Chapter 3

Ethical Publications in Medical Research

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Abstract

Ethics in medical sciences research may not always translate into ethical publications. Unfortunately due to lack of regulatory bodies, publication misconduct is now a global menace for the scientific community. Publication misconducts are not only restricted to research fraud or data manipulations alone but also seriously include plagiarism, duplicate publications especially on figures and tables, authorship disputes and conflict of interests. As global scientific research is expanding particularly in the field of health sciences hence possibilities of more rise of unethical practices from research to publications are very high, authors suggest a strong peer-reviewing system, use latest technological support, strong publication ethics policies, active monitoring, protection of whistle blowers and more liaisons between journals and research institutions or universities possibly to prevent publication misconduct effectively. This chapter discusses how medical publications might have abused various ethical norms not only while conducting research but also during the publication process. The review also discusses the possible preventive measures against unethical practices of research publications.

Keywords: scientific misconduct, medical journals, ethical publications

1. Introduction

Ethics in medical sciences research may not always translate into ethical publications. As peer pressure rises the ethics of conducting medical research and subsequent writing scientific papers and publications gradually erodes in the last couple of years. This phenomenon so much deeply penetrates into the medical researchers that various professional bodies, universities and governments are forced to press panic button against unethical medical research and publications [1]. Ethical violations in conducting medical research always

promote unethical scientific publications. The most important outcome of any research is its findings and observations and definitely improper research or scientific misconduct will lead to unethical publications. The research misconduct that promotes unethical publication impacts badly on other researchers who follow the steps shown in unethical scientific publications and resulting wrong practices or applications on patients [2]. Scientific and research misconduct is defined very clearly by the Royal College of Physicians at Edinburgh —'as any behaviour by a researcher, whether intentional or not, that fails to scrupulously respect high scientific and ethical standards. Various types of research misconduct include fabrication or falsification of data, plagiarism, problematic data presentation or analysis, failure to obtain ethical approval by the Research Ethics Committee or to obtain the subject's informed consent, inappropriate claims of authorship, duplicate publication and undisclosed conflict of interest (COI)' [1]. The statement specifically mentioned that research misconduct does not end at the research works level but also extends to the publication level. One must note that research misconduct either is done intentionally or unintentionally—hardly it matters on its impact to the society that includes fellow researchers, authors, reviewers, editors, institutes, universities, nations and above all future students of medicine, professionals and patients as a whole. In the era of 'publish or perish' medical fraternity should not focus only on his/her career advancement but also consider the professional ethics including research and publication ethics seriously [3]. How serious a research misconduct may be the story of South Korean stem cell scientist Woo Suk Hwang is enough to speak to that! Dr. Hwang's revolutionary work on stem cells published in Science (2004 and 2005) and later found that both the papers are fakes [4].

According to Fanelli, research misconduct should be redefined as 'any omission or misrepresentation of the information necessary and sufficient to evaluate the validity and significance of research, at the level appropriate to the context in which the research is communicated' [5]. Faneli also stated that 'scientific knowledge is reliable not because scientists are more clever, objective or honest than other people, but because their claims are exposed to criticism and replication' [5].

The consequence of research misconduct not only tarnishes the image of the spirit of science but also collaterally damages many things like:

1. Society and humanity: Wrong procedures, false and fabricated data bring out products, which may be considered unsafe for humanity. Here comes the publication ethics regulation, which perhaps control or prevent these danger.

2. Fellow researchers: Published data and knowledge derived from research misconduct in medical sciences will mislead fellow medical researchers and that will lead to huge loss of money, funds, times and reputations.

3. Medical practitioners and students: Medical practitioner also suffers a lot due to unethical research publications as many wrong diagnostic and therapeutic published guidelines lead to professional disaster for them. Medical students might be taught subjects and understanding based on false and fabricated data which will jeopardize the career of future doctors.

4. Public trust and Government policies: Research misconduct and subsequent unethical publications may destroy public trust on science. Such false information and data may misguide government and lead to implement some erroneous health policies and laws. The ultimate sufferers are common man and society.

Hence, we can say that all the stakeholders from researchers, institutions/universities, government agencies, medical journals or book publishers are going to be devastated by research misconduct, which may also be considered as the most serious scientific assault on human health sciences.

While conducting medical research, researchers are usually careful and take all the precautions against any sort of ethical violation either in human or in animal research as per the guidelines of various apex professional bodies. Institutional Regulatory Body/Institutional Ethical Committee of all the countries function near similar pattern which strictly follow Declaration of Helsinki and other international guidelines. In general, all the institutional ethics committee critically obey all the ethical principles as per the Declaration of Helsinki by World Medical Association (WMA), National Institute of Health (NIH), the Food and Drug Administration (FDA), Environmental Protection Agency (EPA), Singapore statement of research integrity, ICMR guidelines, etc. In a nutshell, American Psychological Association comes out with five principles for research ethics: (i) discuss intellectual property frankly, (ii) be conscious of multiple roles, (iii) follow informed consent rules, (iv) respect confidentiality and privacy and (v) tap into ethics resources [6]. NIH also summarizes the principles of 'Codes and Policies for Research ethics' as the following: (i) honesty, (ii) objectivity, (iii) integrity, (iv) carefulness, (v) openness, (vi) respect for intellectual property, (vii) confidentiality, (viii) responsible publication, (ix) responsible mentoring, (x) respect for colleagues, (xi) social responsibility, (xii) nondiscrimination, (xiii) competence, (xiv) legality, (xv) animal care and (xvi) human subject protection [7]. Unfortunately, such strong and mandatory authority is unavailable in case of research publications.

1.1. Aims

This review is undertaken to discuss how medical publications might have abused various ethical norms not only while conducting research but also during the publication process. The review also discusses the possible preventive measures against unethical practices of research and publications.

1.2. Manifestations of medical research misconduct

There are several ways in which ethical violation in medical research are noticed, namely altering instrumentation or research procedure, nonreplicable findings, copying ideas, copying results, false study design, inadequate data, falsifying ethical consent, image manipulations, plagiarism, duplicate publication, etc. These unethical practices are taken place at each of the steps in research, that is performing works to disseminating knowledge through scientific publications [8, 9]. The most common research misconduct, which is manifested through publications, is falsifications and fabrication of data. As per NIH, 'fabrication' means

'the intentional act of making up data or results and recording or reporting them' whereas 'falsification' is manipulating research materials, equipment or processes, or changing or omitting/suppressing data or results without scientific or statistical justification, such that the research is not accurately represented in the research record [10]. It is noticed that 'figures' and 'graphics' where maximum fabrications or falsification take place. The graphical manipulations are mainly through Photoshop and journal editors are struggling hard to fight against these hi-tech manipulations on research data [11, 12]. Overall, we can say that research misconduct manifestation is multidimensional. These may be classified as (1) General research misconduct, (2) Research application misconduct, (3) Data generation misconduct, (4) Financial misconduct, (5) Behavioural misconduct and (6) Publication misconduct.

The foremost important manifestation is *general research misconduct*, which includes fabrication, falsification and plagiarism. These three unethical research practices are very serious offences as it makes research either misrepresented by the facts or underrepresented by the truth. Usually, such unethical practices in research are due to peer pressure and personal gains and pressure from research sponsors. *Research application misconduct* usually occurs while adopting wrong or poor research design or technical errors during experimental, computational and statistical analysis. Improper uses of human subjects, patients or animals also lead to research misconduct and result in ethical violations. *Data generation misconduct* includes false data generation, not including real data in research, not sharing true data with colleagues' especially multicentre studies. *Financial misconduct* in research usually includes misuse of research funds like unauthorized purchase procedures, use of research funds for personal reasons, disclosure of conflict of interest, etc. *Behavioural misconduct* covers inappropriate behaviours towards colleagues, research scholars and gender and religious insensitivities on students, colleagues, patients and subjects. Usually, *publication misconduct* occurs due to authorship dispute, ghost and gifted authorship, plagiarism, duplicate publication and suspicious clinical trials. Study on misconduct in clinical trials found that the most serious forms of research misconduct in clinical trials are selective and biased reporting [12, 13].

1.3. Factors that influence research misconduct

Various factors actually induce research misconduct like:

1. Publish or Perish pressure.
2. Severe competition for funds.
3. Promotion or career advancement policies.
4. Pressure from research sponsors to obtain desired results.
5. Lack of knowledge on research ethics.
6. Desire to 'go ahead'.
7. Personal characters.

In most of the cases, research misconduct is suspected, identified and reported by colleagues. Usually, researchers who work alone and never allow others to observe his or her research

works or researchers who are self centric and do not have an attitude to work in a team are primarily prone to do research misconducts. Research findings in medical sciences should be always repetitive at any place and anytime. Failure to repeat research results by one's own laboratory or external laboratories definitely suspect misconduct.

1.4. Questionable research practices in medicine

These are some criteria which are not direct research misconduct but definitely raise suspicion:

1. Failing to retain significant research data for a reasonable period.
2. Maintaining inadequate research records, especially for results that are published or are relied on by others.
3. Conferring or requesting authorship on the basis of a specialized service or contribution that is not significantly related to the research reported in the paper.
4. Refusing to give peers reasonable access to unique research materials or data that could support published papers.
5. Using inappropriate statistical or other methods of measurement to enhance the significance of research findings.
6. Inadequately supervising research subordinates or exploiting them.
7. Misrepresenting speculations as fact or releasing preliminary research results, especially in the public media, without providing sufficient data to allow peers to judge the validity of the results or to reproduce the experiments.

1.5. Reasons for questionable research practices

The reasons for questionable research practices may be due to poor supervision, excessive workloads, poor training in research, lack of interest of researchers and being over ambitious. These can be found in principal investigators, study coordinators, research scholars, administrative staff, technicians and even the research subjects themselves.

1.6. How questionable research misconduct is done?

The following are some examples of questionable research misconduct [14]:

– Dates misrepresented.
– Duplicate X-rays: different names.
– Blank laboratory reports to fill in.
– Fake subjects: obituary names.
– Analysis done after subjects died.
– Same subject different names.

- Nonexistent subjects created.
- Dates changed in records to match washout periods.
- Consent not signed before entering the study.
- Unqualified staff doing research.
- Inadequate records.
- Failure to get IEC/IRB approval.
- Failure to report changes in research.
- Bogus laboratory results reported.
- Samples study from only a few subjects.
- Subjects received prohibited medication while on study.
- Failure to report adverse events.

Hence, we can say that from knowledge generation (ethical research) to knowledge dissemination (ethical practices and publications) – medical ethics is a common component of research integrity and medical science research cannot afford to lose this integrity for the interest of the humanity (**Figure 1**).

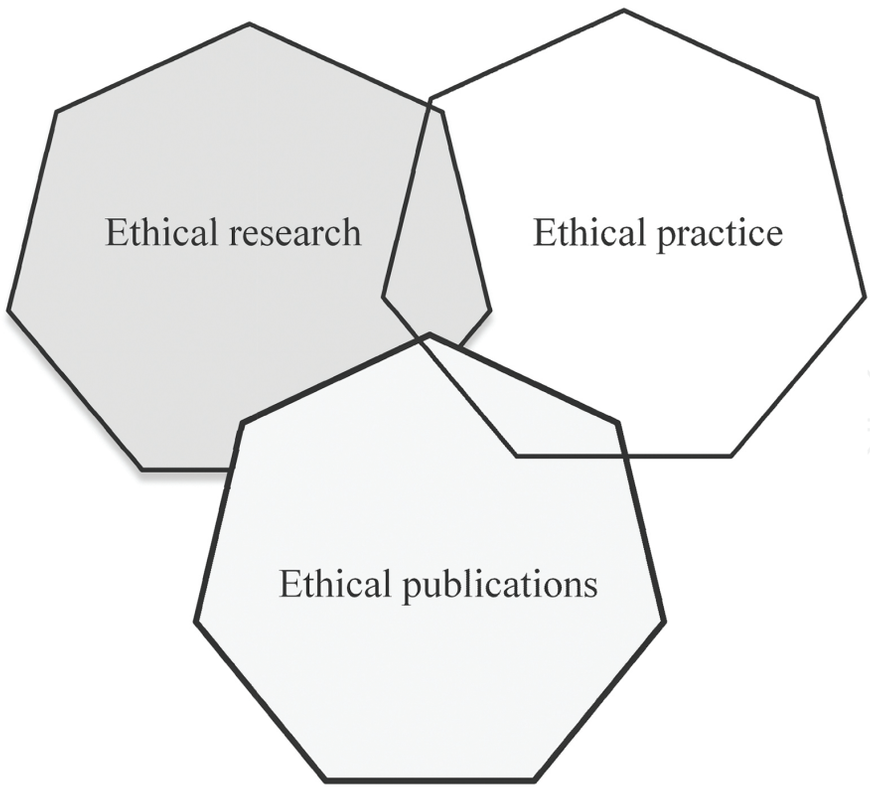

Figure 1. Research integrity through ethical research, practice and publication.

2. Publication ethics

Graf et al. [15] said that academic publishing depends mainly on 'trust'. In the system of research publication procedure, editor trusts reviewers, authors trust editors by expecting fair reviewing processes and finally readers trust authors, reviewers and editors for providing honest sciences. In general, common public outside of research community considers physicians and scientists are just demigod with high morale and integrity. 'Scientists are generally perceived as well-intentioned seekers of truth; universities, as cathedrals of learning and as producers of knowledge vital to the health and welfare of society' [16]. Unfortunately, reports of unethical research publications shake the public confidence on medical scientists. Although medical practitioners, teachers and researchers can recognize publication misconduct and ignore that to some extent, chances of un detection of mistakes and doubtful observations are also may lead to serious consequences. Thorough understanding of publication ethics in medical research is need of the hour. World Association of Medical Editors (WAME), International Committee of Medical Journal Editors (ICMJE) and Committee on Publication Ethics (COPE) are the guiding force to interpret ethical publication appropriately [14]. They have provided guidelines on the publication ethics policies for medical journals on various issues such as study design, authorship, peer review, editorial decisions and plagiarism and also further guided the procedural guidelines to tackle those publication misconduct. These bodies also enlighten editors on various issues such as conflict of interest, authorship disputes, redundant publications, fabrication of data, plagiarism and human and animal rights [17].

2.1. Ethical issues

2.1.1. Why do publication ethics matter?

Published research influences other researchers and establishes credibility for individual or journal. Honest scientific reports build trust among peers and within scientific community. Publication ethics is not confined to one country—it is global by approach and is commonly held throughout the world. Author's seven deadly sin: **Table 1** depicts unethical practices of authors.

2.1.2. Plagiarism

In the era of copy and paste, an excessive dependence on search engine make plagiarism a universally popular among the medical scientists who like to prefer a short cut for the way of success in publication. Plagiarism is defined as 'to copy ideas and passages of text from someone else's work and use them as if they were one's own' [18]. The word plagiarism may be further extended to unreferenced use of the ideas of others submitted as a 'new' paper by a different author! One must know plagiarism may not be considered always as accidental. The most vulnerable part for plagiarism in any research publication is 'methods'.

Another form of plagiarism is self-plagiarism where author copy and paste from his/her previous publications including results, tables and figures without providing copyright clearance certificate from publishers. Self-plagiarism is also an equal crime or research

misconduct like simple plagiarism. Fortunately, due to the availability of many anti-plagiarism softwares, this menace has cut down notably. Editor must make his/her peer reviewers alert and possibly train them on this issue. Universities, medical institutes and funding authorities should also sensitize its medical researchers and practitioners on it. The best way to avoid plagiarism is to cite other's work always in the research articles, put the cited words in quotation marks and seek permission from appropriate authorities for references to cite tables, figures, etc. COPE has given a very useful guideline through flow chart on plagiarism for both submitted manuscripts and published manuscripts [18]. The Committee on Publication Ethics (COPE) is a UK-based charitable organization (established 1997) working mainly on research and publication misconduct. COPE has provided some very authentic guidelines addressing publication ethics from authors, reviewers, editors and publishers' point of views. COPE defines the good practices in publication of research articles, which are really very helpful for authors, readers, editors, peer reviewers, editorial board members and journal and book publishers. COPE is the first organization, which advocates accountability of research institutions for its employee scientist's misdeed [19]. ICMJE also directs authors and editors to follow COPE guidelines in case of suspected unethical practices on publications or any ethical dispute [20].

Sl. no.	Sin	Example
1	Carelessness	Citation bias, understatement, negligence
2	Redundant publication	Same tables or literature review reported without noting prior source
3	Undeclared conflict of interest	Failure to cite funding source
4	Unfair authorship	Failure to include eligible authors, honorary authors
5	Human/animal subjects violations	No approval from review board or ethics committee
6	Plagiarism	Reproducing others' work or ideas without as one's own
7	Other fraudulences	Fabrication or falsification of data, misappropriation of other ideas or plans given in confidence

Table 1. Author's ethical misconduct.

2.1.3. Redundant publications

Redundant or duplicate publication is another serious issue pertaining to ethical publications. It is often revealed by reviewers and readers. In the modern era of Internet, it is relatively easy to find out such unethical publication in the form of duplicate publication. Many times, it happens without the knowledge of co-authors or the group of researchers who published it in previous journal. This unethical publication actually causes serious damage on humanity [21]. It makes waste of time of peer reviewers and editors, waste journal print pages unnecessarily. Redundant publication sometimes assault on academic reward system. It also violates

copyright acts and inflated number of publications that injure society as a whole. Below, the facts that make redundant or duplicate publications are mentioned:

- Data in conference abstract? – **No**
- Same data, different journal? – **Yes**
- Data on website? – **May be**
- Data included in review article? – **No if permission is taken**
- Expansion of published data set? – **Yes**

There are certain norms that may help clarify further on duplicate publications like if one takes an approval from both the journals and subsequently publishes, it may not be considered as 'duplicate'. Secondary version for paper intended to different language readers with appropriate permission may not be taken as 'duplicate'. But in any case secondary version faithfully reflects data and interpretations of the primary version with a clear message that it is the secondary publication for journal 'y' based on previously published article (primary) in journal 'x' in 'z' language. COPE has given some useful guidelines on how to handle suspected redundant (duplicate) publications, especially for journal editors. COPE instructed that at the beginning editor must verify whether it is the case of major or minor redundancy. Major redundancy is always considered with evidence of deliberate duplication such as changes of title and data sheet with identical findings. Minor redundancy is something 'salami publication' types with looks of extended follow-up of previously published article. Whatever it may be, editor must contact corresponding author and ask explanation, if satisfied, do not take any action. If it is not found satisfactory, editor has many choices such as inform the incidence to author's superior organizational authority/employer or prompt rejection of manuscript or notice of retraction immediately [22].

2.1.4. Authorship disputes and ethical misconducts

Probably, one of the most discussed and complex ethical violation in publication in medicine is authorship disputes and ethical misconducts. The difference between 'disputes' and 'misconduct' may be proclaimed as follows:

Disputes—'Question of interpretation' like whether 'contribution' by the authors was substantial? Whether authorship criteria were discussed when research was planned ? Or it was decided before submission of manuscript?

Misconduct—Authorship is unethical like 'gift' or 'ghost' authorship.

Regarding authorship issue, International Committee of Medical Journal Editors (ICMJE) guidelines states 'anyone who has made a substantial contribution to the conception, design or acquisition of data or analysis and interpretation of data, drafting or revising the article for intellectual contents, or participated in the final approval of the version to be published is entitled to be an author' [23]. The studies revealed that 'gift authorship' is prevalent among authorship misconducts. Gift authorship is usually taken place when research or administrative hierarchy comes in to the picture or because of a colleague with whom we have a personal

relationship like son/daughter or husband/wife/relatives etc [24]. But senior researchers or administrative boss who have substantial contribution on the subject at any point like writing manuscript, editing manuscript, reviewing manuscript and providing additional knowledge with high intellectual input on writing science are not considered as 'gifted'. One must clearly remember that simply helping research by way of logistic supports such as sample collections, patients supply, chemicals and reagents supply, helping data collections or providing research funds are not the criteria to become an author [1, 25]. Another unethical authorship dispute is 'ghost authorship'. Ghost authors are the researchers who writes the research article without acknowledgement. This is very common for many cases where researcher drafts an article at the behest of pharmaceutical company. Here, the real author's name never comes in domain of publication. The problem of the ghost author is that whatever they write may not always be correct interpretation and may be biased; hence, it badly affects the researcher community. COPE, ICMJE and WAME have given certain guidelines to tackle this publication misconduct issue. Following are the summarized form of guidelines:

- Journals must have clear authorship criteria.
- Authors should disclose all contributors, regardless of author status and their specific individual contributions and affiliations.
- Authors must sign about their contributions details.
- Authors should disclose any of his/her conflict of interest and a statement whether they have received any support from medical writers [26].

Hence to be précise, it may be stated that as per ICMJE guidelines, the three important mechanics of authorship are 'intellectual input in research, contribution in writing and final written approval of the manuscript' [23, 27]. ICMJE also specifies that authorship criteria should be based only on:

- Substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data.
- Drafting the article or revising it critically for important intellectual content.

Examples of publication misconduct are authorship disputes and misconducts, which are very common in the medical professionals. Various studies in this regard showed the nature and execution of such unethical practices among medical professional. Works of Dhingra and Mishra [3] revealed that majority of respondent on questionnaires confirm publication misconduct especially authorship disputes among Indian biomedical researchers. Another study of Das et al. [25] observed clear authorship misconduct among medical faculty members of India. In their study, they have found that around 81.4% respondents from medical faculty members confessed authorship disputes in any form among themselves. Further, a comparative study with pharmacy faculty members the dispute level was found to be 29.2%, which further indicates that medical researchers are more vulnerable to authorship misconduct. The study also showed that 74.07% of medical and 68.29% of pharmacy faculty members did not have any discussion on authorship issues at any time before they actually started drafting article for publication. About 88.88% of medical and 36.5% of pharmacy faculty members also

mentioned that their professors and head of the departments were included as author although they do not have any contributions or they do not fit in ICMJE authorship criteria. About 81.4% of medical and 29.26% of pharmacy faculty members also mentioned in questionnaires that senior research colleagues interfered while writing manuscript to include their names in the drafted manuscripts. Das et al. further elaborated that even though pharmacy faculty members are better practioners of ethical authorship as compared to their medical counterparts still more sensitization is needed for them to realize ethical authorship [25]. To regulate authorship disputes and misconduct the role of corresponding author should be considered the most important one although other co-authors are also accountable. Every author must have substantial research contribution to justify their inclusion as author. All authors must take their responsibility on manuscript's every pros and cons. The accuracy of all the data, conflict of interest, disclosure of funding authority and get manuscript checked by all the co-authors are the responsibilities must be put on corresponding or principal author's shoulder [9].

2.1.5. Conflict of interest

One of the important but less admitted examples of publication misconduct is nondisclosure of conflict of interest. It may be financial (industry sponsor research) or others like personal interest like employment interest, promotion or career advancement interest, patents, personal believes, grant providing, relationship, academic competition or intellectual passion, etc [23, 28]. Most of the journals make disclosure of potential conflict of interest mandatory and do not publish articles even after acceptance if COI is not disclosed. It has been reported in a study on five leading medical journals like Annals of *Internal Medicine*, *BMJ*, *Lancet*, *JAMA*, *New England Journal of Medicine* that only 52 of total 3642 articles disclosed their potential COI, that is only 1.4% of total [29]. Another study also showed that one in three lead authors had financial interests in their research by patents, shares or payments for being on advisory boards or as a director, etc [30]. A study conducted by Das et al. [31] on awareness of COI among medical scientists/researchers from India showed that only 12% authors understand COI issues correctly and 19 % of medical authors just heard about it. Very interestingly, the authors who had clear knowledge on COI confessed that hardly they provide COI statement to the journal. The study also found that knowledge of COI is equally poor even among peer reviewers (30%) and editorial board members (25%) too! Some peer reviewers even stated that they are biased toward articles submitted by their known colleagues from medical sciences [31]. Another study also showed that there are no clear guidelines for institution and industries are other cause of COI-related issues [32]. In the complex scenario of COI issues among medical publications, editor of the journals, peer reviewers, research institutions or universities and grant providers must pay more attention to tackle this unethical issue in publications [32]. Das suggested COI case comes out even after publication, in which, the publisher and editor may apologize and issue a formal correction and subsequently retract the article [33].

2.1.6. Fabrication and falsification of data

Fabrication means cooking up data or results (fictitious by nature) as per the hypothesis of research and publishes it in a journal whereas falsification is simply manipulating data or

results. It also includes figures or graph distortions. Fabrication also covers selective reporting where authors just report a small number of significant values of the study but hide large number of insignificant observations. Such biasness completely destroys the spirit of science. Normally, both fabrication and falsification of research observations are common for clinical trials (pressure from sponsors) and research activities of medical researchers who have a tendency to go alone instead of working as a research team [1]. In an interest meta-analysis study, Fanelli [9] reported that around 2% of studied medical scientists confessed that they had fabricated or falsified research data. Nearly, one-third of the said study group also confessed that they allowed many publication malpractices including 'dropping data' results of a study in response to pressures from a funding source [9]. The issues on fabrication and falsification of data are very serious by nature, and unfortunately, even the world's top medical research institute faculties are also involved in it. Story of John Long, a pathologist at Harvard Medical School was compelled to resign after publication of his false and fake results on molecular immune complexes related to Hodgkin's disease [34]. Similarly, one Dr. Vijay Soman of Yale University was found an offender on publication ethics because of fabrication and falsification of data from his colleague [35]. This problem is not only restricted on medical researcher/author, but it is even extended to editor also. Malcolm Pearce who was an Assistant Editor of *British Journal of Obstetrics and Gynaecology* was found to be a publication ethics defaulter. His false case report based on a patient who had gone under successful delivery after reimplanting an ectopic pregnancy was actually nonexisting. Later, his all papers were retracted from various journals [36]. One of the classic example of data fabrication is the story of Ram B. Singh between India. Dr. Singh submitted nine papers from 1992 to 1996 on his research on diet and myocardial infarction. The then Editor of BMJ Professor Richard Smith suspected on Dr. Singh's work and asked him to produce raw data. Dr. R. B. Singh failed to produce that and insisted that data were 'eaten by termites'. It was also found that the institution where he did his research was owned by his family members. BMJ initiated an independent inquiry and published his story [37].

3. Publication ethics

3.1. Best practices

Based on ICMJE and COPE guidelines for publishers, editors, peer reviewers and authors must practice and train themselves against publication misconduct. One of the most important things to promote ethical publication is to encourage research integrity among medical researchers. COPE advocated for a research integrity officer in each of the research institution to monitor and guide various issues pertaining to research ethics including publication ethics [18]. Research Institutions share a responsibility with all of its researchers to preserve scientific integrity in research. They bear the primary responsibility for promoting a culture of good scientific conduct among researchers and students and for the prevention, investigation and punishment of scientific misconduct in their midst. One must remember that research integrity requires the highest professional standards by a critical, open-minded approach, frankness and fairness with absolute honesty.

3.1.1. Publishers, editors and peer reviewers

An editor must take into consideration some important points before sending manuscript for reviewing like whether competing interests are cited by authors or reviewers, ensures that reviewer is adequately qualified and can keep confidentiality and also protects the whistle blower in case of reports on publication misconduct. It is suggested that journal editors must provide a link to WAME or COPE or ICMJE for authors, readers or reviewers to get first-hand information on ethics in publication. Editors should encourage peer reviewers to consider ethical issues on research manuscripts while reviewing and may also ask additional information from authors if need arises. Journals editors and publishers must protect confidentiality of research that includes identity of subjects/patients, etc besides identity of reviewers. Editors may also verify institutional review board clearance on each of the research manuscript in medical journal [15]. Ethical publication also includes timely peer reviewing and publication of the manuscript which is the responsibility of editor and publisher. Authors' especially medical authors always should be sensitized by editors, publishers and institutions that medicine is a profession based on 'absolute trust, philanthropy and altruism'. For ethical publication, the great role of peer reviewers must also to be remembered. Reviewer should be competent enough to review the content of manuscript; he/she should not be in hurry, no COI issues, have knowledge on publication ethics. One more important point on best practice for editors is to remain cultural and gender sensitive on any article. They should carefully observe whether any cultural offence is in the content of manuscripts. Language of the authors should not offend anyone among the readers [15].

3.1.2. Prevention

To regulate appropriately on the issues of ethical publications, institutions or universities should be accountable by the journal publishers for any unethical publication practices authored by the researchers belong to that institution. COPE or ICMJE have given some guidelines but that do not make institutions of author as accountable for any publication misconduct. Institution must have clear and transparent functioning on not only ethical research policy but also on ethical publications. Institution of authors and journal must take a special attention on the clinical trial-based publications. A Strong peer-reviewing system, uses of latest technological support, strong publication ethics policies, active monitoring, protection of whistle blowers and more liaisons between journals and research institutions or universities possibly prevent publication misconduct effectively.

In a summary, we may say that the following points may be considered to prevent publication misconduct:

- Better education on publication guidelines and ethics.
- Introduction of registers for planned and ongoing clinical trials.
- Change criteria from quantity to quality when papers are used for assessment of posts or grants.
- Punish the culprits but be careful that innocent is not victimized.

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