

Research Misconduct: The Peril of Publish or Perish

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ABSTRACT

There is a spurt of interest in research productivity in the Gulf Cooperation Council (GCC) to lay the foundation for national development. From a global perspective, increased research productivity could conceivably be accompanied by an exponential increase in research misconduct (RM). Inevitably, erroneous or falsified data will be expected to adversely affect public health by misleading policy makers and clinicians alike into embarking on health policy and allocation of resources that are byproducts of RM. This will contribute significantly to the emerging crisis of confidence of the public in the integrity of scientific research. For a long time, RM has been considered only as plagiarism or data fabrication and falsification. However, the concept of RM nowadays encompasses more and, in this review, we discuss its possible implications in emerging economies, such as those of the GCC countries. We suggest that GCC countries ought to consider implementing remedial and punitive policies to deal with RM.

Scientific research is increasingly recognized as a vital catalyst and important index for national development.¹ In many countries, it is scientific research, rather than rich natural resources, that has a direct bearing on economy and development.² Despite the increased standard of living due to oil, gas, and tourism, the scientific output from rapidly modernizing and emerging economies (e.g. Gulf Cooperation Council (GCC) countries) is still relatively low.³ However, there are reasons for hope and optimism as many of the higher learning centers in the GCC countries have started to focus on research rather than services alone.⁴ Such a trend has coincided with an increased number of scientific publications, proliferation of academic centers, and allocation of funds for research and development.^{5,6}

Compared to three decades ago, the number of medical publications coming from GCC countries has grown modestly.⁴ It has been noted that there is a relationship between the magnitude of research output and the likelihood that some of it may be tainted with either unethical behavior, or has fallen prey to research misconduct (RM).⁷ Medical literature is replete with RM.⁸ Recent publications have focused on misconduct peculiar to emerging economies⁹ and well-developed countries.¹⁰ It has been claimed that RM constitutes a silent epidemic or is simply a disease of modern science.¹¹ There are no established bodies that have been mandated to

safeguard and oversee the best practice in scholarly conduct and ethical behavior in GCC countries. In line with the anticipated growth of scientific output, our aim is to highlight what constitutes RM. In the quest to gain a place in the world of science, it is pertinent that GCC countries ought to have policies on standard codes of scholarly conduct and ethical behavior in professional scientific research, as is present elsewhere.¹² According to the Committee on Publication Ethics (COPE) and British Medical Journal, RM is defined as: “violation of the standard codes of scholarly conduct and ethical behavior in professional scientific research”.¹³

Unscrupulous medical research not only halts the progress of medical knowledge but also creates unanticipated consequences.¹⁴ For example, unsubstantiated claims in medical intervention could create undesirable scaremongering. This has vividly occurred in the case of concocted data on the association between autism and immunization.¹⁵ Gilbert and Denison¹⁶ summarized the adverse effect of RM and confirmed that “research misconduct jeopardizes the reputations of research groups and institutions, reduces public confidence in the scientific community and can halt the progress of medical knowledge.” It is widely acknowledged that RM cannot be simply purged out as there is not yet a global police force for such an endeavor, and neither are there inherent mechanisms to raise the alarm when things go wrong.¹⁷ Reliance on peer review has

Box 1: Classification of research misconduct as modified from the Committee on Publication Ethics

- Fabrication
- Falsification
- Plagiarism
- Failure to get ethical approval from approved body
- Manipulation of data to fit the required paradigm
- Conceal detrimental effect of intervention
- Not seeking informed consent before conducting research on humans
- Gift or ghost authorship
- Denying other contributors as potential authors
- Redundant or duplicate publications
- Concealing a conflict of interest
- Not attempting to publish completed research
- Citation plagiarism that involved failure to credit other or prior publications
- Biased refereeing
- Biased quality assessment
- Condone research malpractice

failed to mitigate RM because most peer reviewers focus on the scientific merit of the study.^{18,19} With such background, we sought to highlight the issues of RM, its many facets and the types of misconduct that are likely to occur as malpractice in research and publication. This article will also review what is known regarding motivation to commit RM. The relevance to GCC countries will also be considered.

The different facets of RM

The literature is replete with concepts, definitions and descriptions of RM which encapsulate terms including academic dishonesty, scientific dishonesty, scientific misconduct, misconduct in medical research, and contaminated research/science. The present discussion focuses on RM that has a direct bearing on, but which is not exclusive to, the COPE definition. Box 1 shows several classifications of RM modified for brevity from COPE, which goes beyond the fabrication, falsification, and plagiarism (FFP) model.¹³ The present classification takes into account the motivation to commit RM, for example, the tendency for reviewers to discriminate against research from developing countries, which is not relevant for those in Western Europe and North America.

Although admittedly representing only the tip of the iceberg, Fanelli²⁰ conducted a systematic review and meta-analysis of surveys on RM. They found that 2% of researchers admitted to having fabricated, falsified or modified data or results at least once.

Similarly, this study indicated that up to one-third of the people involved in research and publication have been involved in questionable research practices, including dropping data points based on a “gut feeling”, and changing the design, methodology or results of a study in response to pressure from a funding source.

As alluded above, most of the focus on RM has been geared towards FFP. However, the history of humankind is glutted with RM, including infamous studies such as the syphilis experiments, Stanley Milligram’s experiment, Vipeholm experiments and human vivisection.^{21,22} Conversely, the subsequent regulations, such as the Nuremberg Code, the Declaration of Helsinki, and Good Clinical Practice were attempting to come to grips with an excess of such medical experimentations.

Protection of research subject confidentiality is one of the backbones of research ethics. To uphold confidentiality, a research organization ought to have mechanisms to limit who can access data containing information on the subject and keep them anonymous.²³ Breaches of confidentiality can include oversights such as failure to acquire consent or purposely creating deceptive patient/subject consent.

RM could also arise due to competing interests. According to the World Association of Medical Editors, conflict of interest entails competing interests that may impair integrity.²⁴ Amiri et al,²⁵ conducted a systematic review of the relationships between the source of funding, study outcome, and merit of research outcomes in spinal research. They hypothesized that industrial financing and the presence of potential conflicts of interest would be associated with low levels of evidence (LOE). The authors examined 1,356 papers of which 864 could be LOE graded. They demonstrated a strong link between the source of funding, study outcome and merit of evidence. Following a similar thread, Bero et al,²⁶ suggested that studies financed by pharmaceutical industries, by definition, are more apt to fall prey to conflict of interest, and are often liable to draw conclusions that favored pharmaceutical agents over placebo.

Another form of RM is known as peer review bias. It is well known that there is no unified format on how to peer review research work. Most peer reviews/reviewers are criticized for being filled with personal bias. According to Wager,¹⁸ there are

two types of reviewers, the minority, who could be seen as the assassin/zealot-types and the majority, who are constructive and do appear to prescribe to the precept of fair play. In addition to personal bias, some authors have suggested that there is an institution bias. Accordingly, there is a tendency for reviewers to favor what has been termed as “well-established research groups”.²⁷ This means that research from well-established academic centers is likely to be published with little difficulty. Such a tendency is likely to overlook research from newly developed centers of research. In addition to favoring some institutions, there is a tendency for reviewers to endorse mainstream theories.²⁸ Progressive thinking is likely to be rejected since the dogmatic view hinders the acceptance of most paradigm shifts. Martin²⁹ has highlighted a phenomenon known as suppression of dissent, which aims to reject manuscripts that present an alternative scientific view. Within such background, there is a need to revamp the existing scope of RM that is beyond FFP. Cabbolet³⁰ proposed two types of RM. The first was dubbed as self-serving and is characterized by the tendencies of some authors to report falsely positive conclusions of their study. On the other hand, type two RM is characterized by outward motives with the aim of stifling others publication. According to Cabbolet,³⁰ the main forms of the second types of RM are biased quality assessment, smear, pseudoskepticism, or tendency to condone RM. An acknowledged trend in the world of scientific publication is the rejection of research from particular regions of the world based on dubious grounds, which is a trend that may deprive humanity of significant contributions to science.³¹⁻³³

There is a tendency by authors to sensationalize. This means that study data is extrapolated to suggest results that do not match the available data with the intention of deception. This often occurs when researchers talk to the press prematurely.²⁸ Koocher and Keith-Spiegel³⁴ have expanded a “catalog of wrongs” in research that include creating unfavorable working conditions for researchers, misuse of research funds, failure to follow ethical rules, and inadequate research supervision of novice researchers. Poor research supervision could impede the quality of the data generated and constitutes a type of RM. Other phenomena include shot gunning, where the author breaks the rule that they should not submit his or her article to more than one journal.³⁵

Publication misconduct

While malpractices in research often persist without any scrutiny by others, the second type of RM relates to either publication practices or the content of the publication. We will focus on two types of publication misconduct. The first one is the emotional issue of authorship credit, and the second is plagiarism. Various attempts have been made to streamline and define who is qualified to be an author. According to the International Committee of Medical Journal Editors (ICMJE), authorship should only be endowed to those who are involved in “formulating the problem or hypothesis, organizing and conducting the statistical analysis, interpreting the results and writing a major portion of the paper”. Many journals require each author to define his/her role, and this is often obligatory for some journals. However, this formula is not as straightforward as it may seem.¹⁸

Another source of friction relevant to authorship is for researchers to hire professional writers. By definition, some professional writers, sometimes known as ghostwriters, may be involved in writing a significant portion of the paper. Therefore, such ghostwriters are entitled to be authors. The debate on this issue still awaits the verdict,³⁶ although some journals now have a policy of including ghostwriters as authors.¹⁸ While the role of ghostwriters may be viewed with caution, another form of authorship credit also needs to be considered. Some interest groups hire professional writers to produce papers and pay other scientists or physicians to attach their names to the papers.³⁶ A related issue is that of honorary authorship,³⁷ where a high caliber individual in the scientific world is given authorship under the pretext their established reputation will obtain a favorable editorial decision. The final point to consider under authorship is the order of the authors. Conventionally, first authorship implies a greater contribution to the research. Sometimes, the principal investigator tends to be the last or corresponding author. Such a position also has implications for prestige. Despite such a clear-cut depiction of authorship order, there are many disgruntled voices in the corridors of medical research. Enlightened and best practice in this regard is available on the COPE website.¹³

The second type of publication misconduct is that favored by the U.S. Federal Policy on Research Misconduct: FFP. No legal framework, either

Box 2: Good practice tips for novice researchers (modified from the Office of Research Integrity).

1. Be aware of the principles of good research practice.
2. Ensure adequate supervision by an experienced researcher.
3. Perform a literature search to ensure that the research question has not already been answered.
4. Obtain early statistical advice.
5. Prepare a detailed protocol of proposed research.
6. Peer review of the study is mandatory.
7. Obtain ethical approval and informed consent.
8. Keep detailed, contemporaneous records of research.
9. Ensure compliance with the Data Protection Act.
10. Always backup computer records.
11. Ensure research project can be completed within an achievable timeframe.
12. Submit completed research for publication, ideally in a peer-reviewed journal.

criminal or civil, for plagiarism exists in our region or elsewhere. The trend is to link plagiarism to cases of unfair competition, violation of the doctrine of moral rights, or an issue pertinent to intellectual property.³⁸ The concept of plagiarism, according to Maruca,³⁹ is “multiple and heterogeneous, riddled with contradictions and blind spots”. Such practice is thought to be ubiquitous in the modern world where information, and publications, are available at one’s fingertips and the temptation to cut and paste is a great one. According to one study, the suspected number of duplications in the biomedical sciences has dramatically increased between 1975 and 2005.⁷

The concept of duplications is marred with controversy. Duplication is often perceived as self-plagiarism which constitutes RM. Conventionally, the term plagiarism is viewed as passing off someone else’s work as one’s own while the term self-plagiarism is used to indicate that someone (deliberately) passes off (a piece of) his/her work as original more than once. With the rising tide of duplications, efforts are needed to define what constitutes duplication and what constitutes plagiarism. There is also an interesting relationship with such a trend. The greater number of publications that come from a particular region, the more likelihood there is for duplications.⁷ Education is essential to stop novice researchers falling into the pitfall of plagiarism. The best practice is to provide full disclosure of the previous work, that is, to acknowledge the original sources.

There is also a cross-disciplinary difference on how to cite previous publications, so vigilance on this front is necessary, if not of paramount importance.

Indeed, to be on the safe side, it is essential that all sources are disclosed. In the academic tradition, the citation is viewed as an essential ingredient of good scholarship.⁴⁰ There is a myriad of anti-plagiarism software to uncover any oversight during the write-up. To curb the ever-rising alleged trend in plagiarism, many journals nowadays employ plagiarism-detection software. However, the efficacy of these software has been questioned.⁴¹ Considering the hazy views of what constitutes plagiarism; such software should be considered as a vital aid rather than a substitute for human judgment. On the whole, the issue of plagiarism should be more orchestrated during the early stage of education, echoing the ancient teaching: “Spare the rod and spoil the child”.

Empirical studies that aim to decipher the motivation to commit RM are lacking despite the fact that it occurs with a fair degree of regularity and with different degrees of severity and magnitude. Most mechanisms to curb RM rely on the action of whistleblowers.³⁴ Previous reliance on peer reviewers as one channel to curb RM has been shown not to be effective. Goodstein⁴² identified easiness of fabrication, the peril of publish or perish, and finances and ideology as strong incentives leading to the motivation to commit RM. Related to motivation is the conspicuous presence of readily available information. These issues are discussed below along with some possible peculiar issues relevant to the GCC and other developing countries.

In this digital age, there is likely to be a strong relationship with RM in the form of plagiarism due to the ease of fabrication, and it being within the reach of most people to transfer information and have access to bodies of knowledge that were considered inaccessible in the past. Such a background has ramifications in heightening the observed increased tendency towards cut and paste. There is no formula for tackling research fraud; however, the Office of Research Integrity⁴³ has identified some rules of thumb on research for the application of good practice in research [Box 2].

Peril of publish or perish

One of the most pressing problems for academic researchers is the career pressure to publish or perish.⁴³ It is becoming increasingly common, despite alternative suggestions, that publications are the most vital element for academic promotions. Such a viewpoint also encroaches on clinical medical

careers. Clinicians are increasingly being evaluated, not for their clinical skills, but rather by the number of publications they produce. Perhaps out of sheer desperation, the peril of RM thrives.⁴⁴

However, publish or perish may not be solely responsible. If this view is correct, it would suggest that individuals who are keen to be successful, but who do not have the drive to work hard, are likely to take short cuts and indulge in many of the mentioned RMs. There is also indication that poor supervision and oversight do contribute significantly to RM.⁴⁵

Finances

Publications bring prestige and promotions that, in turn, beget financial gains. Government agencies, academic institutions, medical societies, and a small group of private sectors and industries fund most research. With the erosion of governmental sponsored research, it has become increasingly common that industry funds most research. Bekelman et al,⁴⁶ analyzed industry-funded research over three decades. The results are bewildering: three decades ago, only 32% of the total biomedical research was financed by the private sector. In recent times, a significantly bigger portion of biomedical research is funded by industry. Cosgrove et al,⁴⁷ demonstrated strong financial ties between panel members responsible for revisions to the Diagnostic and Statistical Manual of Mental Disorders (DSM), who are responsible for psychiatric nomenclature, and drug companies. As a result of such findings, there is a wide call for setting up best practice for such collaboration.⁴⁸⁻⁵⁰ In a nutshell, financial support to researchers should be acknowledged and, to some extent, encouraged.

There is a plethora of research that today stands as a testimony to the medical revolution that has been funded by the private sector.⁵¹ Conflict of interest tainted none of this research. However, as far as the discussion on RM is concerned, conflict of interest needs to be welcomed as a precaution to rule out any sinister possibility.⁵² This is often due to the erosion of the primary interest by a secondary interest that is dictated by the motive of financial rewards.⁵³ In reference to research relevant to surgery, Bailey et al⁵² reported that if there was a conflict of interest in research, the trend was to report a favorable outcome. This suggests that authors with industry funding are likely to report their results in agreement with the interest of the funding agency.

Ideology

The hegemony of a certain ideology in sciences and medicine tends to inspire and act as a catalyst of the philosophy of time. This, in turn, shapes the direction and interpretation of research findings with all the implications that this may entail.

According to the dictionary definition, ideology is a set of ideas that constitutes one's goals, expectations, and actions. In the last century, dominant ideological perspectives, such as fascism, capitalism, and communism, have suggested their version of the world and how to interpret reality. Relevant to the present discussion on RM, it would appear that if research is only being churned out to support the ideology of the day, then this would constitute RM. Data forging, data cooking, data trimming, and data torturing are sometimes a cover for expressing particular ideological orientations. For example, we can consider how Muslims have been featured in medical literature. Laird et al⁵⁴ conducted an ethnographic content analysis of medical publications published from 1966 to 2005 appearing in Ovid Medline including Muslim populations. The results suggested a pervasive negative portrayal of Muslims and Islam. This appears to support the view that prevailing ideological orientation tends to pervade medical literature.^{55,56}

The situation for emerging economies

Emerging economies, such as those of GCC, are increasingly investing in research. It is pertinent here to consider some of the typical situations and some that are unique to emerging economies that could trigger RM. Firstly, as is the societal norm, researchers in developing countries often work in organizations that function in hierarchical ways. This stems from traditional societal stratification.⁵⁷ The figurehead or the head of the hierarchy is usually shown respect and loyalty. This translates into the figurehead appearing in all publications as an honorary author.³⁷ Although such practices are consistent with cultural norms, this may represent RM.

Secondly, some journals in developing countries may not explicitly have provisions for copyright. Some authors use such a loophole to get their work republished elsewhere, possibly in flagship journals. Such practice is a form of duplication and, under present scrutiny, constitutes RM. However, there is a caveat to such view. For example, one can publish a paper, for example, in Arabic in a local journal, and

then publish an English translation in a well-known international journal. If it is acknowledged in the latter paper as a translation, it is usually not considered RM.

There are anecdotal reports that some authors tend to submit their manuscript to non-flagship journals in developing countries. Once the manuscript is reviewed, the authors conspicuously withdraw their manuscript, use the reviewers' recommendations to improve the quality of their write-up, and resubmit it to a better-known journal. This issue, to our knowledge, has not been previously considered or acknowledged in the literature, but such an occurrence, by implication, may indirectly constitute RM because of the deceit involved and the circuitous means to gather the data. Thirdly, citation plagiarism or failing to acknowledge previous findings is a contestable issue that is rife among authors from developing countries. As publications from developing countries are often ignored by researchers from Europe and North America, partly because publications from developing countries often appear in less visible journals, RM in the form of citation plagiarism occurs. This issue has not been featured in discussions relevant to RM, but it deserves due attention.

Finally, often, international collaboration is a good recipe for research development in many developing countries as such encounters are likely to act as a catalyst for further research growth. However, there are rare situations when RM may invariably emerge. Due to the lack of a local body for research regulation, a laissez-faire attitude may develop, including not adhering to the required ethical conduct.⁵⁸ There are also rare but notable instances where a researcher hires a nonmedical counterpart to help with data collection at the expense of existing local health workers. Not involving the local health authority in the research may leave the international team without an informed perspective on the socio-cultural underpinning of that particular society.

CONCLUSION

Looking at both public media and the scientific literature, it is apparent that there is wide recognition of RM. As always, there is no rule of thumb to ensnare fraudulent articles. There is an indication that "contaminated" studies are not discernible compared with "clean" ones. Indeed, there is an indication that some falsified publications often incur multiple citations before their retraction.

In GCC countries, by not having a research culture until recent times, the region could be at the forefront to implement mechanisms to curb RM. We recommended that the GCC implement measurements that deal with RM in its broadest sense, rather than focusing only on FFP. Going beyond the existing conception of what constitute RM might even put the GCC countries ahead of their Western counterparts in the fight against RM.

As an integral part of quality assurance, regulations ought to be in place stipulating what constitutes RM. On this ground, there is no need to reinvent the wheel, but to embrace existing regulations from the international setting that are relevant to the local situation. It is worthwhile to note that although it may appear that research in the region is still in its infancy, the region had one of the earliest discussions on RM. Al-Jāhiz, who lived around 781 AD, was accused of plagiarism in his political treaty, *Kitab al-Hayawan* or *Book of Animals*, but was eventually exonerated.⁵⁹ The idea of attribution, authenticity and integrity have been part and parcel in establishing the validity of *the Hadith*, the teaching of the Prophet Mohammed. The question remains whether an event of the past could become a guide for the future.

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