Presentation and Publication Skills: Publication Governance and Pitfalls to Avoid

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Abstract
There are several pitfalls in the publication process that researchers can fall victim to, and these can occur knowingly or unknowingly. Although some of these errors may have occurred in good faith, disregard of publication governance is a dangerous practice and could bring authors and their co-authors into disrepute. We highlight some of these potential pitfalls, acquaint the reader with some rules that need to be adhered to in research and publishing, and help the reader learn how to avoid tripping-up on the road to publication.

Learning objectives

After reading this paper, you should be able to

- understand the potential issues concerning research governance
- recognize the pitfalls associated with research and publication
- implement some of the rules of research and publishing
- avoid some of these pitfalls

Key messages

This paper will inform readers of the importance to

- Be honest
- Be transparent
- Be accurate
- Keep meticulous records
- Write well and communicate lucidly
- Avoid gift authorship and authorship disputes
- Avoid plagiarism, salami slicing, and over interpretation
- Correct errors

Introduction

One of the end-points of a research study is publication of the findings in a peer-reviewed journal. This helps disseminate the results, improves the researchers' profiles, and serves as a permanent record of the study and the authors. Publication also fosters discussion in the scientific community, provides ideas for further work, and helps develop collaborations. A publication in a prestigious peer-reviewed journal is a true accomplishment and usually fills the authors with a sense of pride and achievement.

However, there are several pitfalls that researchers can fall victim to (**Table 1**), and these can occur knowingly or unknowingly [1]. Some of these errors may have occurred in good faith, and can be corrected with a corrigendum. However, disregard to publication governance is a dangerous practice and could bring authors [2], co-authors [3], reviewers, editors [4] and journals into disrepute.

We will highlight some of these potential pitfalls, acquaint the reader with some rules that need to be adhered to in research and publishing, and provide tips to learn how to avoid tripping on the road to publication.

The research protocol

Any research study should be planned prior to the start, and this should include a hypothesis to be tested, aims, methodology and analytic plan. This protocol should be adhered to and any violations of the protocol and reasons for them should be recorded. While developing the protocol, researchers should follow the guidance from the Equator Network [5] that is appropriate for the type of study (**Table 2**). This will help in writing a better protocol and will also make writing the paper easier. Some journals require that the protocol for a randomised clinical study and the analytic plan should be published in a peer-reviewed journal. *Clinical Nutrition ESPEN* can publish protocols. In addition, protocols should be registered in appropriate databases (e.g., https://clinicaltrials.gov/ for clinical trials and https://www.crd.york.ac.uk/prospero/ for systematic reviews and meta-analyses). This ensures transparency.

Approvals, permissions, and consent

Most research requires appropriate approvals prior to commencement of recruitment, laboratory, or animal work. In most countries this is in the form of approvals from the ethics committees, institutional review boards,

or animal licensing authorities. In some countries, studies such as audits and service improvement projects do not need ethics approval. In the UK, the Medical Research Council and NHS Health Research Authority have provided an online tool to help determine if studies need prior approval [6]. Nevertheless, it is advisable to get such projects registered with your institutional audit office (or similar body) and obtain a registration number. This helps protect researchers and, in addition, some journals mandate a registration number for the project. Rules may vary from country to country, and it is advisable to check local requirements for approvals.

It is also vital to obtain informed consent from participants prior to enrolment. In the UK the General Medical Council has issued guidance for this [7]. Other countries also have guidance, and it may not be necessary to obtain informed consent for certain studies such as database studies, audits, retrospective studies, and service improvement projects. However, researchers are advised to check local rules prior to commencement of the projects.

Human research must be carried out according to the Declaration of Helsinki [8] and many countries require researchers to be trained in Good Clinical Practice [9].

Authorship and contributorship

Authorship is an important issue in publication as it gives credit to researchers who have substantial contribution to the study. Authorship and the order in which the author names appear is usually best decided at the commencement of the study as this helps prevent disputes later. The Committee on Publication Ethics (COPE) has published guidelines on authorship and contributorship [10] and these should be followed. Researchers should be involved in all stages of the research process to qualify for authorship. This usually includes protocol development, data collection/analysis/interpretation, writing of the manuscript, critical review, and final approval of the submitted manuscript. Gratuitous and gift authorship is dangerous, as a potentially fraudulent publication could bring all authors into disrepute [11]. Hence, gift authorship should neither be offered nor accepted. Equally, excluding persons who may potentially qualify for authorship must also be avoided. All authors must be able to take responsibility for the data presented and their interpretation, and should be able to defend the paper. However, the ultimate responsibility

for guaranteeing the publication usually rests with the first, senior, and corresponding author(s).

Some journals limit the number of co-authors to a maximum, unless adequate justification can be provided. A larger number of authors may be justifiable for large scale multi-center trials, but this should not be the case for small single center studies, especially when many authors from outside the institution are included. Co-workers who have contributed to some (e.g., participant recruitment, data collection, provision of resources, etc.) but not all aspects of the study can be added as contributors rather than authors. Although the names of contributors do not appear on the masthead, they will have a citable reference on Medline and other indexing databases.

Ghost authors such as medical writers who help authors write the manuscript should be mentioned in the acknowledgements [12], along with language editors.

Data collection and handling

Data form the backbone of any paper and due attention to detail should be paid to data collection, handling, analysis and interpretation. Data collection should be accurate and truthful and collected data should be stored securely. Appropriate steps should be taken for participant anonymization and the database should be locked (i.e., not modifiable) once data collection has been completed [13]. Data should be analysed according to the statistical plan and introduction of *post hoc* subgroups for analysis should be resisted. Falsification, manipulation, and concealment of data are serious misdemeanours and are to be avoided at all costs. This includes manipulation of graphs and images generated from the data [14].

p-hacking

p-hacking, also known as data dredging, is the misuse of data or statistical analysis to find patterns in data that can be shown to be statistically significant [15]. This increases and understates the risk of false positives and is done by performing multiple statistical tests on the data and only reporting those that come back with significant results (i.e., $p<0.05$). p-hacking is fairly prevalent in the scientific literature and is often difficult to detect. Pre-registration of trials with specified end-points and statistical analysis plans makes data manipulation more difficult after data collection has been completed [15].

HARKing

HARKing is an acronym coined by social psychologist Norbert Kerr and refers to the questionable research practice of "**h**ypothesizing **a**fter the **r**esults are **k**nown" [16]. Kerr defined HARKing as "presenting a *post hoc* hypothesis in the introduction of a research report as if it were an *a priori* hypothesis" [16]. HARKing may occur when a researcher tests an *a priori* hypothesis but then omits that from their report after finding out that the results of the analysis were not what they desired (i.e., statistical significance). This may lead to inappropriate forms of *post hoc* analysis, and/or *post hoc* theorising, then to a *post hoc* hypothesis. For example, if the intention-to-treat analysis in a randomised clinical trial shows no statistically significant difference between groups, the researchers may resort to a non-pre-specified subgroup analysis that may yield statistically significant differences. Effectively, the researchers invent a plausible-sounding explanation for the result that was obtained, after the data have been inspected, thereby deviating from the pre-specified protocol and analytical plan [16].

Poor writing

Whilst poor writing is not a misdemeanour, it is a "cardinal sin" and often submissions with high quality data are rejected because of the inability of the authors to communicate their ideas well [17]. Special attention should be paid to spelling, grammar, and syntax. Reviewers and readers should not have to struggle to understand the authors' message. Authors should read and adhere to the journal instructions and the paper should be in clear and simple English (or whichever language the paper is written). The abstract should be informative and highlight the salient features of the article as this is what usually attracts the attention of editors, reviewers, and readers. Authors should read and re-read the manuscript and check it meticulously for errors. Those not fluent in English should enlist the help of a capable person to edit the manuscript. It is also useful to get a colleague not involved with the study to read and critique the manuscript before submission.

Plagiarism and self-plagiarism

Plagiarism is a serious misdemeanour and a useful definition provided by Bowdoin College is that it "*involves the intentional or negligent use, by paraphrase or direct quotation, of the published or unpublished work of another person without full and clear acknowledgment in all such*

scholarly work as essays, examinations, oral/written reports, homework assignments, laboratory reports, computer programs, music scores, choreography, graphic depictions, and visual presentations. Plagiarism also includes the unacknowledged use of materials prepared by another person or agency engaged in selling of term papers or other academic materials" [18]. Plagiarism may be direct, self, mosaic, or accidental [18]. Direct plagiarism is verbatim transcription of part of someone else's work with using quotation marks or attribution of credit. Self-plagiarism involves repetition of parts or sections of the author's own work. Mosaic plagiarism occurs when an author "borrows" phrases from another source without using quotation marks, or replaces the language from the other source by using synonyms or altering phrases slightly while maintaining the same general structure and meaning of the original. Accidental plagiarism involves neglect to cite or misquotes sources, or unintentionally paraphrasing a source by using similar words, groups of words, and/or sentence structure without attribution. Most journals perform a check for plagiarism. Hence, quotations from previous work, including the authors' own should be in quotation marks with appropriate citations, as has been done for this section. Reproduction of tables or figures from previously published work should be done after obtaining permission from the publisher or the copyright holder and this should be stated in the manuscript.

Two examples of these flaws are a paper that plagiarised another publication that was retracted for plagiarism [19] and a guideline on plagiarism that was retracted because of plagiarism [20]!

Salami slicing

Although it is often tempting to publish more than one paper from a single study, it is preferable to combine the results into one paper rather than duplicate the studies and their results. This practice of salami slicing and publishing several papers from the same dataset should be avoided [21, 22]. Sometimes it may be justified to publish more than one paper from one study, provided these are very different and cover different aspects of the study. This may be acceptable for large studies when different parts of the data tell different stories [21]. In this situation, authors should state this at the time of submission and include a copy of the published/accepted paper so that the reviewers and editors may make an informed judgement. Dual or duplicate publication involves publishing the same paper in more than one place, even if there are modifications made. This is a serious misdemeanour and must be avoided [23]. Dual

publication may be permissible if the paper is being translated into another language and this is stated explicitly.

Bibliography

The bibliography cited at the end of a paper is important as it helps develop the authors' argument in the context of the available literature. The selection of references should be balanced and should include papers that support and refute the authors' findings. Selective citation of the literature is a misdemeanour. It is the responsibility of the authors to ensure that the references they have cited are accurate and up to date and also support the statements that they have been cited for [24]. Citation inaccuracies are not uncommon and a recent study has found that this can be as high as 9% even in influential journals [25]. Papers that have been retracted should not be cited, unless the retraction is being highlighted.

Conflicts of interest

While many authors do not have any conflicts of interest, some do, and these should be declared. Conflicts may be directly (e.g., sponsorship by the company that manufactured the product being tested) or indirectly (e.g., use of materials/methods by a close associate/collaborator) related to the paper. It is advisable to declare all direct and indirect conflicts, including ownership of stocks and shares by the authors or their family members. It is better to err on the side of declaring more than less and allow the editors to make the decision on what conflicts should be revealed.

Interpretation and spin

The discussion is an important part of the paper as it gives the opportunity for the authors to highlight the importance and relevance of their results and discuss them in context of what is already known on the subject, suggest potential impact, and future directions. Results should be interpreted correctly and honestly. The authors should also highlight the strengths and weaknesses of the paper. Another potential pitfall in the interpretation of data, especially those with non-significant results, is "spin" [26], which involves altering the presentation of the facts or the use of "disingenuous, deceptive, and highly manipulative tactics" [27]. Spin is often used to distract the reader from non-significant results and suggest that a treatment may be beneficial [28].

Responding to reviewers

Authors should remember that reviewers devote their own time to reviewing papers without any monetary benefit. Most reviewers try to make suggestions to improve the quality of the paper and authors should respond to reviewers politely. Instances where the authors cannot incorporate the suggestions of the reviewers should be explained, giving reasons for this. All comments should be responded to and choosing to delete the comments that authors do not wish to reply to is an unacceptable practice.

Errors and omissions

Authors are human and genuine errors do occur. When these errors are found after publication, it is the duty of authors to submit a timely corrigendum to the journal and rectify the errors [29]. More serious errors may involve retraction of the paper by the authors themselves or by the editors.

Potential consequences

Publication misdemeanours, whether intentional or not, are problematic and result in a waste of time for reviewers and editors. In serious cases, the Head of the Institution where the authors work was conducted will be informed. At the extreme, misdemeanours could lead to retraction of papers, disciplinary action against authors, termination of academic appointments, or even legal proceedings. This is exemplified by the fraudulent work of several authors, three of whom have had more than 100 papers each retracted and have had their careers ruined [2,30]. Their misdemeanours have also cast a shadow of doubt on their co-authors and institutions.

Conclusions

This article has highlighted some of the potential pitfalls that authors may encounter in the publication process and provides some advice on how to avoid them. It is by no means comprehensive and case studies in publication misdemeanour, errors, and research fraud may be viewed at https://retractionwatch.com. Authors should remember that their work is only as good as their worst paper and that one fraudulent or retracted paper can bring their entire career into disrepute.

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Table 1: Some pitfalls to avoid in scientific publication

Serious Ethical Lapses
Concealing data
Falsifying data
Manipulating the data/images
Not declaring conflicts of interest
Not obtaining consent from participants
Not obtaining ethics committee/IRB approval
Plagiarism/self-plagiarism
Poor study performance
Inappropriate statistical analysis
Not adhering to the protocol
Poor writing practices
Poor writing
Misinterpretation of data
p-hacking
HARKing
Salami slicing
Spin, including undue emphasis on marginal results
Selective citation of references
Incorrect references/misquoting references
Citing retracted papers
Miscellaneous problems
Excluding collaborators eligible for authorship
Granting/accepting gift authorship
Not differentiating between authorship and contributorship
Inappropriate responses to reviewers
Not informing the editor of errors detected after publication

Table 2: Equator Network guidance for reporting of studies

Type of Study	Guideline
Randomised trials	CONSORT
Observational studies	STROBE
Systematic reviews and meta-analyses	PRISMA
Study protocols	SPIRIT
Diagnostic or prognostic studies	STARD
Case reports	CARE
Clinical practice guidelines	AGREE
Qualitative research	SRQR
Animal studies	ARRIVE
Quality improvement studies	SQUIRE
Economic evaluations	CHEERS

Details available at https://www.equator-network.org