

Introduction

Scientific literature grows about 4% annually. Of the 2,555,959 science and engineering publications in 2018, 36% of them were in biomedical and health-related fields [1]. Meanwhile, retractions of peer-reviewed journal articles also grew in these fields. The impact of retractions goes beyond the article itself and profoundly affects both research and healthcare communities. However, there is still no really effective way to prevent retractions from being cited [2]. This study aims to shed light on how these articles were cited after retractions.

Research Questions

- ❖ Did post-retraction OA citing articles acknowledge the retraction?
- ❖ Did post-retraction OA citing articles identify flaws or invalid results?
- ❖ How did post-retraction OA citing articles cite the retracted articles?
- ❖ What are the characteristics of post-retraction OA citing articles?

Methods and Dataset

- ❖ Retracted journal articles were retrieved from [Faculty Opinions](#) (a.k.a. F1000Prime), a literature recommendation system [3]
- ❖ Citing articles of the retracted articles were retrieved from Web of Science
- ❖ Post-retraction citing articles were published two years after the retraction year
- ❖ Only OA citing articles were examined in this poster paper
- ❖ The dataset includes 77 retracted peer-reviewed journal articles published in 38 journals and 961 post-retraction OA citing articles published in 520 journals

References

- [1] White K. (2019). Publications Output: U.S. Trends and International Comparisons. Science and Engineering Indicators <https://nces.gov/pubs/nsb20206>.
- [2] Pfeifer MP and Snodgrass GL. (1990). The Continued Use of Retracted, Invalid Scientific Literature. *JAMA* 1990; 263(10):1420-1423
- [3] Wang & Su. (in press) Expert Recommended Biomedical Journal Articles: Their Retractions or Corrections, and Post-retraction Citing, *J. Inf. Sci.*

Results

- ❖ Of the 961 articles, only 90 (9.37%) clearly mentioned retraction, 829 (86.26%) did not mention retraction or flaws, 23 (2.39%) debunked the article without mentioning retraction, 13 (1.35%) noted retraction in references, and 6 (0.61%) expressed concerns
- ❖ Very few articles identified issues about or expressed concerns with the retracted articles
- ❖ Most articles (79.19%) cited a retracted article once, and most (68.57%) were cited in the Body of the citing articles.
- ❖ Many retracted articles were co-cited with other articles in passing notes

Table 1. Where and how were retracted articles cited

Where & How		Frequency	Percentage
Section	Introduction	246	25.60%
	Body	659	68.57%
	Introduction & Body	50	5.20%
	Conclusion	5	0.52%
	Supplement	1	0.10%
Cited once individually	Introduction	71	21.26%
	Body	263	78.74%
Cited more than once in the paper (not co-cited)	Introduction	14	10.22%
	Body	92	67.15%
	Both	31	22.63%

Table 2. Journals' post-retraction citing articles (Top 10)

Journal	Articles
Retraction Not Mentioned	
<i>PLOS One</i>	39
<i>Circulation Research</i>	33
<i>Scientific Reports</i>	31
<i>International Journal of Molecular Sciences</i>	17
<i>Frontiers in Immunology</i>	16
<i>Oncotarget</i>	16
<i>Stem Cells International</i>	15
<i>Journal of Cellular and Molecular Medicine</i>	9
<i>Stem Cell Research & Therapy</i>	9
<i>Stem Cells Translational Medicine</i>	9
Retraction Cited OR Article Debunked	
<i>Cochrane Database of Systematic Reviews</i>	5
<i>PLOS One</i>	4
<i>Emerging Microbes & Infections</i>	3
<i>International Journal of Molecular Sciences</i>	3
<i>Journal of Translational Medicine</i>	3
<i>Clinical Microbiology Reviews</i>	2
<i>Frontiers in Cardiovascular Medicine</i>	2
<i>Journal of Cellular and Molecular Medicine</i>	2
<i>Scientific Reports</i>	2
<i>Stem Cells International</i>	2

Table 3. Retracted articles co-cited

Co-cited with	Introduction	Body	Conclusion	Introduction & Body
1 article	56	146	2	14
2 or 3 articles	65	134	1	14
4, 5, or 6 articles	34	50		8
7 & more articles	8	8		5

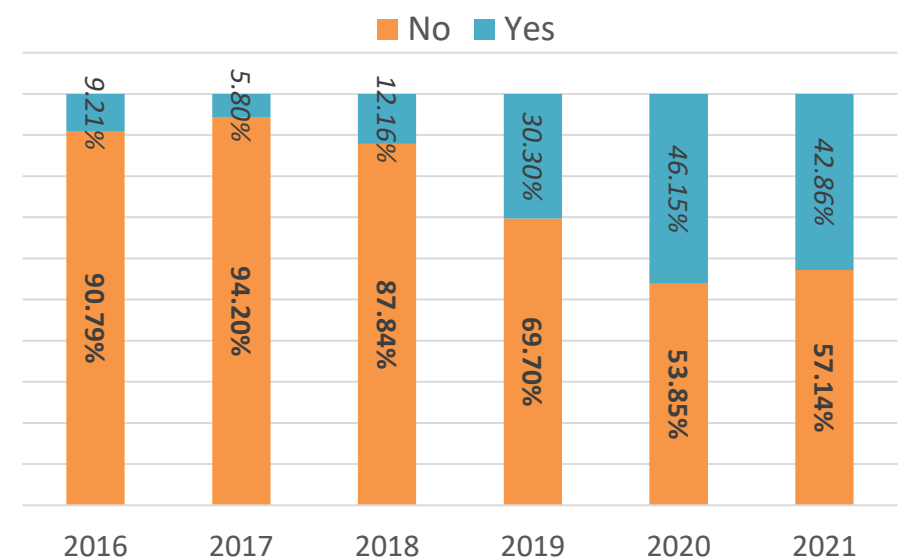


Figure 1. Mentioning retraction or reasons of retraction by 272 post-retraction OA citing articles of the Lancet article (doi: 10.1016/S0140-6736(11)61590-0) retracted in 2014

Conclusions

- ❖ A high percentage of the post-retraction citing articles published in a wide range of journals failed to mention the retractions or the issues/reasons for retractions
- ❖ It is a serious problem that invalid literature continues to be used as valid scientific results in research and medical practices
- ❖ Authors, editors, peer reviewers, publishers, researchers, and information systems all have an important role and responsibility to protect research integrity
- ❖ Effective strategies and methods are needed to ensure that the invalid publications be flagged by various systems and their users timely notified
- ❖ New computational tools need to be developed to help users and scientists identify invalid literature
- ❖ Scientific reporting guidelines and reference manuals need to address how to identify and cite retracted articles appropriately