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The Tits and Bits of Good Abstract Writing for a Medical Science Journal Article

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Abstract

Writing an abstract for a medical journal article could be a daunting task for inexperienced authors. This paper provided a guide to good abstract writing for medical science articles using examples published in a range of journals. By giving a definition of a good abstract, it highlighted the purposes, features, and structure of a good medical science abstract, and illustrated these with examples culled from articles published in peer reviewed journals. The unique features of each section were stressed as well as the need for brevity, objectivity, comprehensiveness, logical organization, good grammatical *writing, and compliance with journal's* specifications with respect to word length and structure. The need for thoroughness in the revision of the abstract was equally emphasized. The authors believe that this paper could serve as a good guide to new and aspiring medical science authors.

Keywords: Abstract, journal article, publication, writing style

Introduction

Writing a scientific article for journal publication can be a daunting task for young inexperienced authors. Although all sections of a manuscript are important and should be well written, the abstract is usually the first section to be read and its content can either attract or repel a reader. There are many factors contributing to poor quality in manuscripts, some of which have been presented in a recent article (Ezeala et al, in press, Ohwovoriole 2011, Pierson, 2004). Notwithstanding the emphasis given to good manuscript preparation and guidelines provided by journals, many authors still find it hard to produce manuscripts that are compelling or abstracts that are enticing to readers. The paper presents the tits and bits of good abstract writing for medical and health science journals taking examples from articles published in high profile journals. The authors hope that this will be an interesting resource for both experienced and armature authors aspiring to write scientific articles for publication.

What is an Abstract?

An understanding of the meaning and purpose of an article abstract is important to good abstract writing. An abstract has been defined as “{A} brief summary of a research article that emphasizes what is new, captures the salient features of the purpose, design, findings, and implications, and contains no unnecessary sentences or explanations” (Ezeala, 2012). The purpose of article abstract is to make it easy for the reader to quickly grasp the key points of the article. This will help him determine his interest in the article and its relevance to his work.

As a brief summary, the abstract is expected to be an exact reflection of the content of the main text. It should not contain any information that is not presented in the main text, nor is it expected to exclude vital findings or shortcomings of the research. The emphasis should be on the novel features of the article, and it should be presented logically along the lines of the sections of the article's main text. This includes context and background, objectives, the setting of the research, work done or materials and methods, findings/results, and conclusions from the results.

As a rule, abstracts do not include citations, figures or tables; but the format of an abstract may vary from discipline to discipline and from journal to journal. Some features of a journal article abstract distinguish it from conference oral or poster abstracts. These features among others include that journal abstracts could be indexed in academic databases while conference abstracts are not so indexed, some journals do not allow conference abstract citation in their articles, and often conference abstracts are not recognized as publications in the same manner articles are treated. Box 1 presents a summary of some factors that make a good medical science journal abstract.

Box 1. Features of a good abstract

What makes an abstract good?

1. It is a brief summary of completed or ongoing research article.
2. It includes information on the context or background of the study;
3. It states the rationale for the study
4. It has clear objectives/project statement
5. It has a succinct presentation of the work done
6. It contains clear and logical presentation of findings;
7. Its conclusions are supported by the results
8. It includes a take-home message or statement of impact;
9. It has been written according to journal guidelines: – structured or unstructured, word limit, etc.
10. It has good grammatical writing.

Sections of an Abstract

Context/ Background: This section of the abstract answers the questions: Why did you start? What is the article about? Why is it important? This should be stated in one or two sentences. A few examples will illustrate this.

Example 1a:

“In north India, vitamin A deficiency (retinol <0.70 µmol/L) is common in pre-school children and 2—3% die at ages 1.0—6.0 years.” (Awasthi et al, 2013)

Example 1b:

“Large health surveys use subjective (self-reported) and objective (biomarkers) measures to assess health status. However, the linkage or disparity of these measures has not been systematically studied in developing countries.” (Butrick et al, 2012)

Example 1c:

“Confidentiality is known to be a challenging aspect of physiotherapy practice. This paper explores current guidance available to the profession in New Zealand.” (Lees and Godbold, 2012)

These examples used one to two sentences each to summarize the respective purposes and importance of the research.

Objectives: You may use one sentence to summarize the aims or objectives of the article. Some journals do not include background material in their abstracts, so the objectives may be the opening section of the abstract.

Example 2a:

“To describe the use of mifepristone in combination with buccal misoprostol in women undergoing an early medical abortion (EMA) in Australia.” (Goldstone et al, 2012)

Example 2b:

“This study explored the transition to parenthood and the relationship between parenthood and family functioning in first-time mothers and fathers.” (Ohashi and Asano, 2012).

Example 2c:

“The purpose of this study was to evaluate the effectiveness of a community-based health promotion program targeting people with hypertension and high cholesterol.” (Wu et al, 2012).

Methods/ Setting/Work Done: In this section, you are expected to provide a concise description of study design & methodology used in the study. Because this section provides a lot of information, it should be generally comparatively longer than the previous two sections. Further examples will illustrate this:

Example 3a:

"Using data from the Philippine Quality Improvement Demonstration Study, QIDS, this study evaluated the associations between General Self-Reported Health Status (GSRH) and height, weight, hemoglobin, red blood cell folate, C-reactive protein, and blood lead levels. The authors modeled each biomarker as a function of GSRH controlling for socioeconomic status and selection effects. Changes in biomarkers and GSRH in children who had previously been hospitalized were also examined." (Butrick et al 2012).

Example 3b:

"We conducted a double-blind, multicenter trial involving 3020 patients with recent symptomatic lacunar infarcts identified by magnetic resonance imaging. Patients were randomly assigned to receive 75 mg of clopidogrel or placebo daily; patients in both groups received 325 mg of aspirin daily. The primary outcome was any recurrent stroke, including ischemic stroke and intracranial hemorrhage." (SPS3 Investigators, 2012).

Example 3c:

"Participants in this cluster-randomised trial were pre-school children in the defined catchment areas of 8338 state-staffed village child-care centres (under-5 population 1 million) in 72 administrative blocks. Groups of four neighbouring blocks (clusters) were cluster-randomly allocated in Oxford, UK, between 6-monthly vitamin A (retinol capsule of 200 000 IU retinyl acetate in oil, to be cut and dripped into the child's mouth every 6 months), albendazole (400 mg tablet every 6 months), both, or neither (open control). Analyses of retinol effects are by block (36 vs 36 clusters). The study spanned 5 calendar years, with 11 6-monthly mass-treatment days for all children then aged 6–72 months. Annually, one centre per block was randomly selected and visited by a study team 1–5 months after any trial vitamin A to sample blood (for retinol assay, technically reliable only after mid-study), examine eyes, and interview caregivers. Separately, all 8338 centres were visited every 6 months to monitor pre-school deaths (100 000 visits, 25 000 deaths at ages 1.0–6.0 years [the primary outcome]). This trial is registered at ClinicalTrials.gov, NCT00222547." (Awasthi et al, 2013).

One of the pitfalls of this section includes omitting vital information on the methods used in attempt to reduce word count. Rephrasing sentences could be helpful while words and phrases that do not add to the understanding of the abstract should of course be removed.

Results: This is usually the longest section of the abstract. Occasionally it may be as long as or shorter than the methods section. You should concisely present your findings including real data! An abstract that contains no real data is not complete. However, abstracts should not contain tables and figures. Presented below are good examples:

Example 4a:

"In developing countries, mean HAZ improved from -1.86 (95% uncertainty interval -2.01 to -1.72) in 1985 to -1.16 (-1.29 to -1.04) in 2011; mean WAZ improved from -1.31 (-1.41 to -1.20) to -0.84 (-0.93 to -0.74). Over this period, prevalences of moderate-and-severe stunting declined from 47.2% (44.0 to 50.3) to 29.9% (27.1 to 32.9) and underweight from 30.1% (26.7 to 33.3) to 19.4% (16.5 to 22.2). The largest absolute improvements were in Asia and the largest relative reductions in prevalence in southern and tropical Latin America. Anthropometric status worsened in sub-Saharan Africa until the late 1990s and improved thereafter. In 2011, 314 (296 to 331) million children younger than 5 years were mildly, moderately, or severely stunted and 258 (240 to 274) million were mildly, moderately, or severely underweight. Developing countries as a whole have less than a 5% chance of meeting the MDG 1 target; but 61 of these 141 countries have a 50–100% chance." (Stevens et al, 2012).

Example 4b:

"The participants had a mean age of 63 years, and 63% were men. After a mean follow-up of 3.4 years, the risk of recurrent stroke was not significantly reduced with aspirin and clopidogrel (dual antiplatelet therapy) (125 strokes; rate, 2.5% per year) as compared with aspirin alone (138 strokes, 2.7% per year) (hazard ratio, 0.92; 95% confidence interval [CI], 0.72 to 1.16), nor was the risk of recurrent ischemic stroke (hazard ratio, 0.82; 95% CI, 0.63 to 1.09) or disabling or fatal stroke (hazard ratio, 1.06; 95% CI, 0.69 to 1.64). The risk of major hemorrhage was almost doubled with dual antiplatelet therapy (105 hemorrhages, 2.1% per year) as compared with aspirin alone (56, 1.1% per year) (hazard ratio, 1.97; 95% CI, 1.41 to 2.71; $P < 0.001$). Among classifiable recurrent ischemic strokes, 71% (133 of 187) were lacunar strokes. All-cause mortality was increased among patients assigned to receive

dual antiplatelet therapy (77 deaths in the group receiving aspirin alone vs. 113 in the group receiving dual antiplatelet therapy) (hazard ratio, 1.52; 95% CI, 1.14 to 2.04; P=0.004); this difference was not accounted for by fatal hemorrhages (9 in the group receiving dual antiplatelet therapy vs. 4 in the group receiving aspirin alone)." (SPS3 Investigators, 2012)

Example 4c:

"Estimated compliance with 6-monthly retinol supplements was 86%. Among 2581 versus 2584 children surveyed during the second half of the study, mean plasma retinol was one-sixth higher (0.72 [SE 0.01] vs 0.62 [0.01] $\mu\text{mol/L}$, increase 0.10 [SE 0.01] $\mu\text{mol/L}$) and the prevalence of severe deficiency was halved (retinol <0.35 $\mu\text{mol/L}$ 6% vs 13%, decrease 7% [SE 1%]), as was that of Bitot's spots (1.4% vs 3.5%, decrease 2.1% [SE 0.7%]). Comparing the 36 retinol-allocated versus 36 control blocks in analyses of the primary outcome, deaths per child-care centre at ages 1.0–6.0 years during the 5-year study were 3.01 retinol versus 3.15 control (absolute reduction 0.14 [SE 0.11], mortality ratio 0.96, 95% CI 0.89–1.03, p=0.22), suggesting absolute risks of death between ages 1.0 and 6.0 years of approximately 2.5% retinol versus 2.6% control. No specific cause of death was significantly affected." (Stevens et al, 2012).

Conclusion: Here you should present a brief interpretation of the results, stating the implications and making recommendations for action. The conclusions should be supported by the results presented. Limitations of the study may be briefly highlighted. One or two sentences will be okay for this section.

Example 5a:

"DEVTA contradicts the expectation from other trials that vitamin A supplementation would reduce child mortality by 20–30%, but cannot rule out some more modest effect. Meta-analysis of DEVTA plus eight previous randomised trials of supplementation (in various different populations) yielded a weighted average mortality reduction of 11% (95% CI 5–16, p=0.00015), reliably contradicting the hypothesis of no effect." (Awasthi et al, 2013).

Example 5b:

"Macroeconomic shocks, structural adjustment, and trade policy reforms in the 1980s and 1990s might have been responsible for worsening child nutritional status in sub-Saharan Africa. Further progress in the improvement of children's growth and nutrition needs equitable economic growth and investment in pro-poor food and primary care programmes, especially relevant in the context of the global economic crisis." (Stevens et al, 2012)

Example 5c:

"In addition to being a measure of overall child health status, GSRH may be a useful and inexpensive screening tool for identifying children that need further health testing." (Butrick et al, 2012).

Form, Style and Grammar

Though the abstract is usually the last section of the article to be written, it should not be done in a hurry. Attention to detail with respect to language is important. The abstract should preferably be written in the active voice, objectively, and briefly. Abstracts generally capture the interest of readers by using a simple language appropriate for conveying information in the discipline. The author as his own editor should read and proofread his abstract and be satisfied that it is a true summary of the text. Submitting the article and, in this context, the abstract to colleagues to proofread may be helpful. Authors should remember that brevity is important! The authors should refer to the journal's instruction to authors to ensure the abstract is in the right format. Some journals have their abstracts structured, with specified subheadings. Others use unstructured format. Whatever the format recommended by the journal, the concepts presented in this article are applicable.

Coping With Word-limits

The word limit required for the abstract varies from one journal to another but generally lies between 100 and 400 words. The authors of this article recommend that the draft of the abstract be written completely, and then edited to remove unnecessary sentences and words. Sentences could be restructured to clarify their meaning or reduce the word length. This should continue until the required word length is achieved without removing important points of the abstract.

Conclusion

Writing an abstract could be fun, but it could also be daunting to the inexperienced writer. Following the guides and examples presented in this paper could simplify the task of abstract writing for medical scientists

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