

A Practical Guide to Writing and Reviewing Abstracts for Pediatric Academic Meetings

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Writing and reviewing abstracts for academic meetings are essential skills for any academic pediatrician. An accurate and reliable peer review process is critical for fair determination of which abstracts are accepted for presentation at these meetings. Unfortunately, studies of abstract review practices across many fields in medicine have found that there is often poor concordance in scores among abstract reviewers,¹⁻⁵ with some scores being so divergent that they are no different from what would be expected if assigned randomly.^{6,7} However, several studies have examined the development of abstract and journal article rating criteria and have found that the use of a standardized scoring process is feasible and can lead to better interrater agreement.⁸⁻¹⁵ The highest levels of interrater reliability occur with the more objective criteria such as those focusing on methods and analysis.^{3,11,15}

The objectives of this commentary are to provide a guide on how to write an abstract for an academic meeting and an example of a structured abstract scoring system with relative weights of importance for the criteria, with the highest weight placed on methods and analysis. We will first discuss the key components that should be present in individual sections of the abstract (title, Background and Objectives, Methods and Analysis, Results, and Conclusions); the components that are part of our abstract scoring system are summarized in Table 1. We will then elaborate on additional criteria that can be incorporated into an abstract scoring system by using examples from the guidelines that have been used by the Academic Pediatric Association (APA) in their mentored abstract review process with fellows for the Pediatric Academic Societies (PAS) meetings since the fall of 2011. The 7-point scale and some of the guidelines were designed based on the scoring system outlined in the PAS Abstract Review Instructions.¹⁶

ASSESSING INDIVIDUAL COMPONENTS OF THE ABSTRACT

Title

Although not used in our scoring system to rate an abstract, the title of an abstract is important to capture the attention and the interest of the reader. Effective titles often use the active voice or ask a question that the abstract will answer. The title should use the fewest words possible to describe the study accurately and emphasize the strengths of the study (eg, multicenter or randomized controlled trial). Titles should also avoid use of nonstandard abbreviations.

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TABLE 1 Guidelines for Abstract Review

Background and Objectives sections	Is rationale for the study appropriately justified? Is the study question clearly stated in the Objectives section?
Methods, Analysis, and Results sections	Is the study design appropriate for the hypothesis or question? Are the sampling procedures adequately described and appropriate? Are inclusion and exclusion criteria explicitly stated? Are issues of bias (eg, information bias, selection bias, confounding) addressed? Are issues of reliability and validity of measures addressed, if appropriate? Are the methods the most rigorous for the type of study design? (see Table 2) Are the statistical or qualitative analyses appropriate for the study design and the best that could have been used?
Importance	Are the results likely to influence delivery of health services, clinical care, education of trainees, research endeavors, or public policy? Is this a topic that conference attendees are very interested in hearing about?
Originality	Does the abstract present new insights or offer a better approach than previous studies performed on the same or similar research questions?
Quality of presentation	Is the abstract clearly written and understandable? Has the author followed the directions for submission? Do precision and formatting of numerical results and statistics meet standard guidelines, and are they presented consistently throughout the abstract? Are themes and interpretations described clearly for a qualitative study? Is the content placed in the proper section of the structured abstract (eg, results are not in the Methods section or methods in the Results section)? Are vague words, such as “substantially,” avoided?

Background and Objectives

The Background and Objectives sections should familiarize the reader with the importance of the topic, the gap in knowledge, and the research question. For example, an abstract on inpatient asthma exacerbations would provide background on the prevalence of asthma followed by what makes this study different from past studies. The Background section, which should be no more than a few sentences long, should justify the need for the new study and lay the groundwork for the objectives.

The Objectives section should follow the Background section and clearly state a specific research question in concise, specific language. The objectives for a quantitative study should include predictor and outcome variables (eg, “the effect of resident work hour changes on handoff errors”) or precise content of a survey.

The objectives for a qualitative study should clearly specify the phenomena the study describes. This section should also prepare the reader to evaluate the Methods section because the research design will be based on the research question.

Most abstracts submitted to national meetings have a word limit of ~250 words. Therefore, the background and objectives should be succinct to leave room for the majority of the abstract to focus on research design, methods, analysis, and results.

Methods, Analysis, and Results

Methods and Analysis

The Methods section 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 section should be as succinct as possible and highlight

the key parts of the methods. The authors must convince the reader that the study design is most appropriate for the research question being asked. For example, a randomized controlled trial is often the most appropriate type of study to assess the effect of an intervention. Observational studies are best for assessing harm or risk (eg, it would not be ethical to randomize someone to smoke cigarettes). Qualitative studies are suitable to generate hypotheses or identify the points of view of people with certain experiences. In addition to choosing the most appropriate type of study, it is important to describe the research participants and the sampling methods.

The abstract reviewer should scrutinize the methods and analysis to ensure the study's reliability and validity (credibility and trustworthiness for qualitative studies). For example, most surveys should have validity evidence; all should be designed to answer the research question. Predictor and outcome variables must be operationalized (and therefore measured in a way as to avoid information bias) and make sense in the context of the objectives. Quantitative studies must measure and account for all relevant confounding variables. Subjects should be chosen in such a way as to avoid selection bias. The reviewer also must assess the appropriate use of data analyses (eg, the use of a regression when multiple confounders are present, strategies for trustworthiness for qualitative analysis). In addition, different categories of studies have specific criteria that should be assessed to determine whether the most rigorous methods were used for that study design. For example, clinical trials should be designed so patients are randomly assigned and the study is controlled and blinded. See Table 2 for a list of rigorous and appropriate methods specific to common study types. Specific texts^{17,18} offer an in-depth look at different types of study designs. Checklists exist for the evaluation of full articles for multiple study designs, but only a few have been designed specifically for the appraisal of conference abstracts (eg, STROBE¹⁹ for observational studies, CONSORT²⁰ for randomized controlled trials, PRISMA²¹ for systematic reviews). These checklists may

TABLE 2 | Examples of Rigorous and Appropriate Methods for Various Study Designs

Observational or cohort	Are possible confounding factors discussed and controlled for? Are predictor and outcome variables defined and measured in an appropriate way?
Secondary dataset analysis	Are possible confounding factors discussed or coded for? Are appropriate statistical analyses performed for the sampling strategy of the database? Is it clear how variables were chosen in a large national dataset (ie, not just a fishing expedition)?
Clinical trial	Is the study randomized, controlled, and double-blinded? Are the intervention and control groups similar, or are differences controlled for in the analysis? Is the intervention appropriate and safe, and are outcomes clinically relevant? Was the method of analysis (ie, intention to treat versus per protocol) discussed, and was it appropriate?
Case-control	Are controls selected in an appropriate manner? Is the case-control method used because the disease or problem is rare or delayed in appearance after the risk factor?
Systematic review	Is the search for the relevant studies detailed and exhaustive? Are the studies found assessed for methodologic quality? Is publication bias assessed? Are sensitivity analyses performed?
Qualitative study	Is the purpose inductive, related to understanding beliefs and points of view, and seeking in-depth understanding from the perspective of those who are experiencing the phenomenon directly? Is the philosophical framework stated (eg, grounded theory, phenomenology) or at least implied? Is purposeful or theoretical sampling used and described, if appropriate? Are data collection methods appropriate for the research objectives? Is sampling done until theoretical saturation or informational redundancy reached? Is the transformation of data to codes or themes clearly described, and is the process iterative? Is trustworthiness of data and key findings ensured through well-described strategies (eg, investigator triangulation, member check-in, theory triangulation, provision of an audit trail, peer debriefing)? Do the themes make sense and seem reductive rather than just a repetition of quotes from subjects?
Study of diagnostic test	Is a blind comparison with an independent gold standard performed? Are likelihood ratios or sensitivity, specificity, and predictive values used and interpreted appropriately?
Education study	Does the study or curriculum development project address the criteria for scholarship (eg, clear goals, adequate preparation, appropriate methods, significant results, effective presentation, and reflective critique)? Is validity evidence presented for evaluation instruments? Does the project address important outcomes (ie, outcomes go beyond learner satisfaction to look at knowledge or skill gained, change in behavior or practice, or effects on patient care, organizations, or systems)?

Themes, relationships between themes, and key interpretations should describe the results of a qualitative study. The results should address all objectives. A figure or table could also clearly summarize findings.

Conclusions

The Conclusions section should concisely summarize the results of the study without stretching the conclusions beyond the actual findings. This section may end with a sentence that considers potential broader implications of the research, such as possible effects on practice, policy, or education.

ADDITIONAL COMPONENTS USED FOR SCORING ABSTRACTS

Importance

After assessing the individual components of an abstract, a reviewer must evaluate the importance of the topic addressed in the abstract. Topics that would be particularly appealing and of interest to the conference attendees should receive a higher rating. The potential impact of the research should be evident, including whether it will influence the delivery of health services, clinical care, education of trainees, research endeavors, or public policy. For example, a study of a new serum marker that is highly sensitive and specific for early detection of neonatal sepsis and that is also inexpensive would get a high score for importance given the potential widespread use and clinical impact.

Originality

Abstracts should also be judged on the originality of the question, design, or results. Asking and answering questions that have been presented year after year makes abstracts unexciting to reviewers and conference attendees. For topics that have been researched extensively, studies should present new insights. Research questions should differ enough from previous studies that they add new information to the field. Studies of common conditions could receive points for originality if they examine the condition in a different population, study a much larger sample than previous studies, or challenge existing practice.

be helpful in both writing and reviewing abstracts with relevant study designs.

Results

The Results section should have a succinct summary of important results and analyses presented in a logical fashion (eg, from

descriptive to bivariate to multivariate). Key statistical measures, such as *P* values and confidence intervals, should be presented. In general, confidence intervals are preferred because they provide a clearer picture of what statistical significance means in practical terms.

TABLE 3 Scoring Guidelines

Section	Possible Points
Background and Objectives	0–0.5
Methods, Analysis, and Results	0–3
Importance	0–2
Originality	0–1
Quality of presentation	0–0.5
Total	0–7
Actual Score (8 minus total points)	Disposition
1	Plenary
2–3	Platform
4–5	Poster
6–7	Not presented

Quality of Presentation

Abstracts must be assessed for overall quality, because even the most novel studies with the most rigorous methods can appear flawed if the reader cannot make sense of the writing or abstract structure. Sentences should be written in a clear and easy-to-understand manner. The author should adhere to all submission guidelines and follow standard guidelines for presenting numerical or qualitative results and statistical or qualitative analyses. All content must be in the correct section of the abstract (eg, no results in the Methods section or methods in the Results section). The abstract should be consistent when referring to variables and other terms. Finally the author should avoid vague words (eg, “substantially”) and instead present statistical results or clear themes and meaningful interpretations.

Scoring

The scoring system discussed in this section has been used by the APA’s mentored review process for abstracts submitted for PAS meetings. Table 1 presents key components to be assessed for each scoring component. Table 3 summarizes the relative weights for the scoring system. The Methods, Analysis, and Results sections receive the most weight in our scoring system, with 3 points out of a possible 7, because the study’s design, implementation, and data analysis procedures indicate whether a study is valid or credible and can be replicated. Previous studies of abstract scoring have shown that

emphasis on the Methods section contributes more to selection of clinical abstracts for presentation than other characteristics,¹⁵ and higher interrater agreement occurs with scoring based on review of the methods rather than more subjective criteria.^{3,11,15} Methods have also been weighted higher in other abstract scoring systems.¹³ In comparison, the background and objectives are allotted just 0.5 points because they should be straightforward and have fewer implications for study validity or credibility and importance of results. The importance of a study has been assigned up to 2 points because even a well-designed study may not merit presentation at a conference, especially a platform or plenary session, if it is of little interest to conference attendees or has few implications for practice. Finally we have assigned ≤ 1 point for originality and 0.5 points for quality of presentation. No points are assigned for the title and conclusions because their content is generally reflected in other parts of the total score.

The total points are then added together and subtracted from 8 to give the actual score with a range of 1 to 7, with 1 being the best. These scores generally relate to the disposition of the abstract (eg, plenary, platform, poster, or not presented). Final scores can be modified slightly at the discretion of the reviewer to reflect his or her overall judgment or major imbalances among the scoring components. For example, topics of very high interest to

conference attendees may be given slightly higher scores even with somewhat imperfect methods. On the other hand, a reviewer may lower the score of an abstract on a novel topic with potential high interest if it is poorly written and there is concern that the poor presentation represents less than rigorous performance of the study. In general, these adjustments should be minor, and the individual components of the score should reflect these concerns. Finally, as stated in the PAS Abstract Review Instructions, it is important to use the entire scale of scores from 1 to 7 when reviewing a pool of abstracts.¹⁶ Assigning too many to the same score (usually in the middle of the range, such as mostly scores of “3” or “4”) without using the extremes of the scale can make it difficult to differentiate the quality of the abstracts and make reliable decisions on disposition.

CONCLUSIONS

In this commentary we have presented the key components of an abstract and an example of guidelines for a structured abstract scoring system. These scoring guidelines have been used in the APA mentored abstract review process for fellows in training for the last 4 years, with positive feedback from fellows and faculty. Use of standardized abstract and journal article rating guidelines can help to reduce some of the subjectivity associated with the abstract review process and can lead to improved concordance among abstract reviewers.^{8–15} These guidelines should provide a useful framework for junior faculty and trainees participating in the abstract review process and also for investigators writing their first abstracts.

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