Description

As we know, publishing is integral to research and to the career of a scientist. It is the goal of the scientific community to disseminate important and innovative research. Despite the known importance of this work, there are still some issues in scientific publishing, including publication bias. This is when journal editors, as well as reviewers and authors, favor positive study results over negative findings. Some might not see the problem here, but bias towards positive findings denies a wider spread of scientific information. Negative findings are valuable, too. It is a waste of research time and funds if studies are denied a chance, due to negative findings, to reach the research community through publication. Recently, to combat these issues the scientific community has begun using registered reports in journal publishing. They hope that this will be an important step towards improving transparency and reproducibility.

Importance of Registered Reports to Researchers

Registered reports highlight the importance of the research question and the quality of methods used by conducting peer review prior to data collection. This format switches the focus of review from favorable results to the substance of research methods. So, this eliminates the bias shown to studies with only positive findings. With this in mind, many feel registered reports can help to fix medical science. They hope this will bring scientific research closer to its roots: inquiry, gathering data, and experimentation.

How will registered reports benefit researchers? There are several ways in which registered reports benefit researchers. Firstly, registered reports make it easier for high-quality research to be published regardless of the nature (positive or negative) of the findings. The decision on whether the proposal merits peer review, based on the importance of the research question rather than projected results, puts the focus back on inquiry and methodology. This will provide more opportunities for researchers to have their work published.

With publication bias in medical research, researchers might focus on developing a hypothesis based on data they already have. This is detrimental to the advancement of scientific knowledge. The registered report improves the quality of a study by giving researchers constructive peer-review comments before data-gathering begins. In addition, with the format of a registered report, potential problems in study methods and design can be recognized and addressed early in the project.

The Submission Process and Peer Review

Registered reports go through a detailed submission process that involves two stages of peer review. The reviewers look for a comprehensive methodology and a clear, relevant research question. If they feel that this information merits review, they will send it through the peer review process.

Stage 1

- Submission: A Stage 1 manuscript should include an introduction, methods, and the results of any experiment that motivated the research proposal.
- Review: The study proposals are evaluated before data collection. This shifts the focus to the significance of the research question, workability of the methodology, and analysis.
- After peer review, researchers can fix issues with the study methods before the experiments begin.

Stage 2

After the acceptance of the proposal and completion of the first phase of peer review, researchers carry out their experiments and prepare the final manuscript.

- Submission: A finalized manuscript with new Results and Discussion sections is submitted for re-review.
- Review: Reviewers examine if the authors' followed the methods in the original manuscript. In addition, they check to ensure that the study's conclusions are acceptable and in line with the methods. A final paper may face rejection if the methods have changed.

Journals Have Embraced Registered Reports

Currently, 204 journals use the registered reports format. Doing so illustrates a strong support of the research done by the scientific community. Journals have embraced this format to improve efforts for transparency, reproducibility, and information sharing. Biomedcentral (BMC) has led the way in using this format in their journals. BMC wants to be at the forefront of advances in open research publishing.

Using registered reports has many benefits for journals. The most significant benefits are due to this format minimizing problems that have plagued the scientific publishing community for some time. This includes publication bias, p-hacking, HARKing – "hypothesizing after results are known", and low statistical power.

- **Publication bias:** Journals selectively publishing results that are statistically significant or otherwise attractive.

- **p-hacking (selective reporting):** The misrepresentation of data sizes and the selective reporting of results to fit a desired outcome.
- **Low statistical power:** Researchers failing to guarantee sufficient sample size to detect a real effect.
- **Hidden outcome switching:** When the design of the study, analysis, and findings are altered by the researchers in the event that they do not like the study results.

Using registered reports to fix these issues increases transparency, originality, and reproducibility. It helps to advance scientific work and ensure that research is relevant, innovative, and honest.

Registered Reports & Medical Science

BMC Medicine is the first medical journal to adopt the Registered Report format. Clinical trials are at the heart of biomedicine and medical research. This format has become invaluable in measuring the effectiveness and validity of clinical trials.

An example of the importance of registered reports is a study on drug interactions and effects. Every clinical trial will have a set of measurable results. Interestingly, these results can be switched (hidden outcome switching) in order to fill a particular narrative the researcher wants to promote. For example, the results of the clinical trials on the effects of a drug on a patient's blood pressure reading can be switched. With a registered report, this would not be possible because a researcher would not be able to change the outcome after their proposal has gone through stage one review.

The registered report format follows concerns about the reliability of published research. This is largely in reference to the Reproducibility Crisis that academia has faced. The registered reports boost transparency by having authors state the research question and methods at the beginning of the submission process. In medical research, 66% of clinical trials never report results. This is not good because these clinical trials still hold valuable information that can further scientific progress.

What are your thoughts on Registered Reports? Have you submitted one to a journal? Please share your comments below.

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