



Review Article

Insight into modern-day plagiarism: The science of pseudo research

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ABSTRACT

In today's world, when there is a rapid surge of biomedical publications, maintaining research integrity of articles is of prime importance. It is expected that the submitted work is genuine of submitting authors'. Ease in the availability of these digitally published biomedical papers and pressure to publish for academic and professional advancement had resulted in numerous novice scientists and students falling into unethical practice of plagiarizing others' work to get the job done quickly. Plagiarists are continuously in search of finding new and easy ways to plagiarize someone else's work, currently seen as different forms of plagiarism. Hence, this narrative review intends to help young and upcoming researchers to understand plagiarism, its type, the reason for plagiarists getting involved in that, and possible ways to detect and prevent it.

KEYWORDS: *Bioethics, Editorial policies, Medical writing, Plagiarism, Scientific misconduct*

INTRODUCTION

In the biomedical sector, where conducting a research and publication in respectable indexed journals is the highest reward for scholarly and professional research scientists, the ease of access to these published researches via the internet has helped to develop and thrive plagiarized researches [1]. The higher number of publications and their credit points according to the Medical Council of India and Dental Council of India has resulted in considering these points as measures of researchers' success in comparison to other researchers [2]. However, those who fail to publish their research remain unadvantaged in biomedical sector for getting opportunities in academic advancement.

Publishing of the research is considered the ultimate goal for a researcher, whereas many unpublished kinds of research struggle to thrive and become nonexistent to the scientific community [3]. Research integrity not only relies on appropriate methodology and conduction of the research but also relies on proper documentation, reporting, and publication of the research. Unethical methods used by some authors to alter these steps are called misconduct, and one such misconduct is plagiarism. Plagiarism not only floods the biomedical literature with false copy-pasted work but also compromises the validity and reliability of such literature [4,5].

A plagiarist not only copies words or short phrases for paraphrasing but also can go to an extreme extent of copying the whole work without giving the other author his/her due credit [6-8]. Today, with continuously evolving pseudoscience

of plagiarism, it is the need of time to adopt a zero-tolerance policy toward plagiarism. No authors should be exempted from punishment and penalties, considering whether the misconduct of plagiarism was intentional or not.

With this narrative review, the authors intend to help young and upcoming researchers to understand plagiarism, its types, reason for plagiarists committing it, reliable detection methods and remedies to prevent it.

WHAT IS PLAGIARISM IN BIOMEDICAL PUBLICATIONS

The word plagiarism is derived from the Latin word "Plagium," meaning manstealing or kidnapping. In terms of biomedical publication, the word plagiarism means stealing the work or the writings of another researcher and presenting as own. It can be both unintentional and intentional [9]. The World Association of Medical Editors states that the term plagiarism implies "appropriation of the language, ideas, or thoughts of another without crediting their true source, and representing them as one's original work [10]." However, the Committee on Publication Ethics (COPE) has defined

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plagiarism as “the unreferenced use of others’ published and unpublished ideas [11].” The work of an author can be said to be plagiarized when six or more consecutive words are copied or seven to eleven words are overlapping the set of thirty letters [9].

CLASSIFICATION OF PLAGIARISM

Although there are many forms of plagiarism that exists, on the basis of intent of author to plagiarize and extent of plagiarized material being used to fabricate the biomedical literature, the plagiarism can basically be classified as follows.

BASED ON INTENT OF AUTHOR TO PLAGIARIZE

Unintentional plagiarism

Unintentional and improper paraphrasing or citation refers to as unintentional plagiarism. In such instances, the authors are truly unaware of the proper referencing style and citation principles to be followed when writing scholarly manuscripts for publication [12-14].

Intentional plagiarism

Deliberate copying of another authors' writing or work without giving credit and presenting it as one's own original work is intentional plagiarism [12,15].

BASED ON THE EXTENT TO WHICH AUTHORS PLAGIARIZE

Direct plagiarism

This type of plagiarism is done with a definite intention to plagiarize; here, the author copy-pastes word-to-word text of other authors’ writing to create his/her work without giving credit or using quotation marks [12,16].

Mosaic plagiarism (patchwork plagiarism)

This type of plagiarism is described as the borrowing of the phrases from an original work of another author without using quotation marks, or a simple replacement of other authors’ writing or words by synonyms, ultimately trying to keep actual language same and meaningful as found in original work [13,17].

THE MOST COMMON TYPE OF PLAGIARISM IN BIOMEDICAL PUBLICATIONS

Secondary source plagiarism

This type of plagiarism occurs when a researcher uses a secondary source but purposefully cites only the primary once within the secondary, e.g., citation of primary sources from a conducted meta-analysis. This type of work, on one hand, fails to give appropriate credit to the work of the authors of a secondary source and, on the other hand, gives a false image of the amount of review that went into research [16,18].

Invalid source plagiarism

This type of plagiarism occurs when researchers quote or reference an inaccurate or incorrect source. This act of citing misleading and nonexistent sources is done to increase the list of references and hiding inadequate research [18].

Duplication or self-plagiarism

In this type of plagiarism, the authors use data or text or even the results from their own published studies or presented paper and publish it without properly citing it or purposefully avoiding it in order to show increased productivity [19].

Paraphrasing

This type of plagiarism is also known as intellectual theft as it involves using the published work of other researchers and changing the words or using synonyms, thus making it look like original research. Some writers purposely avoid quoting the real authors' work in order to avoid getting caught stealing original idea or concept [16,18].

Repetitive research plagiarism

It is one of the types of self-plagiarism as it involves repeating or reusing of data or the entire text from a study with similar methodology and results without properly attributing or citing it. This type of plagiarism gives a false image of increased productivity [18].

Replication plagiarism

This is a serious misconduct in the author’s part and is a direct violation of research ethics. Replication in simpler terms is the submission of a research paper to more than one journal, resulting in the publication of the same paper more than once. Such practice on the authors' part can lead to immediate retraction of an article from the journals [18,20].

Verbatim plagiarism

It is also a type of intellectual theft as the author copy-pastes the work or writing of another author without properly crediting them. In biomedical publication, it can happen in two ways. The first is when the plagiarist cites the source of the original paper, but does not mention or indicate that it is a direct quote. In general, the quotes taken directly should be kept within the quotation marks. In the second type, plagiarists do not quote the source at all, thus devoid the original researcher from its deserved credit [18,21,22].

Translational plagiarism

This type of plagiarism occurs when a research manuscript is published by the original researcher in one language (e.g., English language) and then translated by the same or another author using Google Translate or other computerized translation methods to publish in some other languages [23,24].

Complete plagiarism or stealing

This is a type of extreme intellectual theft, in which the plagiarist takes research, an unpublished manuscript or work of another researcher and submits claiming his/her own [16,18].

WHAT ALL CAN BE PLAGIARIZED IN BIOMEDICAL LITERATURE

In today’s digital world of internet, plagiarism had crept to extreme extents. Today anything can be plagiarized. Plagiarists show their talent from copying basic things such as someone’s research title, ideas, concepts, hypothesis to extreme copying of text, methodology, data, tabulations, graphs, and even figures. In some instances, plagiarists had been caught copying

even images and graphic arts from the internet without crediting them [25].

WHY DOES PLAGIARISM OCCUR IN BIOMEDICAL LITERATURE?

Instances of plagiarism are widespread in the internet era because of poor language skills and easy access to biomedical literature through open access movements which can be easily copy-pasted. Inexperienced researcher and students are under pressure to “Publish or Perish”, indulge themselves in corrupt practice of plagiarism due to lack of knowledge about ethics in the publication of biomedical research. Plagiarism may also result due to ignorance of the fact or sheer unawareness that plagiarism detection softwares are readily available, and journal editors can detect copy-pasting. Previous publication of the manuscript in unreviewed predatory journals may also give overconfidence to the inexperienced researcher that no one is going to check. While some novice researchers and students are involving themselves unwittingly in unethical plagiarism activities due to sheer insufficient knowledge and awareness in biomedical research ethics and morality [25].

CURRENT SCENARIO OF PLAGIARISM IN SCIENTIFIC LITERATURES

It is extremely important to understand that what is the current scenario of plagiarism throughout the world, so that each author and researcher can realize that how the corrupt practice of plagiarism is destroying the biomedical science.

A survey conducted by Nogueira *et al.*, in 2017, reported that out of 72 retracted articles from 44 journals, plagiarism was the main reason for retraction in 13 articles, i.e., 18.1% of the total articles. However, overlap of significant information was found in nine articles, i.e., 13.6% [26].

Analysis of Malaysian retracted papers by Aspura *et al.* in 2018 revealed that their analysis identified 125 retractions between 2009 and June 2017, of which 33 retractions were with clearly defined reason. Out of these 33 retractions, 12 (9.6%) were retracted due to duplicate publication, whereas plagiarism and self-plagiarism are the main reason accounting for 6 (4.8%) and 4 (3.2%), respectively [27].

Another descriptive study conducted by Campos-Varela and Ruano-Raviña in 2017 revealed that their study found 1082 retracted publications indexed in PubMed between January 1, 2013, and December 31, 2016. Analysis of the study data showed the ugly side of scientific misconduct, with plagiarism being the main reason for retraction in 354, i.e., 32.7% of the retractions [28].

The News from Indian continent is also not so encouraging and shows the hideous side of plagiarism in biomedical literature. In a viewpoint published by Misra *et al.* in 2017, the author reports that they identified 46 retractions from India between January 1, 2010, and July 4, 2017, in the MEDLINE database. The most prevalent reason for among these article retractions were duplication of text, figures, or tables in 41.3% of articles, whereas duplicate publication lead to retraction of 15.2% of articles [29].

An excellent example of internet misuse was reported by Eysenbach, in case report of cyber-plagiarism, which took place in Journal of the Royal College of Surgeons of Edinburgh. Here, the plagiarism report generated by the software tool revealed that more than one-third (36%) of the suspected article consisted of phrases that were copied directly from multiple websites without giving credit to the website writer. The extent of plagiarism was to such an extent that the guilty author even copied subjective opinion expressed as statement along with general sentences from this website [30].

It is therefore obvious from the above-mentioned incidences that web is also a source of inspiration for many young researchers as a cut-copy-paste for many plagiarized texts. Incidence of plagiarism is not limited to any particular country or biomedical field, but occurs in almost all the academic fields.

CAN PLAGIARISM BE AVOIDED?

Education and training regarding responsible submission of research

A study conducted by Landau in 2002 reported that plagiarism results from students' inadequate knowledge of proper citation techniques. Proper education and training about plagiarism identification and appropriate way of paraphrasing skills led to better detection of plagiarism. Ironically, when students were taught to identify plagiarized text and paraphrasing, they were less likely to get involved in plagiarizing text [31].

Even procedural plagiarism training program conducted by Newton in 2014 reported that students of the intervention group also performed better as compared to the control group in reference to patchwriting and paraphrasing exercise [32].

USE OF PLAGIARISM DETECTION SOFTWARE

One of the most suited methods of detecting plagiarism in academic papers and manuscripts is utilizing plagiarism detection software. These softwares can not only be used by the editors of the journals in initial screening to assess the extent of similarity and early rejection of plagiarized manuscripts, but also prevent such manuscripts from entering the formal peer-review process. These softwares on the other hand can also benefit authors by assessing their manuscripts for possible plagiarism, so that their manuscripts are not rejected by the journals. Some of the commonly used softwares for the detection of plagiarism are iThenticate, Plagiarism checker X, eTBlast, Turnitin, CitePlag, Plagium, Plagiarism, and Plagiarism Detect [33].

PUNISHMENT AND PENALTIES FOR PLAGIARISTS WHEN FOUND GUILTY

Copyright in Indian scenario is for the lifetime of its creator, i.e., from the day of origination of the respective material to 60 years after original creators' death. Although copyright has no distinctive role in plagiarism, it automatically sets in and comes in to action, as soon as then matter is written or published. Copyright protection is conferred on the

type of works and originally means that the work has not been copied from any other source and is original [34].

As per Section 17 of the Indian copyright act, “the author or creator of the work is the first owner of the copyright.” However, a particular section of the copyright act (i.e., section 57) also known as “Moral Rights” or “authors’ special rights” can be used to deal with the plagiarism. This section basically defines two moral rights of the author, i.e., right of paternity and right of integrity [34].

The right of paternity means that there is a right of an author to claim authorship of work and has a right to prevent all others from claiming authorship of his/her work. However, the heart of the section is the “Right of integrity,” which empowers the author to prevent distortion, mutilation, or other alterations of his/her work or any other action in relation to said work, which would be prejudicial to his/her honor or reputation. Hence, under these two sections of copyright law, the author can claim punishment for the copyright infringer or may claim authorship in the given plagiarized work [34].

It is seen that plagiarist writer is usually involved in verbatim plagiarism to create his/her work, and they use source texts or quotes without proper citation and quotation marks. This makes them fall under copyright infringement laws. Therefore, under these two sections of copyright law, an author may claim punishment for the infringer of copyright or claim authorship in the plagiarized work in question.

As per Part III (Section 4) of University Grants Commission (Promotion of Academic Integrity and Prevention of Plagiarism in Higher Educational Institutions [HEIs]) Regulations, 2018, every HEI should establish an Institutional Academic Integrity Panel. As per the rules, when someone is found guilty, he/she should be imposed with the penalty considering the severity of the plagiarism. These rules consist of total four levels ranging from zero to three, and penalties under each level are as follows: Level 0 (minor similarities) deals with similarities up to 10% and has no penalty and Level 1 deals with similarities above 10%–40% – such student shall be asked to submit a revised script within a stipulated period of not exceeding 6 months. Similarities above 40%–60% will be dealt under Level 2, and under this level, student shall be debarred from submitting a revised script for 1 year, whereas for those students involved in plagiarism with similarities ranging 60% and above will be kept under Level 3, and registration of such students for the program shall be canceled [35,36].

In case, self-plagiarism is suspected in a submitted manuscript, journal editors can follow COPE guidelines to overcome the dilemma of when to propose revision and when to reject a submitted manuscript. According to the guidelines, when the self-plagiarism is suspected, and the author had cited the previous publication, the editors or the reviewers should propose for revision of manuscript with the plagiarized part being corrected. However, to some extent, the overlap in the methodology section can be tolerated, but still, the final decision to allow or not to allow depends on the editor. Nevertheless, in the event that the previous work has not been cited, the submitting author should be notified in

such situations, and the manuscript should be requested with the original article cited for major revision. No considerations should be made to propose the revision of the manuscript when a significant portion of the self-plagiarized text is found, or the plagiarized manuscript contains already published data and methodology [37].

In case of authors involved in obvious violation of copyright transfer and publication of plagiarized material, the plagiarist should be punished by journals and publishing companies by imposing penalties ranging from suspensions, retraction of the published article to blacklisting of the author [38].

CONCLUSION

It is well known that many journals are predatory or are non-English. Therefore, the level of plagiarism that we see may be the iceberg's tip. Many plagiarists may use content of the published and translated articles to fabricate their own work without carrying out their own research. Despite of all these incidences and much of awareness regarding plagiarism among the institution review board members and journal editors, still much confusion exists that who, when, and on which conditions can be declared plagiarist. Educational institutions, government, and policymakers should commit to zero-tolerance policy on plagiarism and should come up with standardizing and strict guidelines to who, when, and on what basis are considered to be involved in plagiarism. In addition, it is necessary to develop several other plagiarism detection methods for early detection of plagiarism and ways of dealing with it. Penalties and punishment should be listed out based on the severity of plagiarism and who will be authorized to sanction them. A forum should be set up at the national and international level to show names of the authors involved in plagiarism if proven guilty, making it difficult for them to write other publications for a certain period of time in the event of less serious plagiarism. Last but not least, educational attempts should be made at the grassroots level to promote research integrity and ethics in upcoming researchers and those who are already established. Genuine researchers with good intention for the upliftment of biomedical science will provide a huge leap toward scientific evolution and thus promoting improvement in the quality of biomedical literature.

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