

The abstract: A ‘three-star’ opportunity

J.G. McVeigh^{a,*} and J.R. Basford^b

^a*Institute of Nursing and Health Research, School of Health Sciences, Ulster University, Newtownabbey, Northern Ireland, UK*

^b*Department of Physical Medicine and Rehabilitation, Mayo Clinic, Rochester, MN, USA*

Authors devote huge amounts of time and thought to the writing and fine tuning of their papers. Unfortunately, this effort often does not extend to the paper’s title and abstract. This is a serious mistake.

In reality, the title and the abstract, whether available in print or online, are the only parts of a paper that most people will read [1]. As such, they are the only way that an author can entice a reader to either devote more time to their work or at least remember its most salient findings. This fact has serious consequences as research shows that abstracts alone are often used to inform clinical decision making, particularly in areas where access to information is limited [2–4]. Perhaps more immediately most journals pre-screen papers for review with as many as 25% being rejected by an editor following an assessment based on the title and abstract [5]. Interesting, well-written and sufficiently detailed abstracts are essential to enable the reader to make an informed judgement about the originality, significance and rigour of the research [3]. Ironically though, the abstract is often the part of the paper given least thought, the last part of the paper that is written, often rushed and with limited input from co-authors [5].

The disjuncture between the quality of a paper’s abstract and its body has been known by editors of both major and minor medical journals for years [6]. As an example, a paper by Berwanger et al. [6] reviewed 227 abstracts of randomised controlled trials (RCTs) in four leading medical journals (the New England Journal of Medicine; the Journal of the American Medical

Association; the British Medical Journal and the Lancet) and confirmed that abstract quality was poor, and particularly so, when it came to reporting the key mythological factors such as subject numbers, blinding, subject attrition, outcome identification, and effect sizes. These findings have been duplicated by others with respect to nursing journals and systematic reviews, at least as presented in conferences [7–9].

The CONSORT Statement provides recommendations for reporting RCTs, but contains limited advice on the preparation of abstracts – other than recommending a structured format [10]. In response to the poor quality of many journal and conference abstracts, and the limited guidance in this area, the CONSORT Group extended the CONSORT Statement in 2008 to include a checklist of essential items for use when reporting the main results of an RCT in a journal or conference abstract (the CONSORT for Abstracts: Table 1) [11]. The CONSORT for Abstracts contains 17 items, which the authors have stated can be sufficiently addressed in the standard 250–300 word abstract. There is evidence that the use of these guidelines has improved the quality, at least in terms of the number of items reported, in journals that have adopted and enforced the policy [12].

The PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) Group have also developed an abstract checklist for systematic reviews ‘PRISMA for Abstracts: reporting systematic reviews in journal and conference abstracts’ [13]. However, there is limited guidance on the best presentation of abstracts of qualitative research. A recent synthesis of recommendations on standards for reporting qualitative research gave little advice on the presentation

*Corresponding author: J.G. McVeigh, Institute of Nursing and Health Research, School of Health Sciences, Ulster University, Newtownabbey BT37 0QB, Northern Ireland, UK. Tel.: +44 0 28 90368148; E-mail: j.mcveigh@ulster.ac.uk.

Table 1
Items to include when reporting randomised trials in journal or conference abstracts

| Item | Description | Reported on line number |
|--------------------|---|-------------------------|
| Title | Identification of the study as randomized | |
| Authors* | Contact details for the corresponding author | |
| Trial design | Description of the trial design (e.g. parallel, cluster, non-inferiority) | |
| <i>Methods</i> | | |
| Participants | Eligibility criteria for participants and the settings where the data were collected | |
| Interventions | Interventions intended for each group | |
| Objective | Specific objective or hypothesis | |
| Outcome | Clearly defined primary outcome for this report | |
| Randomization | How participants were allocated to interventions | |
| Blinding (masking) | Whether or not participants, care givers, and those assessing the outcomes were blinded to group assignment | |
| <i>Results</i> | | |
| Numbers randomized | Number of participants randomized to each group | |
| Recruitment | Trial status | |
| Numbers analysed | Number of participants analysed in each group | |
| Outcome | For the primary outcome, a result for each group and the estimated effect size and its precision | |
| Harms | Important adverse events or side effects | |
| Conclusions | General interpretation of the results | |
| Trial registration | Registration number and name of trial register | |
| Funding | Source of funding | |

*This item is specific to conference abstracts. Hopewell et al. [11].

of an abstract, other than a general overview of its structure [14]. Although the CONSORT for Abstracts was developed for RCTs, the general principles can be applied to abstracts of any research methodology, that is, the abstract should enable the reader to make an accurate estimation of the quality and importance of the research, its rigour, the key findings and their implications.

In recent years there has been a growth in national research assessment exercises. Governments use these assessment exercises to ensure public accountability for the allocation of research funding and as way to encourage research performance. Some of the more established research assessment exercises are: Excellence in Research for Australia; Evaluation of Research Quality, VQR, Italy; Evaluation of R&D Units, Portugal and Research Quality Evaluation in Sweden – FOKUS. In the UK the Research Excellence Framework (REF) [15] is a robust, internationally-recognised system for assessing the quality of UK university research, the results of which are used each year to allocate some £2 billion of government funding. University research submissions to REF panels and sub-panels are evaluated and star-rated (Table 2). Only research outputs rating three-star and above attract research

funding. In the 2014 REF exercise there were more than 10,000 research outputs submitted to the sub-panel evaluating the allied health professions, biomedical sciences, dentistry, nursing, midwifery and pharmacy alone. Each was rigorously assessed and rated. The workload involved is immense and it would seem self-evident that an abstract that is well-written, and can display a project's novelty, quality, and importance will assist the assessors in their efforts. While it may be difficult to upgrade the appearance of "two-star" research into three-star level with good writing, the opposite is true. A poorly written abstract with many omissions, could easily be interpreted as one or two-star research.

Common sections of a structured abstract and how they may address are outlined below, some journals may of course structure their abstracts differently.

1. Title

The title should capture the reader and create impact. A title that identifies the patient population, the intervention, the primary outcome and the design allows the reader to immediately assess the relevance of the study. A title such as 'A Primary Care-Based Randomized

Table 2
Research output star ratings

| | |
|--------------|--|
| Four star | Quality that is world-leading in terms of originality, significance and rigour. |
| Three star | Quality that is internationally excellent in terms of originality, significance and rigour but which falls short of the highest standards of excellence. |
| Two star | Quality that is recognised internationally in terms of originality, significance and rigour. |
| One star | Quality that is recognised nationally in terms of originality, significance and rigour. |
| Unclassified | Quality that falls below the standard of nationally recognised work. Or work which does not meet the published definition of research for the purposes of this assessment. |

Controlled Trial of 12-Week Whole-Body Vibration for Balance Improvement in Type 2 Diabetes Mellitus' [16] can easily be understood and the reader decide if worth reading in full. Whereas a paper with a title such as 'Exercise and the heart: the good, the bad, and the ugly' requires further investigation to reveal the nature of the paper [17]. Incidentally it has been identified that papers with shorter titles are more likely to be cited than papers with longer titles [18] and papers with a question mark or colon in their title tend to be cited less [19].

2. Background

The background (if required) to the abstract should clearly and succinctly outline what is known and what the gap in the literature is. The background can also identify the originality and significance of the work — key aspects of a three-star abstract.

3. Objective

The objective should be a one-sentence statement of the goals of the project. Some journals assist in its brevity by insisting that the objective sentence begin with the word "to."

4. Methods

The methods section enables the reader to make decisions about the project's rigour and credibility. It should include detail on: participants ($n = x$); eligibility criteria; the setting where data was collected; the study design; the intervention(s) used and the primary outcome (if not required elsewhere in the abstract).

For RCTs the method of randomisation and group allocation should be stated; blinding of participants, caregivers and outcome assessors should be described. A brief description of the statistical analysis used may be appropriate depending on its complexity.

5. Results

The results section should concisely summarise the main results from the study. The number of participants included in the analysis and the number analysed in each group should be stated, if appropriate. For the primary outcome, a summary of the results for each group e.g. mean and standard deviation and a contrast between groups, such as effect size and its precision (e.g. confidence intervals) should be presented. *P* values in isolation are inappropriate as effect sizes and measures of uncertainty are key to understanding the results [20]. A frequent problem and one to avoid is an overemphasis on borderline or non-significant findings [11, 21].

6. Conclusions

The conclusion of the abstract should be consistent with the results and should be simply and clearly stated along with their clinical implications. They should address the generality of the findings but not be overstated. Where the results of a study have international implications this should be clearly stated in the conclusions.

In summary, three-star research is that which 'is internationally excellent in terms of originality, significance and rigour' [17], for the quality of a published paper to be immediately and fully recognised, the originality, significance and rigour of the research needs to be conveyed in the abstract. The abstract is often

the only part of the paper that is read, it deserves the author's respect and attention.

References

- [1] Andrade C. How to write a good abstract for a scientific paper or conference presentation. *Indian J Psychiatry* 2011;53(2): 172-5.
- [2] Barry HC, Ebell MH, Shaughnessy AF, et al. Family physicians' use of medical abstracts to guide decision making: Style or substance? *J Am Board Fam Pract* 2001;14:437-42.
- [3] Hopewell S, Clarke M, Moher D, Wager E, Middleton P, Altman DG, Schulz KF. CONSORT Group. CONSORT for reporting randomised trials in journal and conference abstracts. *Lancet* 2008;371(9609):281-3.
- [4] Marcelo A, Gavino A, Isip-Tan IT, Apostol-Nicodemus L, Mesa-Gaerlan FJ, Firaza PN, Faustorilla JF Jr, Callaghan FM, Fontelo P. A comparison of the accuracy of clinical decisions based on full-text articles and on journal abstracts alone: A study among residents in a tertiary care hospital. *Evid Based Med* 2013;18(2):48-53.
- [5] Groves T, Abbasi K. Screening research papers by reading abstracts. *BMJ* 2004;329(7464):470-1.
- [6] Berwanger O, Ribeiro RA, Finkelsztejn A, Watanabe M, Suzumura EA, Duncan BB, Devereaux PJ, Cook D. The quality of reporting of trial abstracts is suboptimal: Survey of major general medical journals. *J Clin Epidemiol* 2009;62(4):387-92.
- [7] Hopewell S, Boutron I, Altman DG, Ravaud P. Deficiencies in the publication and reporting of the results of systematic reviews presented at scientific medical conferences. *J Clin Epidemiol* 2015;68(12):1488-95.
- [8] Beller EM, Glasziou PP, Hopewell S, Altman DG. Reporting of effect direction and size in abstracts of systematic reviews. *JAMA* 2011;306(18):1981-2. [PubMed]
- [9] Kiriakou J, Pandis N, Fleming PS, Madianos P, Polychronopoulou A. Reporting quality of systematic review abstracts in leading oral implantology journals. *J Dent* 2013;41(12):1181-7.
- [10] Schulz KF, Altman DG, Moher D, for the CONSORT Group. CONSORT 2010 Statement: Updated guidelines for reporting parallel group randomised trials. *J Clin Epi* 2010;63(8): 834-40.
- [11] Hopewell S, Clarke M, Moher D, Wager E, Middleton P, Altman DG, Schulz KF. CONSORT Group. CONSORT for reporting randomized controlled trials in journal and conference abstracts: Explanation and elaboration. *PLoS Med* 2008;5(1):e20.
- [12] Hopewell S, Ravaud P, Baron G, Boutron I. Effect of editors' implementation of CONSORT guidelines on the reporting of abstracts in high impact medical journals: Interrupted time series analysis. *BMJ* 2012;344:e4178.
- [13] Beller EM, Glasziou PP, Altman DG, Hopewell S, Bastian H, Chalmers I, Gøtzsche PC, Lasserson T, Tovey D. PRISMA for Abstracts Group. PRISMA for Abstracts: Reporting systematic reviews in journal and conference abstracts. *PLoS Med* 2013;10(4):e1001419.
- [14] O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. Standards for reporting qualitative research: A synthesis of recommendations. *Acad Med* 2014;89(9):1245-51.
- [15] Research Excellence Framework. Higher Education Funding Council for England (HEFCE) <http://www.ref.ac.uk/> [Accessed 28th April 2016]
- [16] Del Pozo-Cruz J, Alfonso-Rosa RM, Ugia JL, McVeigh JG, Pozo-Cruz BD, Sañudo B. A primary care-based randomized controlled trial of 12-week whole-body vibration for balance improvement in type 2 diabetes mellitus. *Arch Phys Med Rehabil* 2013;94(11):2112-8.
- [17] Sharma S, Merghani A, Mont L. Exercise and the heart: The good, the bad, and the ugly. *Eur Heart J* 2015;36(23):1445-53.
- [18] Paiva CE, Lima JP, Paiva BS. Articles with short titles describing the results are cited more often. *Clinics (Sao Paulo)* 2012;67(5):509-13.
- [19] Jamali, HR, Nikzad M. Article title type and its relation with the number of downloads and citations. *Scientometrics* 2011;88(2):653-61.
- [20] Chavalarias D, Wallach JD, Li AH, Ioannidis JP. Evolution of reporting *p* values in the biomedical literature, 1990-2015. *JAMA* 2016;315(11):1141-8.
- [21] Boutron I, Dutton S, Ravaud P, Altman DG. Reporting and interpretation of randomized controlled trials with statistically nonsignificant results for primary outcomes. *JAMA* 2010;303(20):2058-64.