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Editorial - The Secret Life of Retractions in Scientific Publications

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Introduction

From time to time, retraction cases of scientific publications make headlines in mainstream media, such as scandals of doctors with dozens of retractions to research on executed prisoners in China (Kharasch, 2021; Rogers et al., 2019). These shocking cases of research misconduct catch the attention of the general public, as they should, but they are only the minority of all the articles retracted each year.

Although retractions in medical journals appear relatively rare (2 to 4 in 10 000, or 0.02 to 0.04%), they have steadily increased in the past 20 years. The retraction rate has escalated more than the rate of published papers. (Brainard & You, 2018; Oransky et al., 2021). Additionally, there is evidence to consider that more articles should be retracted. For instance, a 1983 New York Times exposé reported that 82 papers by John Darsee were being considered for retraction. However, ultimately only 17 of his articles have been withdrawn. Thus, it is unclear how many papers are not retracted despite requests from universities and sleuths (Oransky et al., 2021)

Since retractions are uncommon, many journals do not have specific policies and experience dealing with them; thus, retraction procedures often take much longer than publications. Naturally, retraction and publication cannot be considered equivalent, and retractions take time since in-depth investigations are needed to ensure accusations are correct and well-founded. Although understandable, aiming for a more standardized approach on how to deal with inevitable instances that need retractions would be beneficial. (Bülow et al., 2021; Loadsman, 2019).

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The Committee on Publication Ethics recommends that retraction notices be linked to the article wherever possible, be published as quickly as possible, be freely available, and that the reasons for retraction be stated. Despite such directives, however, it usually takes around 3 years to index retractions in PubMed (Bülow et al., 2021; Loadsman, 2019).

Several factors at play may complicate the retraction process, such as the "publish or perish" system, which rewards authors only for their number of publications instead of the publication's quality. This means authors usually strongly oppose retractions and may even take legal action, a great fear for journals, as editors from Science have previously expressed (Oransky et al., 2021).

Naturally, it is still not standard practice to specifically search and assess for retraction notices before citing a paper, and thus a multitude of questionable papers can be cited both before and after retraction. This is problematic because this data can be included in evidence synthesis, affecting the results of systematic reviews and meta-analyses, which in turn influence guidelines and evidence-based decisions (Bolland et al., 2022; Kharasch, 2021; Marcus et al., 2022).

Among the causes of retraction, plagiarism is the most common one. A rise in plagiarism detection can be attributed to widespread access to plagiarism software and the pressure for authors to publish. Plagiarised articles, when included in meta-analyses, are also an issue, as they artificially skew results and bias the pooled estimates (Brainard & You, 2018; Kharasch, 2021; Stamm, 2020).

In this scenario, the Retraction Watch Database was created in 2018, encompassing retraction notices in various fields, with over 35 000 articles included, and is the biggest database of its kind, indexing retractions a lot quicker than others (The Center for Scientific Integrity, 2018).

Considering the relevance of this topic for the scientific community, this editorial aims to review the Retraction Watch Database for articles in medical research published between 2018 and 2023 that have been retracted due to plagiarism.

Retraction numbers have increased while time to retraction has not decreased

Considering medical articles retracted for plagiarism in the past five years (n = 142, as per indexed by Retraction Watch for Jan/18 to Jun/23), the time to retraction varied between 0 and 57 months, with the median retraction time being 9.5 months (25th: 3 – 75th: 19). This highlights how articles can circulate for quite some time before appropriate corrections are issued. Since, at this time, they may receive plenty of citations before they are retracted, this delay may very well be impacting evidence synthesis and medical or health policy decision-making (Bolland et al., 2022).

Among medical articles on Retraction Watch retracted for plagiarism, the year with the most retractions was 2018 (n = 43), and there was a relative decrease in the following years (35, 34, 22, 9, and 1 retractions, respectively). The lower number of articles retracted in the past three years may be due to the fact that papers are not retracted yet since the procedure takes up to several years.

Interestingly, there was not much of a difference between 2019 and 2020, which contrasts concerns about the methodological quality of articles published during the pandemic, as there was a remarkably vast amount of literature published, and the review process seemed to be accelerated. Possibly, plagiarism was not the biggest issue of COVID articles, and other causes, such as data fabrication, may have accounted for more retractions (Anderson et al., 2021; Cortegiani et al., 2021).

Ranking countries and specialties by retractions

The medical specialty with the most retractions was Oncology (9.86%), followed by Cardiology (9.15%) and Ophthalmology (8.45%), as shown in Table 1. Notably, a considerable number of oncological studies are conducted in China, the country with the most retractions in this period. A 2018 review reported an increase of 154% in Chinese cancer research articles published between 2012 and 2016, making it the second country with the most publications in the field, right after the United States (Cabral et al., 2018).

Cardiology, which ranks second in the number of retractions (8.33%), has seen a reported increase in retractions over the last decade, as well as a long time to retraction (42% of retractions within a year of publication), with more recent articles being retracted quicker than older ones (Wadhwa et al., 2021).

Anesthesia ranked 10th, at 3.52%, which is surprising, especially considering the three people with the most retractions in any field of science are anesthesiologists (with 477 retractions between the three of them). For this, and perhaps other reasons, several journals in the field have demonstrated concerns about misconduct: Anesthesiology, Anaesthesia, and Anesthesia and Analgesia, all in the last five years (Cortegiani et al., 2019; Kharasch, 2021; Loadsman, 2019).

In the fields of Neurology and Obstetrics, two reviews analyzed the behavior of retractions and found they usually took over a year to be published. It appears most Obstetrics retractions are due to plagiarism or article duplication, while Neurology retractions are mostly due to other forms of misconduct (Bennett et al., 2020; Ozair et al., 2021).

As for the countries where the research was conducted, China was the most prominent one (45.05%), followed by Pakistan (6.34%), India (5.63%), Australia (4.23%), and Russia (4.23%). On the other hand, Argentina, Bangladesh, Germany, Iran, Iraq, Israel, Kyrgyzstan, Malaysia, Nepal, Romania, Spain, Tajikistan, Thailand, and Turkey had one article each and were tabulated as "others" (Table 2).

These data show the delicate situation in China, where misconduct is a major issue, and there have been government policies addressing scientific misconduct as early as 2006, with little success. So much so that government agencies are implementing ever more radical policies, such as revoking bonuses/titles and restricting access to government funding for these researchers, as well as social punishments (restrictions on jobs, loans, and business opportunities outside academia) (Cyranoski, 2018; Mallapaty, 2020).

On the other hand, India is quite an interesting case study, as the country's scientists used to be on the vanguard of research ethics in the 1980s and 1990s, but, around 2005, India's retraction rates suddenly doubled compared to those of the United States (Parvatam, 2019; Shahare & Roberts, 2020).

Indian researchers formed a non-governmental, scientist-driven society (the Society for Scientific Values, or SSV) in 1984, aiming to develop a "healthy scientific environment" while publicly denouncing misconduct cases long before Retraction Watch was ever in circulation. Unfortunately, it appears the country is not immune to the current pressure towards publication, as two-thirds of Indian predatory journals originate in resource-deprived institutions (Parvatam, 2019; Shahare & Roberts, 2020).

Specialty	Absolute Frequency (n)	Relative Frequency (%)
Oncology	14	9.86
Cardiology	13	9.15
Ophthalmology	12	8.45
Gastroenterology	11	7.75
Infectiology	11	7.75
Orthopedics	11	7.75
Gynecology/Obstetrics	9	6.34
Neurology	6	4.23
Pulmonology	6	3.52
Anesthesia	5	3.52
Geriatry	5	3.52
Nephrology	5	3.52
Pediatrics	5	3.52
Rheumatology	5	3.52
Otorhinolaryngology	4	2.82
Surgery	4	2.82
Urology	4	2.82
Dermatology	3	2.11
Neurosurgery	3	2.11
Hematology	2	1.41
Internal Medicine	2	1.41
Endocrinology	1	0.70
Radiology	1	0.70
Total	142	100.00

Table 1: *Specialties ranked by the number of retractions.*

Country	Absolute Frequency (n)	Relative Frequency (%)
China	64	45.07
Pakistan	9	6.34
India	8	5.63
Australia	6	4.23
Russia	6	4.23
United States	6	4.23
Egypt	5	3.52
Ethiopia	4	2.82
Saudi Arabia	3	2.11
United Kingdom	3	2.11
France	2	1.41
Indonesia	2	1.41
Italy	2	1.41
Japan	2	1.41
Morocco	2	1.41
South Korea	2	1.41
Tunisia	2	1.41
Others	14	9.8
Total	142	100.00

Table 2: *Countries ranked by the number of retractions.*

Article type	Absolute Frequency (n)	Relative Frequency (%)
Original article	77	54.23
Narrative review	26	18.31
Systematic review / MA	14	9.86
Case report	9	6.34
Clinical Trial	8	5.63
Conference abstract	5	3.52
Others	3	2.1
Total	142	100.00

Table 3: *Article types ranked by the number of retractions.*

The main types of articles and reasons for retraction

Out of the medical articles retracted for plagiarism in this period, 74.47% (n = 105) were retracted for plagiarism only, while the rest were retracted for multiple reasons, such as data fabrication and paper mills or originated from organizations that mass produce and sell papers to academics for publication, usually making use of fabricated data (Candal-Pedreira et al., 2022).

Plagiarism is naturally an issue; it is unethical and can also violate copyright laws. There are several types of plagiarism, such as direct plagiarism (copy-pasting in itself), paraphrasing without citations, insufficient acknowledgment of the use of sources, and mosaic plagiarism – a mix of original and borrowed ideas without citing the source (Radikė & Camm, 2022).

Whatever type it may be, it appears that retractions due to plagiarism have risen in recent years, and detecting plagiarism in articles is still difficult. Automatic detection software does not solve the issue, as not every similarity is plagiarism, and paraphrasing may not be caught, especially considering plagiarism detection tools are easily available, and thus authors can use them to avoid future detection (Brainard & You, 2018; Radikė & Camm, 2022).

Most of the articles retracted during this time were original articles (54.23%), followed by narrative reviews (18.31%), and systematic reviews (9.86%), which corroborates with previous research (Bennett et al., 2020). Other types, such as book chapters, editorials, and guidelines, had one article each (Table 3). Lastly, there were few journals responsible for more than one retraction, with the highest ranking one representing only 6.34% of the total (n = 9).

Understanding further with four cases in stroke literature

Stroke is a field of research that has several articles being published daily, given its importance to public health. It is then expected that many retractions would be seen. We selected some examples of retractions to inform the readers about the importance of retractions in the process of scientific evidence and present concrete cases of how they might be used.

Dataset Error: In the case of Kufner et al.'s study on the smoking paradox in ischemic stroke patients, the authors acknowledged a significant error in their dataset labeling. This error led to a gross misrepresentation of the number of individuals who had received intra-arterial thrombolysis treatment, undermining the validity of the study's main conclusion. This example underscores the need for meticulous data representation and cleaning in research, highlighting the potential implications of errors and, in the occurrence of errors, the need for adequate conduct, even as it showcases a good example of authors owning their mishaps and shedding light on them (Kufner et al., 2022).

Data Integrity Concerns: In a second instance, the article by Ottani et al., came under scrutiny for the apparent duplication of numerous Western blot figures. Despite the authors' denial of duplication, the editors opted for retraction due to unresolved concerns over the data integrity and the unavailability of underlying data. This case emphasizes the crucial role of transparency and data availability in maintaining the integrity and reproducibility of research publications (Ottani et al., 2023).

Unpermitted Use and Publication of Data: In a third case, the Editor in Chief of Child's Nervous System retracted an article due to the unauthorized use and publication of data. Despite attempts to reach out, one of the authors did not respond to the correspondence. This case serves as a stern reminder of the ethical standards governing data usage and the responsibilities incumbent on authors regarding data licenses and copyrights (Shweikeh et al., 2022).

Plagiarism: Finally, authors Jung KH and Roh JK retracted their review article from the Journal of Clinical Neurology when they realized that several phrases in their article were identical to those in an earlier paper in the Stroke Journal and they had been used without proper citation. This inadvertent plagiarism underlines the fundamental role of proper citation in maintaining academic integrity, as stressed in this editorial (Jung et al., 2012). It is essential to note, however, that when honest mistakes do occur, it's always an option to rectify them by publishing a corrigendum. Such a transparent approach should be promoted, even though the primary objective remains to prevent these errors in the first place.

Each of these cases represents a distinct challenge in scientific publication retractions, collectively underscoring the importance of maintaining rigorous standards of data accuracy, integrity, ethical data usage, and citation practices. They demonstrate the crucial role that retractions play in preserving the trustworthiness of scientific literature.

Conclusions

Papers of questionable quality are lurking in the literature, being cited, influencing guidelines – and should be retracted. However, retractions are time-sensitive and usually take quite some time to be issued. Among all reasons why an article may be deemed unfit for publication, the most common are plagiarism and data fabrication. Despite plagiarism-detection software being widely used, it is still difficult to detect less obvious but also inadequate cases. It seems plagiarism is a widespread issue across countries, specialties, and journals, and it is on the rise. Thus, it is necessary to develop better strategies for detecting scientific misconduct and more accessible, quicker retractions. The PPCR editorial team is committed to conducting a thorough evaluation for misconduct during all phases of the editorial process and promoting a transparent peer review and data sharing. We promote constant surveillance from the initial submission to post-publication that can accelerate the detection of plagiarism and anomalies in the data and, therefore, prevent the publication of dubious studies in the first place or emit a quicker retraction if needed.

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Conflicts of Interest

The authors declare no conflict of interest.

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