

Who Wrote This Paper? A Review of Basics of Authorship and Ethical Issues

Sanwal Ali

*MSc (Eng) Transport Planning and Engineering
MS Project Management B.E Civil Engineering University of Leeds, UK*

Prof Ishtiaq Ahmed FCPS, FRCS

*HOD Surgery
Al-Nafees Medical College and Hospital, Isra university Islamabad, Pakistan*

*For Correspondence: Prof Ishtiaq Ahmed
Department of Surgery Al-NAFEES Medical College & Hospital Lehtrar Road, Farash Town, Islamabad*

Abstract

Honesty and truthfulness in an integral part of medical research which encompasses a variety of different courses relating to medical research and paper writing. For a scientific integrity, it is mandatory that the researcher or author should be fair, objective, complete and accurate in reporting outcome of research. It's also essential that appropriate recognition to be given as an author who has sufficient contribution and that to only those who has participated adequately. This can only be accomplished by accurately reporting and considering the all avenues of scientific integrity and application of appropriate publication ethics. Authorship disputes or doubts arise if transparency and publication ethics are not followed. This review will add to the existing literature by providing a broader overview of the diverse types of authorship-related issues with an attempt on providing tips to detect, avoid and address these issues.

keywords: *Research paper, Publications, Authorship, Authorship Issues, Gift authors, Ghost authors, Authorship order, Correspondence author, Authorship Ethics*

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I. Background

For many years, the journal editors and academics have suspected that the misconduct in research and publication is widespread in medical community. This presumption appears to be supported by fact that a very little empirical research has been performed in medicine especially in underdeveloped or developing countries¹. This trend is widely attributed to increase trend in “pressure to publish” which is resulted in the principle of “publish or perish”, and ultimately leading to increase publication misconduct. It has caused many grave problems including duplication of work, data fabrication, failure to obtain participant informed consent, by passing ethical concerns, plagiarism, unethical practice in publication, redundant publication and so on^{2,3}. Among them, the reports of unethical publications, plagiarism and especially the breach of ethical authorship have brought these ethical issues to the regulatory bodies and in public eyes too. These issues are now being taken seriously and emphasize the need for behaviour improvement and self-policing as a professional with an aspiration to ethical publication of scientific manuscripts.

In medical publications, the authorship comprises not only of manuscript writing, but also for significant participation in research⁴. Therefore, the determination of appropriate authorship comprises of decisions regarding who will be an author and what will be the most appropriate order of authorship. Most of the journals follow International Committee of Medical Journal Editors (ICMJE), guidelines which has given a list of recommendations to clarify the definition and responsibilities of an author^{5,6}. Despite these definitions, no set criteria have been outlined for defining first author or order of authorship in manuscript. Traditionally, in medical literature, usually first author has major contribution, followed in descending order and last author is usually a senior most or principal investigator or supervisory role, provided if authors are not listed alphabetically. Despite this tradition, in literature no guidelines were found to ensure a fair interpretation of authors' contributions^{7,8,9}.

The most common and pressing concerns faced by the editors are authorship assignment and authorship disputes^{10,11}. Most commonly these disputes center around, who merit authorship? Or who is designated as

senior or corresponding author? Or what will be the order of authorship? All these authorship challenges are not only practical but ethical too, including many concerns. We conducted this review to address authorship issues with special emphasis on authorship related ethical concerns and related issues which may arise with an attempt on providing tips to diagnose, avoid and address these issues.

Search Methodology:

The literature for this review is searched from Google, Google Scholar, Research Gate and Expert communication, MEDLINE (Ovid), Medscape, EMBASE, Scopus, HMIC and CINAHL+ along with other sources by using *Research paper, Publications, Authorship, Authorship Issues, Gift authors, Ghost authors, Authorship order, Correspondence author, Authorship Ethics* as key words. Among a total of 108 full text articles and reports, 40 were short listed for review. All relevant scientific papers, written in English were included and non-scientific articles, non-scientific commentary and reports were excluded from the review. Through detailed literature search, all essential sections and subsection mandatory for a research paper were identified followed by the necessary steps or information required in each section or questions which may arise or needs to be addressed were identified. Among shortlisted papers the pertinent information's or data retrieved, analysed and relevant information on authors definition, authorship issues, identification of authorship issues and how to tackle these issues were categorized and reproduced.

Who is an Author?

The author is defined differently in literature i.e., an author is the one who begins or creates¹², or the one who starts a plan or an idea¹³. In research publications, an "author" is usually referred to person "who has made a substantial intellectual contribution to a published paper or study"¹⁴. Technically, all authors should have meaningful and justified participation in developing, planning, execution, or at least in drafting of the manuscript^{5,15}.

Different criteria were followed to assess who will be the author but none of them is clear or considered comprehensive. Recently, the ICJME (International Committee for Journal of Medical Journal Editors) has suggested that to qualify authorship, all authors or contributors of a scientific document (i.e., article, project, report, text) should have contributed to following four activities; (a) conception or design of the study and acquisition, analysis and interpretation of data, (b) drafting the article or critically revising it for substantial content, (c) approval of a version of the document or final text, (d) the accountability agreement to guarantee the fidelity and integrity of the study^{5,16}. As these ICJME guidelines though considered explicit are still subject to vague misinterpretation by those who want to be included their name in authors' list, either willfully or out of ignorance. Other than this, some academics suggest that the eligibility of authorship is valid if all of the co-author should be competent enough to take responsibility for the whole manuscript^{17,18}. Patience et al asserts that all authors should have identifiable and meaningful contribution in design, analysis, performance and reporting of the work¹⁹. Callaham et al has suggested, anyone who has contributed something essential to the conclusions of manuscript¹⁰. Whereas, Erlen et al emphasizes that persons with relevant contribution to research and scientific text and participating similar accountability are considered author²⁰.

Due to these difficulties and ethical concerns inherent to the designation of authorship, several journals recently have issued their own criteria regarding appropriate authorship designation^{2,21}. The widespread problem with researchers is being unfamiliar with the authorship operational definitions and that, a minority who are aware of these definitions, usually feels that these definitions are either unworkable, inappropriate, or both^{17,22,23}.

Contemporary Issues in Publication Ethics:

Literature review shows that in scientific community, authorship and publication disputes account for 2% to 11% of all disagreements^{3,24}. Ghost authorship, authorship order, data plagiarism, requests for inclusion or exclusion of authors after manuscript submission or in the later stages of review or publication are not uncommon^{19,24}. A recent spurt in "authorship abuse" has been attributed to recent culture of "publish or perish" which leads in a rush to increase publication volume for a strong resume¹⁹. To credit an authorship to someone who is not deserving or qualified as an author or omitting a deserving researcher from authorship are serious ethical concerns which have serious implications. At the one end, as the onus of authorship decision lies on researchers, this responsibility also lies on editorial boards as well in minimizing this abuse^{10,25}.

The range of inappropriate authorship described by CSE (Council of Scientific Editors) comprises of gift authorship, "guest" authorship, "ghost" authorship, "honorary," or "anonymous" authorship^{17,26}. Other than this, the number of authors, authorship order and correspondence author nomination are also brought in notice to the editors or institutions^{10,24}. Mostly, these issues go unnoticed or not reported. Sometimes attention towards this misconduct is drawn by the grieved or affected researcher in the form of a formal complaint to the editor^{19,27}. These issues are also noticed when the responsibilities of the authors of manuscript are put to test in case of suspected scientific misconduct. For example, when a misconduct like plagiarism or similar is detected,

one or more of co-authors may declare that they had no personal contribution or involvement with the paper or their names are included without their consent^{1,21}.

Inappropriate Authorship (Why Not Add “Everyone’s” Name?)

The inappropriate authorship comprises of gift (honorary) authorship and ghost authorship which are very common unethical practices observed. This increase trend in inappropriate inclusion of authors have been observed by the journals and regulatory bodies since last two decades^{24,28,29}. Different factors play a role in this inappropriate nomination such as job demands, promotion requirements, pressure to publish, peers and departmental or institutional pressures, increased pressure from superiors to be included etc^{3,19}. In addition, inappropriate authors are also included as a result of ignorance of authorship criteria, or due to ignorance of other domains of recognizing contributions in manuscript like acknowledgments section etc¹⁹. Moreover, the trainee or junior faculty usually find it difficult when approached by their seniors with an expectation of authorship inclusion^{22,23}. Due to this trend the journals started establishing the rules to determine that who genuinely qualifies for authorship^{6,30}.

The main author or researcher or institution has ethical responsibility to decide all final determinations about authorship^{1,4}. It should be remembered that this inappropriate inclusion has multiple negative ramifications academically which include credit dilution of appropriate authors, or inappropriate inflation of credentials or curriculum vitae of non-deserving author^{1,27}. The identification and notification of this unethical practice by journal or authorities can be challenging at times, but the responsibility of authoritative and fair decisions about authorship should be directly communicated to all involved.

Gift Author: The most commonly manifested flagrant abuse, is a “gift” authorship in medical community. It refers to undeserved inclusion of someone as a co-author who does not have insignificant input in paper or research project^{26,29}. Motives of this vary, ranging from nepotism to reciprocating the previously gained favour, to increasing number of publications in perception carry gravitas^{3,31}. Ethical researchers and authors have called for abolition of this practice by appealing to researchers on deontological grounds, that this is a fraudulent practice, and on consequentialist considerations this practice should be considered something like a poisoned chalice for medical practice and research^{4,31}.

Eriksson et al²⁹ has observed that the prevalence of undeserving authors on research papers is highly problematic. To alleviate this issue of gift or honorary authorship, he recommended a dire need to address these aspects of research cultures along with steps to create incentives for scholars who restrict the number of authorships in manuscript. A combined qualitative and quantitative approach is recommended i.e., the scholars who apply for positions should explain the basics of a random selection of their co-authored papers. Secondly, in bibliometric measurements, publications and citations may be divided by the number of authors. This simple measure will help to end honorary authorship and the too many numbers of authorship on a scientific paper.

Ghost Author: This refers to the practice of not citing a person who fulfils authorship criteria as co-authors²⁸. This is clearly an unjustified practice, leading to usurping the intellectual rights of aggrieved person’s and utilising his findings or data over which one does not have a moral (possibly legal too) claim of ownership. This issue is equally serious and a cause of much discontent especially among junior colleagues^{17,28}.

Sometimes the authorship omitted mistakenly for those who had made a substantial contribution to the research or in manuscript²³. Ranging from flagrant plagiarism to unintentional omission, these errors can be destructive to the profession, inter-personal relations and future collaborative efforts^{4,17}. Once again, the first author should assume the responsibility of the justified or appropriate recognition and inclusion of all who has made a significant contribution. All those should be recognised as an author or as a contributor in acknowledgment section²⁷.

How Many Authors to Be Included in a Manuscript?

Literature review shows only a few quantitative instruments to assign the author, co-authorship of a research work and these guidelines addressed only a few general principles of authorship^{9,16}. It is observed that the average number of authorships in a manuscript has increased dramatically and disproportionately over last two decades especially in medical or life sciences publications^{14,26}. Many manuscripts have nominated authors who do not meet criteria of authorship appropriately or have not participated in the research actively.

Historically, in 1981, the maximum authors number on any research paper indexed by Clarivate Analytics was 118 which reached 2500 in 2006, and quickly surpassed up to 3000 in year 2008³². Recently, a paper published in physics discipline with 5,154 authors embraced the largest contributors record in a single scientific paper²⁰. As a matter of fact, the majority of routine institutional or departmental medical research is conducted by an individual, few or a group of researchers from the same department or institution. Recent advances in computing, communication, biotechnology and instrumentation has allowed researchers or scientists

to conduct large-scale investigations by as a team from various institutions sometimes over different continents. Individuals or groups may work on the different or same key aspects of a same project and invariably these collaborations result in multiple-authored publications^{19,33}. Unfortunately, some of these collaborative efforts have given rise to disputes about authorship issues.

This trend is considered as a result of pressure to publish (due to promotion and hiring), wider collaborative efforts, team-based research, specialization of research, honorary or gift authorship^[30]. In true sense, the authorship number should be decided meticulously and only those who have substantial contribution in research should be included as authors. Those who do not qualify as author but have some contribution should be acknowledged. To avoid disputes in future, the authorship of a paper, can and should be determined at the start of the work by specifying the responsibilities in a verbal or written agreement¹⁶.

Author Ship Order in Manuscript:

The authorship order can play a significant role in deciding merit or awards in many research contexts^{7,27}. Literature shows no guideline or global consensus on authorship order, but the most common practice to designate first authorship to the lead or main researcher^{16,34}. The assignment of relative contribution of researchers may be a difficult matter, because due to different kinds of contribution titles, the disagreements among contributors are common. In some circumstances the authorship order has been determined subjectively by ignoring the standards related to "author's right", intellectual property and professional ethics and disregarding academic participation and practical experience of contributors or co-authors^{27,31,34}. Therefore, this matter should be handled genuinely based on merit with great care not only for the sake of fairness, rather for transparency too. The practices of recognizing authorship order vary greatly among different research areas^{21,35}.

In case of multiple authors, this is another common issue i.e., the ordering of authors, especially who will be in the 1st and last position, because of the particular recognition of these positions among the academic community^{18,21}. Historically, the first author of any paper usually considered to have a special role i.e., in making decision about authorship, order of authorship, any other credits and acknowledgments. The last author, not always but usually, is one who has participated in a supervisory role³⁶. Interestingly, different studies have demonstrated a great variability in the relative contributions of all especially non-first authors^{6,7,8,36}.

Literature review suggests that the use of authorship and order of authorship order is necessarily not an ideal way to communicate their contributions in a project or paper. Therefore, a structured list of all contributors, with some less-than-minimal level of detail, may be more informative on both absolute and relative contribution of authors^{6,27}. Now a days, there is a trend toward denoting the nature of the contribution of each author. But it is perceived that in future the status or role of authors will be determined solely by the position of their names in the author byline^{11,34}.

Who is Corresponding Author?

Generally, it is presumed that the correspondence author is the main researcher or most senior author, whereas, it's not necessary. In fact, this is a special responsibility involved while assigning this role and it's not supposed to be a mark of distinction in authorship^{7,36}. The corresponding author act as a secretary for most part whose prime responsibility is to keep primary contact with the journal and respond promptly to all queries raised regarding manuscript. Other than this, he should be able to provide all necessary requirements like authorship details, authors contributions, ethical approval and statement of conflict of interest. After publication of paper, the corresponding author is responsible to respond to readers' comments or questions^{19,34}. Usually, the most senior author of manuscript is too busy to respond to the queries raised during submission and review process, which causes unnecessary delay in the publication process^{27,37}. Moreover, if corresponding author unable to respond promptly during review process, how likely is his response to reader queries or comments after publication in the future?

It is suggested that most suitable author, (or authors) who has time and can respond timely and properly to all issues or queries raised before and after publication. Sometimes, two authors can share this role. For example, in large scale or multicentre study or where two groups collaborate on a project, shared responsibilities of corresponding authors can be assigned in specific domains or groups^{32,37,38}.

Who should be included in the acknowledgments?

As mentioned previously, in "Acknowledgments" section the participants who do not qualify authorship criteria, but contributed in activities such as administrative support, research group supervision, funding procurement, input in writing, technical editing, formatting, technical assistance, sample processing, data entry, data organization with no added value, statistical analysis or overall support (i.e., from a department head or senior)^{18,37}. Moreover, the contribution of material or resources should also be recognized in the acknowledgments⁹.

Other than acknowledgement, the lists of participants who does not have substantial contribution can be credited under different heading such as “Participant researchers”, “Clinical researchers”. Alternatively, their role or contribution in research can be described in several ways like “critically reviewed the study protocol”, “provided scientific advice”, “Recorded information/data”, “processed samples” or “assisted participants/patients in research.” To overcome future disputes or to avoid misunderstanding or confusion a written consent/authorization mentioning “willing to be included in the acknowledgments” must be seeked from all participants^{20,38}.

Critical reflection on “authorship ethics”:^{20,21,25,35,39}

It should be kept in mind that, determining authorship is a complex matter, surrounded by the ethical principles and concerns, which infer the problems of responsibility and integrity. That’s why it is very relevant to have meticulous guidelines which should be clear and objective in assigning authorship. Through literature search following recommendations are charted which can be considered in assigning authorship:

- a. From the outset of a research project, the responsibilities and contribution of each researcher should be clearly assigned in writing.
- b. Authorship order in manuscript should be defined from the beginning of the project after involving all research participants.
- c. Criteria’s and decisions regarding who should and will be included in the acknowledgments section to be charted from the beginning.
- d. Checklists and objective guidelines to reduce the authorship conflicts should be developed comprehensively which must quantify and include beyond doubt, the four criteria of ICJME i.e., participation in the study design; data acquisition or analysis; writing or critically analyzing the manuscript; and final approval of the manuscript.
- e. All agreements and decisions regarding authorship should be set down in writing.
- f. The respect for author’s right, intellectual property and good practices should be encouraged during whole process.
- g. In case of a research work conducted partly or entirely by the students (Undergraduates) or trainees, it should be made clear that they will be the main authors of the paper (depending upon their participation or development of their work) and that under no circumstances will this right be attributed to the group supervisor, coordinator, head of department or some senior. However, the students must fully meet the four criteria of ICJME as author, otherwise, they share the authorship with other participants who has substantially contributed to the project development of the project (i.e., supervisor, researchers from the research group or the original project, among others).
- h. It has recently been proposed to explicitly mention the individual contribution of authors as a complement to the Vancouver recommendations. In this regard, it is suggested that, besides inclusion of an exact description of each authors role in paper, a new role of the guarantor to be created who is an author, in addition to fulfilling the traditional authorship criteria, should be responsible to endorse, guarantee and be accountable for the scientific integrity of the project and research paper as a whole, before and after publication.
- i. The departments and institutions have their prime responsibility to create a system which promotes good ethical practices and contributes to inform precisely who did the work, discouraging the inclusion of guest or courtesy authors and ghost authors.

Signs That Might Indicate Authorship Problems:

Sometimes, in manuscript submitted for publication, the editors or reviewers have concerns about authorship but it’s very difficult for the editors to police the authenticity of authors or contributors or to challenge the authors inclusion or contribution for every submission^{14,28}. The COPE flowchart on ‘What to do if you suspect ghost, guest or gift authorship suggests actions for these situations¹⁵. The following important points are helpful to alert the editors be in suspected inappropriate authorship^{1,5,15,28,29}.

- a. Unfeasibly short or long author list (e.g., randomised trial with a single author or too many authors in a simple case report).
- b. Corresponding author or authors seems unable to respond to reviewers’ comments.
- c. Similar original articles or review articles or editorials/opinions etc have been published by different authors (can be detected by a Medline or Google search using key words or article title).
- d. Missing role in manuscript or research project from list of contributors (e.g., none of the authors were responsible for data analysis, or literature search or drafting of manuscript)
- e. Impossibly prolific author e.g., of review articles/opinion pieces authors experience/qualification/speciality does not match (this may be checked by using authors name on Google search or Medline)

- f. Institution or department having no capacity or facilities to conduct research on this field i.e., study on renal transplant patients conducted at Tehsil level or Primary health care centre.
- g. Sample size does not match with study duration or patient load of that hospital for example, study in Pilonidal sinus comprises of 150 patients in one-year duration or Study on recurrent goitre comprises of 300 patients in a hospital from non-endemic goitre area.
- h. Authors speciality, qualification, designation, place of study etc are not align.
- i. The computers "Document properties" also show that the manuscript was drafted by someone not on the author list or properly acknowledged. (this can be checked from Word document properties that who has written this but it should be bear in mind there may be an innocent explanation for this, e.g., secretary has drafted or a shared computer is used in drafting manuscript)
- j. Suggested changes made by someone not on the author list (see above)
- k. In funded study with no authors from funded or sponsor company (this may be legitimate, but may also possible that deserving authors have been omitted). By reviewing the research protocol one can determine the role of employees.

How ("editorial board") deal with these disputes?

It is realistically not possible for the editor or editorial board to amicably police the authorship issues of individual manuscripts^{21,33}. The institution, main researcher or supervisor has ethical responsibility to decide all final determinations about authorship. In addition, this responsibility also falls upon each author individually to ensure the scientific integrity of their manuscript, authors and contributors' appropriate credit, authorship order and inappropriate authors who have not met authorship criteria^{20,39,40}. The authors are also presumed not to publish under pseudonyms or in any anonymous manner. The journal editors may allow for anonymous authorship only when its fears that revealing authors identity could threaten its life or loss of livelihood²⁶. Meticulous guidelines and good policies are helpful in prevent or minimizing the authorship disputes or alternatively the parties involved should resolve their own issues. It has been observed that even with good policies, the disputes can still happen¹⁶.

By using the age-old adage that "prevention is better than cure," to minimize the incidents of authorship disputes, certain steps after critical literature review are suggested^{6,16,21,23, 25,40}.

- a. To avoid authorship disputes due to ignorance of researcher, the journals on their part to lay down, publish and promote the authorship criteria and guidelines clearly on their website, check strictly for compliance and develop a mechanism to identify and deal with these issues in a resolute manner.
- b. Journals should ask for each authors contribution in project or manuscript duly signed along with statement confirming acceptance of responsibility for manuscript. This allows each contributor to specify his actual participation in different parts or stages of the project.
- c. All those participants, who played a role in research but do not qualify for authorship, should be acknowledged in acknowledgement section of manuscript.
- d. Instead of authorship, the "contributor ship" of manuscript is also suggested as an alternative, which involves no authors ranking, rather authors are listed with their contribution in manuscript or research in the byline.
- e. In case of multicenter studies or with too many coauthors, group authorship is recommended and it practiced by some journals i.e., multiple authors assigned as first author and so on. This practice may be considered in special circumstances because it has not gained popularity due to comments that that this practice will undermine the importance of authorship order or position.
- f. To avoid gift/ honorary or ghost authorship issue especially when senior faculty is involved is very difficult and the formal redressal of authorship issues is not possible because of the very reason of their genesis. Therefore, usually confrontation by the junior researcher with a senior colleague is avoided in institutions. An ombudsman channel or equivalent, may serve as a confidential and informal channel in such cases.
- g. The authors also need to remember that ignorance is not an excuse for misconduct.

It should be remembered that this inappropriate inclusion has multiple negative ramifications academically like credit dilution of appropriate authors, or inappropriate inflation of credentials or curriculum vitae of non-deserving author. Though this is challenging at times, but the responsibility of authoritative and fair decisions about authorship should be directly communicated to all involved.

II. Conclusion:

Authorship of a research paper is not just a list of names but is a mechanism to establish credit, integrity, responsibility and accountability in research which ought to be free from misinterpretations, errors, fraud, wrongful credit and exclusions. In this rapidly growing intense competition era, where an authorship is considered a gateway to professional, academic and promotional incentives, it becomes imperative to preserve the sanctity of this process. This responsibility falls equally on the researcher, institutions and the journal as well. The authorship credit should be predetermined and well-informed decision purely based on an adequate understanding and synthesis of the guidelines because it also questions or tests our professional integrity. Let us not fail this test!

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