RESEARCH INTEGRITY IN PUBLISHING SCIENTIFIC REPORTS

A integridade da pesquisa na publicação de relatos científicos

Scientific papers only add value when their results, either positive, negative, or null, become public.[1] Every year, thousands of dissertations and theses are not published in peer-reviewed journals[2] and remain restricted to the domain of their authors and the archives of institutions.

Knowledge advances when well-formulated hypotheses are tested and the results of original studies are duplicated, confirmed, or refuted. The sum of evidence produced in multiple fields and areas of knowledge can be shared with researchers, workers, users, managers, and decision-makers in health care systems. The best available evidence should always be considered when formulating public policies, taking different opinions and individualities into account, as well as cultural and economic issues.

For the best evidence to be produced, every investigator must commit to core principles that preserve research integrity both in conducting investigations and in publishing their results.

While there have been notable advances in genomic research and nanotechnology, for example, there is also a growing body of article retractions for data falsification and manipulation, plagiarism, or other bad research practices in the most diverse areas of knowledge, with greater highlight in journals with high impact factor, probably because of their visibility.[3]

According to a definition adopted by the National Institutes of Health (NIH), research integrity includes the use of honest and verifiable methods in proposing, conducting, and evaluating research, in presenting and reporting results, with special attention to adherence to rules, regulations, and guidelines, and complying with commonly accepted professional codes or standards.[4]

Those principles are based on adopting and sharing values that include:[4]

- Honesty: disseminate information sincerely and honor commitments;
- Accuracy: report findings accurately, being careful to avoid errors;
- Efficiency: use resources wisely and avoid waste;
- Objectivity: let the facts speak for themselves and avoid prejudice.

The aforementioned items apply to both small and large studies, cover quantitative, qualitative, and mixed designs, and are not exclusive premises for researchers, as they actually comprise codes of conduct extensive to proposing institutions and organizations (academic or not), as well as funding agencies and sponsoring companies.[5]

Adherence to such principles ensures objectivity, clarity, and reproducibility, in addition to improving the sense of usefulness of the scientific information that is being produced and reducing the chance of bias and bad practice. In 2014, a series of five articles published by *The Lancet*, titled "Biomedical Research: Increasing Value, Reducing Waste,"[6] proposed 17 recommendations aimed at researchers, journals, academic institutions, as well as regulatory and research funding agencies, with the purpose of initiating a broader debate on resource waste in the area. These recommendations have recently been reviewed and reinforced by an international scientific integrity consortium, with the aim of encouraging the development of a culture of integrity and significant systemic, organizational, and psychological changes in global research.[5]

To foster best scientific integrity practices, the consortium has developed two general principles (Chart 1) that represent the umbrella under which scientific processes must operate and nine best practices that should be employed to inspire scientific integrity through implementation of the two general principles.

Fostering the culture of scientific integrity should allow the inclusion of all those involved in the process, given that publishing is only one of the stages of this cycle. It is imperative that we rethink this system of productivity at any cost, which perpetuates the perverse mentality of "publish or perish," which often harms and discourages investigators who use good research practices.

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This setting becomes fertile ground for the development of bad practices, such as manufacturing, falsification, or destruction and manipulation of data, redundant publications, plagiarism, inappropriate authorship, mismanagement of conflicts of interest, and other inappropriate ethical conduct, either in the application of funding proposals or in the stages of conducting, analyzing, and publishing the research.

Within this context, Ellis[7] suggests that important contributions to science can and usually are made without a requirement for publishing only in journals with high impact factor. In his opinion, NIH should be recognized for having taken the first steps in favor of science to deconstruct the image that was created around journals with high impact factor.

In order to foster the principles and best practices of scientific integrity, *Geriatrics, Gerontology and Aging* (GGA) has adopted continuous and complex strategies in its editorial policy, including a periodic review of the instructions for authors.[8] The journal's editorial board has progressively increased its proportion of exogeny by including associate editors with international affiliation, as well as inviting external reviewers affiliated with foreign institutions in recent years.

We believe that those reviewers play a critical role in reviewing technical quality and ensuring research integrity in the studies published by a scientific journal. We have recently published the instructions for GGA's external reviewers, with recommendations for writing a good report.[9]

In addition to a recent publication on self-plagiarism,[10] the journal will adopt over the next few months policies to protect intellectual property through specific procedures to curb plagiarism. All manuscripts submitted to GGA will be assessed by tools for detection of similarities, and when the percentage found is higher than internationally accepted standards, the article will be automatically rejected, and the author and respective institution will be notified of such bad practice, as the Committee on Publication Ethics provides for.

In order to encourage reproducibility and foster transparency in the studies published in GGA, the journal will now recommend that authors make their databases and analyses available in international open-access repositories of research data, especially data underlying scientific and medical publications, such as Dryad (https://datadryad.org/stash).

Another initiative undertaken by GGA that aims to increase the reproducibility and quality of study descriptions and that will be progressively introduced as of the next updated instructions for authors (scheduled for 2020) will be the need to send a checklist completed by the author and attached to the submission according to the study design, based on models made available by Equator Network (https://www.equator-network.org/).

Additionally, we would like to publicly thank all external reviewers who contributed their invaluable time, dedication, and knowledge to the growth of GGA in 2019.

In conclusion, we invite you to an extremely pleasant reading. We usually see checklists as simplified content that we should have read in full. But those who dedicate to reading carefully the steps suggested by the UK Research Integrity Office's Code of Practice for Research (www.ukrio.org) (Chart 2), which includes very simple steps to be carried out before, during, and at the end of an investigation, will understand much more clearly what the principles of scientific integrity covered in this editorial are about.

Enjoy your reading.

Chart 1 Principles and best practices for scientific integrity.

Overarching principles for fostering scientific integrity
1. Foster a culture of integrity in the scientific process
2. Evidence-based policy interests may have legitimate roles to play in influencing aspects of the research process, but those roles should not interfere with scientific integrity
Best practices for fostering scientific integrity
1. Require universal training in robust scientific methods, in the use of appropriate experimental design and statistics, and in responsible research practices for scientists at all levels, with the training content regularly updated and presented by qualified scientists
2. Strengthen scientific integrity oversight and processes throughout the research continuum with a focus on training in ethics and conduct
3. Encourage reproducibility of research through transparency
4. Strive to establish open science as the standard operating procedure throughout the scientific enterprise
5. Develop and implement educational tools to teach communication skills that uphold scientific integrity
6. Strive to identify ways to further strengthen the peer review process
7. Encourage scientific journals to publish unanticipated findings that meet standards of quality and scientific integrity
8. Seek harmonization and implementation among journals of rapid, consistent, and transparent processes for correction and/or retraction of published papers
9. Design rigorous and comprehensive evaluation criteria that recognize and reward the highest standards of integrity in scientific research

Source: Kretser et al.[5]

Patrick Alexander Wachholz
Executive Editor

Chart 2 Checklist of questions to be answered when conducting a scientific investigation.

Before conducting your research, and bearing in mind that, subject to legal and ethical requirements, roles and contributions may change during the time span of the research:
1. Does the proposed research address pertinent question(s) and is it designed either to add to existing knowledge about the subject in question or to develop methods for research into it?
2. Is your research design appropriate for the question(s) being asked?
3. Will you have access to all necessary skills and resources to conduct the research?
4. Have you conducted a risk assessment to determine:
a. whether there are any ethical issues and whether ethics review is required;
b. the potential for risks to the organisation, the research, or the health, safety and well-being of researchers and research participants; and
c. what legal requirements govern the research?
5. Will your research comply with all legal and ethical requirements and other applicable guidelines, including those from other organisations and/or countries if relevant?
6. Will your research comply with all requirements of legislation and good practice relating to health and safety?
7. Has your research undergone any necessary ethics review (see 4(a) above), especially if it involves animals, human participants, human material or personal data?
8. Will your research comply with any monitoring and audit requirements?
9. Are you in compliance with any contracts and financial guidelines relating to the project?
10. Have you reached an agreement relating to intellectual property, publication and authorship?
11. Have you reached an agreement relating to collaborative working, if applicable?
12. Have you agreed the roles of researchers and responsibilities for management and supervision?
13. Have all conflicts of interest relating to your research been identified, declared and addressed?
14. Are you aware of the guidance from all applicable organisations on misconduct in research?
When conducting your research:
1. Are you following the agreed research design for the project?
2. Have any changes to the agreed research design been reviewed and approved if applicable?
3. Are you following best practice for the collection, storage and management of data?
4. Are agreed roles and responsibilities for management and supervision being fulfilled?
5. Is your research complying with any monitoring and audit requirements?
When finishing your research:
1. Will your research and its findings be reported accurately, honestly and within a reasonable time frame?
2. Will all contributions to the research be acknowledged?
3. Are agreements relating to intellectual property, publication and authorship being complied with?
4. Will research data be retained in a secure and accessible form and for the required duration?
5. Will your research comply with all legal, ethical and contractual requirements?

Continue....

Source: UK Research Integrity Office.[11]

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