

# Preparing a Manuscript for Submission to the Journal of the International Association of Medical Science Educators

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Journal of the International Association of Medical Science Educators Editorial Board  
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## ABSTRACT

The objective of this paper is to address one of the primary reasons that manuscripts are rejected for publication in the Journal of the International Association of Medical Science Educators (JIAMSE), poor manuscript writing. One of the primary goals of the International Association of Medical Science Educators (IAMSE) annual meeting is to improve the way we teach medical science students. The information that IAMSE members share in their poster presentations represents cutting-edge medical education research. The impact of these presentations is limited if the results are not disseminated beyond the annual IAMSE meeting to a larger audience. It remains a goal of the JIAMSE Editorial Board to encourage IAMSE members to share their medical education research with the community of medical educators by publishing the results of their work in JIAMSE. The journal is the peer-reviewed, biannual (June and December) electronic journal of IAMSE that is published in three languages (i.e., English, French, and Spanish). JIAMSE publishes multiple types of medical education related contributions, including: original research manuscripts, reviews, editorials, opinion papers, and announcements. Submissions address a wide range of topics that are of interest to IAMSE members, such as the introduction, application, and success of new teaching methods. In this paper, readers will receive practical information on how to strengthen their medical education reports for publication in JIAMSE. Guidelines for each section of a medical education research manuscript will be addressed as well as key elements that JIAMSE editors use when reviewing a paper for publication.

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## INTRODUCTION

The annual meetings of the International Association of Medical Science Educators (IAMSE) provide educators with an ephemeral exchange of ideas for improving medical science education, including possible solutions to educational problems. However, publication in our organization's peer-reviewed journal, the *Journal of the International Association of Medical Science Educators (JIAMSE)*, provides a permanent record of medical science education issues, methods, and findings. Published educational research is the delivery system that we as medical science educators rely on to better understand contemporary educational issues and to examine, utilize, and/or test the methods and findings of other medical science educators.<sup>1</sup>

Although other forms of scholarly interchange may reach and influence the ideas of a far greater number of colleagues (e.g., posting an article on an electronic bulletin board),<sup>2</sup> publication in peer-reviewed journals such as *JIAMSE* is

frequently considered the ultimate product of scholarly activity.<sup>3</sup> The rigorous and anonymous assessment of peer-reviewed publications provide employers with an external method for evaluating an employee's professional service. "Within the university, a faculty member's published record is used to guide a host of evaluation-based decisions, such as appointments to tenure, promotion to a higher rank, and awarding merit salary increments."<sup>3</sup> Thus, publishing medical education research in refereed journals is essential to both the growth and development of medical science educators and the field of medical education.

There are articles in the literature that address how to write medical education manuscripts for journal publication.<sup>4,5</sup> Yet, writing poor manuscripts (i.e., "text difficult to follow, to understand ... inappropriate statistics and over interpretation of the results") was recently reported as a fatal flaw warranting manuscript rejection.<sup>6</sup> Although *JIAMSE* publishes different types of medical education-related contributions (i.e., original research manuscripts, reviews, editorials, opinion papers, and announcements), the Editorial

Board of *JIAMSE* has made similar observations of original research manuscript submissions. Thus, the main purpose of this paper is to describe how potential authors can successfully publish their medical education findings as original research manuscripts in the *JIAMSE*. This objective will be accomplished by providing specific guidelines for each section of an original research manuscript. A secondary purpose of this presentation is to describe the publishing process from submission to publication.

### **Original Research Manuscript Section Guidelines**

Organization and presentation of original research manuscripts in most medical education journals (including *JIAMSE*) is SIMRAD.<sup>5</sup> The acronym SIMRAD stands for Summary (or Abstract; manuscript synopsis), Introduction (literature review and research question), Methods (how study was conducted), Results (findings) and Analysis (data statistics, part of results), and Discussion (what results and analysis mean). Original research manuscripts in medical education should employ the scientific method of solving medical education-related problems, or exploring and testing an idea related to medical education. Authors of original research medical education manuscripts can speed up the editorial process and maximize their chances of acceptance by using and understanding SIMRAD, hence the purpose of the following sections.

#### **Title**

Although the manuscript title is not contained within the SIMRAD acronym, it is probably the most important component of a paper.<sup>4,5</sup> Search engines, including both MEDLINE and Educational Resources Information Center (ERIC), use title words to locate indexed research papers.<sup>7</sup> Moreover, the title is the first thing potential readers see and what makes them decide whether to invest the time to read more of a paper.<sup>8</sup>

The title should clearly indicate the content and breadth of the study, and should not be misleading.<sup>4</sup> Key words should be included to capture the reader's attention.<sup>9</sup> However, avoid putting too much information into the title (e.g., conclusions).<sup>8</sup> Prune unnecessary jargon and trite phrases (e.g., "A study of...") to keep the title as short as possible (generally 15 words or less).<sup>7,8</sup> Creation of the title should in most instances follow the body of the entire paper.

#### **Abstract (Summary)**

Abstract and summary are two terms that denote the same component of the original research manuscript. For *JIAMSE*, the heading abstract is used on original research manuscripts. The abstract is as important as the manuscript's title, because it is the only part of the paper that most people will ever read.<sup>8</sup>

The abstract serves two main purposes: 1) it helps a person decide whether to read the paper, and 2) it provides the reader with a framework for understanding the paper.<sup>7</sup> It must precisely cover each and every major aspect of the study. Vague or incomplete abstracts may be one reason why only about half of all published papers are ever cited.<sup>9</sup>

The abstract should summarize the following components: 1) introduction/objective (why study was done), 2) methods (type of study; study setting/conditions; subject and/or group size and selection; interventions/treatment; and main outcome measures), 3) results (main outcomes, including means, standard deviations, level of significance, etc.), and 4) discussion/conclusion (only those conclusions supported by study data; application statement; recommendation).

Abstract length is journal-specific; however, all MEDLINE-indexed abstracts cannot exceed 400 words. *JIAMSE* abstract length is a maximum of 250 words. All numbers in the abstract should be written as numerals. Abbreviations and acronyms should be spelled out the first time in the abstract. References should not be included. On a time-per-word basis, the abstract ought to be the most labor-intensive part of the manuscript.<sup>8</sup>

#### **Introduction**

The introduction should provide enough information to understand the rest of the paper.<sup>7</sup> It should establish a clear relationship between what is already known about the research problem (literature review) and the specific research question(s), hypotheses, and/or objectives under study.

Search the literature carefully—chances are, someone, somewhere had the same idea before you, but that does not negate your work. The literature review provides a framework for the problem under study. It should explain why the problem was researched and how the study will contribute to existing knowledge.<sup>7</sup> Key references should be cited that clearly relate to the study problem. Most references will appear in the introduction section. The unique contribution of the study needs to be highlighted. The research question is the backbone of the study and should be clearly and easily found in the Introduction section.<sup>4</sup>

In specialist journals, some knowledge of the subject can be assumed. However, readers of many journals, including *JIAMSE*, may be unfamiliar with jargon-specific words and phrases related to the study. Consequently, technical language without explanation may obscure the study's value and/or its practical implications to non-expert readers.<sup>4</sup>

#### **Methods**

The methods section should consist of a step-by-step, logical, detailed description of how the study was conducted.<sup>5</sup> "The research design is the second most important element of a study, the research question being the most important."<sup>4</sup> Detailed clarity of the study's methods allow readers to critically evaluate the validity of the study's results and conclusions, as well as to replicate the study. The study design must be appropriate to minimize or control as many invalidating factors as possible (e.g., biases that favor a specific outcome; confounding variables that permit alternate outcomes).<sup>4</sup> Subjects/participants recruitment, exclusion/inclusion, and assignment to different groups should be described. To be statistically valid (i.e.,

generalizable), the subjects must be randomly selected from the population and randomly assigned to study groups.<sup>4</sup> An example of study instruments/tools (e.g., questionnaires, interview forms) should be included as figures or tables. Specific details about the study's independent variables (e.g., treatment/interventions) and dependent variables (e.g., consequences, effects) should be given. If arduous treatments/interventions have already been published, cite the source and give a synopsis only.<sup>8</sup> Describe the statistical methods used to analyze the data. It is essential that the appropriate statistical test(s) be used in data analysis. If you are unsure about statistical procedures, consult someone with the appropriate knowledge. Additionally, cite the name and version of the statistical software used.

### **Results and Analysis**

The results and analysis section is the most important part of an experimental research paper, and is usually written as a singular section in a manuscript called results.<sup>9</sup> This section should provide a summary of what was found rather than an exhaustive listing of every possible analysis and data point.<sup>7</sup> At the beginning of the results section, review group(s) characteristics and composition, and study parameters (e.g., independent variable and dependent variable). The focus of the results should be on the objectives described in the introduction, allowing the data to demonstrate whether these objectives have been achieved.<sup>5</sup>

Tables and figures should be used to help simplify extensive and complex data. They need to summarize information (e.g., means and standard deviations), be accurate (e.g., totals equal data reported), and be able to stand alone (e.g., not require reference to text to explain it).<sup>4</sup> Figure and table abbreviations should be spelled out in corresponding legends. Data in tables and figures need not be restated in the text of the results and vice versa.

Dispassionately describe data and its subsequent analysis from a statistical interpretation only.<sup>8</sup> Avoid subjective interpretation in the results section, such as adjectives that imply opinion (e.g., "there was a huge difference...") as well as conclusions. Judicious use of opinions and conclusions are appropriate for the discussion section. Present the results in varied formats to help maintain the reader's interest.<sup>5</sup>

### **Discussion**

After the abstract, the discussion is the hardest section to write.<sup>8</sup> Begin the discussion section by returning to the specific problem investigated, giving a clear synopsis of your major findings and a critical comparison with findings of similar studies (both areas similarity and difference).<sup>7</sup> Differences are as important as similarities when seeking explaining study's findings. Speculate on points of difference, so the reader can make some overall conclusion of your findings along with others.

Avoid repeating the results section by addressing debatable aspects of your study (e.g., different outcomes from previous studies, study limitations).<sup>9</sup> Question the methods you used (e.g., were they effective, or could they have been improved?) Did you have unexpected changes arise during the study. If so, how were they addressed? Try to anticipate questions a reader will have. Present your thoughts and arguments logically and try not to meander.

Identify the practical and/or theoretical implications of your findings, and how your work has added to knowledge of the topic within the study's limitations.<sup>4</sup> Avoid overstatement and exaggeration (e.g., "These exciting findings demonstrate convincingly..."). Modest conclusions may be more effective than bold claims. Try to avoid an indecisive ending (e.g., "...further work is necessary to answer the question raised in this study"; "These preliminary findings will need to be confirmed by others."). Indicate where further research should be directed to address questions raised by your work.<sup>5</sup>

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