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Original article

References of Brazilian Medical Journals in national publications☆

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ABSTRACT

Objective: To assess whether there is a preference for international journal citation to the detriment of national ones in ten Brazilian medical journals, in two different periods.
Methods: All references in the articles published in Arquivos Brasileiros de Oftalmologia, Revista Brasileira de Cirurgia Cardiovascular, Revista da Associação Médica Brasileira, São Paulo Medical Journal, Arquivos Brasileiros de Endocrinologia e Metabologia, Clinics, Jornal Brasileiro de Pneumologia, Revista da Sociedade Brasileira de Medicina Tropical, Revista Brasileira de Psiquiatria e Acta Ortopédica Brasileira in the years 2011 and 2007 were analyzed, assessing the number of articles published in national and international journals.
Results: A total of 36,125 references from 1,462 articles published in the 10 aforementioned journals were analyzed. Of the total number, 4,242 (11.74%) were from Brazilian journals. There was no significant difference between the two analyzed periods. A total of 453 (30.98%) articles had Brazilian references and 81 (5.54%) articles had more national than international references.
Conclusion: Of total references analyzed, 11.74% were related to articles published in Brazilian journals. This number, when compared to the percentage of Brazilian articles published in the medical area, demonstrates a good number of citations of national articles.

Referências de periódicos médicos brasileiros em publicações nacionais

Palavras-chave:
Artigo de revista
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Bibliografia

RESUMO

Objetivo: Avaliar se há preferência pela citação de periódicos internacionais em detrimento dos nacionais em 10 periódicos nacionais de medicina em dois períodos de tempo distintos.
Métodos: Foram avaliadas todas as referências dos artigos publicados nos periódicos Arquivos Brasileiros de Oftalmologia, Revista Brasileira de Cirurgia Cardiovascular, Revista da Associação Médica Brasileira, São Paulo Medical Journal, Arquivos Brasileiros

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de Endocrinologia e Metabologia, Clinics, Jornal Brasileiro de Pneumologia, Revista da Sociedade Brasileira de Medicina Tropical, Revista Brasileira de Psiquiatria e Acta Ortopédica Brasileira nos anos de 2011 e 2007, verificando a quantidade de artigos provenientes de revistas nacionais e internacionais.

Resultados: Foram analisadas 36.125 referências dispostas em 1.462 artigos nas 10 revistas analisadas. Desse total, 4.242 (11,74%) foram de periódicos nacionais. Não houve diferença significativa entre os dois períodos analisados. Artigos que citaram artigo de periódico nacional somaram 453 (30,98%), enquanto 81 artigos (5,54%) citaram mais artigos nacionais que estrangeiros.

Conclusão: Do total de referências utilizadas, 11,74% foram referentes a artigos de periódicos brasileiros. Esse valor, quando comparado à porcentagem da produção brasileira no mundo na área de medicina, demonstra uma boa citação dos artigos nacionais.

Introduction

The Brazilian publication has grown exponentially in recent years.[1] In the 1960s, the average scientific publications in journals registered in *Information Sciences Institute* was 52 papers per year. In the 1970s, there was little change and the mean increase to 64 papers. However, in 2001, Brazilian researchers published nearly 10,555 papers in indexed journals, corresponding to an increase of 165-fold in national publication. In the same period, global growth was 2.18-fold.[2]

A large part of this scientific production is produced within national public universities through post-graduate studies programs.[3] However, this growth in quantity and quality of publications was not followed by Brazilian journals.[4] They are still far short of international journals, mainly in relation to American journals.[5,6]

Part of this disproportion is related to national policies for evaluating graduate programs, concerning journals in which papers were published. Whereas all the journals with high impact factor are foreign, researchers are eventually induced to publish in them, in order to receive a higher grade by local assessors and research promotion agencies, such as FAPES, CAPES and CNPq.[7-9]

This disregard for national journals generates a bias sometimes unnoticed by most of the Brazilian researchers – the reduced number of citations of national papers. In an attempt to facilitate publication, there is the misconception that the citation of foreign papers will enhance the manuscript, making it equivalent to the works cited therein.[10,11]

The quality assessment of a journal is held through its Impact Factor (IF), based on the number of citations the journal receives. Ventura et al.[12] and Figueiredo[13] studied individually bibliometric data from a Brazilian scientific journal, and found that, respectively, only 9.9% and 4.4% of the citations used were from national journals, and the remaining was foreign citation.

The aim of this study was to evaluate the proportion of citations of papers published in 10 Brazilian journals.

Methods

All references in the articles published in Arquivos Brasileiros de Oftalmologia, Revista Brasileira de Cirurgia Cardiovascular, Revista da Associação Médica Brasileira, São Paulo Medical Journal, Arquivos Brasileiros de Endocrinologia e Metabologia, Clinics, Jornal Brasileiro de Pneumologia, Revista da Sociedade Brasileira de Medicina Tropical, Revista Brasileira de Psiquiatria and Acta Ortopédica Brasileira in the years 2011 and 2007 were analyzed.

The database *Journal Citation Reports*, with 27 national medical journals, was used to randomly select 10 scientific journals using a statistical software. The years of study from the references were based on the study of Teixeira et al.,[14] which proposes a minimum window of 5 years between times of analysis.

All papers defined as "original articles" were included. Articles classified as editorials, literature review, case report, articles without reference and letters to the editor were not included in the research. Articles meeting the inclusion and exclusion criteria were analyzed based on the references used by the national papers.

The research protocol assessed the total number of references used, not considering references from books, web pages or quote from quote (apud). The number of references from national and international journals and the relation between papers from national and foreign journals were verified.

We also studied the amount of citations that journals received and, from these, how many were from national journals and the journal itself. These data were acquired in SciELO for each journal.

Student *t* test was used to check if there was a change between the two periods in each journal, ANOVA test was used to check whether there were differences between the journals, and the linear correlation test served to verify if the number of references used influenced the amount of national references cited. A value of $p < 0.05$ was used to define statistical significance in the tests.

Table 1 – Number of references to national journals, total references used and number of journal articles studied.

Journal	References to national journals				Total references		Total articles	
	2011		2007		2011	2007	2011	2007
	N	%	N	%				
Arquivos Brasileiros de Oftalmologia	144	11.88%	233	9.74%	1,212	2,392	60	117
Revista Brasileira de Cirurgia Cardiovascular[a]	310	20.81%	95	10.88%	1,489	873	56	39
Revista da Associação Médica Brasileira	214	15.97%	208	12.69%	1,340	1,638	55	73
São Paulo Medical Journal[a]	87	9.88%	44	4.01%	880	1,095	33	43
Arquivos Brasileiros de Endocrinologia e Metabologia	111	7.16%	138	6.55%	1,550	2,105	54	69
Clinics	362	4.42%	126	5.81%	8,189	2,165	277	82
Jornal Brasileiro de Pneumologia	315	19.10%	185	13.42%	1,649	1,378	70	61
Revista da Sociedade Brasileira de Medicina Tropical[b]	800	30.18%	527	29.45%	2,650	1,789	112	88
Revista Brasileira de Psiquiatria	85	8.85%	103	12.37%	960	832	34	35
Acta Ortopédica Brasileira	91	9.13%	64	6.78%	996	943	53	51
Total	2,519	12.04%	1,723	11.32%	20,915	15,210	804	658

[a] $p < 0.05$ (Student t - Number of citations of national journals 2011 × 2007).
[b] $p < 0.01$ (ANOVA - Revista da Sociedade Brasileira de Medicina Tropical × other journals 2011 and 2007).
Source: research protocol.

Results

We analyzed 36,125 references in 1,462 articles from 10 journals studied in the two periods, corresponding to an average of 24.71 ± 10.14 citations per article. From the total analyzed, 20,915 (57.89%) citations were used in 804 (54.99%) articles published in 2011, with an average of 26.01 ± 9.59 citations/article. In 2007, 658 (45.01%) papers citing 15,210 (42.11%) references were identified, corresponding to an average of 23.11 ± 10.57 citations/article. There were differences in the two research periods ($p < 0.0001$), and 2011 showed a higher number of citations per paper.

Concerning the citation of national journal articles, 4,242 (11.74%) references from the total references analyzed were identified, corresponding to an average of 2.90 ± 3.82 citations/article. From this number, 2,519 (59.38%) citations were found in articles published in 2011, and 1,723 (40.62%) in articles published in 2007, (average 2.61 ± 3.47 citations/article). There was no statistical difference between the research periods ($p = 0.0092$).

Table 1 shows the number of references to national journals, total number of citations and articles analyzed in the years 2011 and 2007 per journal studied. In the table, it is evident that only São Paulo Medical Journal showed a significant difference in number of citations to national journals between the two periods. Moreover, it is clear that Revista da Sociedade Brasileira de Medicina Tropical had a higher mean citation to Brazilian journals than the other journals ($p < 0.01$).

From all articles studied, 453 (30.98%) had no national reference. In 2011, the number of articles was 251 (31.21%), and in 2007 it was 202 (30.69%), with no difference between the two years ($p = 0.9217$). Eighty-one articles (5.54%) cited more articles from national than foreign journal, 49 (6.09%) articles in 2011 and 32 (4.86%) in 2007, with a significant difference between the two periods ($p = 0.0411$) regarding the amount of articles citing more national than foreign references.

When checked, there was no correlation between the total amount of references to journals used and the number of citations to national journals ($p = 0.0040$, Pearson $r = 0.0924$).

Table 2 shows the number of citations made to the researched journals and how many were received from national and international journals and the journal itself. It is noticed that 4.32% of all citations were received from foreign journals.

Discussion

The scientific knowledge produced in Brazil is in intense expansion, and these articles are achieving an unprecedented level concerning both quantity and quality. However, national publications have failed to follow this growth.[2,4] The quality of a journal is measured by the IF, based on the ratio between total citations the journal received in two years and the number of articles published during this period, therefore, IF is a measure that does not directly assess the articles published, but the set of articles published in a given period.[6]

General citation to national journals, although it seems low (11.74%) when compared to the percentage of Brazilian production in Medicine[2] (0.9%), shows a national effort of the authors to cite in-country research. It is possible to confirm this inference by the significant increase in mean citation to papers from national journals.

Several factors influence the citation, including title, where the research was executed, field of knowledge, among

Table 2 – Number of references found in Brazilian journals from national and international journals, and the journal itself.

Journal	Total citations	Citations from national journals		Citations from international journals		Citations from the journal itself	
Arquivos Brasileiros de Oftalmologia	3,156	3,080	97.59%	76	2.41%	2,078	65.84%
Revista Brasileira de Cirurgia Cardiovascular	2,569	2,550	99.26%	19	0.74%	1,877	73.06%
Revista da Associação Médica Brasileira	4,146	3,971	95.78%	175	4.22%	415	10.01%
São Paulo Medical Journal	1,399	1,293	92.42%	106	7.58%	136	9.72%
Arquivos Brasileiros de Endocrinologia e Metabologia	3,453	3,326	96.32%	127	3.68%	1,423	41.21%
Clinics	1,994	1,971	98.85%	23	1.15%	892	44.73%
Jornal Brasileiro de Pneumologia	2,638	2,597	98.45%	41	1.55%	1,138	43.14%
Revista da Sociedade Brasileira de Medicina Tropical	9,352	8,673	92.74%	679	7.26%	2,671	28.56%
Revista Brasileira de Psiquiatria	3,562	3,390	95.17%	172	4.83%	800	22.46%
Acta Ortopédica Brasileira	721	715	99.17%	6	0.83%	147	20.39%
Total	32,990	31,566	95.68%	1,424	4.32%	11,577	35.09%

Source: SciELO.

others.[15,16] However, Pinto and Andrade[17] emphasize that papers in journals from developing countries tend to have few citations for several reasons, such as difficult access to articles published in national journals, precarious journals purchased by the institutions, or the preference of Brazilian authors by international journals, even without IFand of dubious quality.

Although with a relatively high incidence of citation to national journals, it is necessary to extend this number, since about half of the national papers are never cited.[2] Goffi[10] states that only when there is no national information available on a given subject it is acceptable to use foreign data.

This study is not intended to encourage scientific xenophobia.[14] However, awareness from national authors on this subject is needed, since nearly 1/3 of the articles make no national reference. Studying the journals alone (Table 1), it is noticed that there was a profile maintenance of citation (except one journal), showing what actions should be taken to encourage the citation of Brazilian journals.

Revista da Sociedade Brasileira de Medicina Tropical had the highest citation rate of national articles (30%). This example should be followed, since nearly all of the citations in journals studied were from national journals (95.68%); with a greater citation of Brazilian articles there will be a tendency to increasing IF and the quality of journals, and consequent indexing of these in large databases such as PubMed. Thus, the articles published in these databases may be accessed and read on a worldwide and more unrestrained scale.[11,14]

It should be emphasized that the data may not represent the entire universe of national medical journals, and certain journals can have profiles that differ from those found in this research, since there are several factors that influence an article citation. However, it is necessary to expand discussions on this topic, mainly to ensure the growth of national journals.

Conclusion

Among the total references analyzed, 11.74% were related to articles published in Brazilian journals. This number, when compared to the percentage of Brazilian articles published in the medical area, demonstrates a good number of citations of national articles. It is necessary to expand the citation of national papers without, however, a scientific xenophobia, since this will help national journals to reach major indexing databases and expand the amount of people who would read these articles, and consequently increase its IF.

Conflicts of interest

The authors declare no conflicts of interest.

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