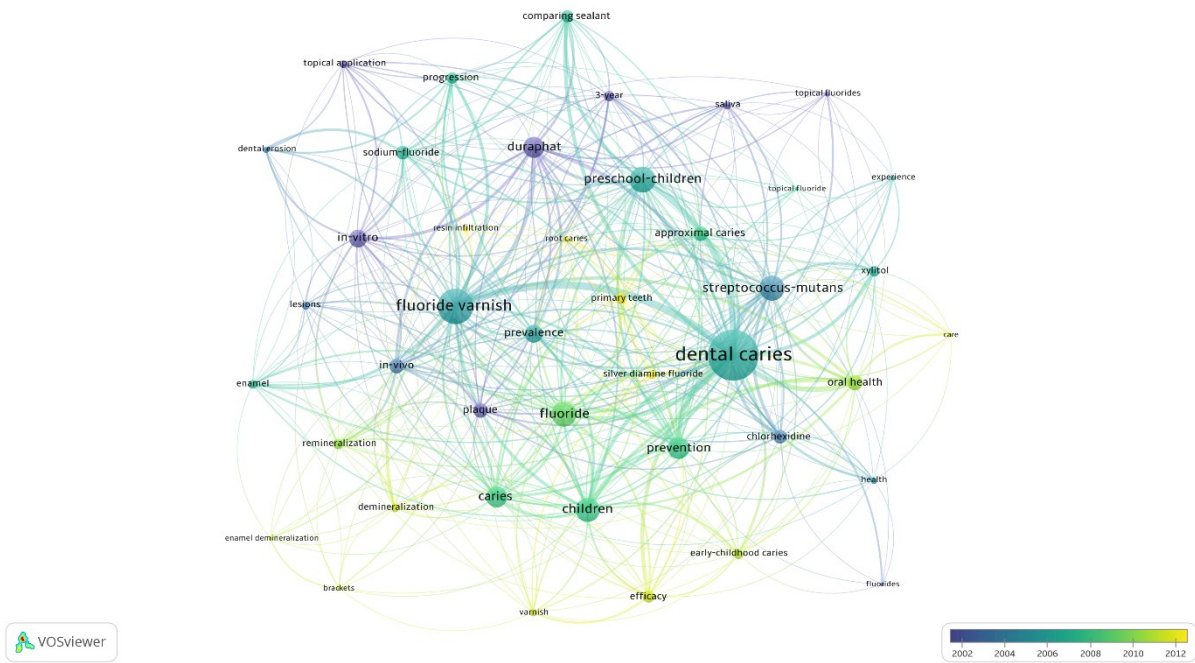
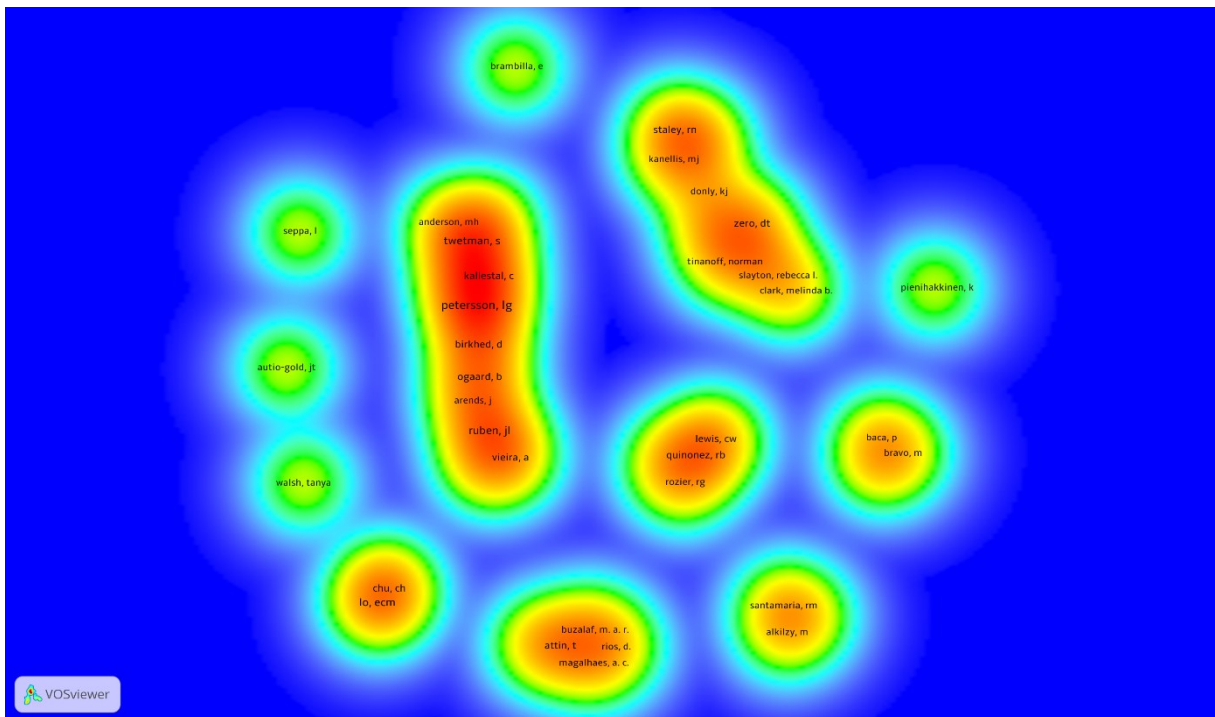


Figure 2. Bibliographic clustering between keywords in the top 100 most-cited papers concerning fluoride varnish.



Online Supp. Figure 1. VOSviewer bibliographic coupling between authors in the top 100 most-cited papers concerning fluoride varnish.

Table 1. The 100 most cited papers in fluoride varnish through the decades.

Publication period	Number of papers	Number of citations
1977 – 1987	8	367
1988 – 1997	12	759
1998 – 2007	34	2.554
2008 – 2018	46	3.253

Table 2. Top 10 Journals with the highest number of papers in the top 100 most-cited list.

Source Title	Number of papers	Number of citations	Impact Factor (2022)
Caries Research	17	973	4.056
Community Dentistry and Oral Epidemiology	9	602	3.383
Journal of the American Dental Association	9	753	3.634
American Journal of Orthodontics and Dentofacial Orthopedics	8	481	2.650
Journal of Dental Research	7	818	6.116
Pediatrics	6	500	7.125
Cochrane Database of Systematic Reviews	4	554	9.289
Scandinavian Journal of Dental Research	4	183	-
Academic Pediatrics	3	147	3.107
Clinical Oral Investigations	3	178	3.573

Online Supp. Table 1. The 100 most-cited papers related to fluoride varnish.

Rank	Paper	Citation Number (Citation Density)		
		WoS Core Collection	Scopus	Google Scholar
1	Marinho VC, Worthington HV, Walsh T, Clarkson JE. Fluoride varnishes for preventing dental caries in children and adolescents. Cochrane Database Syst Rev. 2013 Jul 11;(7):CD002279.	351 (39.00)	240 (26.67)	1296 (144.00)

2	Chu CH, Lo EC, Lin HC. Effectiveness of silver diamine fluoride and sodium fluoride varnish in arresting dentin caries in Chinese pre-school children. <i>J Dent Res.</i> 2002 Nov;81(11):767-70.	230 (11.50)	273 (13.65)	537 (26.85)
3	Weintraub JA, Ramos-Gomez F, Jue B, Shain S, Hoover CI, Featherstone JD, Gansky SA. Fluoride varnish efficacy in preventing early childhood caries. <i>J Dent Res.</i> 2006 Feb;85(2):172-6.	190 (11.88)	221 (13.81)	471 (29.44)
4	Lewis CW, Grossman DC, Domoto PK, Deyo RA. The role of the pediatrician in the oral health of children: A national survey. <i>Pediatrics.</i> 2000 Dec;106(6):E84.	177 (8.05)	205 (9.32)	412 (18.73)
5	Weyant RJ, Tracy SL, Anselmo TT, Beltrán-Aguilar ED, Donly KJ, Frese WA, Hujoel PP, Iafolla T, Kohn W, Kumar J, Levy SM, Tinanoff N, Wright JT, Zero D, Aravamudhan K, Frantsve-Hawley J, Meyer DM; American Dental Association Council on Scientific Affairs Expert Panel on Topical Fluoride Caries Preventive Agents. Topical fluoride for caries prevention: executive summary of the updated clinical recommendations and supporting systematic review. <i>J Am Dent Assoc.</i> 2013 Nov;144(11):1279-91.	177 (19.67)	208 (23.11)	354 (39.33)
6	Gao SS, Zhang S, Mei ML, Lo EC, Chu CH. Caries remineralisation and arresting effect in children by professionally applied fluoride treatment - a systematic review. <i>BMC Oral Health.</i> 2016 Feb 1;16:12.	129 (21.50)	146 (24.33)	306 (51.00)
7	Øgaard B, Larsson E, Henriksson T, Birkhed D, Bishara SE. Effects of combined application of antimicrobial and fluoride varnishes in orthodontic patients. <i>Am J Orthod Dentofacial Orthop.</i> 2001 Jul;120(1):28-35.	120 (5.71)	141 (6.71)	345 (16.43)
8	Attin T, Kielbassa AM, Schwanenberg M, Hellwig E. Effect of fluoride treatment on remineralization of bleached enamel. <i>J Oral Rehabil.</i> 1997 Apr;24(4):282-6.	116 (4.64)	144 (5.76)	315 (12.60)
9	Beltrán-Aguilar ED, Goldstein JW, Lockwood SA. Fluoride varnishes. A review of their clinical use, cariostatic mechanism, efficacy and safety. <i>J Am Dent Assoc.</i> 2000 May;131(5):589-96.	115 (5.23)	157 (7.14)	394 (17.91)
10	Söderling E, Isokangas P, Pienihäkkinen K, Tenovuo J. Influence of maternal xylitol consumption on acquisition of mutans streptococci by infants. <i>J Dent Res.</i> 2000 Mar;79(3):882-7.	107 (26.75)	110 (27.5)	225 (56.25)
11	Tan HP, Lo EC, Dyson JE, Luo Y, Corbet EF. A randomized trial on root caries prevention in elders. <i>J Dent Res.</i> 2010 Oct;89(10):1086-90.	105 (4.77)	134 (6.09)	329 (14.95)

12	Slayton RL, Urquhart O, Araujo MWB, Fontana M, Guzmán-Armstrong S, Nascimento MM, Nový BB, Tinanoff N, Weyant RJ, Wolff MS, Young DA, Zero DT, Tampi MP, Pilcher L, Banfield L, Carrasco-Labra A. Evidence-based clinical practice guideline on nonrestorative treatments for carious lesions: A report from the American Dental Association. <i>J Am Dent Assoc.</i> 2018 Oct;149(10):837-849.e19.	103 (8.58)	120 (10.00)	237 (19.75)
13	Ekstrand KR, Bakhshandeh A, Martignon S. Treatment of proximal superficial caries lesions on primary molar teeth with resin infiltration and fluoride varnish versus fluoride varnish only: efficacy after 1 year. <i>Caries Res.</i> 2010;44(1):41-6.	100 (8.33)	112 (9.33)	246 (20.50)
14	Lawrence HP, Binguis D, Douglas J, McKeown L, Switzer B, Figueiredo R, Laporte A. A 2-year community-randomized controlled trial of fluoride varnish to prevent early childhood caries in Aboriginal children. <i>Community Dent Oral Epidemiol.</i> 2008 Dec;36(6):503-16.	97 (6.93)	95 (6.79)	160 (11.43)
15	Petersson LG, Twetman S, Dahlgren H, Norlund A, Holm AK, Nordenram G, Lagerlöf F, Söder B, Källestål C, Mejäre I, Axelsson S, Lingström P. Professional fluoride varnish treatment for caries control: a systematic review of clinical trials. <i>Acta Odontol Scand.</i> 2004 Jun;62(3):170-6.	96 (5.33)	101 (5.61)	220 (12.22)
16	Bader JD, Shugars DA, Bonito AJ. A systematic review of selected caries prevention and management methods. <i>Community Dent Oral Epidemiol.</i> 2001 Dec;29(6):399-411.	93 (4.43)	181 (8.62)	226 (10.76)
17	Benson PE, Parkin N, Dyer F, Millett DT, Furness S, Germain P. Fluorides for the prevention of early tooth decay (demineralised white lesions) during fixed brace treatment. <i>Cochrane Database Syst Rev.</i> 2013 Dec 12;(12):CD003809.	91 (10.11)	103 (11.44)	214 (23.78)
18	Corona SA, Nascimento TN, Catirse AB, Lizarelli RF, Dinelli W, Palma-Dibb RG. Clinical evaluation of low-level laser therapy and fluoride varnish for treating cervical dentinal hypersensitivity. <i>J Oral Rehabil.</i> 2003 Dec;30(12):1183-9.	91 (4.79)	105 (5.53)	234 (12.32)
19	Helfenstein U, Steiner M. Fluoride varnishes (Duraphat): a meta-analysis. <i>Community Dent Oral Epidemiol.</i> 1994 Feb;22(1):1-5.	90 (3.21)	110 (3.93)	250 (8.93)
20	Schaeken MJ, Keltjens HM, Van Der Hoeven JS. Effects of fluoride and chlorhexidine on the microflora of dental root surfaces and progression of root-surface caries. <i>J Dent Res.</i> 1991 Feb;70(2):150-3.	88 (2.84)	99 (3.19)	196 (6.32)
21	Slade GD, Bailie RS, Roberts-Thomson K, Leach AJ, Raye I, Endean C, Simmons B, Morris P. Effect of health promotion and fluoride varnish on dental caries among Australian Aboriginal children: results from a community-randomized controlled trial. <i>Community Dent Oral Epidemiol.</i> 2011	88 (8.00)	96 (8.73)	141 (12.82)

	Feb;39(1):29-43.			
22	Stecksén-Blicks C, Renfors G, Oscarson ND, Bergstrand F, Twetman S. Caries-preventive effectiveness of a fluoride varnish: a randomized controlled trial in adolescents with fixed orthodontic appliances. <i>Caries Res.</i> 2007;41(6):455-9.	85 (5.67)	89 (5.93)	211 (14.07)
23	Tranaeus S, Al-Khateeb S, Björkman S, Twetman S, Angmar-Månsson B. Application of quantitative light-induced fluorescence to monitor incipient lesions in caries-active children. A comparative study of remineralisation by fluoride varnish and professional cleaning. <i>Eur J Oral Sci.</i> 2001 Apr;109(2):71-5.	83 (5.93)	94 (6.71)	160 (11.43)
24	Sorvari R, Meurman JH, Alakuijala P, Frank RM. Effect of fluoride varnish and solution on enamel erosion in vitro. <i>Caries Res.</i> 1994;28(4):227-32.	83 (3.95)	100 (4.76)	191 (9.10)
25	Moyer VA; US Preventive Services Task Force. Prevention of dental caries in children from birth through age 5 years: US Preventive Services Task Force recommendation statement. <i>Pediatrics.</i> 2014 Jun;133(6):1102-11.	81 (10.13)	86 (10.75)	169 (21.13)
26	Chu CH, Lo EC. Microhardness of dentine in primary teeth after topical fluoride applications. <i>J Dent.</i> 2008 Jun;36(6):387-91.	80 (2.86)	95 (3.39)	217 (7.75)
27	Machado AC, Maximiano V, Yoshida ML, Freitas JG, Mendes FM, Aranha ACC, Scaramucci T. Efficacy of a calcium-phosphate/fluoride varnish and ionomeric sealant on cervical dentin hypersensitivity: A randomized, double-blind, placebo-controlled clinical study. <i>J Oral Rehabil.</i> 2022 Jan;49(1):62-70.	77 (9.63)	85 (10.63)	185 (23.13)
28	Clark MB, Keels MA, Slayton RL; SECTION ON ORAL HEALTH. Fluoride Use in Caries Prevention in the Primary Care Setting. <i>Pediatrics.</i> 2020 Dec;146(6):e2020034637.	77 (9.63)	88 (11.00)	193 (24.13)
29	Pahel BT, Rozier RG, Stearns SC, Quiñonez RB. Effectiveness of preventive dental treatments by physicians for young Medicaid enrollees. <i>Pediatrics.</i> 2011 Mar;127(3):e682-9.	77 (7.00)	82 (7.45)	139 (12.64)
30	Vieira A, Ruben JL, Huysmans MC. Effect of titanium tetrafluoride, amine fluoride and fluoride varnish on enamel erosion in vitro. <i>Caries Res.</i> 2005 Sep-Oct;39(5):371-9.	77 (4.81)	96 (6.00)	228 (14.25)
31	Carey CM. Focus on fluorides: update on the use of fluoride for the prevention of dental caries. <i>J Evid Based Dent Pract.</i> 2014 Jun;14 Suppl:95-102.	75 (4.41)	81 (4.76)	143 (8.41)

32	Magalhães AC, Kato MT, Rios D, Wiegand A, Attin T, Buzalaf MA. The effect of an experimental 4% Tif4 varnish compared to NaF varnishes and 4% TIF4 solution on dental erosion in vitro. <i>Caries Res.</i> 2008;42(4):269-74.	73 (5.21)	73 (5.21)	115 (8.21)
33	Holm AK. Effect of fluoride varnish (Duraphat) in preschool children. <i>Community Dent Oral Epidemiol.</i> 1979 Oct;7(5):241-5.	73 (8.11)	80 (8.89)	194 (21.56)
34	Petersson LG. The role of fluoride in the preventive management of dentin hypersensitivity and root caries. <i>Clin Oral Investig.</i> 2013 Mar;17 Suppl 1(Suppl 1):S63-71.	71 (1.65)	65 (1.51)	150 (3.49)
35	Anderson MH, Bales DJ, Omnell KA. Modern management of dental caries: the cutting edge is not the dental bur. <i>J Am Dent Assoc.</i> 1993 Jun;124(6):36-44.	69 (7.67)	84 (9.33)	177 (19.67)
36	Huang GJ, Roloff-Chiang B, Mills BE, Shalchi S, Spiekerman C, Korpak AM, Starrett JL, Greenlee GM, Drangsholt RJ, Matunas JC. Effectiveness of MI Paste Plus and PreviDent fluoride varnish for treatment of white spot lesions: a randomized controlled trial. <i>Am J Orthod Dentofacial Orthop.</i> 2013 Jan;143(1):31-41.	69 (2.38)	71 (2.45)	226 (7.79)
37	Azarpazhooh A, Main PA. Fluoride varnish in the prevention of dental caries in children and adolescents: a systematic review. <i>Tex Dent J.</i> 2008 Apr;125(4):318-37.	67 (5.15)	83 (6.38)	292 (22.46)
38	Magalhães AC, Comar LP, Rios D, Delbem AC, Buzalaf MA. Effect of a 4% titanium tetrafluoride (TIF4) varnish on demineralisation and remineralisation of bovine enamel in vitro. <i>J Dent.</i> 2008 Feb;36(2):158-62.	67 (4.79)	56 (4.00)	88 (6.29)
39	Moberg Sköld U, Petersson LG, Lith A, Birkhed D. Effect of school-based fluoride varnish programmes on approximal caries in adolescents from different caries risk areas. <i>Caries Res.</i> 2005 Jul-Aug;39(4):273-9.	65 (4.64)	78 (5.57)	198 (14.14)
40	Kagihara LE, Niederhauser VP, Stark M. Assessment, management, and prevention of early childhood caries. <i>J Am Acad Nurse Pract.</i> 2009 Jan;21(1):1-10.	65 (3.82)	61 (3.59)	130 (7.65)
41	Todd MA, Staley RN, Kanellis MJ, Donly KJ, Wefel JS. Effect of a fluoride varnish on demineralization adjacent to orthodontic brackets. <i>Am J Orthod Dentofacial Orthop.</i> 1999 Aug;116(2):159-67.	64 (2.78)	93 (4.04)	262 (11.39)
42	Tomar SL, Reeves AF. Changes in the oral health of US children and adolescents and dental public health infrastructure since the release of the Healthy People 2010 Objectives. <i>Acad Pediatr.</i> 2009 Nov-Dec;9(6):388-95.	61 (4.69)	69 (5.31)	146 (11.23)
43	Källestål C. The effect of five years' implementation of caries-preventive methods in Swedish high-risk adolescents. <i>Caries Res.</i> 2005 Jan-Feb;39(1):20-6.	60 (3.53)	56 (3.29)	110 (6.47)

44	Kumar NG, Mehta DS. Short-term assessment of the Nd:YAG laser with and without sodium fluoride varnish in the treatment of dentin hypersensitivity--a clinical and scanning electron microscopy study. <i>J Periodontol.</i> 2005 Jul;76(7):1140-7.	60 (3.53)	72 (4.24)	141 (8.29)
45	Bravo M, Montero J, Bravo JJ, Baca P, Llodra JC. Sealant and fluoride varnish in caries: a randomized trial. <i>J Dent Res.</i> 2005 Dec;84(12):1138-43.	60 (10.00)	51 (8.50)	146 (24.33)
46	Petersson LG. Fluoride mouthrinses and fluoride varnishes. <i>Caries Res.</i> 1993;27 Suppl 1:35-42.	60 (3.53)	62 (3.65)	124 (7.29)
47	Kashbour W, Gupta P, Worthington HV, Boyers D. Pit and fissure sealants versus fluoride varnishes for preventing dental decay in the permanent teeth of children and adolescents. <i>Cochrane Database Syst Rev.</i> 2020 Nov 4;11:CD003067.	59 (2.03)	70 (2.41)	185 (6.38)
48	Autio-Gold JT, Courts F. Assessing the effect of fluoride varnish on early enamel carious lesions in the primary dentition. <i>J Am Dent Assoc.</i> 2001 Sep;132(9):1247-53; quiz 1317-8.	58 (2.76)	80 (3.81)	212 (10.10)
49	Mod�er T, Twetman S, Bergstrand F. Three-year study of the effect of fluoride varnish (Duraphat) on proximal caries progression in teenagers. <i>Scand J Dent Res.</i> 1984 Oct;92(5):400-7.	57 (5.70)	62 (6.20)	155 (15.50)
50	Cochrane NJ, Shen P, Yuan Y, Reynolds EC. Ion release from calcium and fluoride containing dental varnishes. <i>Aust Dent J.</i> 2014 Mar;59(1):100-5.	54 (1.42)	54 (1.42)	90 (2.37)
51	Farhadian N, Miresmaeili A, Eslami B, Mehrabi S. Effect of fluoride varnish on enamel demineralization around brackets: an in-vivo study. <i>Am J Orthod Dentofacial Orthop.</i> 2008 Apr;133(4 Suppl):S95-8.	54 (6.75)	61 (7.63)	117 (14.63)
52	Schmit JL, Staley RN, Wefel JS, Kanellis M, Jakobsen JR, Keenan PJ. Effect of fluoride varnish on demineralization adjacent to brackets bonded with RMGI cement. <i>Am J Orthod Dentofacial Orthop.</i> 2002 Aug;122(2):125-34.	53 (10.60)	54 (10.80)	105 (21.00)
53	Dorri M, Dunne SM, Walsh T, Schwendicke F. Micro-invasive interventions for managing proximal dental decay in primary and permanent teeth. <i>Cochrane Database Syst Rev.</i> 2015 Nov 5;2015(11):CD010431.	52 (3.06)	52 (3.06)	119 (7.00)
54	Du M, Cheng N, Tai B, Jiang H, Li J, Bian Z. Randomized controlled trial on fluoride varnish application for treatment of white spot lesion after fixed orthodontic treatment. <i>Clin Oral Investig.</i> 2012 Apr;16(2):463-8.	52 (2.26)	64 (2.78)	164 (7.13)
55	Gomez SS, Basili CP, Emilson CG. A 2-year clinical evaluation of sealed noncavitated approximal posterior carious lesions in adolescents. <i>Clin Oral Investig.</i> 2005 Dec;9(4):239-43.	52 (7.43)	70 (10.00)	156 (22.29)

56	Lan WH, Liu HC, Lin CP. The combined occluding effect of sodium fluoride varnish and Nd:YAG laser irradiation on human dentinal tubules. <i>J Endod.</i> 1999 Jun;25(6):424-6.	52 (3.71)	60 (4.29)	147 (10.50)
57	Höchli D, Hersberger-Zurfluh M, Papageorgiou SN, Eliades T. Interventions for orthodontically induced white spot lesions: a systematic review and meta-analysis. <i>Eur J Orthod.</i> 2017 Apr 1;39(2):122-133.	52 (2.60)	69 (3.45)	183 (9.15)
58	Chou R, Cantor A, Zakher B, Mitchell JP, Pappas M. Preventing dental caries in children <5 years: systematic review updating USPSTF recommendation. <i>Pediatrics.</i> 2013 Aug;132(2):332-50.	51 (10.20)	59 (11.8)	157 (31.40)
59	Murakami C, Bönecker M, Corrêa MS, Mendes FM, Rodrigues CR. Effect of fluoride varnish and gel on dental erosion in primary and permanent teeth. <i>Arch Oral Biol.</i> 2009 Nov;54(11):997-1001.	49 (5.44)	56 (6.22)	123 (13.67)
60	Seppä L, Leppänen T, Hausen H. Fluoride varnish versus acidulated phosphate fluoride gel: a 3-year clinical trial. <i>Caries Res.</i> 1995;29(5):327-30.	48 (1.78)	62 (2.30)	151 (5.59)
61	Khoroushi M, Kachuie M. Prevention and Treatment of White Spot Lesions in Orthodontic Patients. <i>Contemp Clin Dent.</i> 2017 Jan-Mar;8(1):11-19.	48 (3.69)	51 (3.92)	118 (9.08)
62	Øgaard B, Rølla G, Helgeland K. Fluoride retention in sound and demineralized enamel in vivo after treatment with a fluoride varnish (Duraphat). <i>Scand J Dent Res.</i> 1984 Jun;92(3):190-7.	47 (1.24)	47 (1.24)	91 (2.39)
63	Cunha-Cruz J, Wataha JC, Zhou L, Manning W, Trantow M, Bettendorf MM, Heaton LJ, Berg J. Treating dentin hypersensitivity: therapeutic choices made by dentists of the northwest PRECEDENT network. <i>J Am Dent Assoc.</i> 2010 Sep;141(9):1097-105.	46 (1.53)	49 (1.63)	119 (3.97)
64	Quiñonez RB, Stearns SC, Talekar BS, Rozier RG, Downs SM. Simulating cost-effectiveness of fluoride varnish during well-child visits for Medicaid-enrolled children. <i>Arch Pediatr Adolesc Med.</i> 2006 Feb;160(2):164-70.	46 (2.88)	45 (2.81)	82 (5.13)
65	Strohmer L, Brambilla E. The use of fluoride varnishes in the prevention of dental caries: a short review. <i>Oral Dis.</i> 2001 Mar;7(2):71-80.	46 (3.83)	54 (4.50)	120 (10.00)
66	Peyron M, Matsson L, Birkhed D. Progression of approximal caries in primary molars and the effect of Duraphat treatment. <i>Scand J Dent Res.</i> 1992 Dec;100(6):314-8.	46 (5.75)	49 (6.13)	76 (9.50)
67	Quinonez RB, Kranz AM, Lewis CW, Barone L, Boulter S, O'Connor KG, Keels MA. Oral health opinions and practices of pediatricians: updated results from a national survey. <i>Acad Pediatr.</i> 2014 Nov-Dec;14(6):616-23.	46 (3.83)	63 (5.25)	107 (8.92)

68	Lee YE, Baek HJ, Choi YH, Jeong SH, Park YD, Song KB. Comparison of remineralization effect of three topical fluoride regimens on enamel initial carious lesions. <i>J Dent.</i> 2010 Feb;38(2):166-71.	45 (2.14)	52 (2.48)	110 (5.24)
69	James P, Parnell C, Whelton H. The caries-preventive effect of chlorhexidine varnish in children and adolescents: a systematic review. <i>Caries Res.</i> 2010;44(4):333-40.	44 (3.67)	56 (4.67)	99 (8.25)
70	Mok TB, McIntyre J, Hunt D. Dental erosion: in vitro model of wine assessor's erosion. <i>Aust Dent J.</i> 2001 Dec;46(4):263-8.	44 (2.10)	53 (2.52)	101 (4.81)
71	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)	125 (8.93)
72	Källestål C, Wang NJ, Petersen PE, Arnadottir IB. Caries-preventive methods used for children and adolescents in Denmark, Iceland, Norway and Sweden. <i>Community Dent Oral Epidemiol.</i> 1999 Apr;27(2):144-51.	44 (1.91)	48 (2.09)	104 (4.52)
73	Øgaard B, Duschner H, Ruben J, Arends J. Microradiography and confocal laser scanning microscopy applied to enamel lesions formed in vivo with and without fluoride varnish treatment. <i>Eur J Oral Sci.</i> 1996 Aug;104(4 (Pt 1)):378-83.	43 (1.65)	42 (1.62)	111 (4.27)
74	Kara C, Orbak R. Comparative evaluation of Nd:YAG laser and fluoride varnish for the treatment of dentinal hypersensitivity. <i>J Endod.</i> 2009 Jul;35(7):971-4.	42 (3.23)	48 (3.69)	94 (7.23)
75	Alkilzy M, Tarabaih A, Santamaria RM, Splieth CH. Self-assembling Peptide P11-4 and Fluoride for Regenerating Enamel. <i>J Dent Res.</i> 2018 Feb;97(2):148-154.	42 (10.50)	50 (12.50)	79 (19.75)
76	Vieira A, Lugtenborg M, Ruben JL, Huysmans MC. Brushing abrasion of eroded bovine enamel pretreated with topical fluorides. <i>Caries Res.</i> 2006;40(3):224-30.	42 (1.68)	50 (2.00)	121 (4.84)
77	Pienihäkkinen K, Jokela J. Clinical outcomes of risk-based caries prevention in preschool-aged children. <i>Community Dent Oral Epidemiol.</i> 2002 Apr;30(2):143-50.	42 (1.35)	49 (1.58)	98 (3.16)
78	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. <i>J Public Health Dent.</i> 1997 Summer;57(3):184-6.	42 (8.40)	59 (11.8)	88 (17.60)
79	Petersson LG, Arthursson L, Ostberg C, Jönsson G, Gleerup A. Caries-inhibiting effects of different modes of Duraphat varnish reapplication: a 3-year radiographic study. <i>Caries Res.</i> 1991;25(1):70-3.	41 (1.03)	38 (0.95)	82 (2.05)
80	de Bruyn H, Arends J. Fluoride varnishes--a review. <i>J Biol Buccale.</i> 1987 Jun;15(2):71-82.	41 (1.17)	40 (1.14)	103 (2.94)

81	Clark DC. A review on fluoride varnishes: an alternative topical fluoride treatment. <i>Community Dent Oral Epidemiol.</i> 1982 Jun;10(3):117-23.	41 (2.05)	48 (2.40)	121 (6.05)
82	Murray JJ, Winter GB, Hurst CP. Duraphat fluoride varnish. A 2-year clinical trial in 5-year-old children. <i>Br Dent J.</i> 1977 Jul 5;143(1):11-7.	41 (0.91)	37 (0.82)	77 (1.71)
83	Santamaría RM, Innes NPT, Machiulskiene V, Schmoeckel J, Alkilzy M, Splieth CH. Alternative Caries Management Options for Primary Molars: 2.5-Year Outcomes of a Randomised Clinical Trial. <i>Caries Res.</i> 2017;51(6):605-614.	41 (2.56)	46 (2.88)	75 (4.69)
84	Milgrom P, Zero DT, Tanzer JM. An examination of the advances in science and technology of prevention of tooth decay in young children since the Surgeon General's Report on Oral Health. <i>Acad Pediatr.</i> 2009 Nov-Dec;9(6):404-9.	40 (1.90)	45 (2.14)	97 (4.62)
85	Vieira A, Jager DH, Ruben JL, Huysmans MC. Inhibition of erosive wear by fluoride varnish. <i>Caries Res.</i> 2007;41(1):61-7.	40 (3.08)	45 (3.46)	80 (6.15)
86	Brambilla E. Fluoride - is it capable of fighting old and new dental diseases? An overview of existing fluoride compounds and their clinical applications. <i>Caries Res.</i> 2001;35 Suppl 1:6-9.	40 (2.67)	45 (3.00)	107 (7.13)
87	Evans RW, Dennison PJ. The Caries Management System: an evidence-based preventive strategy for dental practitioners. Application for children and adolescents. <i>Aust Dent J.</i> 2009 Dec;54(4):381-9.	40 (6.67)	43 (7.17)	65 (10.83)
88	Lewis C, Lynch H, Richardson L. Fluoride varnish use in primary care: what do providers think? <i>Pediatrics.</i> 2005 Jan;115(1):e69-76.	39 (5.57)	44 (6.29)	79 (11.29)
89	Anderson M, Dahllöf G, Twetman S, Jansson L, Bergenlid AC, Grindefjord M. Effectiveness of Early Preventive Intervention with Semiannual Fluoride Varnish Application in Toddlers Living in High-Risk Areas: A Stratified Cluster-Randomized Controlled Trial. <i>Caries Res.</i> 2016;50(1):17-23.	39 (3.00)	37 (2.85)	70 (5.38)
90	Douglass JM, Clark MB. Integrating Oral Health Into Overall Health Care to Prevent Early Childhood Caries: Need, Evidence, and Solutions. <i>Pediatr Dent.</i> 2015 May-Jun;37(3):266-74.	39 (1.95)	54 (2.70)	125 (6.25)
91	Slot DE, Vaandrager NC, Van Loveren C, Van Palenstein Helderma WH, Van der Weijden GA. The effect of chlorhexidine varnish on root caries: a systematic review. <i>Caries Res.</i> 2011;45(2):162-73.	39 (2.29)	45 (2.65)	77 (4.53)

92	Behnan SM, Arruda AO, González-Cabezas C, Sohn W, Peters MC. In-vitro evaluation of various treatments to prevent demineralization next to orthodontic brackets. <i>Am J Orthod Dentofacial Orthop.</i> 2010 Dec;138(6):712.e1-7; discussion 712-3.	39 (3.55)	42 (3.82)	81 (7.36)
93	Shen C, Autio-Gold J. Assessing fluoride concentration uniformity and fluoride release from three varnishes. <i>J Am Dent Assoc.</i> 2002 Feb;133(2):176-82.	39 (3.55)	45 (4.09)	102 (9.27)
94	Yilmaz HG, Kurtulmus-Yilmaz S, Cengiz E. Long-term effect of diode laser irradiation compared to sodium fluoride varnish in the treatment of dentine hypersensitivity in periodontal maintenance patients: a randomized controlled clinical study. <i>Photomed Laser Surg.</i> 2011 Nov;29(11):721-5.	38 (2.00)	43 (2.26)	140 (7.37)
95	Hawkins R, Locker D, Noble J, Kay EJ. Prevention. Part 7: professionally applied topical fluorides for caries prevention. <i>Br Dent J.</i> 2003 Sep 27;195(6):313-7.	38 (3.17)	50 (4.17)	116 (9.67)
96	Zimmer S, Robke FJ, Roulet JF. Caries prevention with fluoride varnish in a socially deprived community. <i>Community Dent Oral Epidemiol.</i> 1999 Apr;27(2):103-8.	38 (6.33)	42 (7.00)	79 (13.17)
97	Attin T, Hartmann O, Hilgers RD, Hellwig E. Fluoride retention of incipient enamel lesions after treatment with a calcium fluoride varnish in vivo. <i>Arch Oral Biol.</i> 1995 Mar;40(3):169-74.	37 (1.61)	44 (1.91)	134 (5.83)
98	Seppä L, Tuutti H, Luoma H. Three-year report on caries prevention of using fluoride varnishes for caries risk children in a community with fluoridated water. <i>Scand J Dent Res.</i> 1982 Apr;90(2):89-94.	36 (0.84)	33 (0.77)	53 (1.23)
99	Koch G, Petersson LG, Rydén H. Effect of flouride varnish (Duraphat) treatment every six months compared with weekly mouthrinses with 0.2 per cent NaF solution on dental caries. <i>Swed Dent J.</i> 1979;3(2):39-44.	36 (0.90)	32 (0.80)	54 (1.35)
100	Perrini F, Lombardo L, Arreghini A, Medori S, Siciliani G. Caries prevention during orthodontic treatment: In-vivo assessment of high-fluoride varnish to prevent white spot lesions. <i>Am J Orthod Dentofacial Orthop.</i> 2016 Feb;149(2):238-43.	36 (1.33)	46 (1.70)	99 (3.67)

Online Supp. Table 2. Top 10 Universities with the highest number of papers in the top 100 most-cited list.

Institution	Country	Number of papers	Number of citations
-------------	---------	------------------	---------------------

University of Umea	Sweden	8	516
University of North Carolina	USA	6	418
University of Washington	USA	5	370
University of Groningen	Netherlands	4	196
University of São Paulo	Brazil	4	279
University of Hong Kong	China	4	467
University of Florida	USA	3	162
University of Kuopio	Finland	3	164
University of Oslo	Norway	3	203
University of Stockholm	Sweden	3	172
University of Toronto	Canada	3	191

Online Supp. Table 3. Top 10 authors with the highest number of papers in the top 100 most cited list.

Authors	Number of papers among the 100 most cited	Number of citations among the 100 most cited	Number of papers in WoS-CC	Number of citations	H Index
Petersson LG	6	362	186	4.443	37
Tweetman S	5	351	263	7.489	45
Lo ECM	4	517	393	7.600	51
Ruben JL	4	199	86	2.215	29
Chu CH	3	418	310	6.900	41
Zero DT	3	303	163	5.281	42
Lewis CW	3	257	48	1.122	18
Birkhed D	3	228	223	5.017	39
Attin T	3	223	446	11.583	53
Ogaard B	3	207	138	3.884	36

5 CONSIDERAÇÕES FINAIS

Esta análise bibliométrica proporciona informações significativas acerca dos 100 artigos mais citados no uso de verniz de flúor na odontologia e pode ser utilizada para compreender de que forma essa seleção de artigos influenciou as comunidades científica e clínica. Em suma, demonstrou-se que houve uma inclinação global para o aumento da publicação relacionada ao tópico, com um crescimento significativo no número de publicações a partir de 2008, sendo os Estados Unidos da América e Suécia se apresentaram como os líderes nesse quesito. No quesito lacuna de pesquisa, foi identificado um número limitado de estudos in vitro conduzidos nas novas formulações de verniz fluoretado contendo CCP-ACP e TCP. Os 100 artigos mais citados evidenciaram que estudos de intervenção e revisão da literatura foram os desenhos de estudo mais comuns abordando a prevenção de cárie dentária, remineralização da estrutura dentária e dessensibilização como temáticas principais.

REFERÊNCIAS

ABUZINADAH, S. H.; ALHADDAD, A. J. A randomized clinical trial of dentin hypersensitivity reduction over one month after a single topical application of comparable materials. **Scientific Reports**, v. 11, p. 6793, 2021.

ADNAN, S.; ULLAH, R. **Top-cited Articles in Regenerative Endodontics: A Bibliometric Analysis**. **Journal of Endodontics** Elsevier Inc., , 1 nov. 2018.

AHMAD, P. et al. A bibliometric study of the top 100 most-cited randomized controlled trials, systematic reviews and meta-analyses published in endodontic journals. **International Endodontic Journal**, v. 52, p. 1297–1316, 2019.

AHMAD, P. et al. **A bibliometric analysis of the top 50 most cited articles published in the Dental Traumatology**. **Dental Traumatology** Blackwell Munksgaard, , 1 abr. 2020.

AKHAVAN, P. et al. Major trends in knowledge management research: a bibliometric study. **Scientometrics**, v. 107, n. 3, p. 1249–1264, 1 jun. 2016.

ALAM, B. F. et al. A bibliometric analysis of minimally invasive dentistry: A review of the literature from 1994 to 2021. **The Journal of Prosthetic Dentistry**, p. 1–8, 2021a.

ALAM, B. F. et al. A bibliometric analysis of minimally invasive dentistry: A review of the literature from 1994 to 2021. **Journal of Prosthetic Dentistry**, 2021b.

ALGARNI, A. A. et al. Tooth Age Impact on Dental Erosion Susceptibility and Treatment Efficacy. **Caries Research**, v. 55, n. 6, p. 585–593, 9 dez. 2021.

ALKILZY, M. et al. Self-assembling Peptide P11-4 and Fluoride for Regenerating Enamel. **journals.sagepub.com**, v. 97, n. 2, p. 148–154, 1 fev. 2018.

ASLAM-PERVEZ, N.; LUBEK, J. E. Most cited publications in oral and maxillofacial surgery: a bibliometric analysis. **Oral and Maxillofacial Surgery**, v. 22, n. 1, p. 25–37, 1 mar. 2018.

ATTIN, T. et al. Effect of fluoride treatment on remineralization of bleached enamel. **Wiley Online Library**, v. 24, n. 4, p. 282–286, 1997.

BAKKALBASI, N. et al. Three options for citation tracking: Google Scholar, Scopus and Web of Science. **Biomedical Digital Libraries**, v. 3, 29 jun. 2006.

BALDIOTTI, A. L. P. et al. The Top 100 Most-Cited Papers in Cariology: A Bibliometric Analysis. **Caries Research**, v. 55, n. 1, p. 32–40, 1 fev. 2021.

BAWDEN, J. W. Fluoride Varnish: a Useful New Tool for Public Health Dentistry. **Journal of Public Health Dentistry**, v. 58, n. 4, p. 266–269, 1 dez. 1998.

BRÄNNSTRÖM, M. The hydrodynamic theory of dentinal pain: Sensation in preparations, caries, and the dentinal crack syndrome. **Journal of Endodontics**, v. 12, n. 10, p. 453–457, 1986.

CAREY, C. M. Focus on Fluorides: Update on the Use of Fluoride for the Prevention of Dental Caries. **Journal of Evidence Based Dental Practice**, v. 14, n. SUPPL., p. 95–102, 1 jun. 2014.

CASTRO, C. R. D. DE et al. Hypomineralized Teeth Have a Higher Frequency of Dental Hypersensitivity. **Pediatric dentistry**, 2021.

CELESTE, R. K.; BROADBENT, J. M.; MOYSES, S. J. Half-century of Dental Public Health research: bibliometric analysis of world scientific trends. **Community Dentistry and Oral Epidemiology**, v. 44, n. 6, p. 557–563, 1 dez. 2016.

CHENG, L. et al. Expert consensus on dental caries management. [s.d.].

CHU, C. H.; LO, E. C. M.; LIN, H. C. Effectiveness of silver diamine fluoride and sodium fluoride varnish in arresting dentin caries in Chinese pre-school children. **Journal of Dental Research**, v. 81, n. 11, p. 767–770, 1 nov. 2002.

COCHRANE, N. J. et al. New Approaches to Enhanced Remineralization of Tooth Enamel. **J Dent Res**, v. 89, n. 11, p. 1187–1197, 2010.

DE, J. et al. In situ Effect of CO₂ Laser (9.3 μm) Irradiation Combined with AmF/NaF/SnCl₂ Solution in Prevention and Control of Erosive Tooth Wear in Human Enamel. **Research Article Caries Res**, v. 55, p. 617–628, 2021.

DOPPALAPUDI, N.; BURUGAPALLI, R. K. Effect of Fluoride Varnish in Caries Reduction among Children and Adolescents: A Review. **Dental Research and Oral Health**, v. 3, n. 4, p. 182–189, 2020.

ENAX, J. et al. Remineralization Strategies for Teeth with Molar Incisor Hypomineralization (MIH): A Literature Review. **Dentistry Journal 2023, Vol. 11, Page 80**, v. 11, n. 3, p. 80, 13 mar. 2023.

FARHADIAN, N. et al. Effect of fluoride varnish on enamel demineralization around brackets: an in-vivo study. **American journal of orthodontics and dentofacial orthopedics : official publication of the American Association of**

Orthodontists, its constituent societies, and the American Board of Orthodontics, v. 133, n. 4 SUPPL., abr. 2008.

FEATHERSTONE, J. D. B. Prevention and reversal of dental caries: role of low level fluoride. **Community Dentistry and Oral Epidemiology**, v. 27, n. 1, p. 31–40, 1 fev. 1999.

GARFIELD, E. 100 Citation Classics From The Journal of the American Medical Association. **JAMA**, v. 257, n. 1, p. 52–59, 2 jan. 1987.

GJERSVIK, P.; GULBRANDSEN E; T AASHEIM. Poor title--poor manuscript? **europemc.org**, 2013.

HAAG, D. et al. Oral conditions and health-related quality of life: a systematic review. **Journal of Dental Research**, v. 96, n. 8, p. 864–874, 1 jul. 2017.

HAWKINS, R. et al. Prevention. Part 7: Professionally applied topical fluorides for caries prevention. **British Dental Journal**, v. 195, n. 6, p. 313–317, 27 set. 2003.

HOLM, A. K. Effect of a fluoride varnish (Duraphat ®) in preschool children. **Community Dentistry and Oral Epidemiology**, v. 7, n. 5, p. 241–245, 1979.

JAFARZADEH, H.; SARRAF SHIRAZI, A.; ANDERSSON, L. The most-cited articles in dental, oral, and maxillofacial traumatology during 64 years. **Dental Traumatology**, v. 31, n. 5, p. 350–360, 1 out. 2015.

JAN VAN ECK, N.; WALTMAN, L. Citation-based clustering of publications using CitNetExplorer and VOSviewer. [s.d.].

JAYARATNE, Y. S. N.; ZWAHLEN, R. A. The evolution of dental journals from 2003 to 2012: A bibliometric analysis. **PLoS ONE**, v. 10, n. 3, 17 mar. 2015.

JI, B. et al. Mapping the field of constructed wetland-microbial fuel cell: A review and bibliometric analysis. **Chemosphere**, v. 262, 1 jan. 2021.

JIN, L. J. et al. Global burden of oral diseases: emerging concepts, management and interplay with systemic health. **Oral Diseases**, v. 22, n. 7, p. 609–619, 1 out. 2016.

KOCH, G. et al. Effect of flouride varnish (Duraphat) treatment every six months compared with weekly mouthrinses with 0.2 per cent NaF solution on dental caries. **europemc.org**, 1979.

LUO, F. et al. Exploring prestigious citations sourced from top universities in bibliometrics and altmetrics: a case study in the computer science discipline. **Scientometrics**, v. 114, n. 1, p. 1–17, 1 jan. 2018.

LUSSI, A. et al. The use of fluoride for the prevention of dental erosion and erosive tooth wear in children and adolescents. **European Archives of Paediatric Dentistry**, v. 20, p. 517–527, 2019.

MARINHO, V. C. C. et al. **Fluoride varnishes for preventing dental caries in children and adolescents. Cochrane Database of Systematic Reviews** John Wiley and Sons Ltd, , 11 jul. 2013.

MEKKY, A.; DOWIDAR, KML.; TALAAT, DM. Casein Phosphopeptide Amorphous Calcium Phosphate Fluoride Varnish in Remineralization of Early Carious Lesions in Primary Dentition: Randomized Clinical Trial. **Pediatric Dentistry**, v. 43, n. 1, p. 17–23, 2021.

MOHD, S. S. N. B.; EKAMBARAM, M.; YIU, C. K. Y. Effect of different fluoride varnishes on remineralization of artificial enamel carious lesions. **International Journal of Paediatric Dentistry**, v. 27, n. 3, p. 163–173, 1 maio 2017.

MURAD, H. et al. New evidence pyramid. v. 21, 2016.

MURRAY, J.; GB, W.; CP, H. DURAPHAT FLUORIDE VARNISH. A 2-YEAR CLINICAL TRIAL IN 5-YEAR-OLD CHILDREN. **DURAPHAT FLUORIDE VARNISH. A 2-YEAR CLINICAL TRIAL IN 5-YEAR-OLD CHILDREN.**, 1977.

NATARAJAN, K. et al. An analysis of clinical queries in an electronic health record search utility. **International Journal of Medical Informatics**, v. 79, n. 7, p. 515–522, 1 jul. 2010.

OGAARD, B.; SEPPÄ, L.; RØLLA, G. Professional topical fluoride applications--clinical efficacy and mechanism of action. **Advances in dental research**, v. 8, n. 2, p. 190–201, jul. 1994.

PATIL, S. S. et al. **A bibliometric analysis of the 100 most cited articles on early childhood caries. International Journal of Paediatric Dentistry** Blackwell Publishing Ltd, , 1 set. 2020.

PERAZZO, M. F. et al. The top 100 most-cited papers in Paediatric Dentistry journals: A bibliometric analysis. **International Journal of Paediatric Dentistry**, v. 29, n. 6, p. 692–711, 1 nov. 2019.

PETERSSON, L.; PAKHOMOV, G.; TWETMAN, S. Fluoride varnish for community-based caries prevention in children. 1997.

RAMOS-GOMEZ, F. et al. Understanding oral health disparities in children as a global public health issue: how dental health professionals can make a difference. **Springer**, v. 41, n. 2, p. 114–124, 1 jun. 2020.

RAMOS-GOMEZ, F.; KINSLER, J.; ASKARYAR, H. Understanding oral health disparities in children as a global public health issue: how dental health professionals can make a difference. **Journal of public health policy**, v. 41, n. 2, p. 114–124, 13 jun. 2020.

RITTER, A. et al. Treating cervical dentin hypersensitivity with fluoride varnish. **Elsevier**, [s.d.].

RITTER, A. V. et al. Treating cervical dentin hypersensitivity with fluoride varnish. **The Journal of the American Dental Association**, v. 137, n. 7, p. 1013–1020, 1 jul. 2006.

ROCHA, A. D. O. et al. **The Top 100 Most-Cited Papers in Erosive Tooth Wear: A Bibliometric Analysis**. **Caries Research**. Karger AG, , 1 mar. 2022.

ROLDAN-VALADEZ, E. et al. Current concepts on bibliometrics: a brief review about impact factor, Eigenfactor score, CiteScore, SCImago Journal Rank, Source-Normalised Impact per Paper, H-index, and alternative metrics. **Irish Journal of Medical Science**, v. 188, n. 3, p. 939–951, 1 ago. 2019.

SANTOS, P. et al. The top 100 most-cited papers authored by Dr. Jens Ove Andreasen: A bibliometric analysis. **Wiley Online Library**, v. 37, n. 3, p. 365–382, 1 jun. 2021.

SHADGAN, B. et al. Top-Cited Articles in Rehabilitation. **Archives of Physical Medicine and Rehabilitation**, v. 91, n. 5, p. 806–815, 1 maio 2010.

SKÖLD-LARSSON, K.; MODÉER, T.; TWETMAN, S. Fluoride concentration in plaque in adolescents after topical application of different fluoride varnishes. **Clinical oral investigations**, v. 4, n. 1, p. 31–34, 2000.

SLEIBI, A.; TAPPUNI, A. R.; BAYSAN, A. Reversal of Root Caries with Casein Phosphopeptide-Amorphous Calcium Phosphate and Fluoride Varnish in Xerostomia. **Caries Research**, v. 55, n. 5, p. 475–484, 11 nov. 2021.

SONESSON, M. et al. Fluoride varnish for the prevention of white spot lesions during orthodontic treatment with fixed appliances: a randomized controlled trial. **European Journal of Orthodontics**, v. 42, n. 3, p. 326–330, 23 jun. 2020.

VAN NOORDEN, R.; MAHER, B.; NUZZO, R. THE TOP 100 PAPERS Nature explores the most-cited research of all time. **Nature**, v. 514, p. 550–553, 30 out. 2014.

VITALI, F. et al. Endodontic therapy in primary teeth: a bibliometric analysis of the 100 most-cited papers. **SciELO Brasil**, [s.d.].

WEN, P. Y. F. et al. Global Burden and Inequality of Dental Caries, 1990 to 2019. **Journal of Dental Research**, v. 101, n. 4, p. 392–399, 1 abr. 2021.

YILMAZ, H. G.; KURTULMUS-YILMAZ, S.; CENGIZ, E. Long-term effect of diode laser irradiation compared to sodium fluoride varnish in the treatment of dentine hypersensitivity in periodontal maintenance patients: A randomized controlled clinical study. **Photomedicine and Laser Surgery**, v. 29, n. 11, p. 721–725, 1 nov. 2011.

YOUNG H. Glossary of library and information science. **Journal of the American Society for Information Science**, v. 36, n. 4, p. 272–273, 1 jul. 1985.

ZHANG, J. et al. Factors Associated with Dental Root Caries: A Systematic Review. **JDR Clinical & Translational Research**, v. 5, n. 1, p. 13–29, 1 jan. 2020.

ZHAO, F. et al. Theme trends and knowledge structure on choroidal neovascularization: A quantitative and co-word analysis. **BMC Ophthalmology**, v. 18, n. 1, p. 1–11, 3 abr. 2018.