WRITING ABSTRACTS: CREATING IMPRESSIONS

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WHY BOTHER ABOUT ABSTRACTS?

The title and abstract are probably the most important ways to disseminate the findings of a research study. The reasons are manifold. Firstly, most researchers skim through titles and abstracts more often than reading full-text of manuscripts as it saves time. They may select a few papers to read in full if they find the abstract interesting. Secondly, not all have access to full-text in most reputed journals as they are paid ones, and the only portion that is available free is abstract. Most search portals such as MEDLINE/PubMed, EMBASE or PsychINFO provide only abstracts. Thirdly, in some situations, abstracts are the only thing available to readers, as in conference presentations or if full article is only available in a language not understood by the reader. Also, readers in countries where English is not the primary language may have access to an abstract translated to their own language, but not to a translated full text. Therefore, providing a clear, accurate and lucid abstract would help to get your research noticed. After the title, the abstract is the most read part of a biomedical article.

The abstract can be succinctly summarized as: AB – absolutely, STR – straightforward, ACT – actual data presentation and interpretation.[1] Usually, there is a word limit specified for the abstract (250 or 300 words). Essentially, an abstract is a summary of the whole paper and is extracted from it. It is worthwhile to write the abstract only after the whole manuscript is completely written.

TYPES OF ABSTRACTS

Abstracts can be either unstructured or structured. It has been found that structured abstracts are more informative than unstructured abstracts, and hence are more preferred. In 1993, the International Committee of Medical Journal Editors (the so-called ''Vancouver group'') recommended, in the ''Uniform Requirements for Journals Submitted to Biomedical Journals,'' the use of structured abstracts.[2] Most journals, barring a few, recommend the use of structured abstracts. Therefore, unless it is specified in instruction to authors to submit unstructured abstracts, it is recommended to write all abstracts in a structured way.

Unstructured abstracts

There are no subheadings in the unstructured abstracts. However, the content of the abstract is more or less the same as in structured abstracts. Some argue that it is easy to read an unstructured abstract as the flow is not interrupted in comparison to a structured abstract which the readers tend to skim. Some journals allow case reports to have unstructured abstracts.

Structured abstracts

Structured abstracts usually follow *IMRaD* or *four-heading format*, i.e. introduction, methods, results, and discussion, which is the standard adopted for reporting research articles.

However, in the abstracts, conclusion replaces discussion, i.e. introduction, methods, results, and

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Table 1: Structured abstracts – IMRaC and eight-heading format

IMRaD format for articles	IMRaC format for abstracts	Eight heading format	Description
1. Introduction	1. Introduction	1. Objective	Knowledge gap, research question
2. Methods	2. Methods	2. Design	Study design
		3. Setting	Location, time
		4. Participants	Number, eligibility criteria
		5. Intervention/exposure	Treatment given or exposures
		6. Main outcome measures	Primary outcome (*a priori*)
3. Results	3. Results	7. Results	Key findings
4. Discussion	4. Conclusion(s)	8. Conclusion(s)	Key conclusion(s), clinical implication

conclusion (IMRaC). Another recommended format for structured abstracts is the *eight-heading format* (objective, design, setting, patients, intervention, main outcome measures, results, and conclusions).[3] Most journals will specify either of the four- or eight-heading format for structured abstracts in the instruction to authors. A comparison of the two formats is presented in table 1.

BODY OF STRUCTURED ABSTRACTS

Introduction (or Background)

This section should be a few sentences long (usually two or three). It should justify the need for the study and lay the framework for study objectives. The three components of this section include:

- the importance of the topic,
- the gap in knowledge, and
- the research question.

The first one or two sentences introduce the topic and state the previous work done, with important limitations or missing information. The last sentence is the research question, which is stated as the objective of the study. It has to be stated in concise, clear and unambiguous terms. The components of the objective vary according to the study design. If there are more than one objectives, only the main objective and the key secondary objectives need to be stated. References are not necessary in the abstracts.

Methods

This is the most important section of the abstract and should provide enough details to clearly describe the setting, study design, research participants, sampling procedures, interventions, data collection, and analysis. The study design should be stated, i.e. randomized-controlled trial, single or double blind, or cross-sectional study, etc. Mentioning the study setting (hospital-based or community) helps in extrapolating the findings to the study population. It is imperative to mention the sampling procedure (random or convenient sampling) and sample size (if more than one group, n for each group). Similarly, the eligibility criteria for participants (which includes inclusion and exclusion criteria) should be clearly stated which helps in generalizing the study findings. The interventions are described, including the dose and duration. The details of statistical methods can usually be omitted from the abstract. All this information should be written in no more than two to three sentences.

Results

While reporting the results of studies, it is essential to identify the main question that the study addressed, i.e. the primary outcome, even though the article reports other outcome measures too. This information is essential to avoid overemphasis of

chance findings and underreporting of negative findings.

One of the most common errors is omission of the main quantitative findings. It is advised to add the numerical results with estimates of precision, such as confidence intervals. For example, instead of "suicidal ideas were more common in depressed patients", write "Among subjects with depression, 22% (95% confidence interval 18 to 27%) had suicidal ideation".

The exact p values are preferred because they provide more information than arbitrary cut-points, such as "< .05" and "not significant". Furthermore, it is not sufficient to include only the p values — wherever possible, effect size measures should be reported. Also, reporting the number needed to treat or harm is encouraged, as they are easier to understand than mean differences alone. No data should be reported in the abstract that do not appear in the rest of the article.

Conclusions

The conclusions should be brief and straightforward and based on the study findings. The conclusion can be stated in two sentences: One that concisely summarizes the main findings, and a second that states interpretation or clinical implications. For a trial, the sentence on main findings should contain statements on both the efficacy and the safety. Any major limitations should also be included.

Also, remember not to overestimate the importance of your research findings. Though the findings may appear important to you after completing the study, for others it may be modest. Thinking in terms of clinical usefulness makes it easier to appreciate the research findings in real terms. Avoid clichés such as "more research is needed" or "this study has important implications for psychiatrists." If there are implications, state them.

ABSTRACTS OF RESEARCH PAPERS

A journal abstract should be an accurate reflection of what is included in the full article and should not include information that does not appear in the body of the paper. Omitting important contrary results from the abstract, such as those concerning side effects, could seriously mislead a reader's interpretation of the trial findings. There are guidelines for reporting abstracts for different kinds of studies, like Consolidated Standards of Reporting Trials (CONSORT)[4] and STrengthening the Reporting of OBservational studies in Epidemiology (STROBE) for abstracts (draft version).[5] Table 2 summarizes an adaptation of CONSORT for abstracts for randomized-controlled trials.

ABSTRACTS OF META-ANALYSES

Abstracts for a systematic review and meta-analysis follow similar principles, but use seven section headings: objective(s), data sources, study selection, intervention(s) or main exposure(s), main outcome measure(s), results, and conclusion(s).[6] There are specific guidelines for reporting systematic reviews and meta-analyses such as Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines for abstract.[7] Table 3

summarizes abstract for systematic reviews and meta-analyses, which is adapted from PRISMA guidelines for abstract.

ABSTRACTS FOR CONFERENCES

Conferences usually solicit abstracts of paper or poster presentations from researchers. These abstracts are mostly of the studies or reviews undertaken by the researchers and would follow the same principles as described above. These abstracts are different from those of papers submitted to journals, as sometimes fellowships and awards are decided based on them. Abstracts presented at major international meetings are generally of high quality, as they undergo extensive scrutiny by the scientific committee. Of the submitted abstracts, only a third are actually accepted.[1] If an abstract is accepted, it is

Table 2: *Abstract for randomized controlled trials (Adapted from CONSORT for abstracts)*[4]

Headings	Subheadings	Description
1. Background	1. Objectives	Research question including *PICO* (participants, interventions, comparators, and outcomes) components
	2. Trial design	Identify as randomized, description of design (parallel, cluster, non-inferiority)
2. Methods	3. Participants	Eligibility criteria for participants and the settings where the data were collected
	4. Intervention	Interventions intended for each group
	5. Objective	Methods for assessing risk of bias
	6. Outcome	The primary and secondary outcomes
	7. Randomization	Method of randomization and allocation concealment
	8. Blinding	Who was blinded and how in was ensured
3. Results	5. Included studies	Number and type of included studies and participants and relevant characteristics of studies
	6. Synthesis of results	Results for main outcomes (benefits and harms) with number of studies and participants for each, and summary measures with confidence intervals (for meta-analysis)
	7. Description of the effect	Effect size and direction, meaningful to clinicians and patients
4. Discussion	8. Strengths and Limitations of evidence	Summary of strengths and limitations of evidence (inconsistency, imprecision or risk of bias)
	9. Interpretation	General interpretation of the results and important implications
5. Others	10. Funding	Primary source of funding for the review
	11. Registration	Registration number and registry name

usually published in the conference handbook, and sometimes in journal supplements as *conference abstracts*. Many a time, the delegates would use these to decide whether to attend these presentations or not. Furthermore, if the abstract is accepted, it is published as such without any opportunity for corrections, in contrast to journal abstracts. One common problem observed in abstracts submitted for free papers presentations is that they will not include the results and will rather say "results and conclusion will be presented later". This happens when the authors have not analyzed the data and the results are not ready. Whenever possible, this is to be avoided, as this is what is published in conference abstracts and readers will not have access to the results and conclusions later.

LAY ABSTRACTS

Sometimes, writing scientific reports aimed at the lay public and other stakeholders is necessary for widespread dissemination or for grant applications. Some scientific journals and institutional review boards require abstracts or research summaries written specifically for the lay public. A checklist for writing a lay abstract is given by Dubé and Lapane.[7] Such lay abstract or summary should be written in a language different from the scientific articles which are full of jargon. Therefore, just copying the abstract from the scientific articles will not work. Avoid long winding sentences, use active voice and avoid acronyms. Also, check the readability and specifically avoid statistical jargon. It is worthwhile

Table 3: *Abstract for systematic reviews and meta-analyses (Adapted from PRISMA for abstracts)*[7]

Headings	Subheadings	Description
1. Background	1. Objectives	Research question including *PICO* (participants, interventions, comparators, and outcomes) components
2. Methods	2. Eligibility criteria	Study and report characteristics used as criteria for inclusion
	3. Information sources	Key databases searched with search dates
	4. Risk of bias	Methods for assessing risk of bias
3. Results	5. Included studies	Number and type of included studies and participants and relevant characteristics of studies
	6. Synthesis of results	Results for main outcomes (benefits and harms) with number of studies and participants for each, and summary measures with confidence intervals (for meta-analysis)
	7. Description of the effect	Effect size and direction, meaningful to clinicians and patients
4. Discussion	8. Strengths and limitations of evidence	Summary of strengths and limitations of evidence (inconsistency, imprecision or risk of bias)
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to take feedbacks from laypersons and revise accordingly.

PARTING COMMENTS

Summarize the manuscript and that becomes abstract. Write the abstract only when the final draft of the manuscript is ready so that no important finding or conclusion is missed. In the end, revise and double-check the final abstract content so that it matches the text of the manuscript. Remember the bottom line: an abstract creates an impression about the manuscript.

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