STUDIA UBB BIOETHICA, LX, 2, 2015 (p. 95-102)
(RECOMMENDED CITATION)

RESEARCH MISCONDUCT IN MEDICAL SCIENCES

JELENA DOTLIC[1], VIDA JEREMIC[2]

REZUMAT. **Conduita greşită în cercetarea medicală**. Conduita necorespunzătoare în cercetare este un fenomen foarte răspândit, care, în medicină, poate afecta oamenii. Prevenţia acesteia include educarea cercetătorilor, promovarea integrităţii autorilor şi a eticii, scăderea presiunii academice, crearea şi ascultarea de norme, dar, de asemenea, investigarea actelor de plagiat şi a fraudei.

Cuvinte-cheie*: medicină, cercetare, conduită necorespunzătoare, incidenţă, prevenţie*

ABSTRACT. Research misconduct is widespread phenomenon, which in medicine can potentially harm people. Its prevention includes educating researchers, promoting authors integrity and ethics, lowering academic pressure, creating and obeying norms, but also inspection for plagiarism or fraud.

Keywords*: medicine, research, misconduct, incidence, prevention*

Why is It Important to Talk about Research Misconduct in Medicine?

Scientific misconduct is a widespread phenomenon, belonging to the category of irresponsible research of inappropriately performed or published studies (12, 17). By producing unreliable results, wrong decisions are made, resources wasted, people harmed or killed and environment endangered. Thus, it is important to prevent and uncover scientific misconduct and to promote scientific honesty (5). Responsible research encourages general trust in science

[1] *Corresponding author, MD, PhD, Clinic for Obstetrics and Gynecology, Clinical Center of Serbia, Faculty of Medicine, University of Belgrade, Visegradska 26, Belgrade, Serbia. Email: enadot@yubc.net*
[2] *Department of Humanities, Faculty of Medicine, University of Belgrade, Dr Subotica 8, Belgrade, Serbia*

and scientists (7). One of the most problematic fields regarding research misconduct seems to be medical science (2, 17). Contemporary medicine is „evidence-based“, meaning that every decision in medicine should be supported by scientific proof. The explosion of medical writing can be partially explained by scientific progress and new technologies being applied in diagnostics and patient treatment. Still, when investigated more thoroughly, besides original papers, a significant number of publications in medical journals can be classified as some type of research misconduct (2, 19).

Definition of Scientific Misconduct

A research error can be made unintentionally or deliberately (1). Research misconduct does not include honest error, sloppy and disorganized behaviour, or a difference of opinion. Scientific community has set the criteria for research practice that should be considered as misconduct: a significant deviation from established practice of the research community, misconduct is preformed intentionally and the allegation of misconduct is proven by clear evidence (13).

Different definitions of research misconduct are being used according to various legislative regulations and circumstances (11, 19). The widest and the most commonly used classification, made by the American Office of Research Integrity, divides misconduct into: fabrication, falsification and plagiarism (13). However, it is clear that some other forms of malpractice can also cause significant damage (undisclosed conflict of interests, honorary or “ghost” authorship, reporting results without “outliers”, publishing the same data in several journals) (12). Therefore, a wider definition of research misconduct also involves so-called questionable research practices (16). These are all procedures that are done contrary to ethically accepted values in designing and undertaking the study or publishing the obtained results, such as inaccuracy, misrepresentation and bias in research as well as problems with authorship (11).

Fabrication includes making up data or results and publishing them as if they were real (10). Usually it means that data were never collected or tested in the field, or reporting results of experiments that were never conducted. Fabrication is considered the most serious fraudulent behaviour, with the clear intent to deceive. Fabrication is strongly condemned by scientific community, which keeps it very rare (6).

Falsification is distortion of data or results. It includes “manipulating research material, equipment or processes, changing or omitting data or results, causing inaccurately represented research records” (10). Falsification can be done in several ways with different levels of scientist’s intention. So called “data

cooking" is selecting and reporting only data that fits the hypothesis; "trimming" data is smoothing of irregularities in order to make results look more accurate. Falsification can be performed through inappropriate methods of data analysing, the exclusion of outliers, or unpermitted manipulation of graphics (4).

In the field of medicine, both fabrication and falsification can have grave consequences. In these cases of misconduct the results are either made up and not tested at all, or presented incorrectly according to the desires of authors and disregarding the truth. This is not only unethical, but the conclusions and recommendations of such work can be harmful for people, which is of the utmost importance in medicine.

Plagiarism is a violation of copyright, meaning presenting someone else's ideas or findings as yours, without citing the original source and author (14). World Association of Medical Editors set the rule that copying six consecutive words with 30 identical characters should be considered as plagiarism (14). Still, it is not that easy to differentiate plagiarism from original work. Moreover, there are different variants of plagiarism and, although all unethical, some are worse than the others (14). Writing plagiarism (using numerous same words from the original so that almost all source is copied, changing some words but copying the sentence structure without citations or incorrect citations) is somewhat less problematic and therefore quite frequent. Conversely, presenting someone else's work or ideas as yours is the worst type of plagiarism and should be considered as theft (14).

Another special form of plagiarism is self-plagiarism or duplicate, redundant or secondary publications. These are republications of an article in which either the most important parts overlap or the majority of text is the same with the already published copy (1, 10). Types of self-plagiarism are: republishing an article with identical content and the same subjects in two different journals (the worst violation); republishing some parts of the main study as a separate manuscript; republishing an article with adding few more data, but using the same text of the original work (1, 10).

Unethical authorship is the most common publication misconduct (2, 16). The International Committee of Medical Journal Editors has recommended that the manuscript authors should be only those researchers who have significantly contributed to all stages of investigation from idea to publication of results (9, 12). All authors must know the study aim, methods and findings. Although large research teams are necessary to perform different components of the work, in medical journals even case reports have numerous authors (2). Gift authorship to friends or exchanging authorship between investigators in order to amplify their publications should be strictly banned (8, 12). Younger

researchers should be protected from pressure of giving authorship to professors, mentors or older colleagues (2, 15). Still, the authors of this article believe that all hard work on the research, such as data collection, should qualify a researcher for authorship. There is an ongoing debate on this matter. The majority of editors believe that authorship is not linked with hours of work but with its intellectual quality (2). Nevertheless, responsibility for the accuracy of data-base, and results obtained from it, lies greatly on the data collector, which makes that person an essential part of the research team. Furthermore, the person who has collected the data (performed the experiments, interviewed the patients) definitely knows the study aim and method.

Why Does Scientific Misconduct Happen?

Misconduct is present in all human activities, so it is not odd to find it in medical science as well (3). Some of the reasons for scientific misconduct may be found in medical research environment, which is highly competitive and demanding. Stressful activities accompanying scientific career, like struggling to get funds and publish your work, put pressure on researcher to act irresponsibly (11).

The common etiological factors are the need to publish for career advancement or the hospital status, unhealthy ambitions, the will to grow rich and the lack of motivation to seek the truth. Having more publications brings greater recognition and better opportunities. Published authors are invited to present their results on conferences, enabling them to visit different places and sometimes bringing even profit in speaker's fees. Moreover, being a published author may boost ones self-esteem and vanity. Other authors emphasize lack of education and training on research ethics as very important factors (2, 5).

However, career promotion is the leading cause of misconduct and stress for investigators in Europe (19). For medical scientists, publishing research papers in journals with high impact factors has become a major criterion for career advancement. Number of publications and their citations are a measure of success (10). Some medical faculties consider having high impact papers obligatory prior to defence of doctoral thesis. Furthermore, many grants and project sponsors are requesting that researchers have regular publications in order to continue receiving funds. Non-publishing doctors are invisible to the scientific community (10).

The Process of Dealing with Scientific Misconduct

According to the Scientific Misconduct Strategy adopted in 2012, host institutions are responsible for detecting and addressing misconduct allegations (5). However, it seems that in practice the most important role have journal editors and reviewers. Editors should test every submitted paper for plagiarism using one of the many currently available software. Reviewers should search literature and check for duplication of results, idea theft, fabrication or falsification. Original paper requires addition of new findings to the previous data. However, obtaining new results is not easy and does not happen on regular bases. Any well-done research takes months to perform and publish, implying on the fact that not more than a couple of papers can be submitted to journals annually. Author with extremely large number of publications who produces a new paper on weakly/monthly bases should raise editors' suspicion.

In the United States and the European Union there are special scientific boards that are in charge of dealing with allegations of scientific misconduct (US: Office of Research Integrity; EU: European Research Council) (5). Almost all European countries have official national guidelines strictly defining how to address research misconduct, but they differ significantly among countries. Conversely, some countries (usually developing and undeveloped) still do not have policies regulating scientific misconduct, making it easier to commit (5).

The usual procedure starts when allegation of scientific misconduct is reported. First, the board examines if the allegation seems accurate. During the whole procedure authors should be notified and given the chance to explain their work. If there appears allegation truthful, an analysis of the whole performed study is undertaken (5). If misconduct is not confirmed the case is dismissed. But if it is proven, the board determines sanctions. The extent of action should match the severity of the fraud. Manuscript revision is demanded if it is the question of writing plagiarism or incorrect references (2). Authors can get the letter of reprimand and be sent to educative counselling. However, paper must be rejected if it cannot be corrected (forgery or theft of the idea or methodology) while authors can be punished by suspension or even employment termination (5).

Prevention of Misconduct

The education about research ethics, scientific methodology, literature review, proper paper writing and types of research misconduct and how to avoid it, should be provided even to medical graduate students and definitely postgraduate students who are starting their career as investigators (20).

Education could be in the form of formal classes, but also in the form of discussions, workshops, etc. Important factor for reducing unethical research behaviour is mentoring (18). Mentor as a role model for students, has a great responsibility to teach ethical standards through his own proper actions and to correct potential misconduct at the beginning stages. Institutions involved in research work should promote scientific integrity with policies and educational programs (18).

In order to avoid plagiarism of literature data used for references, authors should paraphrase (express someone else's ideas in your own language) and summarize (take out the essence of someone else's work) the information from other papers (10). Authors should acknowledge the original source and check that references are correct and used appropriately in the text. Written permission should be obtained to use other investigators published work.

However, sometimes there are not too many ways to say some well-known definitions. Moreover, some reviewers insist that every sentence in discussion is based on some already published paper. If an author is giving his own opinion or explanation of observed phenomena and obtained results paper will most likely be sent to corrections or even rejected. This is completely contrary to the concept of originality. So, before submission authors are advised to run their manuscript through plagiarism-check websites (10).

Moreover, current polices in scientific community must be changed. The pressure to publish must be taken of the researchers. This can be done by making new and less demanding requirements for career promotion and emphasizing quality and not quantity of papers or impact factors. Expectations of a researcher in terms of publications that are needed for sustaining project or scholarship funding should also be limited to a conceivable publication rate. Demand for a new original idea tested on a large sample and published in a high impact journal every 3 to 4 months is unrealistic and it is clearly pushing investigators to misconduct (at least self-plagiarism and even complete fabrication). Harvard University tried to implement the rule that just 10 articles are required when applying for the post of a full professor (2). This rule can be used universally.

Conclusion

It is clear that more discussions about research misconduct are needed to promote good scientific practice and raise the awareness of the issue. By taking serious and conscientious approach to research ethics scientific community, through discussions, education and intensive work, can make codes and polices that would support research integrity, lower academic pressures and prevent misconduct in medical science.

Acknowledgement

This paper was supported by the START Project: 16_PA07-C1, funded by the Danube Region Project fund and the European Union; PI: Prof. dr. Ioan Marcus, Department of Pathophysiology, University of Agricultural Sciences and Veterinary Medicine, Cluj-Napoca, Romania.

REFERENCES

Adibi P, Kianpour M, Shirani S. *Investigating the Root Causes of Duplicate Publication in Research Articles.* J Educ Health Promot 2015; doi: 10.4103/2277-9531.154023

Avula J, Avula H. *Authors, Authorship Order, the Moving Finger Writes.* J Indian Soc Periodontol 2015;19:258-262

Bedi N. *Medical Research Misconduct Need Regulatory Reforms*. Indian J Community Med 2014; 39:194–196

Bornman L. *Research Misconduct – Definitions, Manifestations and Extent.* Publications 2013;1:87-89

Fanelli D, Costas R, Lariviere V. *Misconduct Policies, Academic Culture and Career Stage, Not Gender or Pressures to Publish, Affect Scientific Integrity.* Plos One 2015; doi:10.1371/journal.pone.0127556.

Fanelli D. *How Many Scientists Fabricate and Falsify Research? A Systematic Review and Meta-Analysis of Survey Data.* Plos One 2009; doi: 10.1371/journal.pone.0005738.

Forsmann B. *An Ethical Analysis of the Phenomenon of Misconduct in Research.* Acta Oncologica 1999;38:107-110

Hayter M, Noyes J, Perry L, Pickler R, Roe B, Watson R. *Who Writes, Whose Rights, and Who's Right. Issues in Authorship?* J Adv Nurs 2013;69:2599-601

Horner J, Minifie FD. *Research Ethics III: Publication Practices and Authorship, Conflicts of Interest, and Research Misconduct.* J Speech Lang Hear Res 2011;54:S346-362

Juyal D, Thawani V, Thaledi S. *Plagiarism: An Egregious Form of Misconduct.* N Am J Med Sci 2015;7:77–80

Komic D, Marusic SL, Marusic A. *Research Integrity and Research Ethics in Professional Codes of Ethics: Survey of Terminology Used by Professional Organizations Across Research Disciplines.* Plos One 2015; doi:10.1371/journal.pone.0133662

Mandal M, Bagchi D, Ranjan Basu S. *Scientific Misconducts and Authorship Conflicts: Indian Perspective.* Indian J Anaesth 2015;59:400-405

Martinson BC, Anderson MS, de Vries R. *Scientists Behaving Badly.* Nature 2005;435:737-738

Masic I. *Plagiarism in Scientific Research and Publications and How to Prevent It.* Mater Sociomed 2014;26:141–146

Rajasekaran S, Shan RL, Finnoff JT. *Honorary Authorship: Frequency and Associated Factors in Physical Medicine and Rehabilitation Research Articles.* Arch Phys Med Rehabil 2014;95:418-428

Schoenherr JR. *Social Cognitive Barriers to Ethical Authorship.* Front Psychol 2015 doi: 10.3389/fpsyg.2015.00877

Sculier JP. *Bad Behaviours Regarding Research and Scientific and Medical Publication.* Rev Med Brux 2013;34:491-499

Shamoo AE, Resnik DB. *Responsible Conduct of Research.* 2nd ed. New York: Oxford University Press, Inc, 2009.

Tijdink JK, Verbeke R, Smulders YM. *Publication Pressure and Scientific Misconduct in Medical Scientists.* J Empirical Res Hum Res Ethics 2014;9:64-71

Varghese J, Jacob M. *Do Medical Students Require Education on Issues Related to Plagiarism?* Indian J Med Ethics 2015;12:82–87