



Review Article

Ethically Determining the Authorship of Health Science Research Publications: A Scoping Review

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Abstract: Authorship is a significant aspect of scientific research publications, serving as a primary means of acknowledging the intellectual contributions of individuals and shaping career trajectories. However, determining authorship ethically and fairly in health science research remains a complex and multifaceted issue. This scoping review aims to explore the existing literature surrounding ethical considerations associated with authorship determination in health science research publications, published between 1989 and 2023. A total of 25 studies met the inclusion criteria. The findings revealed that ethical authorship practices in health science research are complex and multifaceted. This review emphasized how crucial it is to have precise rules and guidelines for deciding who is the author in academic journals, research institutes, and societies. The International Committee of Medical Journal Editors (ICMJE) has published several ethical principles to address the difficulties associated with authorship determination. Still, there are differences and disagreements in how these rules are interpreted and applied, which could present moral enigmas. The review also examines new ethical issues arising from multidisciplinary and collaborative research, such as the responsibilities and funding of industry collaborations, shared authorship, and acknowledging the contributions of other groups. Maintaining the integrity of health science research and encouraging responsible collaboration requires making sure that authorship determination is transparent, equitable, and accountable. Authors should disclose any conflicts of interest that could influence their judgment or interpretation of the research findings.

Keywords: authorship, ethics, health science research, publication, scoping review

Introduction: Health science research publications have complex and contentious authorship issues with ethical, legal, and academic impacts. A common challenge

for researchers in multidisciplinary health sciences journals is how to assign credit fairly among the authors of a publication. Publication practices such as ghost and

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gift-authorship, or conflicts of interest, have been widely debated in the health sciences literature, but there is a lack of practical guidance on how to decide who should be an author and what their roles and responsibilities should be¹. Authorship credit implies both contribution and accountability for the scientific research findings reported in a publication, but it is not clear what kinds of contributions the author has in writing, or who should be accountable for the quality and content of the research.¹ A scientific project requires a team of authors with different skills and roles to achieve its objectives efficiently and effectively. Otherwise, the project may face delays or difficulties in reaching its expected outcomes within a reasonable timeframe. Therefore, multi-authorship is a common and necessary practice in science².

The publication of new work relies on trust and demands that authors adhere to standards of honesty, completeness, and fairness. The current system of authorship, designed for articles with a single author, has become inadequate due to the increasing number of authors, specialized coauthor work, complex relationships, and the obscured assessment of credit and accountability³. To address this, the authors advocate for a radical change to reflect the realities of multiple authorship and reinforce accountability. Authors and editors propose replacing the outdated notion of "author" with the more practical "contributor," necessitating disclosure of contributors' research and manuscript contributions to readers. All participants would be named as contributors, eliminating the artificial distinction between authors and acknowledgments and enhancing publication integrity³.

Authorship criteria and practices vary across disciplines, journals, and institutions, and may not adequately reflect the contributions and responsibilities of researchers involved in multi-author studies⁴. Unfortunately, while such roles are not awarded appropriately, it is considered as a form and abuse of authorship⁴. Clear and fair guidelines for authorship determination and recognition are needed in health science research publications. In this paper, we examine the ethical and health science arguments and the

policies or guidelines proposed by learned societies and journals, to explore how author contribution and responsibility are linked in multi-author multidisciplinary health science publications. We also critically evaluate the different methods used in the field to help researchers allocate authorship fairly¹.

Therefore, this article discussed identifying and synthesizing the literature on ethical authorship practices in health science research publications. The article analyses the current practices and guidelines for authorship attribution and recognition in health science journals and institutions.

Methodology: We followed the framework proposed by Arksey and O'Malley⁵ for conducting scoping reviews. We searched four electronic databases (PubMed, MEDLINE, Scopus, Web of Science) for articles published in English from January 1989 to December 2023 that addressed authorship issues in health science research. We included articles that discussed the definition, criteria, order, contribution, and responsibility of authors, as well as the challenges and best practices for ethically determining authorship in multi-author studies. We excluded articles that focused on specific cases of authorship misconduct or disputes, or that did not relate to health science research. We extracted data on the article's title, authors, year, journal, discipline, aim, methods, results, and conclusions. We used a thematic analysis approach to synthesize the main findings and themes emerging from the literature. And then we arranged all the information in a matrix according to themes for analysis and reporting.

Findings: According to our thematic approach to the findings, the following are the main themes that were discussed.

1. Authorship
2. Authorship Criteria
3. Ethical Issues
4. Recommendations and
5. Implications

Authorship: An author of a scientific or research manuscript contributes intellectually

and creatively to the content, shaping the research aspect into a presentable and comprehensible form. The efforts involved are substantial and deserving of credit^{4,6}.

An “author” is generally considered to be someone who has made substantive intellectual contributions to a published study.⁷ Being recognized as an author of a research output is a commendable achievement. Authorship also indicates that an individual is responsible for its contents. It also holds considerable importance for a researcher. Therefore, authorship must be attributed with accuracy and accountability⁷.

According to the International Committee of Medical Journals Editors (ICMJE), Authorship gives credit and carries academic, social, and financial significance. These recommendations aim to ensure that contributors making substantive intellectual contributions are credited as authors, and that credited authors understand their role in taking responsibility and being accountable for the published work⁸.

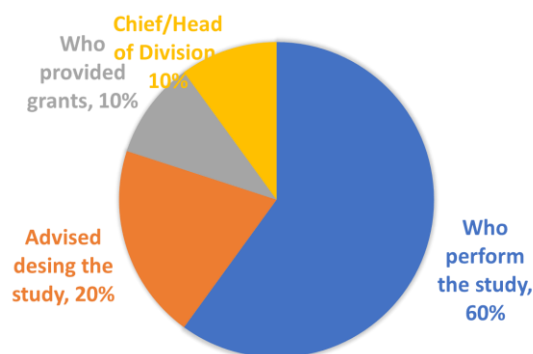
According to The ICMJE following are the recommended criteria of an authorship⁸:

- Significant contributions to the hypothesis or design of the scientific work; or the attainment, analysis, and understanding of data for the work;
- Writing the initial draft of the work or conducting a critical review for significant intellectual content;
- Final authorization of the version to be published;

Commitment to taking responsibility for all aspects of the work, ensuring that any questions regarding the accuracy or integrity of any part of the work are thoroughly investigated and resolved. Additionally, authors should be capable of identifying which co-authors are responsible for specific parts of the work and should have confidence in the integrity of their co-authors' contributions⁶.

Ethical Issues: There are several dilemmas in authorship, which create confusion among the new authors and researchers. A study was done among 30 post-graduate medical students to determine the understating of authorship among them. The study revealed

that 60% of them considered those who performed the study as the author, 20% considered those who advised the design of the study as the author, 10% considered those who provided grants for the study as authors, and the rest 10% considered those is the chief or head of division should be the author⁹ (Graph 01).



Graph 01: Understating of authorship among post-graduate medical students (n=30) Source: Bangladesh Journal of Bioethics 2021; 12 (1): 25-34⁹

Multi-center trials pose considerable and distinct difficulties for deciding who should be credited as authors, due to the practical and ethical aspects involved¹⁰. Several departments may participate in multi-center trials that last for a long duration, and the local researchers may vary throughout the study. It is hard, and often unfeasible, for everyone involved to contribute to the writing process. A possible way to avoid authorship disputes is to establish an authorship agreement at the beginning of the research, e.g. before enrolling the first patient in the trial.¹¹ A good method to determine who should be authors on papers related to the study could reduce tension among the researchers and help guarantee strong and prompt sharing of study outcomes¹². The Contributors can choose a distinctive name for their group and select some members to form the writing committee, which can author “on behalf of” or “for” the whole group and also ensure the correctness and clarity of the data and its meanings¹³. Given the different kinds of multi-disciplinary collaborations in the health sciences and other research areas, the collaborations have different characteristics and sizes that imply that a single solution to authorship is likely

unfeasible, or not very comprehensive at least.¹⁴ In multi-centered or large-group research, the team leader of each center or group can be awarded authorship¹⁴.

1. Funding/collection of data/general supervision: Those who funded the research projects or who helped in collecting the data and provided general supervision of the research projects cannot be considered authors. However, their contribution can be acknowledged⁸. ICMJE has specific 4 criteria for selecting or determining authorship⁸.

2. New Authors' Confusions: Choosing the authors is an essential step for any publication. Conflicts over authorship make up 2% to 11% of all disputes in the scientific community¹⁵. New authors are sometimes confused regarding the criteria for authorship, especially multiple authors (more than 2 authors per article) are the main source of problems. The number of authors per article can range from 1 to many¹⁶. They may be confused about the specific formatting requirements for manuscripts, including citation styles, reference formats, and overall document structure¹⁷. When choosing co-authors ethically, one should consider the expertise and contribution of each author, clearly discuss the authorship expectations, and agree on the order of authors, recognizing the contributions who do not meet authorship criteria by acknowledging their contributions, include authors from diverse backgrounds and lastly avoid conflicts that could affect research integrity.

Predatory Publishers: A predatory journal is a fake academic publication that pretends to be a reputable one but does not follow the standards of scholarly publishing. Some of the ways that predatory journals deceive authors are by lying about their peer review process, hiding their fees for publishing articles, using false or unauthorized names of editors, and breaking the rules of intellectual property or academic integrity¹⁸. Predatory journals are driven by money. They trick authors into paying for publishing without offering rigorous peer-review or editorial services, thus prioritizing money over reliable and quality

science. For many, publishing is essential for advancing their careers, so they may be tempted by journals that claim to accept all papers¹⁸.

1. Fake author: A common and harmful form of unethical conduct or dubious research methods is improper authorship, which has been reported in both advanced and developing nations¹⁹⁻²³. A "fake author" refers to an individual who falsely claims authorship of a work, such as a research paper, article, or creative piece, without having made a genuine contribution to its creation. The academic publishing world is very competitive. Researchers frequently feel pressured to publish their papers because their work and future opportunities depend on the number of journal publications. Sadly, this leads to many dishonest behaviors and fake authors²⁴. Another form of fake authorship is to include someone as a co-author without informing him or her. This happens as new or small-scale researchers face difficulties in publishing their papers. This is mainly because the editors prefer experienced or renowned scientists. Therefore, the new authors sometimes use a false co-author to boost their chances of publication²⁴. This deceptive practice is a form of academic dishonesty and can have serious ethical and legal implications.

2. Gift Authorship: The study in Accountability in Research says that the most frequent research fraud in the US is 'gift' authorship, where researchers become co-authors without doing much or any work. The study by Michael Reisig, a criminology and criminal justice professor at Arizona State University, asked 613 researchers from 100 top US research universities. Data fabrication was the rarest research fraud²⁵. Some researchers add well-known scholars as co-authors – knowingly or not – to boost their publication or funding prospects. Honorary authorship is when senior researchers are authors for their status or funding role in the institution or research. Honorary authors usually agree and know about this. Gift authorship, also known as honorary authorship or guest authorship, occurs when an individual is listed as an author of a research paper or academic work

without having made a substantial contribution to the research, writing, or intellectual content of the work. Instead, their inclusion as an author is often based on factors unrelated to their scholarly or intellectual input, such as professional relationships, seniority, or as a favor²⁵.

This practice can be problematic as it misrepresents the true contributions of the listed authors and can lead to a lack of accountability for the content of the work. Gift authorship undermines the principles of academic integrity and scholarly recognition by attributing authorship to individuals who have not actively participated in the creation of the work.

3. Ghost Author: Ghost authorship occurs when someone who made a significant contribution to a study is not included as an author. It happens when professional writers are paid to do scientific work that is credited to another author. The work of these writers (and/or researchers) is not mentioned in the author list or acknowledgments. This is also called anonymous authorship²⁶.

This is common because of the high demand for researchers to publish new research. In many biomedical research institutions, students need to publish at least one paper as the first author in a certain type of journal (e.g., SCI-listed, SCOPUS Q1 or Q2) to graduate. Career advancement, job security, and research reputation largely depend on one's publication record²⁶. For example, the main author might hire someone for data analysis, reporting, manuscript drafting, and editing²⁶.

4. Guest Author: Guest authorship is when influential people are named as authors to increase a study's credibility, but they do not do the research²⁶. It is similar to gift authorship, and they are sometimes mixed up. In both cases, the people involved think it is beneficial for them. For example, the junior researcher cites a senior one, as mentioned before. A main cause of guest authorship is the lab hierarchy. For instance, principal investigators often want their names to be added or first in research done in their

department or lab. They want this because they got the research funds or given high-level guidance. This is "coercive authorship"²⁶.

Conclusion and Recommendation: Ethical authorship practices are crucial for the quality and trustworthiness of health science research publications. Authorship attribution is a shared responsibility among researchers, institutions, and journal editors. Journal editors should implement and apply clear and consistent policies on authorship to promote transparency and fairness in the publication process. Implications for practices include:

- Researchers should follow ethical guidelines for authorship.
- Institutions should offer training and support for researchers on ethical authorship practices.
- Journal editors should apply clear and consistent policies on authorship.

Ethical authorship practices are vital for the integrity and credibility of health science research publications. The International Committee of Medical Journal Editors (ICMJE) has set criteria that each author should meet, highlighting the importance of proper attribution. Authors contribute intellectually and creatively to the scientific content, and their efforts deserve recognition. According to the common census, key ethical considerations include:

- Authorship should be based on substantial contributions to the research project.
- Authors should be transparent about their contributions and accountable for the content of the publication.
- Ghost authorship, where individuals who have made significant contributions are not listed as authors, and gift authorship, where individuals who have not made significant contributions are included as authors, are unethical practices.

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