

Review Article

What pharmacy practitioners need to know about ethics in scientific publishing

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ABSTRACT

Pharmacy practice is an ever-changing science and profession. We are witnessing many advancement of pharmacy technology, drug-related information and applied clinical pharmacy literature, which influence our every day's life. Thus, new knowledge generated by research and clinical experience widen the knowledge; change the understanding of drugs and their application in therapeutics and every days life. Thus, policy makers, pharmacists, clinicians and researchers must evaluate and use the information existing in the literature to implement in their healthcare delivery. This paper is prepared for pharmacy researchers and pharmacy students and analyzes the major principles of ethical conduct in general science and also closely related topics on ghost authorship, conflict of interest, assigning co-authorship, redundant/repetitive and duplicate publication. Furthermore, the paper provides an insight into fabrication and falsification of data, as the most common form of scientific fraud. Scientific misconduct goes against everything that normal scientific method wants to reach for and pharmacy practitioners as one the first line available health care professionals all round the world should be enough aware of its importance and details when they want to evaluate the medical and pharmaceutical literature and deliver unbiased and ethically published knowledge of drugs both for the research or during consultations for patients care.

Keywords: Authorship, bioethical issues, conflict of interest, duplicate publication, plagiarism

INTRODUCTION

In every day's life we are supposed to make many ethical decisions and being a pharmacy practitioner and the drug specialist advisor to physicians for choosing an ethical decision for the sake of patients' health, makes this situation much more difficult and complex.^[1,2] The ancient Greek physician Hippocrates from many years ago showed the health care professional (especially physicians) "to help and do no harm".^[3] In recent century the same goal was followed in after the second world war which resulted in Nuremburg code of ethics and after that

the Helsinki declaration (with all of its consecutive revisions) and the Belmont report^[4] resulting in the four major principles of respect for human autonomy, beneficence, nonmaleficence and justice. These basic principles are supposed to be considered the cornerstone of medical practice, medical research and also ethical publication.^[5]

In difficult ethical issues and situations, some scientist judge about the significance of misconducts by their own wisdom and personal judgment. Obviously, almost all people recognize some common ethical norms, but different individuals interpret, apply, and balance these norms in different ways in the light of their own values, beliefs and life experiences. In general, it can be said that unethical behavior in science is any significant mistreatment of intellectual property or participation of other parties, deliberately hampering the research process or distortion of scientific evidence, as well as all the behaviors that affect the integrity of scientific practice. In 2000, the United States defined the fraud in scientific research

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defined as fabrication, falsifying and plagiarism in the process of proposing, conducting and publishing the results. The Nordic countries proposed a much broader definition and fraud in scientific research defines as dishonesty in any degree.^[6] Whatever the definition is, there are numerous examples of unethical behavior in biomedical research that will be discussed in this article.

TYPES OF ETHICAL MALPRACTICE IN BIOMEDICAL PUBLICATIONS

There are various forms of unethical behavior in publishing of the results of scientific researches that are described briefly below:

Plagiarism

One of the most important problems which participants in the academic process may encounter is plagiarism.^[7] This is, unfortunately, one of the common ways of compromising the academic integrity of the author and cause of constant conflict in scientific-research sphere of interest. Copy, use or otherwise the exploitation of other people's ideas, words or creations, without citing sources in an appropriate form is prohibited. It is not enough to change a few words in a phrase from the source material into "own words." Change the order of words in a sentence is also not acceptable, as well as the use of synonyms, such as changes from the "air" to "atmosphere."

The process of preparation of each scientific work normally starts by consultations with existing resources, potential research and then writing the work giving it a personal stamp.

When writing papers it is possible to use other people's words and ideas, but with mandatory labeling and reference to the source from which these words and ideas are taken and in a clear way that people who read the paper can even in the very sentences recognize whether something is written in original work or just taken as a piece from another text. The references, as an indispensable part of any scientific and professional work, contribute to the quality of work, speaks of the sources used and thus the depth of information on the subject by which the work is dedicated.

There are many different definitions of plagiarism. Plagiarism from the Latin origin of *plagium* (kidnapping) is a transcription of other people's works and illegal appropriation of another's spiritual property. A plagiarist illegally trespass intellectual property of the others and uses other people's ideas, opinions or theories, either literally or paraphrased,

which does not mention the author and source of information. Such a "copy-paste" act constitutes theft of authorship, which is definitely unacceptable in scientific, technical articles or in books, monographs, specialist or graduate student papers. In the wider academic community, plagiarism is a serious breach of ethical standards and a disciplinary liability and sanctions of various types and weights. There is a dilemma: Who, on what basis (criteria, standards, rules), when and how should someone be declared as plagiarist or which someone's scientific work or part of that work to declare as plagiarism. Then, which institutions or that scientific body committee at the national or international level, when plagiarism is proven, can sanction or punish the plagiarist and what are the sanctions. It is necessary to work for improving the mechanisms for early and sophisticated plagiarism detection through software applications, which in the foreseeable future must become compulsory for every editor of an indexed journal to use. A transparent database in which disclosed plagiarism ("black list of plagiarators") could be found should be made at the international level.^[8]

Repetitive publication

This special form of plagiarism is defined as the publication of a copyright material with the addition of new, unpublished data.^[9] Hence, this is a form of unethical behavior in science, where part or parts of already published article are published again. There are several logics for the unethical nature of this form of publishing. The first is the violation of the international copyrights. The second is wastage of the valuable time of peer-review. Another reason is the unnecessary inflation of the already published literature. Committee on Publication Ethics proposes several recommendations concerning repetitive publications:^[10]

- Already published studies should not be republished if they do not support the further study
- Repeated publication of an article that has been published in another language is allowed only when is clearly stated the original source
- At the time of the article submission, the authors must submit the materials that are used in their article.

Therefore, the basis is that authors should not attempt to publish information that is already published in some of the articles. If they find that already published data are of utmost importance for their study, then they should repeat the study or parts of the research, and use these data in a new publication.

According to the logical rule of Ingelfinger, each manuscript could be considered for publication only

if has not been published previously.^[11] Duplication can be full or partial, in electronic format or hardcopy, in the same language or in a different language, including new data, or simply reproduce the results of the original publication without adding any information.

Hence, it could be defined as publication of knowledge resulted from the data set of a research, which is identical or convincingly overlaps with the previously published results of the same research and in the meantime both articles share the same hypothesis, results and conclusions. Why scientists try to republish of the same article? One reason is their perception that if someone wants to survive in the highly competitive field of science, one must create voluminous curriculum vitae. This is true in certain situations, especially subsequent when the number of articles rather than their quality, are largely valued as a factor in promotion and academic progress. Another and perhaps more justifiable reason for resorting to such unethical behavior lies in the fact that the authors sometimes try to reach the readers who are not so familiar with the journals in which the first article was already published, especially if the article was published in another language, such as for example Chinese which is also relatively inaccessible. Authors must have the consent of both journals before they decide to publish an article again.

Duplicate publication is considered unethical for several reasons.^[5,12] The first is that the author in unethical way attempts to increase the scope of their own published works, and the second, is that the article has the potential to change the image of documents.

Good practice in publishing some work requires that authors can submit drafts of their work only to one journal at a given moment. Authors may choose to re-propose to the same or another journal revised work only when the first application receives a negative answer on its publication. Regardless of this, duplicate papers still occur and as such continue to be a significant problem across scientific journals.

With the increasing availability of computerized medical databases such as PubMed, it becomes increasingly difficult for scientists to duplicate previously published works. When the duplicated article is detect and reported by the reviewer, the journal rejects the proposed work or withdraws article if it is already published. Statement on duplication is published in PubMed-in, which can have serious consequences for the author's reputation.

Conflict of interest

Conflict of interest may be individual or institutional.^[13] Recognizing the potential conflict of interest is usually simple, but sometimes it can be

a challenge to determine whether a conflict exists or not, if it is not communicated. This is significant, because everything that is not transparent can be interpreted as a bias or corruption. Therefore, authors must clearly highlight potential conflicts so they can be treated appropriately.

National Institute of Health, since 1995 decides to terminate a number of restrictions that had previously existed in terms of external cooperation, all in order to get the renowned scientists from different fields.^[14] This means the abolition of limits on the amount of articles that scientists can publish, or the time that can be spent on work outside the institute, as long as it does not affect their current job. However, it is very important that every scientist clearly specify each source of income besides their regular employment.

However, it turned out that the big problem is the cooperation with pharmaceutical and biotech companies, so many have the opinion that such cooperation should be terminated.^[15] This also led the New England Journal of Medicine to ban the authors to write review articles if they had a financial interest (including everything from salaries or other income, interest in shares and intellectual property like patents and copyrights) in the company concerning the research. However in recent years, it is increasingly difficult to find authors who are completely independent of the industry.

Fabrication and falsification of data

Fabrication and falsification of data represents for about half of all cases reported as a form of unethical behavior. Falsification of data includes its creation, selective publication of results (e.g. those corresponding to the study goals) and the omission of conflicting data, as well as the conscious exclusion or modification of data.^[16] It is unethical for several reasons:

- It affects the integrity of other studies, also the authors that are their creators and other authors in the same field of science
- If such article is not discovered one time, other authors lose their energy and time in vain trying to take advantage of the presented results in their studies
- Creates a negative image of science in general and affects the general trust.

The problem of this kind of behavior is particularly evident in clinical studies and may have negative consequences for patients. Therefore, each author must faithfully and accurately collect, present and publish the experimental data.

Authorship issues

Being the author of a scientific paper is a privilege and has great satisfaction. Not only that authorship

contributes to science in general, but it also brings respect and reputation and also serves as a measure for the promotion and advancement. However, this seems only part of the author's equation. Another aspect is that authorship entails great responsibility. Every scientist has its own vision of what it takes to become an author. But often, among the authors of the project these visions are different. Personal conflicts and turmoil can often lead to disagreements on the issue of whom belongs the authorship. There are some guides, issued by the National Institutes of Health, which define the authorship. In a broad sense, the author is any person who has significant intellectual contribution to a particular study. The International Committee of Medical Journal Editors (ICMJE) is recognized organization dealing with ethical issues in biomedical research and defines the authorship as follows:^[17]

- A significant contribution to the concept, design, collection, analysis or the interpretation of the data
- Writing study template or revision in terms of intellectual content
- Final approval of the version to its publication.

All author should meet a, b and c.

Ghost authorship is amongst the most important issues in this case and occurs when an individual who has significantly contributed to and participated in the development of specific scientific work was not mentioned as an author.^[18] A special form is a publication of the work of the invisible author by the request of industry, where is questionable the credibility of the results, on account of the conflict of interest. An example is a situation where influential pharmaceutical industry or any party can offer the benefit, employs professional writers or agencies to produce an article that will later be attributed to a certain recognized scientific researcher.^[19,20]

Inappropriate authorship may involve honorary authors, individuals who are named as authors, but who have not met authorship criteria^[21] and have not contributed substantially to be able to take public responsibility for the work, and ghost authors, individuals who have made substantial contributions to the work reported in an article but who are not named as authors. Ghost authorship raises important ethical questions for conflict of interest and academic integrity.^[22] Conflict of interest is a serious problem. Evidence-based medicine requires that clinical decisions are based on clear empirical evidences published in medical journals that are regularly audited. If clinicians base their decisions on such inadequate research results, it can have serious negative consequences for patients. For example, certain medication that may not be the best drug

of choice for a particular disease or patient, but, for example, as such is promoted by an influential expert in a reputable medical journal. In this way, patient receives suboptimal treatment.

Honorary and ghost authorship (which are both the clear examples of Inappropriate authorship) and the consequencing lack of transparency and accountability of the research is more of less a universal problem which obviously jeopardize the final goal of doing researches. The Recent reports of real examples of the aforementioned inappropriate authorship have attracted the attention of the news media and government officials, and the research integrity of the authors is a concern for the editors of many journals.^[23]

Unfortunately, there is an increasing demand and pressure on academic researchers to publish more and more and this emerged the probable concept of looking to a published paper as the academic currency.^[24] Employment, wages and reputation in academic circles is largely related to the number, quality and frequency of the research papers publication, and regularly is seen as a good indicator of one's work and abilities.^[25] In the case of the ghost authorship, when often a particular author is hired for a specific publication, which was actually written by another person, this publication is no longer an adequate measure of his work. Furthermore, ghost authorship separates the author from the responsibility. Universally accepted, an individual or group of authors, we consider responsible for the information presented to the public. Knowing that they will be held responsible for their results, the researchers are trying to implement all the measures to better prepare the work before its publication. Therefore, if a person is listed as an author, but did not contribute to any stage of work or research project, his responsibility is questionable.^[26]

CONCLUSION

For the sake of promoting human health, pharmacists and pharmacy practitioners need to use and evaluate medical and pharmaceutical literature. This depends on valid researches which determine the best treatment plans. When evidence of efficacy is falsified with unethical publication behavior, it effects finally and directly on patient's health status. Scientific misconduct goes against everything that normal scientific method wants to reach for and pharmacy practitioners as one the first line available health care professionals all round the world should be enough aware of its importance and details when they want to evaluate the medical and pharmaceutical literature and deliver unbiased and ethically published knowledge of drugs both for the research or during consultations for patients care.

AUTHORS' CONTRIBUTION

Both authors shared the idea and have assisted in preparation of the manuscript and have read and approved the content of the manuscript and are accountable for all aspects of the work.

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