



Original

Main Topics Published in Veterinary Science by High-Impact Journals: *Scimago* indexing

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ABSTRACT

Background: The journals of veterinary science publish the results of research done particularly in the areas of applied medicine. **Aim:** to characterize the types of most frequently papers published in high-impact veterinary medicine journals indexed in *Scimago*, with emphasis on topic areas and titles.

Methods: The top-twenty veterinary-related journals were chosen, based on their ranking as scientific journals (SJR). The article type, topic, title, and animal species treated were examined in each paper.

Results: The highest SJR indexes of veterinary journals were within the 0.909-1.863 range. The percent of articles that include punctuation marks in the title was 40.29%. The most commonly published topics are related to viruses and parasites (34%). Pets, cats, and dog comprise 19.7% of the papers published, though species of productive interests accounted for 43.4%.

Conclusions: The review indicates that the journals with the highest number of citation rates in veterinary medicine, include a wide variety of topics and species, though infectious diseases is the topic of preference.

Key words: Veterinary Sciences, Impact factor, H index, SJR (Source: *AIMS*)

INTRODUCTION

The phrase *publish or perish* shows the high need of the scientific community to increase the flow of information from every area of knowledge, not just through research, but also by the

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publication of results (García *et al.*, 2015). The scientific journals are an opportunity to publish the outcome of research. Since these are specialized journals targeted to specialized readers as well, researchers can be sure that their jobs will be properly publicized, which increases the repeatability of studies, and international collaboration (Lindenmayer *et al.*, 2017).

Scientific journals are important tools because apart from spreading knowledge, they ensure quality evaluation processes of research whose results are published. Quite a few researchers who work on their CVs submit their manuscripts to journals without visibility, or they even subdivide the information (salami papers) to produce a higher number of articles. However, today, publishing in indexed journals is a requirement for universities to get quality accreditations, as well as financing through national and international funding organizations (Salinas, 2010). Authors use several strategies to increase the number of citation rates in their papers, one of them is to focus on the manner the title is written.

The impact factor of journals (citations in the next two years/number of documents) has been used for over 60 years; however, it does not show the history in the life of a publication. Recently, the Hirsh (H) index has gained popularity, not only to recognize the history of researchers, but also that of scientific journals (Hirsch, 2005). It can be easily determined by giving a decreasing order to the number of citations, resulting from the highest value of citation rate coincidences, and the number of articles.

The journals of veterinary science publish the results of research done particularly in the areas of applied medicine. This is mainly done in indexed journals. In this context, these publications bring to light the scientific work being done (Nel *et al.*, 2016). In the area of Veterinary Medicine, the H index and impact factor are generally lower than in other areas. Recently, the *Scimago* index (SJR) has allowed a ranking comparable to other areas of knowledge (Flagas *et al.*, 2008), since it normalizes the references according to the area investigated. Accordingly, the aim of this paper was to conduct an analysis of Veterinary Medicine journals, according to their citation rates in *Scimago*, and the most commonly published topics in the journals with the highest impact in the area.

MATERIALS AND METHODS

The indexes of the most frequently cited journals within Veterinary Medicine were collected from website *Scimago Journal & Country Rank* (<http://www.Scimagojr.com/>), a tool made by *Scimago Research Group* that offers journal indicators, areas of knowledge, and countries, based on data compiled from *Scopus*. They were arranged in a decreasing order, according to the H index, so the impact factor and Scientific Journal Rankings (SJR) index could be obtained. A correlation analysis between H, SJR, and the impact factor was conducted. Besides, the linear regression of the impact factor, the H index, and SJR was evaluated.

The first 20 journals in the area of Veterinary Medicine were chosen, according to the SJR index of scientific journal ranking. The most frequently cited articles (25) in each journal site were reviewed. In each article, the title, topic, redaction of the title, and animal species treated, were identified. The articles that included more than one species were classified as *multiple species*; when the article did not include any specific species, it was considered as *no clarity*.

RESULTS

Table 1 shows the ranking of the first 20 journals in the area of Veterinary Medicine, according to *Scimago*, based on the H index, and their values of impact factor and SJR. The highest H indexes correspond to journals Vaccine (164), and Theriogenology (118). Other two journals have H indexes above 100 (Veterinary Parasitology, Veterinary Microbiology). Only eleven journals of 236 are published in Spanish, nine of them in Latin America.

Table 1. Ranking of the first 20 journals in the area of Veterinary Medicine, according to indexes (H, SJR), and the impact factor

Ranking ^a	Name of the journal	SJR	H index	IF ^b
1	Vaccine	1.759	164	3.31
2	Theriogenology	0.905	118	2.33
3	Veterinary Microbiology	1.166	114	2.82
4	Veterinary Parasitology:	1.041	109	2.14
5	Journal of the American Veterinary Medical Association	0.67	100	1.09
6	Livestock Science	0.666	99	1.44
7	Applied Animal Behaviour Science	0.857	95	1.99
8	Veterinary Journal	0.908	94	2.02
9	Veterinary Research	1.321	93	3.09
10	Animal Reproduction Science	0.622	92	1.85
11	Journal of Veterinary Internal Medicine	1.246	92	2.32
12	Veterinary Record	0.402	91	0.81
13	Acta Tropica	1.224	89	2.65
14	Journal of Medical Entomology	0.848	87	1.87
15	Veterinary Immunology and Immunopathology	0.749	86	1.89
16	Parasitology Research	0.786	84	2.26
17	Preventive Veterinary Medicine	1.102	84	2.33
18	American Journal of Veterinary Research	0.631	82	1.14
19	Veterinary Pathology	0.893	80	2.2
20	Equine Veterinary Journal	0.941	79	2.15

^aRanking according to the H index. ^bIF: Impact factor Source: <https://www.Scimagojr.com/>

Of the journals with the highest SJR index, the most frequently cited articles were published in Vaccine, Nanoparticle vaccines (Zhao *et al.*, 2014); Understanding vaccines from a global

perspective: a systematic review of published literature, and Vaccine: definition, scope, and determinants (MacDonald, 2015).

The correlation between the SJR index and the impact factor (0.93) is higher than SJR with the H index (0.699). Similarly, linearity (SJR vs Impact factor, $r^2=0.87$; SJR vs H index $r^2=0.49$) (Figure 1).

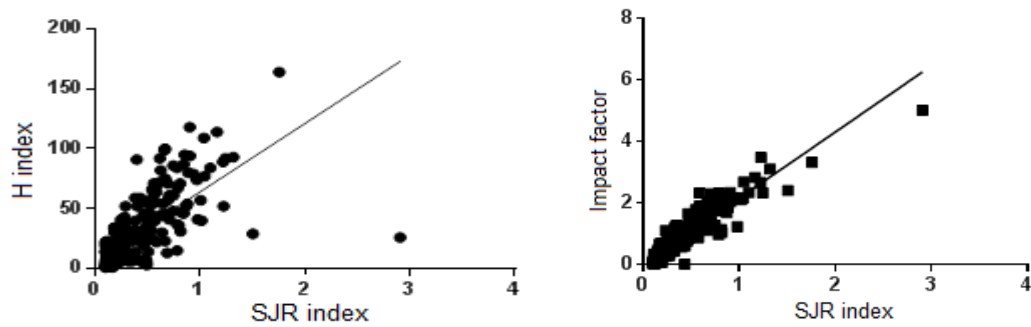


Figure 1. Linear ratio between the scientific ranking of veterinary journals indexed in *Scimago*, and the impact factor, and H index

Of a total of 350 papers, 164 corresponded to reviews (46.86%), and 162 to experiments (46.29%). The rest were reviews with meta-analysis (1.71%); systematic reviews and guides (1.43%); and case reports (0.29%).

Figure 2 shows the distribution of the most frequently cited articles by topics. The highest number (71) corresponded to articles that dealt with several topics simultaneously. Articles that reported works on viruses and parasites are 62 and 57, respectively, whereas the papers dealing with bacteria totaled 36. Epidemiology was included in 32 papers.

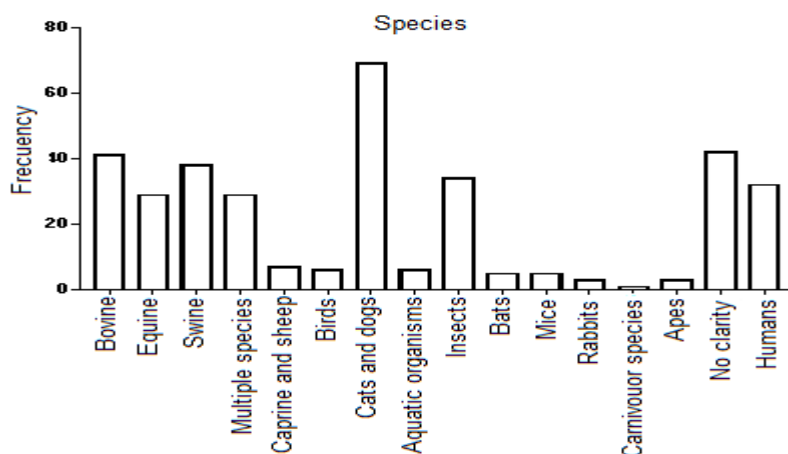


Figure 2. Frequency of published topics by the first 20 journals in the scientific ranking (SJR), in the area of Veterinary Medicine

Of 350 articles, 69 were experimental studies with dogs and cats. Swine (38), cattle (36), and insects (34), were the other most commonly treated species. Humans were considered in 32 articles, whereas horses were studied in 29 papers (Figure 3).

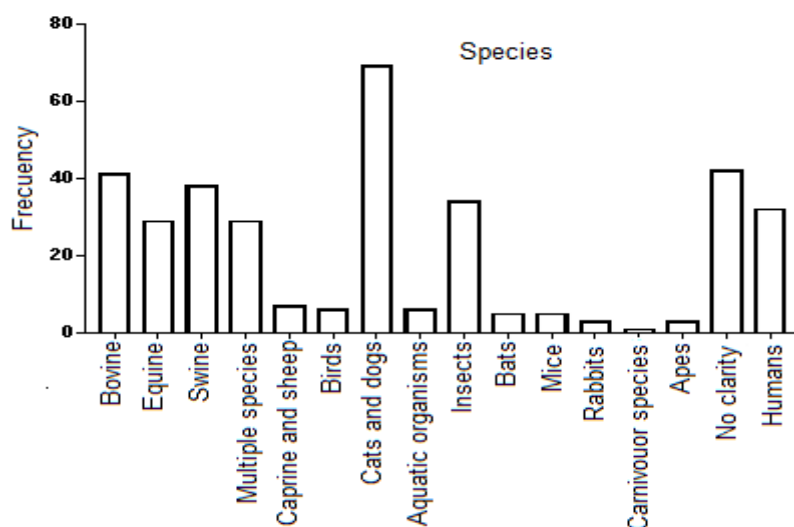


Figure 3. Frequency of animal species published by the first 20 journals in the scientific ranking (SJR), in the area of Veterinary Medicine

The way in which the 350 manuscripts were written was varied; the highest number (209 articles) had no distinctive features. The articles containing colons (:) totaled 96. Titles including a dash (-) were in 37 articles. Other articles (8) combined a colon (:) and a question mark (?).

DISCUSSION

Recently, Demeter (2018) suggested the inclusion of the SJR index in the estimation of author scientific productivity, considering that this index not only normalizes the citations of each article, but also within the area of science in which it is published. Likewise, its standardization may be an indicator of journal evolution and trends (Yu, 2009).

SJR is highly correlated to the impact factor and the H index, which presupposes its relation with the repute and popularity of the journals. In the areas of neurosurgery, biochemistry, and molecular biology, there is a high correlation among the different citation indexes (Ahmad *et al.*, 2018; Yuen, 2018). Today, the predominant trend is to consider SJR as the one with the highest value, since it is more related to the area of science in which papers are published (Joseph, 2019). The lower linearity of SJR in relation to the H index may be caused by the fact that the H index is more dependent on the journal's age.

The number of citations of authors may indicate the quality of research. However, the relation between the number of citations and the scientific merit of authors is not very clear (Seeber *et al.*,

2017). Moreover, the number of citations of authors is known to be biased by the co-authorship of the article. In the articles with at least one co-author with a high H index, the citation rate is higher in the articles with co-authors having lower H indexes than the first co-author (Benevenuto *et al.*, 2016). It has been demonstrated that publishing in English enables authors to get more citations, based on the fact that articles are more accessible (Di Bitetti *et al.*, 2017). This has been assumed by several journals as part of their strategies of diffusion (Álvarez *et al.*, 2017).

Furthermore, throughout this research, a high proportion of articles with punctuation marks in the title was observed, which indicates a trend to greater impact. Rostami *et al.* (2014) described that the dash and comma to separate ideas in the titles of scientific papers raises the number of citations. The articles who include question marks in the title are increasingly getting more citations (Falahati *et al.*, 2015); however, this study shows that less than one per cent of the most frequently cited articles in the area of Veterinary Medicine have question marks in their titles (Nair *et al.*, 2016).

Similarly, in the area of veterinary, the review articles get more citations than the original research papers. Coincidentally, Alimoradi *et al.* (2016) found that the type of article allows for a prediction of citation rates. Nevertheless, the length and type of the title lacks impact, as to the number of citations in an article. In addition to that, case reports were found to have a low proportion. These results match the reports of Lira *et al.* (2014), who recommend not to publish case reports, due to the low proportion in the number of citations in relation to original research.

In this study, the articles that cover infectious diseases were found to have more citations than other specialties. The reason for this is unclear. In that sense, in a study of the most frequently cited articles of the Journal of Internal Medicine, the articles referring to infectious diseases were reported to be more frequently cited than the other specialties (Giuffrida *et al.*, 2012). One of the possible causes is the high frequency of articles related to diagnosis and vaccination, regarding viruses, and parasites, particularly the one related to resistance development.

Likewise, the articles referring to pets get the highest number of citations, though an increase in zoonotic diseases has been observed in veterinary journals. Giuffrida *et al.* (2012) described that even when the quality of techniques and procedures were poor, the articles referring to pets are more commonly cited than other species.

CONCLUSIONS

Undoubtedly, this study shows that in order to evaluate the Veterinary Medicine journals, several bibliometric indexes should be used. The editors of Veterinary Medicine journals should consider the characteristics of titles, to get higher citation rates.

The journals with the highest citation rates in Veterinary Medicine include a wide variety of topics and species, though infectious diseases is the topic of preference.

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AUTHOR CONTRIBUTION

Conception and design of research: RGLS, NHA, ADF, AAC; analysis and interpretation of data: RGLS, NHA, ADF, AAC; redaction of the manuscript: RGLS, NHA, ADF, AAC.

CONFLICT OF INTERESTS

The authors declare no conflict of interests.