

Comparison of Google Scholar and Pubmed Databases for Oral Health Related Keywords Search: A Cross-Sectional Observational Study

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Abstract

Background: This search engine provides a simple way to access "peer-reviewed papers, theses, books, abstracts, and articles from academic publishers' sites, professional societies, preprint repositories, universities and other scholarly organizations". However, several authors suggest that Google Scholar should not be the first or sole choice when searching for patient care information, clinical trials, or literature reviews.

Aim: To assess and compare the literature retrieved from Google Scholar and PubMed database using oral health related keywords.

Materials and methods: A cross-sectional observational study was carried out. The official home pages of PubMed and Google Scholar were searched using ten oral health related keywords to identify and extract information regarding the various characteristics of these databases. All the keywords were searched with use of parentheses (“ ”) as a Boolean operator to limit the search to required area of focus.

Results: In nine of the ten searches, Google Scholar returned larger retrieval sets than PubMed. Most items retrieved by Google Scholar were journaled articles. Items in other formats included: journal article, book citation, book reviews, and others. These results yielded few gray literature items.

Conclusion: Google Scholar does not appear to be a replacement for PubMed, though it may serve effectively as an adjunct resource to complement databases with more fully developed searching features.

Keyword: Google Scholar, PubMed, Oral Health.

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Introduction

Google Scholar has been met with both enthusiasm and criticism since its introduction in 2004. This search engine provides a simple way to access "peer-reviewed papers, theses, books, abstracts, and articles from academic publishers' sites, professional societies, preprint repositories,

universities and other scholarly organizations". The familiarity of Google may allow librarians and educators to ease students into the scholarly searching process by starting with Google Scholar and eventually moving to more complex systems. Felter noted that "as researchers work with Google Scholar and reach

limitations of searching capabilities and options, they may become more receptive to other products'[1].

PubMed is a free search engine accessing primarily the MEDLINE database of references and abstracts on life sciences and biomedical topics. The United States National Library of Medicine (NLM) at the National Institutes of Health maintains the database as part of the Entrez system of information retrieval. PubMed, first released in January 1996, ushered in the era of private, free, home- and office-based MEDLINE searching [2]. The PubMed system was offered free to the public in June 1997, when MEDLINE searches via the Web were demonstrated, in a ceremony, by Vice President Al Gore [3]. The beta version of Google Scholar (GS) has attracted worldwide attention from health professionals and librarians since its launch in November 2004. Though it purports to “locate scholarly literature across all disciplines in many formats” and to offer “the best scholarly search experience for users”, GS has generated considerable debate in library circles about its usefulness. Google Scholar is a freely accessible web search engine that indexes the full text or metadata of scholarly literature across an array of publishing formats and disciplines [4]. Released in beta in November 2004, the Google Scholar index includes most peer-reviewed online academic journals and books, conference papers, theses and dissertations, preprints, abstracts, technical reports, and other scholarly literature, including court opinions and patents [5]. The most relevant results for the searched keywords will be listed first, in order of the author's ranking, the number of references that are linked to it and their relevance to other scholarly literature, and the ranking of the publication that the journal appears [6]. The search of literature in google scholar and PubMed are different in term of the material accessed. The present study highlights to assess the

differences in the databases and the kind of literature accessed in relation to oral health.

Material And Methods

A cross-sectional observational study was carried out. The official home pages of PubMed and Google Scholar were searched to identify and extract information regarding the various characteristics of these databases. The date of the official inauguration, content, coverage, number of keywords allowed for each search, uses, updating, owner, and characteristics and quality of citations were the focus for the analysis of PubMed and Google Scholar. Furthermore, the utility of these databases in retrieving information on a particular subject by using a specific keyword referring to oral health was evaluated.

Ten searches were performed in PubMed using a variety of available search features. The searches were repeated in Google Scholar to approximate a user's approach to those same topics in that search engine. The searches, performed between February and March 2016, were by topic, author, title, journal name, and/ or combinations of those fields (Appendix online). Topics included for each search, the citations received via Google Scholar and PubMed were examined to determine a variety of characteristics including format, date, Medical Subject Headings (MeSH) where appropriate, uniqueness, duplications, and full-text availability from the author's institution. Most searches were narrowed by date to produce sets of a reasonable size to allow comparison of unique items retrieved by each system. The search results were analyzed to determine possible reasons for the retrieval of unique items in each resource and together information on the general features of the Google Scholar results.

The keywords that were employed in the search in our study were:

1. Dental caries vaccine
2. Atraumatic restorative treatment
3. Peer Assessment Rating Index

4. Pit and fissure sealants
5. Fluoride tablet
6. Fluoride stain
7. Nursing Bottle caries
8. Powered toothbrush
9. Gingival massage
10. Interdental cleaning aids

Inclusion criteria: The totals of ten keywords were used to search the google scholar and pubmed databases respectively.

Exclusion criteria: Search results not directing to the word of focus in parentheses.

Search strategy: All the keywords were searched with use of parentheses as a Boolean operator to limit the search to required area of focus.

Results

In nine of the ten searches, Google Scholar returned larger retrieval sets than PubMed. Remaining one search PubMed returned larger retrieval sets than google scholar. characteristics of google scholar results shows the characteristics of the items retrieved by Google Scholar, Most items retrieved by Google Scholar were journal articles. Items in other formats included: journal article, book citation, book reviews, and others. These results yielded few gray literature items. When the keyword dental caries vaccine was searched in google scholar the following results were retrieved Journal article – 23, Book citation- 2, Book review- 0, Others – 8. When the keyword Atraumatic Restorative Treatment was searched in google scholar the following results were retrieved Journal article – 263, Book citation- 14, Book review- 0, Others – 54. When the keyword Peer Assessment Rating index was searched in google scholar the following results were retrieved Journal article – 32, Book citation- 0, Book review- 0, Others – 21. When the keyword pit and fissure sealant was searched in google scholar the following results were retrieved Journal article – 172, Book citation- 10, Book review- 0, Others – 76. When the keyword fluoride tablet was

searched on google scholar the following results were retrieved Journal article – 19, Book citation- 1, Book review- 0, Others – 7. When the keyword fluoride stain was searched on google scholar the following results were retrieved Journal article – 2, Book citation- 0, Book review- 0. When the keyword interdental cleaning aids were searched in google scholar the following results were retrieved Journal article – 32, Book citation- 3, Book review- 1, Others – 6. When the keyword Atraumatic Restorative Treatment was searched in Pubmed the following results were retrieved Journal article – 31, Full text – 12. When the keyword Peer Assessment Rating index was searched in Pubmed the following results were retrieved Journal article – 2, Full text - 0

Discussion

The current version of Google Scholar focuses on Internet sites that contain information that is critically appraised, such as the peer-reviewed journal literature, or that are produced by reputable sources, such as universities. Through agreements with publishers, Scholar accesses the “invisible” or “deep” Web, that is, commercial Web sites the automated “spiders” used by search engines such as Google cannot access [7]. Use of PubMed’s oral terminology search filter, with the “narrow, specific” subfilter, helps to explain PubMed’s higher specificity. Researchers from McMaster University developed the search strategies that the National Library of Medicine adopted for this filter. In a validation study of this filter, searches related to therapy, with the “narrow, specific” subfilter, yielded 93% sensitivity and 97% specificity for rigorously designed studies that were previously retrieved via hand-searching 170 journals. In contrast to PubMed, Google Scholar searches a wide range of multidisciplinary topics and offers few options for filtering large amounts of information. It relies on an inherent algorithm to determine search results, and it

lacks a filter similar to PubMed's Clinical Queries to search for rigorously designed studies. Google Scholar also lacks the capacity to map search terms to the MEDLINE Medical Subject Headings [8]. Given these inadequacies, Henderson concluded that Google Scholar is inappropriate as the sole alternative for clinicians [9]. Google Scholar is still labeled as a beta version; perhaps future upgrades will address the shortcomings. For now, the optimal application of Google Scholar may be as an adjunct resource, for known authors or articles, or perhaps for initial searches to quickly find a relevant article. The present study is a unique comparison of PubMed and Google Scholar for searches of oral health related topics. Our results are consistent with those of previous studies, which targeted various topics and used different methods, including PubMed search strategies other than the Clinical Queries filter. A study that targeted drug- information reviews and limited the comparison to the first 100 citations, determined that PubMed was more precise than Google Scholar [10].

Conclusion

Clinicians should understand the strengths and weaknesses of Google Scholar and be prepared to explain them to their users. For example, Google Scholar does not offer the number and extent of special searching and limiting features available in PubMed. However, Google Scholar provides some advantages in that it is an easy place to begin a search to find an initial retrieval of possibly worthwhile articles. One of the most advantageous features of searching PubMed is the ability to utilize the MeSH vocabulary, as Google Scholar does not currently implement controlled vocabulary searching mechanisms. PubMed also offers substantially more features that allow searchers to narrow their retrieval to citations from clearly identified sources, as detailed in NLM's List of Journals Indexed for MEDLINE and List of Serials Indexed for Online Users. Google Scholar does not

appear to be a replacement for PubMed, though it may serve effectively as an adjunct resource to complement databases with more fully developed searching features. It is important to note that both PubMed and Google Scholar are often upgraded with new features or with intended improvement of existing functions.

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