

## OPEN SCIENCE: TRENDS IN SCIENTIFIC PUBLICATION

Elisiane Lorenzini<sup>1</sup> 

Flavia Giron Camerini<sup>2</sup> 

Leticia de Lima Trindade<sup>3</sup> 

Glilciane Morceli<sup>4</sup> 

Jaime Alonso Caravaca-Morera<sup>5</sup> 

Clemente Neves de Sousa<sup>6</sup> 

Bruno Miguel Borges de Sousa Magalhães<sup>7</sup> 

<sup>1</sup>Universidade Federal de Santa Catarina. Florianópolis, SC, Brasil.

<sup>2</sup>Universidade do Estado do Rio de Janeiro. Rio de Janeiro, RJ, Brasil.

<sup>3</sup>Universidade do Estado de Santa Catarina. Chapecó, SC, Brasil.

<sup>4</sup>Universidade do Estado de Minas Gerais. Passos, MG, Brasil.

<sup>5</sup>Universidad de Costa Rica. San Jose, Costa Rica.

<sup>6</sup>Escola Superior de Enfermagem do Porto. Porto, Portugal.

<sup>7</sup>Universidade de Trás-os-Montes e Alto Douro. Vila Real, Portugal.

As we began writing this editorial, we questioned its pertinence, given the amount of content already available on the topic and in several languages. Even so, we converged on the idea that we can contribute with our community of authors, reviewers, editors and readers for the required paradigm shift, towards the future of Citizen Science, which is both an objective and an instrument for the promotion of Open Science<sup>1</sup>.

In this sense, we also understand that this change has a fundamental implication and practical direction in the scientific production process, with aspects that will be culturally and gradually internalized by each reality, as Open Science is appropriated within institutions and by researchers.

Let us look, then, at the history and reasons that sustain this movement. The origins of publications date back to the 17<sup>th</sup> century, with the first academic journals. Peer-review began in the 17<sup>th</sup> century with the *Royal Society of London* (1662) and the *Académie Royale des Sciences de Paris* (1699), as a way for Science to censor itself, rather than being censored by the Church. Even so, establishing peer-review demanded many years. As an example of this recent process, we mention the *Nature* journal, which only initiated peer-review in 1947<sup>2</sup>.

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The Open Science movement aims at strategies that allow making scientific knowledge open and shared for the scientific community, for society and for companies and in different countries. This movement also allows reinforcing the concept of scientific social responsibility and generating multiple innovation opportunities. The growing desire to share resources in an interdisciplinary way, as well as the need for transparency to achieve greater responsibility, efficiency and rigor, in addition to sustainability for future generations and reproducibility of research studies, comprise the set of reasons in favor of Open Science. The debate on ethics and scientific publication and the need for a better analysis of the multiple cases with ethical problems, which require increased transparency, reduction of frauds, undue data manipulation and selective disclosure of results, also leads to the need for Open Science. All of this is reinforced in the digital age, where such situations are rapidly publicized.

In addition to that, academic communities and governmental institutions also exert pressure in the sense that scientific projects funded with public resources must have their results openly shared, contributing to accelerating economic and social growth and innovation. It is noted that this requires a cultural change in the way scientific research is carried out and in the adoption of Web tools that encourage scientific collaboration and access to the science produced.

One aspect that deserves to be highlighted among researchers in the Nursing area is what encompasses research data. In general, they represent the most valuable result of most projects and constitute the primary source that supports scientific research, which enables new theoretical discoveries and updating of care, management, educational and investigative practices. Here, the best practice recommendation is that data be as open as possible and consistent with the principles set forth in FAIR, acronym for *Findable, Accessible, Interoperable and Reusable*<sup>\*</sup>. This is to render research results replicable, or at least reproducible or reusable in any other way.

Another aspect that we need to advance is in the analysis of the emergence of new dissemination means, such as preprints in repositories and servers, which have already been widely discussed. Currently, they feature new open preprint peer-review processes. New publication platforms also emerged, such as those funded by the *Wellcome Trust*<sup>\*\*</sup> and the *Bill and Melinda Gates Foundation*<sup>\*\*\*</sup>. The growing use of publication platforms brings with it changes in the research evaluation process, in the current form of peer-review and in the editorial team duties. On the platforms, the readers know the reviewers' identity and follow the evolution of the manuscript versions that the authors can deposit, at any time, in response to the revisions received. On these platforms, the editors' decision does not take place and the peer-review is completely transparent. It is to be noted that, if these platforms consolidate themselves as the most used tool for scientific publication, the editorial team will need to redefine its role. Open publication makes it possible to accelerate the knowledge transfer and translation pace<sup>3</sup>, with the corresponding increase in the economic and social impacts of science, with the respective involvement of society.

In the new publication platforms, as well as in scientific journals, open peer-review offers benefits linked to the democratization of scientific knowledge, which translates into the guarantee of standards of rigor, quality, objectivity and reliability of the results that will be published. In addition to that, it improves transparency and promotes best research practices. Likewise, open peer-review encourages participation and collaboration among researchers and contributes to more detailed and constructive feedback. Finally, by making their reports and comments public, the reviewers' work is recognized and they have the opportunity of being identified and cited, which can be beneficial to their academic career and reputation as experts in their respective areas.

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\* The Future of Research Communications and e-Scholarship. <https://force11.org/info/the-fair-data-principles/>

\*\* <https://wellcomeopenresearch.org/>

\*\*\* <https://gatesopenresearch.org/>

Open peer-review can also improve diversity of opinions in a review, including reviewers from different profiles and expertise areas, promoting greater diversity in scientific research with greater engagement of the scientific community throughout the process<sup>4-5</sup>. In the practice, Open Science also requires infrastructure, reinforces scientific production in different languages and requires more practical access means, with less complex and potentially more creative platforms, as it suggests an inclusive construction, which allows increasing collaborations and sharing of information, as well as a focus on how society can access the benefits of science.

However, it is important to highlight the risks associated with open peer-review. According to Tran et al.<sup>6</sup>, non-anonymity of the reviewers can lead to retaliation by the authors, compromising quality and objectivity of a review. These long-term retaliations may induce reviewers to be less critical and/or discerning, which would compromise quality of the published contents. In the same direction, conflicts of interest are more difficult to mitigate. The reviewers' workload may also increase due to the possibility of additional reviews being required by the scientific community. This can impair the quality of a review and lead to reviewers being overloaded, compromising their supply and availability, accentuating an existing problem<sup>7</sup>.

In addition to that, research institutions and research funding and evaluation agencies need to recognize the scientific merit of open access publications, and the authors need to feel secure in relation to copyright. The debate here also focuses on the access time of the material published in open access, generally protected by *Creative Commons* or *Science Commons* licenses, which allow adjusting these licenses according to choice of the author or institution to grant the right to use, distribute or recombine the information<sup>8</sup>.

In addition, as this movement has as the following pillars: open scientific knowledge, open science infrastructures, scientific communication, open engagement of social actors and open dialog with other knowledge systems<sup>9</sup>, it will require reviewing the current practices. Therefore, we are going through a process that may initially be multilateral, that is, it requires journals to maintain closed and open evaluation processes for a period of time and imposes old and new challenges.

In this sense, in addition to the challenges, Open Science currently presents some possibilities. In addition to pointing out risks and benefits, Open Science has divided opinions in the academic and scientific circles. It will be necessary to mature the discussions and analysis of its impact on Nursing and Health publications.

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## **HISTORICAL**

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