

Present and future of medical journals

Presente y futuro de las publicaciones médicas

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Access to medical literature has seen dramatic changes over the last few years. In less than two decades it has gone from a paper-based system to an online digital sending system. The advances made on computing and, above all, the Internet has revolutionized not only the way manuscripts are sent, but also how fast these get to the public (including reference manager software adaptable to the different format of various journals). This revolution has also touched the way information is being accessed these days. The databases generated at the beginning of the 21st century are «prehistoric» compared to the ones we use today. The digitalization of clinical histories and the creation of software for data mining purposes have accelerated exponentially the preparation and analysis of the data included in the studies. Even researchers have a much more transversal training and it is common to see research teams that are savvy in statistics and that facilitate data analysis. However, all these important changes are nothing compared to the actual access to general medical information. Even though access to medical literature is not actually open (something we will refer to later), access to a great deal of information is just huge. And all this has resulted in an exponential increase in the amount of papers that scientific journals receive on a monthly basis. Also, this is accentuated by the growing productivity of emerging countries or powers, such as China, that has noticeably multiplied the number of scientific papers published over the last few years. As an example, one of the leading journals in the field of cardiovascular disease, the Journal of the American College of Cardiology (JACC), received some 4000 manuscripts every year (3200 original papers/reviews) in a five-year span of time ever since the Spaniard Valentín Fuster took over as editor-in-chief back in 2014. Due to the acceleration in the generation of knowledge and how technical different subspecialties have become, the audience of cardiology journals is particularly interested in certain areas. The large volume and ongoing specialization of the manuscripts being sent to journals, added to the limited number of monthly publications lead to reduced success rates, since quality interesting papers for the cardiological community end up being rejected. Following the JACC example, the acceptance rate of original papers/reviews in the aforementioned span of time was barely 9%. These circumstances have resulted in the creation of sister journals of major journals such as those specialized in interventionism, imaging, heart failure, or arrhythmias, among others. It is expected that this increase in the number of manuscripts submitted to journals will go on and with it, the number of cardiology and subspecialty journals. This growth not only does not dilute the relevance of

these journals, but it also promotes medical science while increasing access to knowledge and how this knowledge is spread. A common practice of high-impact journals for high-quality papers that are considered highly specialized is to offer the authors the re-submission of the manuscript to sister journals. In the aforementioned years, around 4% of the original papers/reviews published by the JACC were re-submitted and ultimately accepted by JACC: Cardiovascular Interventions. This practice accelerates the process of publication and guides authors on the possible interest of the journal at hand.

It is a paradox that, with all the digitalization we have seen so far, the main scientific journals, particularly the cardiology ones, still have the classic format of a paper journal with a limited number of papers being published each year. We believe that the actual global tendency will put this format to rest any time soon. It was with this idea in mind that the digital format open access journals were born. But yet despite its appeal, its impact is nowhere close to that of classical journals, which opens the debate on what readers and authors of journal manuscripts are really looking for. In a general sense, readers want to have access to information to know about the advances being made and be briefed on a particular theme. On many occasions, the reader cannot evaluate whether the studies published have been done correctly, or whether the existing literature on a particular issue has been reviewed appropriately. That is why the reader is in a quest for «leading» journals with a quality seal that will guarantee that the material being published has passed all the filters and has, therefore, been appropriately arranged and exposed for the public. In this sense, the role of editors is just essential since, in a way, they bring their own imprint to the journal. There are several quality seals for the assessment of journals, among them, the impact factor (IF) is the most popular one to assess the impact a journal has made among its audience. The IF is an annual «official» estimate - it is the measure between the citations received during a year to the articles published in a journal over the two previous years and the number of articles published during the same period. The higher the IF the higher the quality of a journal. The IF is estimated annually by a private company (Clarivate Analytics) that establishes the ranking of journals within their field of expertise. There are other metrics for the assessment of the impact journals make (Google Scholar¹ is becoming more and more popular these days) but, as it occurs with the IF, these metrics are imperfect and do not make assessments of all the quality aspects included in a

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scientific journal. As the JACC editor-in-chief says in an editorial from 2017,² the IF is a curious fanciful metrics, since the presence of a highly cited paper (clinical guidelines would be the most significant example here) plays a very important role in the journal overall IF, even if the remaining papers do not draw much attention. On the other hand, the author of a paper wants to be published in a journal that will give his or her study the highest visibility possible for all the professional implications this brings to the author. Again, the IF plays a very important role when it comes to deciding what journal a paper should be sent to for evaluation purposes. Also, scientists are always looking for national and international funding for their studies, and most assessment agencies measure CVs based on the number and quality of the publications included, which is estimated by the IF and its position relative to other journals in the field. There is, therefore, some sort of vicious circle where readers and authors alike end up looking for the same journals, and it is these journals that will eventually choose, first hand, the most relevant papers, which will, in turn, guarantee good citation levels, high IFs and, eventually, the audience's interest. Although this system has been highly criticized, there are so many factors orbiting around metrics, that it is hard to imagine a future where readers and authors will abandon these parameters.

A very relevant issue for the editorial committee of a scientific journal is to know what the target audience looks like and, especially, what type of information will be transmitted to them. On this regard, journals can be purely scientific (with predominant original papers) or educational (with predominant reviews on issues of high clinical interest). Journals usually go for some sort of mixed format between the two. However, some purely educational journals have ended up having very high IFs in the field of cardiology such as Nature Reviews Cardiology, that back in 2017 was positioned among the top spots in its field of expertise.

Over the last few years, the Internet revolution has resulted in the creation and vertical growth of social networks that have become a significant ingredient to spread the papers that are being published in scientific journals.³ Social networks are essential when it comes to spreading research not only among scientists and doctors, but also among the general public, thus contributing to promote health. This aspect of information spread to non-medical audiences is critical and has become more and more relevant through the years. Recently created metrics such as the Almetric scores measure the impact of journals based on the activity they generate in the social media.⁴ A study conducted on the Almetric scores of the four most relevant cardiology journals revealed some interesting data:⁵ a) the Almetric scores from cardiology journals are usually very high; b) over half of the most popular papers were not original papers but editorials, points of view, clinical practice guidelines, and consensus documents; c) the papers with the highest impact based on this metric were those based on nutrition and lifestyles; and d) open access papers did not have a higher impact compared to pay per read papers.⁵

One final relevant controversial issue is the cost associated with the publication of a paper and the access to this paper. Several journals -certainly those with the highest IFs of all- usually sign

exclusivity deals with major publishing houses that will be formatting, publishing, and editing the papers. In order to have access to complete papers, universities, research centers and even individual professionals pay a subscription fee. This pay per read system certainly limits the spread of knowledge. Several authors decide to pay a fee when their paper has been accepted by a journal so that it is open access, and anybody can have access to it without having to pay a subscription. This fee -usually between 2500€ and 4500€- is already included in the public funding received by the authors. The journals send the manuscript to external unpaid reviewers who are only moved by responsibility and altruism. Therefore, we face a complex situation where the creator of the paper -the author-, the evaluator -the external reviewer and, on many occasions, the editorial committee- and the end user -the reader- pay for the journal in such a way that the economic benefits only go to the distributor of the material -the publishing house- that has only participated in the editing and distribution stages. The fact that studies conducted with public funds are not open access and, therefore, cannot be read by the community and the public, is highly questionable. That is why in some European countries like Sweden they have decided to cancel all subscriptions with big publishing houses in an attempt to push forward the open access to science.⁶

In sum, at the present time, medical journals are undergoing major changes, mainly due to the advance of the Internet and the social media. The future of this road is hard to predict but it seems that journals will end up being completely digital and will go open access for the readers, and with quality seals different than the classical IFs. Due to the huge amount of information available, the creation of subspecialty journals is a tendency that will become more and more popular in order to update professionals on their specific fields of expertise. *REC: Interventional Cardiology* already possesses many of these future traits. For this reason, we strongly believe the future looks bright ahead thanks to its excellent editorial team and parenting from *Revista Española de Cardiología*.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest whatsoever.

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