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Comparison of bibliographic databases features regarding oral and maxillofacial surgery literature

Comparação das características das plataformas bibliográficas em relação à literatura de cirurgia oral e maxilofacial

Comparación de las características de las bases de datos bibliográficas sobre la literatura de cirugía oral y maxilofacial

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Abstract
This paper aims to provide a bibliometric analysis of the literature on oral and maxillofacial surgery, comparing different databases and discussing the advantages, disadvantages, and specific features of each one. A bibliographical search for oral and maxillofacial surgery literature was conducted on Pubmed, Scopus, Web of Science, Dimensions, SciELO, LILACS, and Google Scholar. Seven different search strategies were used on each database. VOSViewer and Microsoft Excel were used for tabulation and data visualization. Some statistical tests were performed with a 95% confidence interval, which was considered significant. A table comparing the number of articles obtained during seven different literature searches was created. A correlogram created in RStudio showed the correlation between the number of articles in the different databases evaluated. The functionalities of each database were compared. It is recommended to use more than one database when searching for literature related to surgery. Among the analyzed databases, PubMed stands out for its functionalities, precision, and quantity of available articles.
Keywords: Bibliometrics; Maxillofacial injuries; Surgery, Oral; Ameloblastoma; Orthognathic surgery.

Resumo
Este trabalho tem como objetivo fornecer uma análise bibliométrica da literatura sobre cirurgia oral e maxilofacial, comparando diferentes bancos de dados e discutindo as vantagens, desvantagens e características específicas de cada um deles. Uma pesquisa bibliográfica da literatura sobre cirurgia bucomaxilofacial foi realizada em Pubmed, Scopus, Web of Science, Dimensions, SciELO, LILACS, e Google Scholar. Sete diferentes estratégias de busca foram usadas em cada banco de dados. VOSViewer e Microsoft Excel foram usados para tabulação e visualização de dados. Alguns testes estatísticos foram realizados com um intervalo de confiança de 95%, o que foi considerado significativo. Foi criada uma tabela comparando o número de artigos obtidos durante sete diferentes pesquisas bibliográficas. Um correlograma criado no RStudio mostrou a correlação entre o número de artigos nas diferentes bases de dados avaliadas. As funcionalidades de cada base de dados foram comparadas. Recomenda-se a utilização de mais de uma base de dados na busca de literatura relacionada à cirurgia. Entre as bases de dados analisadas, o PubMed se destaca por suas funcionalidades, precisão e quantidade de artigos disponíveis.
Palavras-chave: Bibliometria; Traumatismos maxilofaciais; Cirurgia bucal; Ameloblastoma; Cirurgia ortognática.

Resumen
El objetivo de este trabajo es realizar un análisis bibliométrico de la literatura sobre cirugía oral y maxilofacial, comparando diferentes bases de datos y discutiendo las ventajas, desventajas y características específicas de cada una. Se realizó una búsqueda bibliográfica de la literatura de cirugía oral y maxilofacial en Pubmed, Scopus, Web of Science, Dimensions, SciELO, LILACS y Google Scholar. Se utilizaron siete estrategias de búsqueda diferentes en cada base de datos. Se utilizaron VOSViewer y Microsoft Excel para la tabulación y visualización de los datos. Se realizaron algunas pruebas estadísticas con un intervalo de confianza del 95%, que se consideró significativo. Se creó una tabla que compara el número de artículos obtenidos durante siete búsquedas bibliográficas diferentes. Un correlograma creado en RStudio mostró la correlación entre el número de artículos en las diferentes bases de datos evaluadas. Se compararon las funcionalidades de cada base de datos. Se recomienda utilizar más de una base de datos cuando se busque literatura relacionada con la cirugía. Entre las bases de datos analizadas, PubMed destaca por sus funcionalidades, precisión y cantidad de artículos disponibles.
Palabras clave: Bibliometría; Lesiones maxilofaciales; Cirugía, oral; Ameloblastoma; Cirugía ortognática.

1. Introduction

The number of scientific publications increases considerably year by year (Grillo 2021b). Thanks to this massive amount of information, an accurate bibliographic search becomes an increasingly complex task (Aksoy et al. 2022). Several tools can be used in this task (Villatte et al. 2020). From time to time, new search databases emerge with the proposition of being the "ultimate database for all researchers".

Unfortunately, every literature search, every journal, and every article differs significantly, from area to area. For this reason, there are several types of databases (Morshed and Hayden 2020). Some are for the health sciences, others for exact sciences, and so on. In addition, it must be said that the features and the number of articles made available vary greatly from database to database (Aslam-Pervez and Lubek 2018; Avau et al. 2021). The choice of the ideal database would be somewhat difficult. Or would the choice of the ideal database be something impossible to establish?

The results of these bibliographic searches can vary drastically. Therefore, this paper aims to discuss which would be the most adequate alternative to the bibliographic search databases in the field of maxillofacial surgery.

2. Methodology

A broad literature search was performed using Pubmed, Scopus, Web of Science (WS), Dimensions, SciELO, LILACS, and Google Scholar (GS) for oral and maxillofacial surgery articles. The strategies used were: (odontogenic infection), (orthognathic surgery), (ameloblastoma), (cleft lip), (third molar surgery), and (MRONJ). These strategies were chosen to avoid generic searches such as oral surgery, oral pathology, or facial fractures. All seven searches were performed on the same day to avoid bias. The seven oral and maxillofacial surgery literature topics were retrieved to avoid the use of Boolean operators and the grouping of terms with quotation marks to avoid bias. No language or year publications restriction were applied. This retrospective study is a bibliometric analysis that follows the principles of the Leiden Manifesto (Hicks et al. 2015).

The article selection process was independently conducted by two reviewers (MB and RG) to assess correlation among databases. If there was any disagreement between the reviewers, the consensus was reached through discussion. No language restrictions, year of publication, language, or Journal Impact Factor (IF) were applied. Discussion about the functionalities of each database was carried out. A table has been created with the different functionalities of each database. A score of 1 was assigned in the positive case of this functionality and 0 in the negative case. A total score was assigned to grade which database would be the most effective in the case of oral and maxillofacial surgery search.

Some charts and tables were created with Microsoft Excel ® (Microsoft Corporation, Redmond, USA), RStudio ® (RStudio, GNU GPL), and VOS-Viewer (Leiden University, The Netherlands). Statistical analyzes were performed and only considered significant with a 95% confidence interval.

3. Results

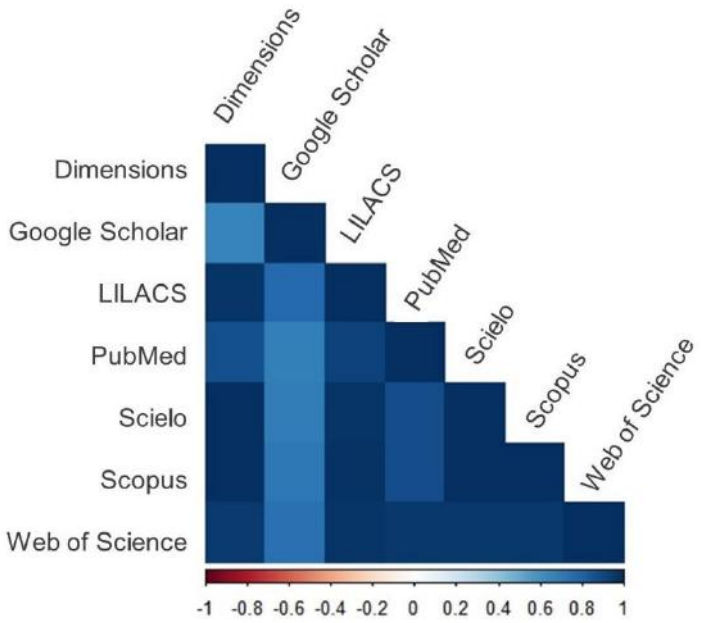
The number of articles varied considerably on the different databases in all the searches performed (Table 1). The correlogram created shows randomness between some databases. The lowermost Pearson´s correlation was between the GS and Dimensions ($\rho = 0.661698$). The lowest Pearson correlations found were between the GS and the other databases (Figure 1).

Table 1 – Number of articles retrieved in every database in different databases.

	Dimensions	GS	LILACS	PubMed	SciELO	Scopus	WS
(orthognathic surgery)	10481	60000	500	10665	219	8344	6873
(ameloblastoma)	7369	34700	400	5064	112	6669	2730
(odontogenic infection)	3262	33700	129	2922	50	2818	1459
(third molar surgery)	4294	313000	430	6873	98	5047	4477
(MRONJ)	1115	4890	23	759	13	839	733
(cleft lip)	28636	351000	1316	21064	561	26109	16591
(TMJ surgery)	2289	60900	277	10739	28	2226	4443

Legend: GS – Google Scholar, WS – Web of Science. Note the discrepancy on the number of articles in different databases. Source: Authors.

Figure 1 – Correlogram between different databases regarding the number of articles retrieved.



Note the lower correlation (light blue) between GS and other databases. Source: Authors.

Some functionalities were analyzed and tabled in every database. According to our analysis, PubMed has a mild superiority over the other databases (Table 2). According to our study, LILACS and SciELO have a disadvantage over the others due to the number of indexed journals, reducing the available quantity of articles. On the other hand, WS and Scopus have a wide range of indexed journals, but access is paid, making it difficult for some researchers.

Table 2 – Functionalities assessment of included databases. Grade 1 for a positive outcome, grade 0 for a negative. The sum was obtained without any kind of adjustment.

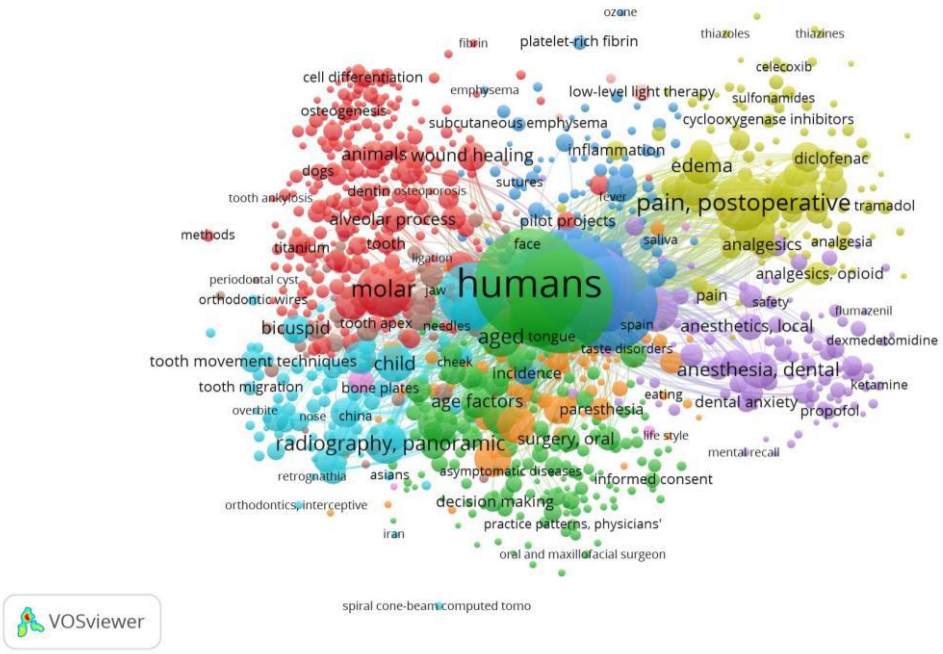
	Dimensions	GS	LILACS	PubMed	SciELO	Scopus	WS
Abstract	1	1	1	1	1	1	1
Age	0	0	0	1	0	0	0
Author	1	1	1	1	1	1	1
Bibliometrics possibility	1	0	0	1	0	1	1
Citations	1	1	0	0	0	1	1
Country	0	0	1	1	1	1	1
Funding	0	0	0	0	0	1	1
Institutional affiliation	0	0	1	0	1	1	1
Journal	1	1	1	1	1	1	1
Open access	1	1	1	1	1	1	1
Patents	1	0	0	0	0	1	1
Range of languages	0	1	0	1	0	1	1
Sex	0	0	0	1	0	0	0
Species	0	0	0	1	0	0	0
Title	1	1	1	1	1	1	1
Type of article	1	1	1	1	1	1	1
Type of Study	0	0	1	1	0	0	0
Unpaid access	1	1	1	1	1	0	0
Year of publication	1	1	1	1	1	1	1
TOTAL	**10**	**10**	**11**	**15**	**10**	**14**	**14**

Source: Authors.

LILACS and SciELO work very well for local languages (Portuguese and Spanish). Although free, its functionalities do not include several items such as searching by languages, country, or type of study. Same as Dimensions.

Only in four databases, it was possible to evaluate citations (GS, WS, Scopus, and Dimensions). Some graphic software can visually evaluate scientific production, but only in databases where citation analysis is not possible (Figure 2).

Figure 2 – (Third molar surgery) MeSH keywords visualization through VOSViewer software.



Source: Authors.

Data visualization through VOSViewer could be very useful in selecting appropriate keywords. This enables a more widespread article.

4. Discussion

The Leiden Manifesto (Hicks et al. 2015) is considered to be an important guide in the field of bibliometrics. It outlines ten principles that should be followed or avoided on the subject. A crucial point in bibliometric analyses is to avoid statements that lead one to believe that this type of study is accurate. The present work intends to discuss the subject with the appropriate information, avoiding sediment from the subject through exactitude.

All literature search databases have their advantages and disadvantages, however selecting the least efficient database for a given area can generate an inefficient search, increasing the bias of the future publication (Kokol and Vošner 2018). Accessibility is a crucial point when searching and selecting articles. Two points stand out regarding accessibility, the cost of access and the number of indexed journals. Pubmed and GS have advantages over the other database in this regard. Both databases have a different search algorithm (Nourbakhsh et al. 2012). PubMed focused on MeSH keywords and Google on the number of citations (Falagas et al. 2008). Theoretically, GS can search all available electronic material, including non-scientific texts. Despite being useful to clinicians, there is an increase in screen-filtering time for researchers (Falagas et al. 2008; Nourbakhsh et al. 2012). The excessive number of false or unrelated results considerably increases the risk of failure with a single use of this database (Morshed and Hayden 2020; Sauvayre 2022). Very few articles were published comparing SciELO and LILACS databases.

The possibility of performing a citation analysis is a valuable issue (Falagas et al. 2008; Cheng et al. 2017). Analysis of citations is extremely useful for discovering classic articles with cornerstone information. Efficient bibliometrics saves time and effort (Grillo 2021b; Cantrell et al. 2022). Citation analysis is essential during the search for articles in a systematic review. This considerably decreases the risk of bias in the conclusions in this type of publication (Cantrell et al. 2022). Another astonishing feature of citation analysis is the properly choose of effective MeSH keywords (Grillo et al. 2022). The choice of the most

appropriate keywords is crucial for the most efficient dissemination of publications (Mondal et al. 2018; Grillo 2021a, 2022). The use of databases that perform searches against keywords or generate citation analysis is very useful to researchers. Although GS analyzes citations, the database does not do it autonomously. There is a need for other software to do so and takes more time (Cantrell et al. 2022).

This item is one of the disadvantages of PubMed, LILACS, and SciELO to other databases. Dimensions has a big advantage in this respect over the other databases. The database can perform another form of scientometric analysis, altmetrics (Martín-Martín et al. 2021). Instead of evaluating the number of citations, the number of mentions is evaluated. A mention is the amount of attention a search gets over the internet. A new web-based form of analysis that can help researchers on relevant contemporary issues. Bibliometrics and altmetrics are considered complementary analyses (Grillo 2022). Dimensions is considered an interesting alternative to paid databases (Martín-Martín et al. 2021).

LILACS, SciELO, and Dimensions present efficient but limited search tools. The number of languages as other flaws during the search decreases their efficiency. Both LILACS, SciELO, and Dimensions can be considered moderate functionality as a search tool for maxillofacial surgery. Pubmed and WS are considered by some authors as the most efficient databases, because of the ease and effectiveness of the searches (Falagas et al. 2008; Kokol and Vošner 2018). PubMed is considered the most relevant and precise database (Nourbakhsh et al. 2012; Powell 2019; Morshed and Hayden 2020). The use of different databases is recommended since there are different functionalities in each one (Nourbakhsh et al. 2012; Morshed and Hayden 2020; Villatte et al. 2020).

Open access articles are considered by many authors to be a very efficient way of sharing wisdom. The possibility of performing a literature search containing only open articles can be considered a great advantage (Basson et al. 2022).

There are some limitations of the present study. First, our data were obtained from specific search terms, not encompassing all maxillofacial surgery publications. Second, only a few bibliographic databases were used because of the limitation of analyzing data with much higher scores. Some databases are widely used in other parts of the world such as Embase (Avau et al. 2021) or the Chinese Biomedical Literature Database (CBLD) (Xia et al. 2008). Finally, some points that are considered important, such as the authors' H-index and self-citations, were not analyzed because they are specific to only a few databases.

5. Conclusion

Pubmed can be considered the most efficient search database in maxillofacial surgery although it has the disadvantage of not performing citation analysis. Scopus and Web of Science are considered very efficient and perform citation analysis, but they are paid tools, not available to everyone. SciELO and LILACS can be considered lower databases, with few disadvantages over the other databases regarding functionalities, but with a much lower number of results than the other databases. Dimensions can be considered an interesting alternative to classical and more-knowing databases. Google Scholar should be used sparingly by researchers for the high time in screen reading and the need for a more detailed selection of articles. Future studies are necessary since the databases are constantly being updated. Different topics should also be analyzed to assess whether there are any similarities between the researched topics and other areas of study.

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