

## LIBRARIAN'S ROLE IN DENTISTRY SYSTEMATIC REVIEWS: AN EPIDEMIOLOGIC STUDY

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### ABSTRACT

**Objective:** Identify the librarian presence in dentistry systematic reviews. The primary outcome was the frequency and role of librarian presence. The secondary outcomes were to assess whether there are differences regarding impact factor, strategy availability, number of databases, and registration of protocol, in the systematic reviews that included or not a librarian. **Methods:** It were included systematic reviews in dentistry, in English, published in dental journals, indexed from July 1<sup>st</sup>, 2018 to July 1<sup>st</sup>, 2019 available on MEDLINE/PubMed. For statistical analysis, the T-test and Pearson's chi-squared test were used. The significance level was 5%. **Results:** Among 280 included studies 14% systematic reviews mention librarian participation, 9% as consultants and 5% as co-authors. There was no statistical difference for impact factor ( $p=0.928$ ) outcomes, search strategy available ( $p=0.850$ ), and number of database ( $p=0.240$ ) among the studies that had or not the presence of the librarian. The number of systematic reviews registered was higher when the librarian was present. The databases mentioned more frequently were MEDLINE, Cochrane, and Embase. **Conclusion:** The frequency of librarian participation in the included systematic reviews was 14%. The most frequent participation was as consultants. Systematic reviews with a librarian on the team were associated with more protocol registration.

**Keywords:** Librarians. Systematic review. Dentistry.

### O PAPEL DO BIBLIOTECÁRIO EM REVISÕES SISTEMÁTICAS EM ODONTOLOGIA: UM ESTUDO EPIDEMIOLÓGICO

#### RESUMO

**Objetivo:** Identificar a presença do bibliotecário em revisões sistemáticas de odontologia. E ainda se há diferenças em relação ao fator de impacto, disponibilidade da estratégia de busca, número de bases de dados pesquisadas e registro do protocolo nas revisões sistemáticas que contaram ou não com um bibliotecário. **Métodos:** Foram incluídas revisões sistemáticas de odontologia, em inglês, publicadas em periódicos odontológicos, indexadas de 1º de julho de 2018 a 1º de julho de 2019, no MEDLINE/PubMed. Para análise estatística, foram utilizados o teste t e o teste qui-quadrado de Pearson. O nível de significância foi de 5%. **Resultados:** Das 280 revisões incluídas, 14% mencionam a participação de bibliotecários, 9% como consultores e 5% como coautores. Não houve diferença estatística para fator de impacto ( $p = 0,928$ ), estratégia de busca ( $p = 0,850$ ) e número de bases de dados ( $p = 0,240$ ). A participação do bibliotecário foi associada ao registro do protocolo das revisões. As bases de dados mencionadas com mais frequência foram MEDLINE, Cochrane e Embase. **Conclusão:** A frequência de participação do bibliotecário nas revisões sistemáticas incluídas foi de 14%, sendo consultor o papel mais frequente. As revisões sistemáticas com bibliotecário na equipe foram associadas a mais registros de protocolo.

Palavras-chave: Bibliotecários. Revisões Sistemáticas. Odontologia.

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## 1 INTRODUCTION

The increasing number of systematic reviews that have been published raises the need for assessing their quality. Librarians are key professionals that can help to achieve reproducible, high-quality systematic reviews (LACKEY; GREENBERG; RETHLEFSEN, 2019). They have a broad knowledge-base and skills such as bibliographic retrieval, organization of large amounts of data, and information identification and verification. All of them can be applied to research in many areas (MCGOWAN; SAMPSON, 2005).

Guidelines as Cochrane Handbook for Systematic Reviews of Interventions (HIGGINS *et al.*, 2019) and the US Institute of Medicine Committee Standards for Systematic Reviews of Comparative Effectiveness Research (INSTITUTE..., 2011) have state that the librarian involvement is essential. The former advises the review team to work closely with a librarian from the start of the protocol. The latter requires the review team to “work with a librarian or other information specialist trained in performing systematic reviews to plan the search strategy” (INSTITUTE..., 2011, p. 106). Beyond systematic reviews, other methodological guides for research synthesis are also specifically listing librarian or information specialist involvement in the search process (GORE; JONES, 2015).

Several studies have associated librarian with better-reported systematic reviews, search quality and reproducibility in fields like internal medicine (RETHLEFSEN *et al.*, 2015), pediatrics (MEERT; TORABI; COSTELLA, 2016), physiotherapy (SWINKELS; BRIDDON; HALL, 2006), veterinary (TOEWS, 2019).

There are not studies relating librarian participation and systematic review quality improvement in dentistry. Ferreira (2017) conducted a study that aimed to assess the quality of search strategies published in systematic review and meta-analysis studies with authors from Brazilian dental institutions. They concluded that the search strategies were poorly reported, and the information presented did not guarantee reproducibility. The study could not relate librarian participation to the quality of search strategies due to the low number of systematic reviews informing librarian participation in the studies.

The numbers of systematic reviews published over the years in dentistry have increased as well as the concern about their quality. There is a need for

improving the reporting quality of systematic reviews in that field (BASSANI *et al.*, 2019).

That said, a more accurate measure of librarian involvement is crucial for continued progress in determining librarian impact (KOFFEL, 2015). Although there are many studies that related librarian participation in systematic reviews, it is difficult to determine librarian's roles and to what extent is their contribution. Then, this study intends to present more evidence about the importance of librarian participation in systematic reviews, especially in the dentistry field, by answering the following question: What is the frequency of librarian as co-author or a consultant in dentistry systematic reviews?

## 2 MATERIALS AND METHODS

Although this study is not a systematic review, we have followed some of its methodological steps, including the development of a protocol, structured search strategy, screening, and selection of the studies in accordance with eligibility criteria. The steps are detailed as follows.

### 2.1 Eligibility criteria

We selected systematic reviews in dentistry published in English in dental journals, from 2018 to 2019, available on PubMed. For this study we considered a systematic review in dentistry, articles related to the evaluation, diagnosis, prevention and/or treatment of diseases, disorders and/or conditions of the oral cavity, maxillofacial and/or adjacent area and associated structures independent of the type of study included.

The primary outcome was the frequency of librarian presence as a team member or consultant. The secondary outcomes were search strategy availability and reporting; and how many and which databases were used.

We consider as systematic reviews studies those that met the minimum criteria proposed by the Cochrane Handbook for Systematic Reviews of Interventions (HIGGINS *et al.*, 2019), which include:

- 1) A clearly stated set of objectives with pre-defined eligibility criteria for studies;
- 2) An explicit, reproducible methodology;

- 3) A systematic search that attempts to identify all studies that meet the eligibility criteria;
- 4) An assessment of the validity of the findings of the included studies, for example through the assessment of risk of bias;
- 5) A systematic presentation, and synthesis, of the characteristics and findings of the included studies.

Studies that do not fill Cochrane Handbook concept of systematic review were excluded, as were letters, conferences, abstracts, personal opinions, guidelines, book chapters, protocols, or systematic reviews of studies in animals or in vitro. Articles reported as narrative/non-systematic literature reviews, rapid reviews, overviews (or umbrella reviews), scoping reviews, methodology articles evaluating quality of studies, comments and protocols or summaries of systematic reviews and those published in languages other than English were also excluded.

## 2.2 Search

The search was performed on PubMed for systematic reviews in dentistry, indexed from July 1<sup>st</sup>, 2018 to July 1<sup>st</sup>, 2019. The search strategy was developed by the first reviewer (KML), a librarian, and validated by an expert, also a librarian, with years of experience in health science (MGMS). The search strategy combined Medical Subject Headings (MeSH) terms and free terms as presented in Table 1.

**Table 1** – Search strategy on PubMed

Search Strategy	Items found	Date
("systematic review"[Publication Type] OR "systematic reviews as topic"[MeSH Terms] OR "systematic review"[Title/Abstract] OR "systematic reviews"[Title/Abstract] OR "systematic literature review"[Title/Abstract] OR "meta analysis"[Publication Type] OR "meta-analysis as topic"[MeSH Terms] OR "meta analysis"[Title/Abstract] OR "metaanalyses"[Title/Abstract] OR "meta analyses"[Title/Abstract] OR "meta synthesis"[Title/Abstract] OR systematic[sb]) Filters: Publication date from 2018/07/01 to 2019/07/01; English; Dental journals.	431	August, 10th 2019

**Source:** Authors (2020).

To retrieve systematic reviews published in dentistry journals we have adopted the filter “dental journals”. This filter limits the search to the PubMed dental journal subset. Lastly, the results were filtered by English language.

### 2.3 Screening

Possible duplicates were checked with EndNote X9<sup>1</sup> reference manager software. Two authors (KML and CZS) identified, independently, articles by reviewing titles and abstracts for relevance.

The full-text articles of the included and uncertain records were selected for further eligibility screening by the same two reviewers using an online software, Rayyan, Qatar Computing Research Institute (OUZZANI *et al.*, 2016). Disagreements were resolved by the third reviewer (PP).

### 2.4 Data extraction

The following data were collected: author, publication year, country, journal, journal impact factor, dentistry specialty (e.g., periodontology, operative dentistry, prosthesis, among others), librarian participation, librarian role, search strategy availability, databases and online sources identification, databases and online sources quantity, additional search, types of additional search performed, protocol registration on International Prospective Register of Systematic Reviews (PROSPERO).

To determine librarian participation the full text was screened as well as its appendix or supplements when available. The reviewers looked for mentions in the text, acknowledgments and at the author's affiliation.

When the degree or affiliation of an author or acknowledged individual was unclear, the person's name was searched using Open Researcher and Contributor ID (ORCID), *LinkedIn* or even *Google*. That was necessary in a few articles and only to confirm the information. The primary source to settle librarian participation was the article itself. It was necessary to contact the corresponding author only in two specific situations.

### 2.5 Data analysis

For statistical analysis, the statistical software Statistical Package for the Social Sciences (SPSS)<sup>2</sup> and Review Manager<sup>3</sup> were used. Data normality was

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<sup>1</sup> EndNote X9®, Thomson Reuters, Philadelphia, PA.

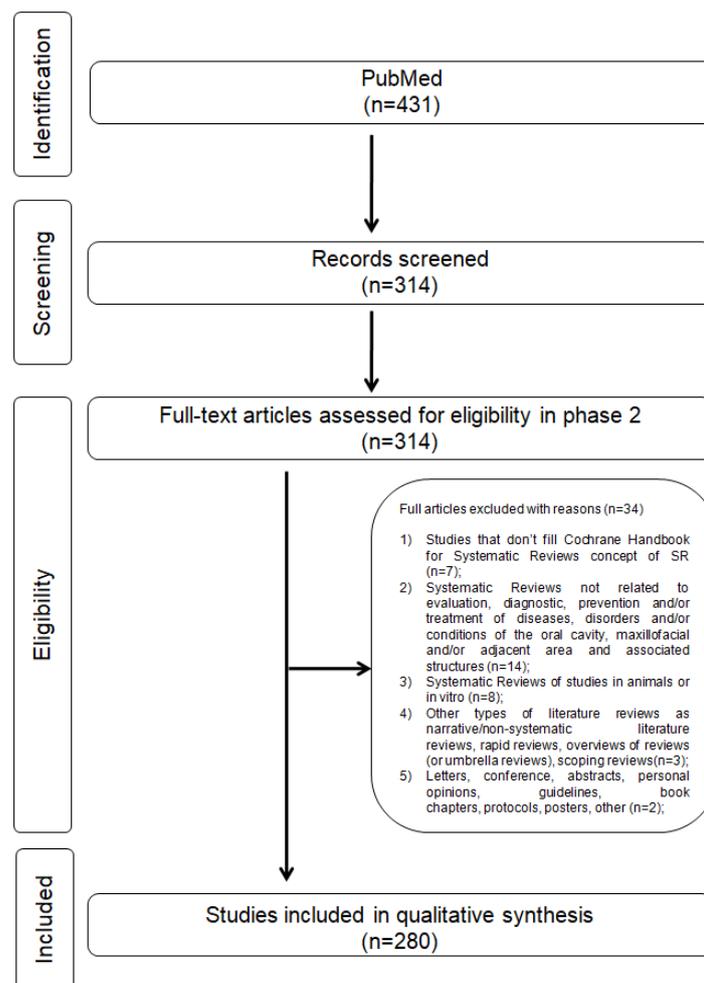
verified by the Kolmogorov-Smirnov test. The tests used were T-test for database quantity and impact factor outcomes. Regarding search strategy availability and protocol registration in PROSPERO, the Pearson's chi-squared test was used. The adopted significance level was 5%.

### 3 RESULTS

#### 3.1 Study selection

We identified 431 systematic reviews. After a careful evaluation of the abstracts, 314 studies were deemed potentially useful and selected for phase-2 assessment. From these studies, 34 were subsequently excluded, and 280 studies were retained for the final synthesis. The Figure 1 demonstrates a flow chart of the process of identification, inclusion, and exclusion of studies.

**Figure 1** – Flow diagram of literature search and selection criteria



**Source:** adapted from PRISMA (MOHER *et al.*, 2010).

<sup>2</sup> International Business Machines (IBM) SPSS Statistics 21.

<sup>3</sup> RevMan version 5.3, Copenhagen: The Nordic Cochrane Center, The Cochrane Collaboration, 2014.

### 3.1 Study characteristics

The 280 systematic reviews that had their data collected were categorized into the following dental topics: implantology (n=55), surgery (n=32), periodontology (n=32), orthodontics (n=24), endodontics (n=24), dental prostheses (n=23), temporomandibular disorders (n=20), oral pathology (n=18), pediatric dentistry (n=10), restorative dentistry (n=7), radiology (n=6), obstructive sleep apnea (n=5), dental trauma (n=5), cariology (n=5), oral health (n=4), dental care (n=3), anesthesiology (n=3), sleep bruxism (n=1), orofacial pain (n=1), dental education (n=1) and dental aesthetics (n=1).

The journals that published the most systematic reviews in dentistry available in PubMed were: Clinical Oral Implants Research (Impact Factor 3.825) (n= 32 - 11,4%), followed by Clinical Oral Investigations Journal (Impact Factor: 2.453) (n=18 - 6,4%) and International Journal of Oral and Maxillofacial Surgery (Impact Factor: 1.961) (n=17 - 6,0%).

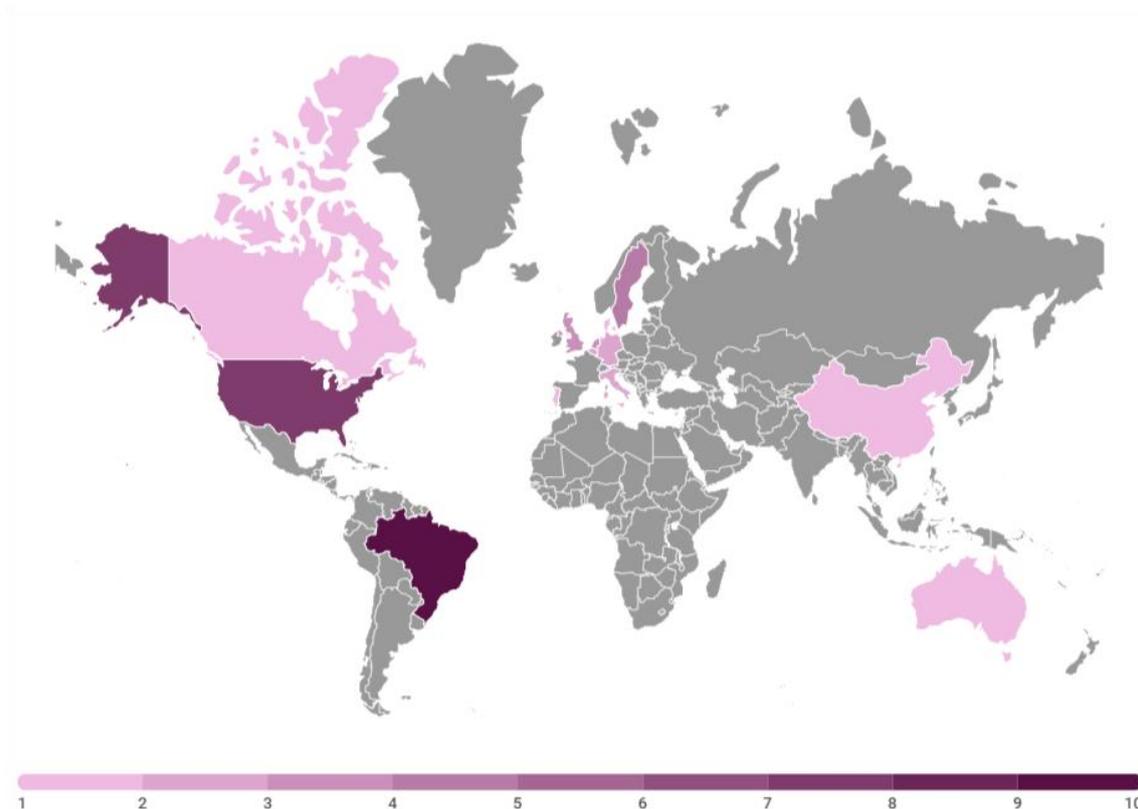
Systematic reviews were carried out in 41 different countries. The countries that published the most systematic reviews in the period evaluated were Brazil (n=67 - 37,2%), China (n=30 - 10,7%) and the United States (n=23 - 8,2%).

### 3.2 Librarian frequency

Among the included studies, 241 (87%) systematic reviews did not mention librarian participation compared to 39 (14%) that informed it. Librarians were consultants in 26 (9%) studies and co-authors in 13 (5%). Regarding the librarian participation as a consultant, that information was available at the "acknowledgments" section in 14 studies and at "materials and methods" in 12.

In Figure 2 dark colors represent countries with higher number of published systematic reviews that reported librarian participation. Most systematic reviews with librarian participation were from Brazil (10). United States and Sweden come in second and third, respectively.

**Figure 2** – Number of systematic reviews that reported librarian participation, by first author's country.



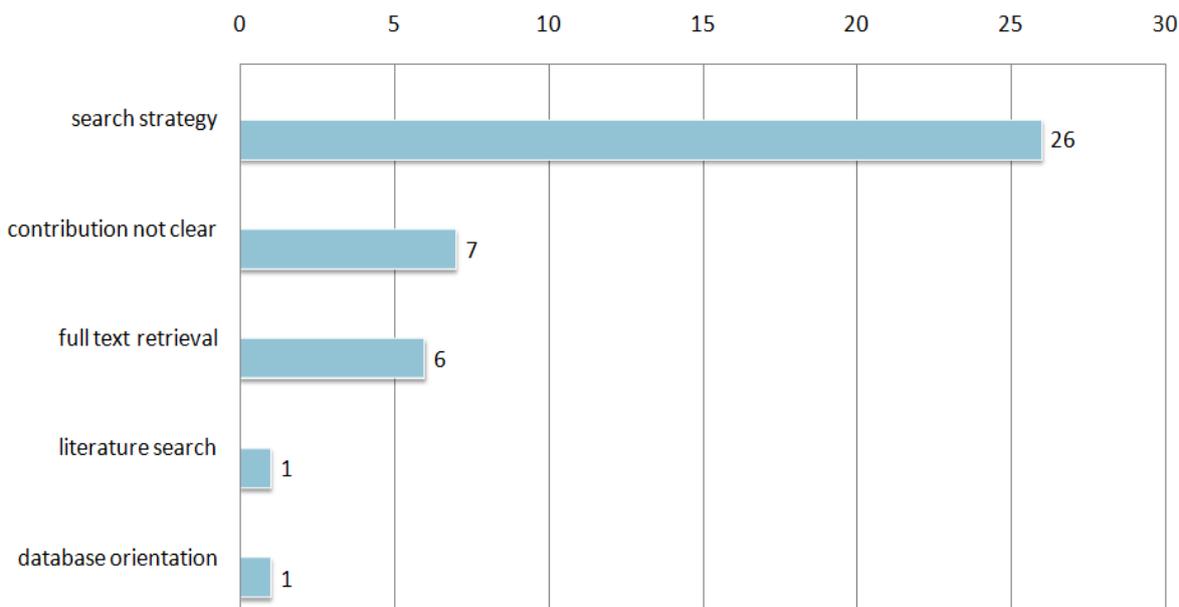
**Source:** Authors (2020).

### 3.3 Librarian's roles

Regarding librarian's role, they were mostly related to search strategy development or validation. This information was usually in the "materials and methods" section. There were two systematic reviews that mentioned search strategy validation or development by information specialists. However, it was not clear if those specialists were librarians. After questioning the corresponding authors, one of the specialists was confirmed as librarian. The other corresponding author declared no librarian involvement.

Most systematic reviews that were co-authored by librarians did not mention what was their contribution to the study. Also, some systematic reviews mentioned that the librarian aided during the completion of the study, but it was not explicit what kind of assistance. In Figure 3 those cases were considered as contribution not clear. Some systematic review teams only asked for librarian assistance to retrieve full texts. Also, one study mentioned librarian support for literature search and other for database orientation.

**Figure 3** – Activities performed by librarians in the included systematic reviews.

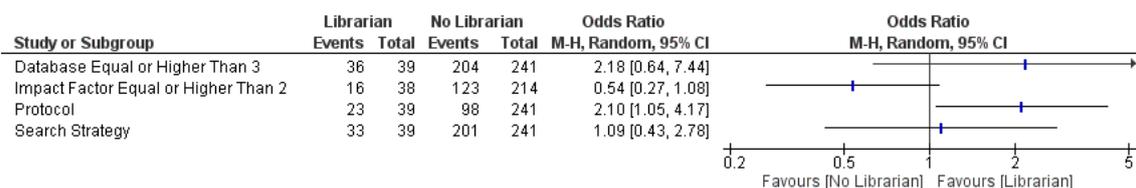


Source: Authors (2020).

### 3.4 Impact Factor

The average found of impact factor was 2,326 for systematic reviews not reporting librarian participation and 2,139 for systematic reviews reporting librarian participation ( $p = 0.928$ ). It was also verified the odds ratio for this outcome,  $OR=0.54$  (CI: 0.27 to 1.08), showing that there was no difference in the publication of an impact factor greater than 2 regarding librarian presence or absence (Figure 4).

**Figure 4** – Impact factor odds ratio



Source: Authors (2020).

### 3.5 Search Strategy

The search strategy was considered as available when the terms used in the search were reported as well as Boolean logic combination of them. The reproducibility of the search strategy was not assessed so even simple strategies were considered. To verify the search strategy availability, we have read the full



text and checked appendices or supplements. Search strategy was considered not available when there was no information about it or only the terms were presented, without the logic relation among them.

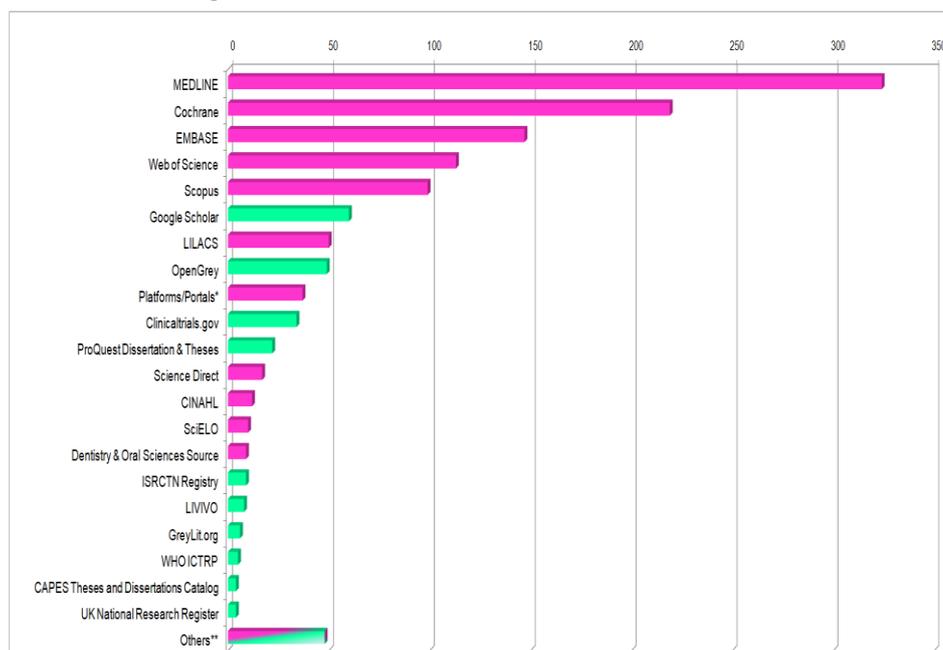
Considering the group of systematic reviews that did not report librarian involvement, 201 (83.4%) presented the search strategy. Among the systematic reviews with librarian participation, 33 (84.61%) presented the search strategy. There was no statistical difference between the presence or not of the librarian ( $p = 0.850$ ). OR = 1.09 (CI: 0.43 to 2.78).

### 3.6 Databases

Regarding the number of databases searched, the average found in the systematic reviews that did not mention the participation of the librarian was 4,556, while in the systematic reviews that mentioned the librarian participation was 5,692 ( $p=0.240$ ).

The databases mentioned more frequently were Medical Literature Analysis and Retrieval System Online (MEDLINE), Cochrane databases and Embase (Figure 5). MEDLINE was accessed mostly via PubMed, but also many studies informed other platforms (e.g. Ovid). For this study, the platform differences were not considered. Main databases are in pink. In green are grey literature and other information resources (Figure 5).

**Figure 5** – Databases and other information sources



Source: Authors (2020).

### 3.7 Protocol Registration

Among the systematic reviews that did not report librarian participation, 98 (40.66%) registered their research protocol in PROSPERO. The systematic reviews that reported librarian participation, 23 (58.97%) recorded the protocol in PROSPERO ( $p=0.032$ ), showing a statistical difference between the groups. The systematic reviews that reported librarian participation were associated with protocol registration at PROSPERO. OR= 2.10 (CI: 1.05 to 4.17).

## 4 DISCUSSION

### 4.1 Summary of evidence

This study aimed to gather more evidence about librarian's participation in systematic reviews and the impact on the quality of those studies. In particular, the frequency of librarians as co-author or consultant in dentistry systematic reviews.

Since the inception of the evidence-based practice approach in dentistry, the number of published systematic reviews conducted in dental fields has rapidly increased (BADER; ISMAIL, 2004). Bassani *et al.* (2019) has reported that Brazil was the first in the production of systematic reviews in dentistry. The same was detected by this study among the total of included systematic reviews as well as those that reported librarian participation.

### 4.2 Librarian frequency

Despite the promising findings (BEVERLEY; BOOTH; BATH, 2003; BORREGO; ARDANUY; URBANO, 2018; DUDDEN; PROTZKO, 2011; FOUTCH, 2016; GORE; JONES, 2015; KOFFEL, 2015; LACKEY; GREENBERG; RETHLEFSEN, 2019; MCGOWAN; SAMPSON, 2005; MEERT; TORABI; COSTELLA, 2016; RETHLEFSEN *et al.*, 2015; SPENCER; ELDREDGE, 2018; SWINKELS; BRIDDON; HALL, 2006; TOEWS, 2019) about librarians' contributions to systematic reviews, just a small percentage of the systematic reviews included in this study informed librarian participation. Since we were limited to the data available in the articles it is possible that some teams counted with the assistance of a librarian but did not acknowledge that.

Koffel (2015) surveyed systematic reviews corresponding authors and half of the responses reported a librarian involvement in their systematic reviews.

However, even librarians that developed search strategies did not have their contributions acknowledged in the publication. For Meert, Torabi and Costella (2016) very often there was no indication of librarian role or to what extent that professional was involved in the systematic review.

Ferreira (2017) had a similar result when sought to identify librarian participation in dentistry systematic reviews. In countless times the few professionals who are part of the teams and work throughout the systematic review process are not included in the authorship of the studies.

That said, this study intention was to contribute with more evidence on librarian importance in systematic reviews.

### **4.3 Librarian's role**

In this study librarian involvement was mostly as a consultant. Co-authorship was a minority. The librarian participation was mentioned mostly at the acknowledgement section of the article. In some articles it was possible to verify what was the task performed by the librarian at "materials and methods". Ferreira (2017) had similar results since librarians were cited only in the materials and methods section.

Regardless of the role as consultant or co-author, the tasks performed by librarians did not vary that much. Mostly were related to search strategy development, validation, and translation to different databases. Other tasks were database orientation and full text retrieval. And, in some systematic reviews co-authored by librarians, there was not any data regarding their responsibility in the study.

Librarians can perform many tasks in systematic review studies including advising on resources, translating, and running searches across different databases and downloading results for the reviewers (BETHEL; ROGERS, 2014). Spencer and Eldredge (2018) went beyond it and identified 18 different roles librarians can perform in systematic reviews, between expected and unexpected roles. Expected roles are tasks also advocated by Beverley, Booth and Bath (2003): project manager, literature searcher, reference manager, document supplier, critical appraiser, data extractor, data synthesizer, report writer, disseminator. Less documented roles were planning, question formulation, and peer review (SPENCER; ELDREDGE, 2018).

Toews (2019) analyzed tasks performed by librarians in veterinary systematic reviews and clustered them in three categories: adviser, teacher, or member of the review team. The survey showed that advising was the most common role, followed by formal teaching and participating as a review team member. The librarians were advisers in question formulation, database selection, search strategy formulation and reference managing. But as team members some librarians also performed tasks like question formulation and search strategy development.

That said to what extent the librarian's contribution should be only acknowledged or consider as co-authorship? The International Committee of Medical Journal Editors ([2020]) recommends that authorship is based on the following criteria:

1. Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work;
2. Drafting the work or revising it critically for important intellectual content;
3. Final approval of the version to be published;
4. Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

The most traditional task performed by librarians when collaborating with a research team on a systematic review falls clearly in the first criterion of authorship. Structuring the search, adapting it for various databases and writing the search part of a methods section of a paper are clearly all intellectual contributions to that paper (DESMEULES; CAMPBELL; DORGAN, 2016). A librarian that works with a review team is as responsible for the work as the other reviewers. For Toews (2019) participating as a team member should mean receiving formal credit as a coauthor of the review.

McKeown and Ross-White (2019) developed a model for librarian support in systematic review that classified librarian's tasks in two groups: advisory consultation or collaboration. Activities considered as collaboration were more time consuming and presume closer work with the review team. Consequently, librarians can negotiate authorship. For Gore and Jones (2015)

librarians should, at least, be given the choice to receive an acknowledgement (or no credit at all) for their contributions to the systematic review.

As said before librarians have a set of skills that are suitable for working with systematic review teams. However, many librarians start their professional careers without systematic review training (BULLERS *et al.*, 2018). Education and training are essential for those professionals wishing to provide systematic reviews services. That can be done through continuing education or by a hands-on approach, working with a review team.

Collaboration should be beneficial for everyone involved in the systematic review process. Swinkels, Briddon, and Hall (2006) stated that working together has enabled them to fully appreciate the benefits of collaborative work between librarians, clinicians, and academics. The integration of a librarian into a research team contains both individual and institutional benefits. Librarians gain valuable experience and knowledge about how a faculty research project operates, which could foster future collaborations. Librarians involved with systematic reviews can take satisfaction in knowing that their expertise has contributed to the development of a faculty driven product. In return, the faculty will develop an appreciation for the services provided by librarians (FOUTCH, 2016). As a matter of fact, a librarian in the team adds value to the team and the research.

#### **4.4 Search strategy**

Search strategies for systematic reviews should be an expert search. The Medical Library Association (2005) states that expert search is “a mediate process in which a user with an information need seeks consultation and assistance from a recognized expert”. Librarians have a combined set of skills and knowledge that meet the needs of evidence-based practice and can be considered as a search expert.

In this study search strategy was available in most systematic reviews, which it is an important aspect related to a good quality study. Although there was no statistical difference between librarian presence or absence regarding search strategy availability, systematic reviews with librarian participation were more likely to present the search strategy.

Another outcome of this study is search strategy reporting. A search strategy for systematic review should be as transparent as possible and documented in a way that enables it to be evaluated and reproduced. According to Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist the full electronic search strategy should be presented for at least one database, including any limits used, in a way that can be reproducible (MOHER *et al.*, 2010).

We did not aim to assess search strategies reproducibility, but it was possible to detect that several search strategies were not reported in accordance with PRISMA Statement. For example, in some cases the terms and Boolean logic were presented, but it was not clear what the fields or limits were adopted. Golder, Loke and McIntosh (2008) evaluated search strategy reporting in systematic reviews of adverse effect and three quarters of the reviews provided information about the search strategy, although very few gave sufficient details to allow the search to be reproduced. And even when search strategies were reported they were of variable quality.

According to Rethlefsen *et al.* (2015) systematic reviews with librarians as authors are more likely to pay particular attention to quality search strategy development and reporting. A librarian could write materials and methods section and properly report the search strategies in compliance with PRISMA.

Also, librarians could peer-review the search strategy in accordance with Peer Review of Electronic Search Strategies (PRESS). The evidence suggests that peer review of electronic literature search strategies using a structured tool enhances the quality and comprehensiveness of the search compared with searches that are not peer reviewed (MCGOWAN *et al.*, 2016). Franco *et al.* (2018) identified problems in Cochrane reviews regarding search strategy design and reporting and concluded that peer-reviewing of search strategies could reduce the number of identified problems.

Studies reinforce that librarians were significantly associated with searching two or more databases, including the full search strategy and were more likely to be reproducible (GOLDER; LOKE; MCINTOSH, 2008; KOFFEL, 2015). Therefore, having a librarian as a coauthor or as a member of a systematic review team suggests better-reported search quality.



#### 4.5 Databases

Despite no statistical difference, this study showed that the systematic reviews with librarian participation were more likely to search in more databases.

Meert, Torabi, and Costella (2016) investigated the number of databases (general and subject-specific) used in systematic reviews. In general, the systematic reviews without librarian involvement used fewer databases; the authors who consulted a librarian used more databases; and those reviews that had a librarian as a coauthor or team member used the highest number of databases.

The databases searched more frequently among the systematic reviews included in this study were MEDLINE, Cochrane databases and EMBASE, in this order. That meets Cochrane Handbook of Systematic Reviews of Interventions (HIGGINS *et al.*, 2019) recommendations. According to the Handbook the search for studies in a Cochrane Review should be as extensive as possible to reduce the risk of reporting bias and to identify as much relevant evidence as possible. The three bibliographic databases generally considered to be the most important sources to search for reports of trials are The Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE and Embase.

Depending on the topic, a multidisciplinary database such as Web of Science or more specific databases, such as Cumulative Index to Nursing and Allied Health Literature (CINAHL) – nursing and health sciences –, PsycINFO – psychology and psychiatry – or Education Resources Information Center (ERIC) – education –, should also be considered (DONATO, H.; DONATO, M., 2019).

Grey literature should be always considered as a resource for systematic reviews because it yields information that is not found in proprietary databases and indexes. In this study, other information sources beyond bibliographic databases were also present and with a high number of mentions.

Also, with the presence of a librarian as a consultant or a coauthor, more studies searched subject-specific or regional databases and grey literature resources. Usually librarians are more informed about the existence of these sources of information and can direct researchers on how to access and use them. This is particularly true for grey literature sources, which can be difficult to identify and navigate (MEERT; TORABI; COSTELLA, 2016).

#### 4.6 Protocol registration

Less than half of the systematic reviews included in this study, were registered with in the PROSPERO. The highest frequency of records was detected in the systematic reviews that had a librarian on the team.

Prospero was launched in February 2011 to mitigate problems with systematic review transparency (BOOTH *et al.*, 2011, 2012). The study by Sideri, Papageorgiou and Eliades (2018) verified the frequency of records in PROSPERO, in systematic reviews of orthodontics, and found that of the 182 systematic reviews included, 37 (20.3%) were registered in PROSPERO. In the same study, they found that there was a better assessment of the risk of bias in the systematic reviews that had been recorded.

That said, librarians could advise the review team on the importance of protocol to promote transparency and prevent work duplication.

#### 4.7 Limitations

Among the study limitations we can mention the use of only one database. However, it is justified by the large number of publications. The time frame for the year 2018 and 2019, as well as the language restriction may have had an influence on the librarian's participation in dentistry systematic reviews. Lack of clear information about librarian participation was also an issue.

### 5 CONCLUSION

Most systematic reviews in dentistry did not count with or reported librarian participation (87%). Among the systematic reviews that informed librarian participation, mostly they were consultants participating in the search strategy development. Concerning the secondary outcomes, search strategy was available in most systematic reviews. And almost all systematic reviews with librarian participation reported the search strategy. MEDLINE, Cochrane databases and Embase were the most searched. Although there is no statistical significance, systematic reviews with librarian participation were more likely to search in more databases. In relation to protocol registration, there was a statistical difference between systematic reviews with librarian participation and those ones without.

The frequency of librarian participation in the included systematic reviews was 14%. The most frequent participation was as consultants acting in the search strategy development. There was no difference regarding impact factor, search strategy reporting and bases number, with librarian presence or absence. Systematic reviews with a librarian on the team were associated with protocol registration at PROSPERO.

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