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ORIGINAL ARTICLE

Barriers to peer-reviewed journal article publication of abstracts presented at the 2006–2008 Association of Chiropractic Colleges Educational Conference and Research Agenda Conference Meetings

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Objective: We investigated the self-reported barriers to publication for authors of abstracts presented at the most recent chiropractic scientific meetings for which publication rates are known, that is the 2006 to 2008 Association of Chiropractic Colleges Educational Conference and Research Agenda Conference (ACC/RAC) meetings.
Methods: A 4-question electronic survey was sent via email to 1 of the listed authors for each abstract not published as a full paper within 4 years of the 2006 to 2008 ACC/RAC meetings. Each author was asked to complete the survey for only 1 abstract. Taking into account authors who appeared on more than 1 abstract, a link to the electronic survey was emailed to 111 potential participants.
Results: Of 111 participants, 67 completed a survey for a return rate of 60%. Over 80% (55/67) of the respondents were chiropractors who were faculty members at educational institutions. Of the subjects, 30% (20/67) indicated that the meeting abstract had either been published after 2012 or still was in the publishing process. For those who had not submitted a manuscript for publication, the most frequently cited barriers to publishing were pursuit of publishing as a low priority followed by a lack of time to prepare a manuscript.
Conclusion: The main barriers to publishing in this sample were that publishing had a low priority compared to other possible uses of the abstract author's time and a perceived lack of time to pursue the publication process.

Key Indexing Terms: Journal Article (Publication Type); Publication Formats (Publication Type); Congresses (Publication Type); Chiropractic

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INTRODUCTION

The fundamental goal of science is discovery. This is followed closely by communicating that new information to others. Communication in science typically takes place in several ways. Information frequently is published in peer-reviewed journals[1] to ensure a wide distribution of data to the scientific community. Since the process of publication can be time-consuming, a more rapid method of communicating a new discovery is by presenting it at a scientific meeting, generally by poster or platform presentation. Even though published abstracts of conference proceedings often accompany these presentations, this method of communication has a limited audience (i.e., those attending the meeting). Therefore, the generally accepted practice is to attempt to follow the meeting presentation with publication in a peer-reviewed journal.

Previous studies have examined publication rates of abstracts from scientific meetings associated with various spine and orthopedic surgery national organizational meetings showing rates ranging from 34% to 59.4%.[1–11] The annual Association of Chiropractic Colleges Educational Conference and Research Agenda Conference (ACC/RAC) is considered the premier chiropractic research and education meeting in the world.[12] A recent study determined that 32% (249/776) of the abstracts from the 2002 to 2008 ACC/RAC meetings were published as articles in peer-reviewed journals, which seems to fall on the lower end of the range for other similar scientific meetings.[13]

Although publication rates of abstracts from many types of health science meetings have been reported in the literature, few reports have addressed the issue of barriers to publication of these abstracts. Of those that do, a common theme emerges among them: a lack of time for the abstracts' authors. A survey of abstract authors of 3 Spanish clinical pharmacology congresses indicated that lack of time and lack of interest were the main barriers to publication.[14] Another study of Indian dental postgraduate teachers also indicated that lack of time due to other

commitments was the main reason for not publishing.[15] A survey of Saudi Arabian hospital interns showed that lack of time and training in research methods were the main obstacles to conducting and publishing research.[16] In addition, a study of an international emergency medicine meeting held in Canada indicated that English language barriers may have had a role in the rates of publication of those meeting abstracts.[17]

One study delved deeper into the reasons some orthopedic surgeons did not publish. Sprague et al.[18] studied the barriers to publication of abstracts from an annual meeting of the American Academy of Orthopaedic Surgeons. They found that the most frequent reason for failure to publish was a lack of sufficient time for research activities. Other barriers were that the study still was in progress, the subject believed that the writing responsibility belonged to someone else, difficulties existed with coauthors who would not participate, and the pursuit of publication was a low priority.

While there has been some investigation into the barriers to peer-reviewed journal article publication for authors of abstracts at meetings, in general health sciences and in orthopedic surgery in particular, we found no information about the barriers to publication for abstracts presented at chiropractic research meetings. Therefore, the purpose of this study was to investigate the self-reported barriers to publication for authors of abstracts presented at the most recent chiropractic scientific meetings for which publication rates are known (the 2006–2008 ACC/RAC meetings).

METHODS

We used a literature search and survey methods for this study.

Literature Search

A comprehensive literature search was performed using PubMed (Medline) and Index to Chiropractic Literature. Keywords in the searches included: barriers, publication, rate, full-text, peer review, journal, article, abstract, chiropractic, medical, health, and faculty. Also, reference sections from articles revealed from this search were used as a source for articles from the literature.

Study Sample

There were 356 meeting abstracts generated from the poster and platform presentations at the 2006 to 2008 ACC/RAC meetings. A previous study found that 124 (35%) of these were published as journal articles within 4 years after the meeting.[13] Thus, the authors of 232 abstracts were potential subjects of the present study.

We were able to locate a valid email address for at least 1 author of each of 223 of these 232 meeting abstracts (2006, 88/91; 2007, 74/77; 2008, 61/64). For abstracts in which the email address of more than 1 author was located, only 1 author was contacted, with priority given to the most likely principle investigator who was identified by either being listed as first author, last author, and/or their names were recognized from the literature as having a track record of publication. The survey was designed so that it could be completed only once per email address. Thus, authors whose names appeared on more than 1 meeting abstract (either in the same year or in different years) could fill out the survey only once. Therefore, a total of 111 authors (2006, 31; 2007, 39; 2008, 41) met the study qualifications to complete the survey.

Survey Development

A 4-question survey was developed based on a survey used by Sprague et al.[18] in an orthopedic setting. Sprague et al.[18] had enlisted an epidemiologist to help them develop questions to study the barriers to publication for orthopedic surgeons. Questions from that survey were modified to reflect the present study population. These were reviewed by an independent statistician for clarity. To pilot test the survey, it was administered to 3 peers (that were not included in the study) who were asked for comment. The first 2 questions for the ACC/RAC subjects were biographical, and the subjects could select more than 1 answer. For the third question, only 1 answer was allowed. For the last question, only the subjects who had never submitted the study for publication were asked to answer this question and subjects could choose more than 1 answer. The institutional review board of the Illinois College of Optometry approved the study protocol and consent information.

Survey Administration

The subjects received an email with consent information and a link to the multiple choice, 4-question survey that was hosted by Survey Monkey (Fig. 1). This email included the title of the abstract to help the subject remember which abstract was the focus of the survey. If the subject appeared on abstracts from different years, the title from the abstract from the most recent meeting was referenced. If the subject had more than one abstract at a single meeting, only the randomly chosen title of one of them was included in the email. The surveys were anonymous, so specific answers could not be linked to specific authors or abstracts. The survey did not ask for nor did the authors receive any information from the respondents about where articles were published or were in the publication process. Thus, the authors were truly blinded to which information originated from which respondent. Subjects were asked to complete the online survey within 4 weeks. Reminder emails were sent to the subjects after 2 weeks and again the day before the survey closed.

RESULTS

A total of 67 surveys were completed, giving a return rate of 60% (67/111; Table 1). For the subjects' academic background, the majority of the respondents (82%, 55/67) were doctors of chiropractic (Fig. 2). There were respondents who had multiple degrees, thus allowing for a total of more than 100% for academic background. The combinations of academic backgrounds could not be determined because of the anonymous nature of the survey. For the professional situation, most of the subjects

PARTICIPATION IN THIS STUDY: If you are receiving this communication, you were an author on either a platform or poster presentation at the 2008 ACC/RAC meeting. We are conducting a four question survey to find out information on the barriers to publication of abstracts presented at a chiropractic scientific meeting as articles in peer-reviewed journals. Your participation in this study is voluntary and will be treated anonymously.

You will also be asked to provide some basic information about yourself that will remain confidential with only the doctors involved in the study having access to the subject's information. If the results are published all subject information will be kept anonymous.

I have read and understood the above information. I understand that my participation in this study is strictly voluntary. I have had the opportunity to ask questions concerning this study by calling the numbers below, and I agree to participate in this study. By completing this survey, I agree to allow my answers to be used.

If you have any questions about the study, please call Dr. Barclay Bakkum (312-949-7267). If you have any questions about your rights in the study, please call the chairman of the Institutional Review Board of the Illinois College of Optometry, Dr. Robert Donati (312-949-7136).

Thank you!!!

1. What was your academic background (at the time of the 2008 ACC/RAC meeting)?
   _____ DC
   _____ PhD
   _____ Student (if student – skip to question 3)
   _____ Other (please specify) _____

2. What was your professional situation (at the time of the 2008 ACC/RAC meeting)?
   _____ Clinical faculty member at a chiropractic college
   _____ Basic science faculty member at a chiropractic college
   _____ Administrator at a chiropractic college
   _____ Private practice
   _____ Other (please specify) _____

3. What is the current status of the abstract?
   _____ Never submitted for publication
   _____ Submitted to a journal for publication and rejected
   _____ Under consideration by a journal
   _____ Accepted for publication (in press): Journal _____
   _____ Published: Journal _____ Year _____

4. If the presentation was not submitted for publication, indicate the reason(s) by choosing one or more of the following responses:
   _____ Not enough time to prepare the paper for publication
   _____ Pursuit of publication was a low priority
   _____ Presentation was preliminary work for a larger ongoing study
   _____ Other studies with similar findings were already published
   _____ Difficulty with co-authors
   _____ Responsibility of writing the manuscript belonged to someone else
   _____ The results were not important enough
   _____ The statistical analysis was not positive
   _____ A low likelihood that a journal would accept it for publication because of methodological limitations of the work (e.g., weak study design or small sample size)
   _____ Plan to submit for publication
   _____ Different version of the data published
   _____ Other (please specify) _____

Figure 1 - Survey tool with consent verbiage for 2008 meeting abstracts. The year was changed in the survey tools for 2006 and 2007 meeting abstracts.

were clinical faculty members (52%, 34/65), followed by basic science faculty members, including those in research departments (34%, 22/65; Fig. 3). Of the subjects, 25% (16/65) held administrative positions. Again, some subjects fell into more than 1 category and the totals add up to more than 100%. However, because of the anonymous nature of the survey, combinations of professional situations could not be determined.

Table 1 - Frequency Count and Percent of Responses

	2006		2007		2008		Total	
	n	%	*n*	%	*n*	%	*n*	%
Abstracts not published	91		77		64		232	
Valid email address for at least 1 author	88		74		61		223	
Emails sent, 1/abstract, no repeats	31		39		41		111	
Returned	22	71	22	56	23	56	67	60

Only 66% (44/67) of the abstracts were reported as never being submitted for publication (Fig. 4), while 4% (3/67) had a manuscript submitted and rejected. The other 30% (20 of 67) either were published or still were in the publication process. Overall, the self-reported barriers to publication for those that had not submitted a manuscript for publication ($n = 44$) were varied, with publishing as a low priority named the most frequent barrier, followed by inadequate time (Fig. 5). Even over 5 years after the latest meeting, 16% (7/44) of authors still were planning on submitting a manuscript for publication.

DISCUSSION

The response rate for this survey of 60% (67/111 online surveys complete) differed somewhat from previous survey studies. This rate is slightly lower than the 65% (199/306) response rate for a similar survey of barriers to publication for orthopedic surgeons.[18]

This survey was sent to authors of meeting abstracts who had not published manuscripts within a 4-year period after the 2008 ACC/RAC meeting.[13] Studies of publication rates of abstracts from scientific meetings and the barriers to publication must include a lag time for the publication process to occur. Even though research shows that 90% of medical meeting abstracts are published within 4 years of the meeting,[11] the data from the present study showed that this rate may not be as typical for this study population. This survey, conducted 5 years after the latest meeting at which these abstracts were associated, showed that 30% (20/67) of the studies not published within 4 years after the meeting had actually either been published (after the 4-year window) or still were in the process of being published. This rate may even be higher if the authors who still are planning to submit their studies for publication are included. Future studies of publication rates in the chiropractic profession may need to have a time frame of more than 4 years to allow adequate time for the publications to appear in the literature.

The most frequently cited barrier to publication in this study was that publishing has a low priority (59%, 26/44) followed by lack of time to submit a paper (41%, 18/44). Interestingly, for 2008 alone, these barriers were reversed in frequency. When comparing the barriers to publication for this study sample, the vast majority represented faculty members of chiropractic educational institutions. This is different than the respondents of the Sprague study,[18] who were orthopedic surgeons. While the most common obstacle to publication noted in the present study was that pursuit of publication was a low priority, results of the Sprague study showed low priority to publish was only the fifth most common barrier. The orthopedic surgeons listed lack of time to prepare a paper as the most frequent barrier, which was the second most frequent barrier reported by the subjects of this study. In actuality, these 2 barriers may be linked, since they both seem to be related to issues of time use, either as decided by the abstract authors themselves or as mandated by a person of higher authority.

One reason why a higher percentage of authors in this study, who were mostly faculty members at chiropractic educational institutions, indicated that publishing has a low priority as compared to the orthopedic surgeons may be because most chiropractic colleges and universities see themselves mainly as teaching institutions, as opposed to research institutions. For most large universities, the priority for faculty members is research. Even though faculty members also are expected to teach, faculty evaluations for salary, promotion, and tenure at these institutions are mostly linked to performance in publishing, research, and obtaining grant funding.[19]

When teaching loads are examined, it appears that the de facto expectation for faculty members at most chiropractic institutions is mainly teaching, and not scholarly activity. Faculty members at chiropractic teach-

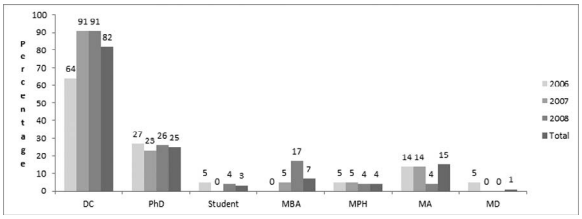

Figure 2 - Academic background of authors responding to surveys.

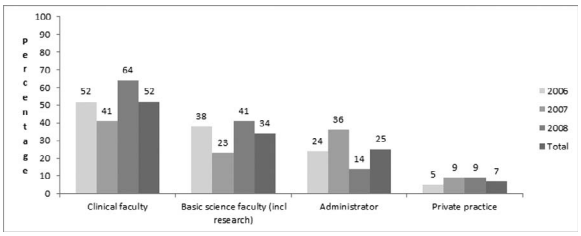

Figure 3 - Professional situation/occupation of survey respondents.

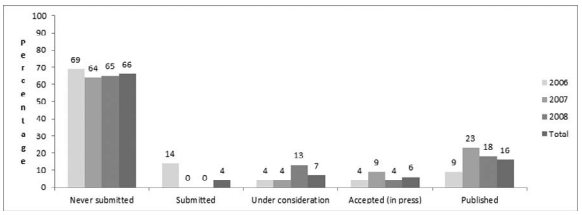

Figure 4 - Status of abstract with regard to publication.

ing institutions may actually have less time to devote to scholarly activities than faculty members at other types of institutions of higher learning. The American Association of University Professors (AAUP) recommends the preferred teaching load for university faculty members to be 9 hours per week, with a maximum teaching load of 12 hours per week.[20] Faculty members at chiropractic universities and colleges typically carry a heavier teaching load, upwards of 30 teaching hours per week. Ward[21] found that teaching work loads of chiropractic faculty were 2.7 times that of comparable institutions in higher education in the United States and were 3.5 times higher than the maximum teaching load at the graduate level proposed by the AAUP. Therefore, institutionally, the expectation of chiropractic faculty members to publish may not be as high as that expectation for faculty members at other colleges and universities, including most medical schools.

Another distinction between the sample of this study and the orthopedic surgeons in the Sprague study was that only 20% (9/44) of the chiropractic survey responders indicated that their meeting presentation had been preliminary data of an on-going study, while 31% (22/71) of the orthopedic survey responders had presented preliminary data.[18] The lower rate for the authors in this study claiming this as a barrier may be, in part, due to the fact that submissions to the ACC/RAC meetings are supposed to be completed studies,[22] while this is not necessarily a requirement for other scientific meetings.

A total of 16% (7/44) of authors in the current study responded that they still planned to submit their work for publication more than 5 years after the meeting at which it was presented. Studies have shown, though, that the more time that elapses, the priority given to a research project tends to decline.[23] Also, the timeliness of the information starts to become a problem with long lag periods between when a study was conducted and its publication.

One limitation of this study is the sample size, since only 3 meetings of the ACC/RAC were investigated. Even though the sample size is not large, it does represent information from 60% (67/111) of authors of abstracts that were not published from 3 of the years of the premier chiropractic research and education meetings. It may be advantageous to conduct a larger survey comprised of more years of the ACC/RAC meetings to see if the data in this study are consistent across other years. If more years of the ACC/RAC meetings are surveyed, it would be necessary to look at years before 2006 because of the lag time necessary for the publication process to occur. However, that in itself can create an over demanding recall bias; a subject's recollection of information may become less reliable as time passes. The results of this survey study may not be generalizable to other health professions.

Another limitation to this study was that authors could only complete the survey once. There were authors who had more than 1 presentation at any given ACC/RAC meeting or had presentations in multiple years, but only 1 response was allowed from each author. Allowing authors to comment on each of their meeting abstracts may be beneficial. On the other hand, this also may create an over demanding recall bias. It may be difficult for authors to remember what barriers applied to which abstracts, provided the barriers were different. Also, asking the same author about barriers to multiple abstracts at the same meeting or abstracts from different meetings may make interpretation of data difficult.

A great number of people who responded to this study survey were academics. It is not known what the professional situation of the nonresponders was. It is possible that researchers that are in private practice, for example, may have barriers that are different than those who are academics. Because of the anonymous nature of

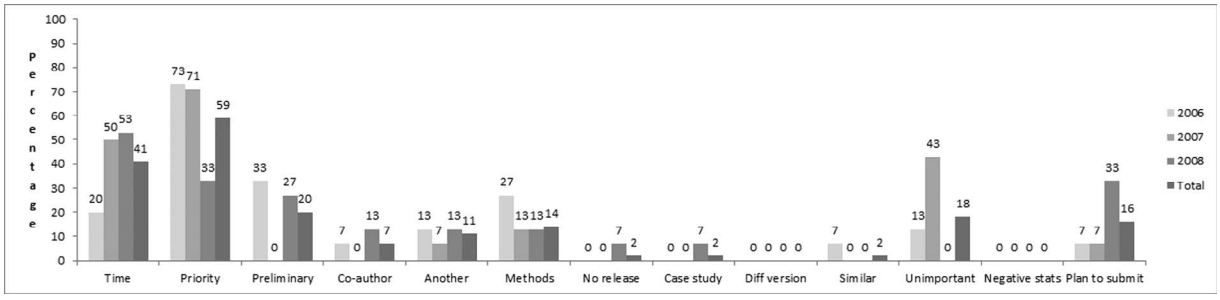

Figure 5 - Barriers to publication. *Time*: not enough time to prepare the paper for manuscript. *Priority*: pursuit of publication was a low priority. *Preliminary*: presentation was preliminary work for a larger ongoing study. *Co-author*: difficulty with co-authors. *Another*: responsibility of writing the manuscript belonged to someone else. *Methods*: a low likelihood that a journal would accept it for publication because of methodological limitations of the work. *No release*: no release time was granted to work on the manuscript. *Case study*: the presentation was a case study and rules of the group supporting the study forbid publication of case studies. *Diff version*: a different version of the data were published. *Similar*: other studies with similar findings were already published. *Unimportant*: the results were not important enough. *Negative stats*: the statistical analysis was not positive. *Plan to submit*: plan to submit for publication.

the survey, some potentially interesting data (e.g., combinations of academic backgrounds and professional situations) could not be determined. Some people may not like to participate in research projects unless their anonymity is guaranteed throughout the process. This may be especially true for research projects that cover subjects who are potentially stressful (e.g., why someone did not complete a task that was expected of them). The authors decided that attempting to maximize the number of subjects who returned a survey by using an anonymous format was more important than trying to collect these extra details from a potentially smaller number of subjects.

CONCLUSION

The main self-reported barriers to publication for authors of abstracts presented at the 2006 to 2008 ACC/RAC meetings were a low priority to publish followed by a perceived lack of time to prepare a manuscript. These barriers may be linked as both appear to issues related to time. Further research into this subject is warranted, so that strategies for increasing publication rates can possibly be developed.

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Author Contributions

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