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Protocol: Resin-based adhesives, composites, and luting agents: A cross-sectional study of citations and altmetrics

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Resin-based materials; Adhesives; Composites; Luting agents; Scientometric 

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1 Study protocol

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Resin-based adhesives, composites, and luting agents: A cross-sectional study of citations and altmetrics

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REGISTRATION

This study will be registered in Open Science Framework (www.osf.io).

OBJECTIVE

Resin-based materials are widely used in dentistry for a multitude of purposes but the literature is lacking of scientometric analysis on the topic. The aim of this cross-sectional, scientometric study is to investigate factors associated with journal citations and altmetrics of dental articles reporting original research on resin-based materials.

2 METHODS

Eligibility criteria

Studies reporting original research on resin-based dental materials will be included. A wide range of dental materials could be classified as being based on resin, thus in the scope of this study we will only consider the following types of resin-based materials: 1) adhesives, i.e., agents used to promote the bonding of resin-based materials to different surfaces; 2) restorative composites, which are materials with a polymer matrix highly filled by inorganic particles used for several purposes; and 3) luting agents, which also are composites but have a lower filler load and are used to provide the fixation between structures and surfaces.

To be included, the article should investigate one of these three dental materials and the main study outcome should concern that specific material. For example, studies classified as belonging to the 'adhesives' category should have been designed to evaluate the effect, influence, impact, behavior, and/or performance of one or more dental bonding agents,

although the adhesive could be associated with other materials, for instance. In case the study aimed to evaluate an accessory material, e.g. a light-curing unit, the article will be included provided that the main outcome or response-variable is related to one of the eligible types of materials. In case the study cannot be clearly designated as a research on adhesive, restorative composite, or luting agent, the study will be excluded. The following materials are not eligible: glass ionomer cements, varnishes, silanes, products based on poly(methyl methacrylate), polymer-containing ceramics, and any other material that does not contain resin. Laboratory, animal, observational or interventional clinical studies, case reports, case series and reviews will be included, but opinions, letters, and editorials will be excluded.

Only papers in the field of dentistry, written in English, and published in 2019 will be considered. This year was selected because it was the last year before influence of the COVID-19 pandemic and, since the data is planned to be extracted in mid-2022, this will give at least 2.5 years for citations since publication of the article (MARX *et al.* 2001; PATSOPOULOS *et al.* 2005). A single year was selected to avoid further differences in citation timeframe that could be present if different years were included.

Search strategy

A structured search will be performed in the international scientific database Scopus (Elsevier, Amsterdam, Netherlands). This database was selected because it is comprehensive in terms of the number of dental journals indexed as well as because of the quantity of information about citations and other metrics it can provide. The search strategy will be based on specific terms using the keywords shown in Table 1. The search in Scopus will be refined limiting the results to: year (2019), subject area (dentistry), document type (article), publication stage (final), source type (journal), and language (English).

3

A
Table 1. Search strategy that will be used in Scopus
TITLE-ABS-KEY (resin*) OR (resin-based) OR (resin AND matrix) OR (resin-based AND composite) OR (composite*) OR (composite AND resin) OR (dental AND resin) OR (self-curing AND dental AND resin) OR (polymers*) OR (bond*) OR (resin AND bonded) OR (dental AND adhesives) OR (adhesion) OR (adhesives*) OR (adhesive systems) OR (dentin-bonding AND agents) OR (dental AND bonding) OR (chemical curing AND dental AND adhesives) OR (chemically-cured AND dental AND bonding) OR (luting agents) OR (resin AND cements) OR (cements*) OR (dental bonding light-cured) OR (dental bonding dual-cure) OR (dental bonding self-cured) OR (dual-curing AND resin AND cements) OR (dual-curing AND dental AND resins) OR (self-cured AND dental AND bonding) OR (dental AND cement AND curing) OR (dental AND cements) OR dental AND cements AND light-cured) AND (LIMIT-TO (SRCTYPE, "j")) AND (LIMIT-TO (DOCTYPE, "ar")) AND (LIMIT-TO (PUBYEAR, 2019)) AND (LIMIT-TO (LANGUAGE, "English")) AND (LIMIT-TO (PUBSTAGE, "final"))

Screening

The refined search results will be exported as a comma-separated values (CSV) file and imported into MS Excel (Microsoft Corporation, Redmond, WA, USA). Two independent investigators (FL and RRS) will assess the articles for eligibility. The investigators will be previously trained using a random sample of 50 articles from the search. Training will be supervised by a third investigator (RRM). In case of disagreement, a consensus will be reached between the two independent investigators after discussion and, if needed, the opinion of the third investigator will be decisive. The screening process will be performed by the two independent reviewers. One by one, titles and abstracts will be assessed for eligibility. Full-texts will be consulted in case of doubt. Discrepancies in the screening of titles, abstracts, and full-texts will be resolved by discussion between the two independent reviewers. In case of disagreement, the opinion of a third reviewer will be decisive (RRM).

4 Data collection

For each study included, independent and dependent variables will be collected as shown in Table 2.

A	B	C
Table 2. Independent and dependent variables that will be collected from each article and sources of information		
Variables	Type	Source
<i>Independent variables</i>		
Resin-based material type (adhesive/composite/luting agent)	Categorical	Article
Journal	Categorical	Scopus
Journal Impact Factor (JIF)	Numerical	JCR/Web of Science
CiteScore	Numerical	Scopus
Publication access type (open access/subscription)	Categorical	Scopus
Number of authors	Numerical	Article
Presence of international collaboration (yes/no)	Categorical	Article
First author country	Categorical	Article
Corresponding author country	Categorical	Article
Conflict of interest (reported/not reported/unclear)	Categorical	Article
Sponsorship (none/non-profit/for-profit/mixed/unclear)	Categorical	Article
<i>Dependent variables</i>		
Article citations	Numerical	Scopus
Article citations	Numerical	Google Scholar
Altmetric Attention Score (AAS)	Numerical	Altmetric.com
Field-Weighted Citation Impact (FWCI)	Numerical	Scopus

The combinations between materials used in the different studies will be collected, i.e., how many times an adhesive was associated with a resin composite or with a luting agent, for instance. Number of citations in Scopus and Google Scholar, and AAS, will be considered as primary outcomes of the study because they provide measures of attention gained by the articles in different scenarios, generating a broader view of the impact of the article (Altmetric, 2021). The FWCI of each article will be treated as a secondary outcome. The FWCI is a field-weighted metric that uses the ratio of the total citations received by the denominator's output, and the total citations that would be expected based on the average of the subject field (Elsevier, 2021). A FWCI=1 means that the article performed as expected for the global average, whereas more or less than 1 means more or less citations according to the global average.

Data will be collected and recorded in an Excel spreadsheet by one evaluator (FL) and checked by a second evaluator (RRS). After collection, data for categorical variables will be categorized by one evaluator (RRS) and checked by a second (FL). The JIF will be extracted from the latest Clarivates list available. CiteScore will be collected on a same day for all journals to avoid updates on the metric during data collection. International collaboration will be classified as present whenever two countries were present in the authors' affiliations. If the information about who was the corresponding author is missing, last authors will be considered corresponding authors (ICMJE, 2022). The conflict of interest will be considered unclear when a decision between reported or not reported is not clear. Sponsorship classification will consider as a non-profit sponsor for government, university, hospital, research institute, and charitable foundations. Companies will be considered as for-profit sponsor. Mixed sponsorship should include both non- and for-profit sponsors, and unclear will be classified when we are not sure if the sponsor is a non- or for-profit organization (FAGGION *et al.* 2020).

5 Data analysis

Data will be analyzed using descriptive statistics, estimating the absolute and relative frequencies of the variables of interest and their respective 95% confidence intervals. Separate analyses will be carried out for each of the four independent variables. Regression models will be used to assess differences in citations, AAS, or FWCI among the resin-based materials types. Multilevel models will be used to evaluate the influence of the independent variables on citation rates, AAS, and FWCI. All variables will be retained in the final models (if applicable), but only those with p-value < 0.05 will be considered statistically significant.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest associated with this manuscript.

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