Chapter-36

Scientific Misconduct in Medical Writing: An Overview with two cases as examples

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Scientific misconduct is a vast subject. It is a dilemma to decide where to begin and when to end. The subject is all related to research and its publication. Research, first known in French language in 1577, meant "to go about seeking".[1] Actually Research is the quest for something new and needs an inquisitive mind looking for new knowledge. Not everyone is a born researcher. Good researchers need intelligence, skill and an ability to write as they have to be well informed about the past research results on the subject and the ability to add a new aspect. The entire process starts from conceiving the idea, shaping it, conducting the research and achieving the results. The final obligatory step is getting it published.

Research has created new theories and brought about a revolution in various fields. The treatment of many diseases which were at one time thought to be incurable, is the fruitful result of research. Examples are: discovery of insulin in 1921 by Banting and Best,[2] which has saved the lives of millions of diabetics all over the world. Discovery of Penicillin by Alexander Fleming in 1928[3] initiated the era of antibiotics. This has been a life saver for many infectious diseases. Biomedical research conducted world wide, including low resource countries, has helped in eradicating diseases as Poliomyelitis and small pox. Morbid disorders as various cancers have been treated. Research has thus lead to betterment in health and quality of life.

For conducting good research and its publication a code of conduct has to be followed. This is the umbrella of ethics which has pre-determined, acceptable rules formulated by the community of scientists as, Committee on Publication Ethics (COPE), International Committee of Medical Journal Editors (ICMJE), World Association of Medical Editors (WAME), European Association of Science Editors (EASE) and many others. Publication of research results is a moral obligation as this is necessary to disseminate knowledge and assist other researchers to investigate further. Clinicians learn to give better care to the sick.

All institutions involved in research have pre-determined principles and regulations for conducting good and ethical research. The important ones are, Honesty, Integrity, cooperation, accountability, professionalism and safety of all involved. **Responsible conduct of research or** "conducting research with professional responsibility" and **Research integrity or** "steadfastly adhering to high moral principles and professional standards" are absolutely mandatory.[4,5]

At times, questionable research practices are observed. These are "actions that violate traditional values of the research enterprise and may be detrimental to the research process."[5] Research misconduct comprises of falsification, fabrication and plagiarism.

Components of Scientific Misconduct:

1. Plagiarism: Piracy stealing
2. Fabrication: Desk Top Publishing
3. Falsification: Tampering with data/results
4. Duplicate or Redundant Publication: Multiple Publications of same data.
5. Conflict of Interest which could influence the results
6. Authorship Problems: Get maximum benefit with minimum efforts due to unauthorized persons included or deserving persons excluded.
7. Ethical Review Board: Missing Approval of the authority.

Plagiarism:

This is derived from the Latin word *"plagiaries"* meaning *"kidnapper"*.[6]

Collins dictionary describes it as, "The action of using or copying someone else's idea or work and pretending that you thought of it or created it".[7]

There are various types of Plagiarisms as:

- Word for word
- Mosaic
- Paraphrase
- Stealing of Ideas
- Salami slicing
- Cyber.

Word for Word Plagiarism:

This is defined as *"Copy and Paste with No referencing."* An entire paragraph is lifted intact and used in the authors' article. A graph from another article is inserted in the authors' manuscript as their own. Usually, a great part of the introduction or discussion is copied from another article making the task easy.

Mosaic Plagiarism:

This is borrowing ideas and opinions from another source and adding a few words or phrases to it. This at times mixes up the two ideas and can cause confusion. If no credit is given to the original author by referencing, it is plagiarism.

Paraphrasing:

This is obtaining information from other pertinent literature and summarizing it in ones own words. It is usually used in the introduction of an article. If no reference is provided it is plagiarism.

Stealing of Ideas:

Changing a few words here and there, or changing the order of a few words in a sentence or paragraph from an article, is still plagiarism of ideas. Ideas are usually stolen while reviewing an article.

Salami slicing:

This can be called fragmentary publication. In an on-going research, early results are often submitted by the authors without stating that the project is still incomplete. These may not be sufficient to provide the correct implication. The final results are published later. This is called *"salami"* slicing and it places burdens on editors, peer reviewers and readers to get to the right perspective.

Cyber Plagiarism:

Cutting and pasting information from web pages and then claiming it as one's own original work is Cyberplagiarism or webnapping.

Fabrication or Desk Top Publishing:

The entire data and results are fabricated without any actual research being done. This can be called invention of data or cases. It is not very commonly encountered but there are examples as that of Mr Pearce, a senior obstetric consultant at St George's Hospital, London in 1995, when he claimed that he had re-located an ectopic pregnancy in the uterine cavity and the woman eventually had a normal baby. The fabrication was detected and Mr. Pearce lost his job.[8]

Data Falsification:

To make the results attractive, negative or undesirable results are left out, missing data is not revealed or the adverse effects of a drug are not reported. This amounts to wilful distortion of the data or Falsification. A recent example is of Dr. Haruko Obokata of Japan, who plagiarized her past work and possibly falsified her data on stem cell research – Nature (2014)[9]

Image Manipulation: is a sub category of Falsification. It is an act of inappropriately altering or enhancing the quality of an image in order to present the image factitiously better. It is done by combining, cropping, correcting, restoring, and blending photographs or original artwork.

Duplicate publication:

This is making minor changes in the same data with identical text and slightly changing the authors order along with a few alterations in the title and submitting to another journal.

Redundant Publication:

This is publication of a paper that overlaps substantially with one already published in print or electronic media. It can be the same data with somewhat different text as additional data or a different analyses. No reference of the other article is provided. This can result in double counting.

Conflict of Interest:

When judgment on an article could be influenced by personal relationships, honoraria received, financial relationships, relationship with industry or academic competition, it amounts to conflict of interest. This should always be declared.

Authorship Criteria:

Substantive intellectual contributions to the project merit authorship.

Authorship order should be based on each author's contribution to the project. The decision should be made before the research is started and mutually agreed upon by all authors. Colleagues who have helped can only be acknowledged.

Authorship criteria have been precisely defined by the International Committee for Medical Journal Editors (ICMJE). The Guidelines for Authorship (2015)[10] are as follows:

1. Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work; AND
2. Drafting the work or revising it critically for important intellectual content; AND
3. Final approval of the version to be published; AND
4. Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Every author has to fulfill all four Requirements

Ghost Authors:

These are people not involved in the research but have the skills of writing. Usually they are paid professionals and the authors do not disclose their names. They are used more by the industry who have funds. Researchers who are not very comfortable with writing articles or are short of time use their services. The disadvantage of having an article written by a professional writer can be that the underlying experiments may not be clearly understood by the writer and context of the work can remain unclear. The relevant facts can be diluted causing errors.This can lead to a poor presentation of the research results.

GIFT Authorship:

This is including an author, usually a senior faculty member, who has not participated in the research or writing the results. It is usually adopted by a junior researcher to gain recognition. At times the senior may not be aware of it. Occasionally a senior researcher may desire to take credit from a junior member to gain an increase in citations or to add credits on his curriculum vitae. This is also known as Unethical Bribery.

Institution Review Board: Missing Approval:

An article submitted without an Institution Review Board (IRB) certificate cannot be considered for publication. Every institution having research facilities should have an IRB with a minimum of 5 experienced members. Each research protocol and informed consent document should be inspected to ensure protection of the research subjects. The certificate provided by the IRB should be enclosed with the article for publication.

The certificate assures, that appropriate steps were taken to protect the rights and welfare of humans participating as subjects in a research study, particularly the vulnerable group as children, elderly, mentally incapacitated, prisoners, poor and addicts.

Why do researchers resort to unethical practices?

There is a universal challenge on scholars to publish

research. It has also been made mandatory by the regulatory bodies for promotion in career and gain a degree or at times it is a matter of prestige. The individual may not be competent at writing or may not have sufficient time or intellectual resources to produce a good manuscript. Thus taking a short cut by using unethical means is a simple solution. At times the supervisors of students find investing their time as taxing. The students may not be given the correct knowledge and training specially on the

Table-I: The Principles of good research and its publication.[11]

1. ***Honesty:*** in respect of one's own research and others' and in writing it.
2. ***Integrity:*** fulfilling legal and ethical requirements.
3. ***Co-operation:*** open exchange of ideas and subject to scrutiny.
4. ***Accountability:*** to employers, funders and the public.
5. ***Professionalism:*** researchers having sufficient skills and training to do the job and meet professional standards.
6. ***Safety:*** of all involved in research.
7. ***Authorship:*** should be appropriate.

ethical norms of conducting research. The seniors may tutor the wrong methods to accelerate the process of performing research or writing an article. There is a dire need to produce strong and learned mentors to pass on the true message to the juniors.

How to avoid misconduct:

Research integrity (RI) and responsible conduct of research emerged as a research topic in the 1990s after public reports of scientific fraud and the response by national policy makers to deal with the problem.[12]

"Research integrity can be defined as the trustworthiness of research due to the soundness of its methods and the honesty and accuracy of its presentation."- Draft Singapore Statement (2010) Dec 5, 2011.[13]

'Responsible Conduct of Research' (RCR) refers to a wide range of areas of research compliance, professional conduct, and personal responsibility.[14]

Both RI and RCR are implied from initiation to conclusion of research. They include, conducting research and finally getting it published. The components comprise of:

- **HONESTY -** convey information truthfully and honouring commitments.
- **ACCURACY -** report findings precisely and take care to avoid errors
- **EFFICIENCY -** use resources wisely and avoid waste
- **OBJECTIVITY -** let the facts speak for themselves and avoid improper bias
- **Commitment to creating an environment that promotes responsible conduct** by embracing standards of excellence, trustworthiness, and lawfulness.

Following all the guidance provided by institutions involved in research and its publication, will assist the mentors and the students to perform honest research and publish the true results.

Some of the Helping Hands for conducting ethical research and its writing comprise of:

-Committee on Publication Ethics (COPE) https://publicationethics.org
-World Association of Medical Editors (WAME) www.wame.org
-International Committee of Medical Journal Editors (ICMJE) www.icmje.org

CONCLUSION:

Research is necessary for promoting health and overcoming disease. Writing the research findings are obligatory to spread the knowledge to other members of the profession, researchers and the patients. For performing research and getting it published, the initial requirement is **Responsible conduct and Integrity.** If researchers adhere to the principles of these two guidelines, there will be no misconduct and true and honest results will be obtained and dispersed, leading to success in treatment of many diseases.

CASE-1

Plagiarism Word for word:

An article published in one of the monthly issues of the Journal of Pakistan Medical Association (JPMA) in 2006 was

reported by a reader to have been published earlier in an American Cardiology Journal in 2003 with a slightly changed title and American authors. The article submitted to JPMA was the same one with authors from Pakistan. After perusal, it was confirmed that it was the same article with change in names of the institution and the authors.

In those early years, JPMA did not have the facilities of scanning for overlapping of text. The authors who belonged to a teaching institution of Pakistan, were contacted and asked for an explanation. Both articles in pdf format were sent to them for providing their opinion.

It was made evident that taking an article from the web and making slight changes and replacing the authors names was unethical and a serious crime. According to COPE's guidelines, the corresponding author was asked to provide an explanation as this incidence called for a disciplinary action.

The author sent a prompt reply.The letter was in the national language, Urdu, stating that the author and his colleagues were not competent in the English language. He wrote that they were not aware that the article had been stolen. As they had difficulty in writing they gave their data to a friend whom they trusted and who worked on it and submitted it to JPMA.

The article was flawless and was immediately accepted after all the processes. The writer friend unfortunately passed away. The authors tried to prove their innocence by stating that they had not understood what the article was about, which was not acceptable by the journal. The authors were told that according to rules of ICMJE and COPE, the responsibility of an article from all aspects lies on all the authors equally.

The guidelines provided by COPE for redundant publication and plagiarism were adopted by the editor of JPMA. The first step was to retract the article from the JPMA website, National indexation agency, Pakmedinet and Pubmed-medline.

The head of the authors' institution was informed about the incidence and the regulatory authority, PMDC was sent a report with all supporting documents.

This incidence of misconduct brought shame and disgrace to all the authors and as learnt later, their promotion was stopped.

This was an evident case of redundant publication or a total word to word plagiarism, which is unethical. The authors had to face embarrassment.

CASE 2

Image manipulation:

An article published in the prestigious journal *"Nature"* in January 2014, authored by a Japanese research scholar Haruko Obokata, from the Riken Center for Developmental Biology in Kobe was retracted in July 2014 after post-publication review. The reasons stated were plagiarized writing, misidentified images, and misreported data.[15] The data had been falsified.

The story goes as follows:

Haruko Obokata, the lead author, who performed the studies and wrote the manuscripts, was found guilty of falsifying the data. Biologist Yoshiki Sasai, leader of the Riken research group, was a co-author on two of her papers. The research was on stem cells and figures had been manipulated to produce extra ordinary results.Sasai was the senior co-author, a top scholar having research spanning on developmental biology, stem cells and the generation of organs and tissue engineering. Sasai had planned to improve on each of his three-dimensional brain structures, for example creating a pituitary gland with a blood supply.[16]

Over the past several months, a post publication peer review raised questions on research misconduct on both publications. Investigations focused on the two papers about a simple new method for creating stem cells. The papers describing the method, called stimulus-triggered acquisition of pluripotency (STAP), were published in the prestigious journal Nature in January, 2014.[17]

On 1 April, the RIKEN committee investigating the case gave the judgement that Obokata had committed scientific misconduct by including in one of the papers a manipulated

figure and an image that she had already used in her dissertation to illustrate a different phenomenon.[18]

Sasai, the senior colleague and co-author, was cleared of any direct involvement, but he was found to have *"grave responsibility"* for failure in oversight of the project. He was awaiting the judgment of a RIKEN disciplinary committee who declared that Sasai should have taken more care to ensure the reproducibility of such extraordinary claims, and that he was guilty of overhyping the research.

The articles were retracted by Nature in August, 2014.[19]

Although Prof Sasai was not declared guilty of the offence, but he felt deeply ashamed which lead to his committing suicide on 4th August, 2014.[20] A scientific fraud with a sad end.

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