

Column: Tips on Research and Publication

AUTHORSHIP TO CONTRIBUTORSHIP: ISSUES RELATED TO CREDIT IN RESEARCH PUBLICATIONS

Samir Kumar Praharaj*¹, Shahul Ameen²

¹Department of Psychiatry, Kasturba Medical College, Manipal, Manipal Academy of Higher Education, Manipal, Karnataka.

²Consultant Psychiatrist, St. Thomas Hospital, Changanacherry, Kerala

*Corresponding address: Professor & Head, Department of Psychiatry, Kasturba Medical College, Manipal, Manipal Academy of Higher Education, Manipal, Karnataka, India, PIN-576104.

E-mail: samirpsyche@yahoo.co.in

ABSTRACT

'Authorship' in a research article is mostly determined on the basis of 'substantial contribution,' which has diverse definitions. The broader concept of contributorship is based on the multiple roles of the contributors, especially in interprofessional and collaborative research. Issues related to authorship include order of authorship, corresponding authorship, and co-contributorship. To prevent disputes, the authors should negotiate these early in the research.

Keywords: Authorship, contributions, credit

Researchers should get due credit for their work in the form of authorship in scientific publications based on it. Regarding authorship, who conceived the idea or identified the research question ('conceptual contributions') is much more important than other aspects such as data collection, data analysis, or manuscript writing ('technical contributions'). Both these contributions are sufficient for authorship, and no one should be denied such credit. However, a 'technical contribution' may not be adequate for *first* authorship, and it should preferably go to the person who conceptualised the study. Nevertheless, in practice, someone who has made the *most contribution* is usually the first author, and there is no consensus regarding this.

Who is an Author?

Two Aspects of Authorship

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1. Credit: Authorship is a recognition for those who contributed to the research and the manuscript.
2. Accountability: Authorship also means accountability for the integrity of the research and the manuscript's content.

The Golden Rule of Authorship

Some aspects of authorship are to be followed strictly, no matter who is the first author, the corresponding author, or any other author.

All the authors are responsible for the content of the published article. Hence, all must read and approve the final manuscript. Any credit is shared by all authors. Similarly, any mistake is owned up by all authors.

Authorship criteria

Different organisations have developed eligibility criteria for authorship, i.e., "ethical

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Table 1: Authorship criteria (Ethical authorship)

<i>Criteria</i>	<i>Description</i>	<i>Comments</i>
ICMJE	<ol style="list-style-type: none"> 1. Substantial contribution in conception or acquisition or analysis or interpretation 2. Writing the draft or revising it critically 3. Approval of content 4. Agree to take accountability for content 	All four should be met. Contribution can be either of the four mentioned. Most widely-used criteria.
COPE	<ol style="list-style-type: none"> 1. Creator or originator of the idea 2. Develop and disseminate the intellectual work arising from the idea 	Gives most importance to the “originator” of the idea
WAME	Substantial intellectual contributions to the study (research question, design, analysis, interpretation, and written description)	Any other contribution should be acknowledged only
CSE	<ol style="list-style-type: none"> 1. Substantial contribution 2. Agree to be accountable for the content 	Similar to ICMJE criteria; also mentions McNutt’s criteria
NIH	<ol style="list-style-type: none"> 1. Original idea, planning, and inputs for study design and interpretation of results 2. Active intellectual contributions 3. Active involvement in the project 4. Novel provision of resources 5. Original experimental work 6. Data acquisition and analysis beyond the basic 7. Drafting of the manuscript 	Emphasises “active involvement” in the research. Writing the draft warrants first authorship.
McNutt et al.	Substantial contribution in conception OR design OR acquisition, analysis OR interpretation OR drafting, revising, AND approved the final version, AND agree to be accountable for the content	More clarity and breadth than ICMJE criteria (criterion 2 subsumed under criterion 1), and more practical

ICMJE – International Committee of Medical Journal Editors (<https://www.icmje.org/>), COPE – Committee on Publication Ethics (<https://publicationethics.org/>), WAME – World Association of Medical Editors (<https://wame.org/authorship>), CSE – Council for Science Editors (<https://www.councilscienceeditors.org/>), NIH – National Institute of Health (<https://oir.nih.gov/>)

authorship.” However, the criteria vary across journals and disciplines. The most widely used one is by the Vancouver group, i.e. the *International Committee of Medical Journal Editors (ICMJE)* (<https://www.icmje.org/>). All four criteria should be met to be eligible to be an author (see Table 1), the first being the most important: substantial contribution in *either* of the four areas, i.e. a) conceptualisation or planning, b) data acquisition, c) data analysis, or d) interpretation of results. However, “*substantial contribution*” is not clearly delineated. All who meet the above criterion should be offered to edit/revise the manuscript, approve the final draft, and agree to be accountable regarding the content of the manuscript, making them eligible for

authorship. Any contribution other than this may be acknowledged (Praharaj and Ameen, 2022).

McNutt et al. (2018) criteria are similar but broader. Besides the criteria specified by ICMJE, the areas to which substantial contribution is expected include drafting or substantially revising the article. The second and third criteria are similar to those of ICMJE.

The Council of Science Editors has defined 11 contributor roles which can be used as a checklist: 1) Concept, 2) Design, 3) Supervision, 4) Resources, 5) Material, 6) Data collection and processing, 7) Analysis and interpretation, 8) Literature search, 9) Writing, 10) Critical review, and 11) Other novel

Table 2: CRediT taxonomy (14 contributor roles)

	<i>Contributor roles</i>	<i>Description</i>
1	Conceptualisation	Formulating research questions, aims, objectives
2	Data curation	Managing data through its cycle (data cycle)
3	Formal analysis	Statistical analysis or synthesis of study data
4	Funding acquisition	Getting financial support for research till publication
5	Investigation	Data collection through surveys, experiments
6	Methodology	Developing methodology or models
7	Project administration	Management of research planning and execution
8	Resources	Arranging for all material resources
9	Software	Programming and developing codes and algorithms
10	Supervision	Oversight, leadership or mentoring research
11	Validation	Verification of the research findings
12	Visualisation	Preparation and presentation of research work
13	Writing – original draft	Writing the initial draft
14	Writing – review and editing	Critical review, comments, and editing of the draft before and after publication

contributions (Steneck, 2007).

Criteria for Authorship for Statisticians

In some research, statisticians may play a significant role. For example, they may get involved from planning the study, monitoring the progress, carrying out statistical analysis, helping interpret the results and writing or editing the manuscript beyond the statistical analysis portion. In such situations, they could fulfil the ICMJE criteria for authorship. Even those who do extensive statistical analysis for the paper and contribute to manuscript writing should not be denied the position of co-author.

How Many Authors?

There are manuscripts with “solo authors,” but such submissions are less frequent now. In some subjects, there can be thousands of authors in a manuscript. However, there is no specific rule or guideline regarding the limits to the number of authors. Nevertheless, several journals limit the number of authors based on the type of submissions. For example, many journals do not permit more than five authors for a case report. This may be useful to prevent unethical authorship practices. When the number of authors is large, “group authorship” is an option. For example:

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collaborators.

List the “major authors” followed by the “group authors,” as listing all the authors could reduce credit for the major authors. The details of the group authors can be added as an appendix or footnote. Those who do not fulfil the authorship criteria can be acknowledged.

How to Arrange the List of Authors?

Authorship Order

The order of the authors is based on their relative contributions to the research, thus conveying some information to the readers and institutions. As stated above, the “first (primary) author” is the primary researcher who came up with the idea and contributed the most to the research, followed by subsequent authors as per their relative contributions. In most cases, it is the first author who also writes the first draft of the manuscript. In thesis and dissertations, the student should be the first author, followed by the guide, then co-guide(s), if any, followed by any other contributor eligible to be an author. In Western countries, the seniormost author who originated the idea is usually the “last author”. However, in India, this practice is uncommon as the last author may not get some of the benefits accorded to the initial authors – for

Table 3: Inappropriate or unethical authorship practices

<i>Authorship practices</i>	<i>Description</i>
Honorary or courtesy authorship	Including someone as an author who has not made any substantial contribution to the research
Gift authorship	Adding as an author out of respect or gratitude only
Guest authorship	Adding a senior or well-known author to increase the value of the manuscript
Coercive or pressed authorship	Adding a senior author or group leader out of pressure to a junior researcher (e.g. departmental tradition)
Ghost or orphan authorship	Exclusion of a researcher with a substantial contribution from the publication
Anonymous authorship	Publishing under a pseudonym or anonymously could compromise the accountability of content
Forged authorship	Adding an author without their knowledge or consent
Theft authorship	Using someone's research to publish as their own

example, the National Medical Council considers only the first three authors, in their promotion criteria. The journals leave the decision of the order of authorship to the authors themselves. To avoid conflicts, it is pertinent to discuss authorship at the beginning of the research, reach a consensus, and spell it out clearly in collaboration letters.

Corresponding Author

With the approval of all authors, one author is usually designated as the "corresponding author", who is responsible for communicating with the editor regarding that manuscript during the submission, peer review, publication, and post-publication reviews. During the publication process, the corresponding author takes care of the journal requirements, including the authorships and acknowledgements, details of ethics approval and registration in trial registries, disclosures, and funding information, and promptly responds to editorial queries. The primary researcher, usually the senior-most author, is the corresponding author, while for thesis and dissertations, the guide is usually the corresponding author. However, if the guide or the senior-most author cannot spare time for all correspondence, they can assign the role to someone else or opt for a co-corresponding

author if the journal allows.

Who Should Not Be an Author?

Persons involved in the following are not considered as authors because their contribution is not directly related to the scientific aspect of research, analysis, or writing:

- 1) Any general supervision or managerial role in the research project
- 2) Involvement in training the researcher
- 3) Providing infrastructure, equipment, funding, or other material support
- 4) Routine work such as patient care, laboratory studies, or technical support
- 5) Basic collection or analysis of data
- 6) Proof-reading or commenting on the manuscript and
- 7) Language editing and providing any technical assistance in writing or preparing illustrations.

These contributions are rather duly acknowledged.

The "Rule of 5"

Kressel and Dixon suggested that the author should be able to speak on the content of the without any prior preparation, after five years of the published work for at least five minutes, of publication!

From Authorship to Contributorship

With the increasing number of authors in a study, each researcher plays a specific, limited role. Hence, instead of mere authorship, “contributor roles” are being increasingly used, where we have to define the specific role(s) each contributor played.

Contributorship Statement

Identifying each author’s contribution to the overall research is always challenging, specifically in a multicentric study involving several persons. A contributorship statement is an explicit way of documenting individual contributions to the research and manuscript writing. Most journals recommend this, and it is usually written in the following format:

“SKP and SA conceptualised the research. SKP collected the data and performed the data analysis. SA wrote the first draft. Both the authors have contributed to the manuscript and approved the final content.”

Contributorship Models

Some leading journals have adopted Contributor Roles Taxonomy (CRediT, <https://credit.niso.org/>), a more elaborate method of defining and documenting 14 different roles of contributors (see Table 2). Some roles go beyond the traditional “authorship roles” and may require only “acknowledgement” in the published manuscript (see Praharaj and Ameen, 2022). Individual contributors can assume multiple roles (e.g. data collection, analysis, and writing) in a research project, while some roles (e.g. software programming) may not be relevant to certain kinds of research.

Authorship Grids

Another way to represent the contributor roles is to use grids. They are divided into eight sections of rows: 1) responsibility, 2) coordination and communication, 3) participant protections, 4) design, 5) data, 6) analysis, 7) writing, and 8) final approvals and submission. The roles of each author are

entered in columns (Phillippi et al., 2018).

There can be another grid to reflect the literature synthesis process. It can have sections such as: 1) roles and responsibilities, 2) coordination and communication in the team, 3) designing the review and performing the literature search, 4) documenting and storing the sources for review, 5) data evaluation and synthesis, 6) writing the manuscript, and 7) final approvals and submission (Phillippi et al., 2018).

Co-contributorship or Equal co-authorship

If more than one person has done the major work, several journals allow co-contributorship so that credit is given for “equal contribution.” There can be “joint first authors” or “co-first-authors,” or they can be “joint corresponding authors” or “co-corresponding authors.” However, this provision should not be misused if the contribution is not equal, and if the contributions are not equal, it is better to spell out the role of each contributor.

Problems in Authorship

The Power Struggle

Problems sometimes arise when there is a differential of power: for example, between the ‘student’ and ‘guide’ in a thesis, or the ‘research associate’ or ‘research fellow’ and ‘grant holder’ in funded research. Practices vary across institutions and countries regarding authorship; however, it would be prudent for the person in power not to claim first authorship when the bulk of work is done by the other person. A similar problem may arise regarding the position of the corresponding author. As much as possible, these roles should be defined in the planning stage itself and a consensus reached among the co-authors.

Authorship Inflation

In collaborative research, a high number of authors is inevitable in published papers. However, it is unethical to add more authors as

a part of conferring honorary authorship, specifically when prominent researchers are added to facilitate publication. However, it may be difficult for an editor to discern this, and it is left to the authors to decide on the number of authors. Some journals limit the number of authors for brief publications such as letters and, as mentioned before, case reports.

Unethical or Inappropriate Authorship

Authorships given to those who do not fulfil ICMJE (or equivalent) criteria are considered inappropriate. Such unethical practices can be of several types, including guest, gift, or pressed authorship, in which authors who have not made substantial contributions are included (see Table 3). Ghostwriting is another unethical practice in which an author with substantial contribution is excluded, such as with an intention to hide the actual author's identity (e.g., articles prepared by the pharma industry or entirely written by a professional writing agency).

Issues Peculiar to the Indian Context

India has some unique problems in research and publications. Students who worked on a research project may not get proper credit for their work, which may be published by the senior authors to fulfil their promotional or other academic requirements. Conversely, some students may publish research work excluding the guide or the senior author who conceptualised the study, more so when the latter has retired. A study done as part of a thesis or dissertation often remains unpublished as the student does not show any interest in publishing it. In such a scenario, if a faculty member writes the manuscript, they should still give due credit to the student (as the first author) and the guide or co-guide (as second and third authors), and maybe as the corresponding author too, if they are willing to take the responsibility (or co-corresponding author if the journal allows).

In the End

It is not the role of the editor to determine who qualifies to be an author in a submitted manuscript, although they can detect some unethical practices. Rather, it is a good practice to negotiate regarding authorship and other contributor roles early on in the research so as to avoid disputes later. All those who have contributed substantially to the manuscript should be included as authors, and no one fulfilling the criteria should be denied this opportunity. Journals have authorship policies that should be adhered to while submitting a manuscript. Good authorship practices build confidence in collaborative research work.

Suggested Readings

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