

Increasing publications count by falsifying, fabricating, and misconducting research data. Is it worth it?

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Introduction

No one can deny that scientific research articles publications are the currency for recognition, promotion, obtaining further grants, and career progression for senior and junior researchers [1–4]. Unfortunately, seeking to increase the number of publications and getting more citations have driven some researchers to commit unethical behaviors to achieve these goals, leading to a breach in the research integrity honor code [5].

Research integrity means adhering to professional values and practices while conducting or reporting scientific research. This allows others to trust and confidently use the methods and findings resulting from such research activities; furthermore, it allows others to reproduce and replicate what has already been reported [6,7].

Breaching research integrity and committing research misconduct has concerned the scientific community regarding ways to detect and possible techniques to prevent or at least keep it at a minimum level, which was handled and discussed in various research articles and reviews [4,7,8].

In a scoping review by Armond and colleagues the authors aimed to collect and discuss different aspects related to the published cases of research misconduct, mainly associated with breaching research ethics and integrity. They analyzed 238 cases; fabrication and falsification represented the most commonly occurring violations (about 45%). Regrettably enough, 80.8% of cases were reported in health sciences and medical-related publications [4].

What are the types of research misconduct?

The three main types of research misconduct, or what we might call the ‘terrible triad,’ are fabrication, falsification, and plagiarism [5,9,10]. It is noteworthy that Armond *et al.* listed about 21 other types of research integrity violations apart from the previous three, including but not limited to violating patient safety issues, duplication, undeclared conflicts of interest, and authorship manipulation [4]. However, this terrible triad is considered the primary concern and most commonly occurring, which, if committed, will endanger individual researchers, the laboratory, and even the whole organization (faculty, university, or corporation) [5,9,10].

Here are simple definitions for each type:

- (a) Fabrication (reporting what was never assessed) refers to the composition, interpretation, addition (or combination of the three) of data, observations, or results that were never evaluated or measured while running the experiment or during data collection. This could include ‘filling out,’ which means building claims and assumptions based on an incomplete data set when the researchers fail to complete the research data.
- (b) Falsification (manipulating the research data or results) refers to changing or excluding some of the

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research data or results to support specific claims or hypotheses based on the researchers' needs, not the actual results after data analysis. This could be achieved by manipulating the research instruments, processing data, and interpreting results.

- (c) Plagiarism (claiming others' data as yours) is probably the most common type of research misconduct; sometimes, young researchers unintentionally commit it. When quoting or representing others' work, researchers must cite all these sources and refer to their original authors instead of falsely claiming the work for themselves.

What are the consequences or penalties of research misconduct?

On the academic and official levels, apart from affecting one's reputation and honesty, it creates a stigma that is challenging to eliminate. Armond and colleagues listed some penalties detected in their collected cases; most were either paper retraction (45.4%) or abundance from funding applications (35.5%). However, other sanctions were reported, including being fired from work, paying fines, undergoing trials, and up to a prison sentence [4].

On the moral level, imagine that fabricated or falsified data had been published regarding a new drug, surgical technique, or instrument claiming its effectiveness in managing or curing certain diseases or conditions. Based on these false and fabricated claims, patients, surgeons, and manufacturers started adopting and adhering to these results; what would be the amount of harm caused to each one?

A typical recent example was the claim that Hydroxychloroquine or chloroquine effectively managed some of the coronavirus disease 2019 related symptoms [11], which was soon retracted by the journal after some concerns related to its research integrity [12]. However, the retraction came after some physicians and hospitals had already used these drugs for coronavirus disease 2019 patients; even more, some reports raised concerns regarding its possible hazardous effect on patients [13].

Advice for young researchers:

- (a) Please resist the temptation of increasing the quantity of your publications at the expense of its quality. Think twice before your feet slip into the swamp of research misconduct.
- (b) Only approve authoring an article by actively participating in all the research and manuscript preparation phases (do not play a guest author role).

- (c) Last, think twice about committing one of these research misconducts; you might end your research career before it even starts. Most importantly, avoid being a 'demo case' published to explain research misconduct.

Advice for senior researchers:

- (a) Be aware of the academic, moral, and criminal consequences of breaching research integrity [10].
- (b) Act as an honest role model for young researchers, teaching and advising them to be honest while conducting and reporting research experiments and results.
- (c) When colleagues or lab personnel engage in suspicious behavior, it is better to report it politely and confidentially to the higher authorities or personnel in charge.

In conclusion, although various measures have been implemented by the higher authorities, funding bodies, journals, and editors to avoid research misconduct, it is and will be happening. A major part depends on individual researcher honesty; if lost, no one can predict the consequences for the research community.

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Availability of data and material

All the data related to the study are mentioned in the manuscript; however, the raw data are available with the corresponding author and will be provided on a written request.

Authors' contribution

Both authors contributed equally to the manuscript conception, drafting, and final revision.

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Conflicts of interest

There are no conflicts of interest.

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