

## Original Article

# Publication Rates of Abstracts Presented at Five National Pharmacy Association Meetings

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### Abstract

**Background:** Abstract presentations at professional meetings provide a medium for disseminating the findings of scholarly activity. Rates of abstract publication from various biomedical disciplines have been evaluated, with pharmacy noted to be lower than other specialties. Previous research on pharmacy abstract publication rates was conducted for a limited number of professional meetings but has not been assessed using *Google Scholar*.

**Objective:** To determine the full publication rate of abstracts presented at the 2005 American College of Clinical Pharmacy (ACCP) Spring and Annual Meetings, American Pharmacists Association (APhA) Annual Meeting, and American Society of Health-System Pharmacists (ASHP) Summer and Midyear Clinical Meetings.

**Methods:** Publication status was assessed for abstracts presented during the 2005 ACCP Spring and Annual Meetings, APhA Annual Meeting, and ASHP Summer and Midyear Clinical Meetings using *PubMed* and *Google Scholar*. Data collected included abstract category, study category, practice site, database(s) in which publication appeared, time in months to publication, publication type, and journal of publication.

**Results:** Evaluation of 2,000 abstracts presented in 2005 revealed an overall full publication rate of 19.8% (n = 384). Nearly all pharmacy abstracts were published as manuscripts (98.4%; n=378) and indexed in *PubMed* and *Google Scholar* (91.9%; n = 353), although a significant percentage were indexed in *Google Scholar* only (7.8%; n = 30). The mean time to full publication was 16.8 months (SD ±11.9 months).

**Conclusions:** Results were consistent with previously reported full publication rates of abstracts from pharmacy association meetings, indicating that abstracts presented at pharmacy meetings continue to have a lower full publication rate than other health disciplines.

**Key Words**—abstracts, journals, meetings, pharmacy, publications

**Hosp Pharm**—2013;48(3):219–226

Abstract presentations at professional meetings provide a valuable medium for disseminating the findings of scholarly activity, with representation from a broad spectrum of topic categories and practice settings. Abstract data are typically published by the respective organization and may also appear in secondary databases such as *International Pharmaceutical Abstracts*, *Ovid*, *PubMed*, and *Google Scholar*;

however, the data contained within many abstracts may never be published in complete manuscript format.

Rates of abstract publication from various disciplines have been previously evaluated.<sup>1–56</sup> A 2007 Cochrane meta-analysis including over 29,000 biomedical abstracts presented between 1978 and 2003 found a weighted mean full publication rate of 44.5% (95% CI, 43.9–45.1).<sup>1</sup> Previous assessments of full publication rates

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subsequent to abstract presentation at pharmacy association meetings have been significantly lower than other health disciplines.<sup>4-7</sup>

Previous research on pharmacy abstract publication rates has been conducted for a limited number of professional meetings, but pharmacy abstract publication status has not been assessed using *Google Scholar*. *Google Scholar* provides search results encompassing peer-reviewed publications, theses, books, abstracts, and articles from a variety of organizations and thus can potentially retrieve a greater variety of literature than the database *PubMed*, which is maintained by the National Library of Medicine and indexes citations from biomedical journals and books.<sup>57</sup>

The primary objective of this study was to determine the full publication rate of abstracts presented at 5 national pharmacy association meetings in 2005. The secondary objective was to describe abstract characteristics associated with full publication.

## **METHODS**

Published listings of abstracts presented at 5 national pharmacy association meetings in 2005 were obtained through the respective organization's Web site or *International Pharmaceutical Abstracts*. The meetings included the American College of Clinical Pharmacy (ACCP) Spring and Annual Meetings, American Pharmacists Association (APhA) Annual Meeting, and the American Society of Health-System Pharmacists (ASHP) Summer and Midyear Clinical Meetings. To assess the publication status of each abstract, database searches were conducted using *PubMed* and *Google Scholar* between August and November 2011. The meeting year 2005 was selected to allow for an adequate amount of time for full publications to appear in the secondary literature databases. Institutional review board approval was not sought due to the publicly available nature of the data.

Searches were conducted using predefined search criteria. Initial search terms used were a combination of the last name of the first and second authors. If more than 50 hits were returned, a search was conducted using the name of the first author combined with a key word from the abstract. If no publications were identified, the last name of the second author was combined with a key word from the abstract title to identify the publication of interest. Searches were limited to the years 2005 to October 2011 and conducted in both databases. Article title, research objectives, methodology, study population, and results retrieved from the secondary literature databases were compared with the meeting abstract listing to ensure the publication assessed the

same project. Full publication was defined as a citation (article, letter to the editor, or case report) other than the national pharmacy association meeting published abstract listing. Abstracts noted to have been previously published in the meeting organization's published abstract listing were excluded from analysis. Publication dates were indexed as the first day of the month of journal publication or the publication date of a weekly or bi-monthly journal. In the case of e-publication prior to print, the date of e-publishing was used. Time to publication was measured in months, beginning with the date of the respective national pharmacy association meeting.

Data collected included the national pharmacy meeting at which the abstract was presented, topic category, practice setting, database(s) in which publication was indexed, time to publication in months, type of publication (full manuscript, case report, or letter to the editor), and journal of publication. Topic categories were indexed as administrative/management, drug information/informatics, education, medication safety, pharmacotherapy, sterile compounding/stability, or other. Practice settings were classified as ambulatory/outpatient, college/school of pharmacy, community/retail, hospital/institution, pharmacy benefit manager/managed care, research laboratory, or other. The categorical variables of meeting presentation, topic category, and practice setting were analyzed using Pearson chi-square tests. All other data were analyzed using descriptive statistics.

## **RESULTS**

A total of 2,000 abstracts were evaluated from the meeting year 2005. After excluding abstracts known to have been previously published in full (3%; n = 59), the overall full publication rate was 19.8% (n = 384). Nearly all abstracts were published in full as manuscripts (98.4%; n = 378), with few published as case reports (1%; n = 4) or letters to the editor (0.5%; n = 2).

Publications appeared in 151 different journals encompassing a wide variety of specialty topic areas and readership. The most common journals in which full publications appeared were the *American Journal of Health-System Pharmacy* (AJHP; 12.8%; n = 49), *Pharmacotherapy* (11.2%; n = 43), *Journal of the American Pharmacists Association* (JAPhA; 5.5%; n = 21), *Annals of Pharmacotherapy* (3.4%; n = 13), and *Hospital Pharmacy* (3.4%; n = 13) (Table 1). The journals of the respective meeting associations evaluated (AJHP, JAPhA, *Pharmacotherapy*) accounted for 29% (n = 113) of all abstracts published in full. Each organization's journal also published a majority of

**Table 1.** Journals in which full publications of abstracts that were presented at selected national pharmacy association meetings in 2005 appeared

Journal	Abstracts published (n)
<i>American Journal of Health-System Pharmacy</i>	49
<i>Pharmacotherapy</i>	43
<i>Journal of the American Pharmacists Association</i>	21
<i>Annals of Pharmacotherapy, Hospital Pharmacy<sup>a</sup></i>	13
<i>Research in Social and Administrative Pharmacy</i>	12
<i>Journal of Managed Care Pharmacy</i>	8
<i>American Journal of Pharmaceutical Education, Clinical Therapeutics</i>	7
<i>American Journal of Managed Care, Current Medical Research and Opinion</i>	6
<i>Journal of Clinical Pharmacology, Journal of Clinical Psychiatry</i>	5
<i>American Journal of Medicine, Obstetrics and Gynecology<sup>a</sup></i>	4
Other	181

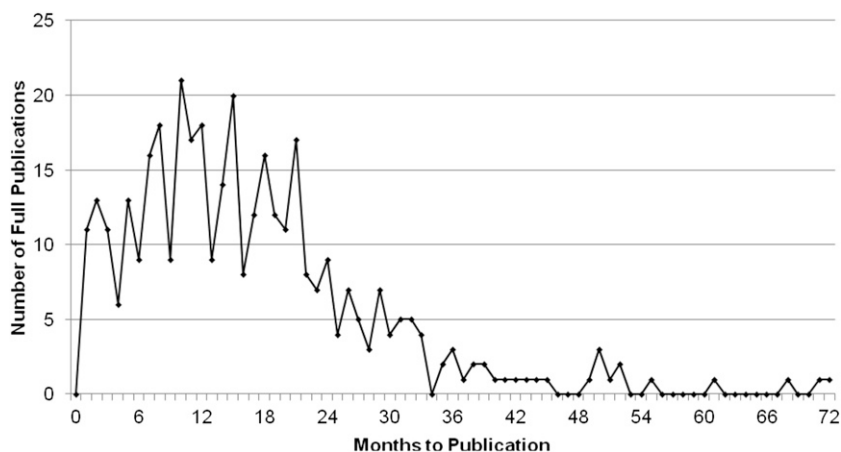
<sup>a</sup>Indexed in Google Scholar only.

abstracts that were originally presented at each respective organization’s meeting(s). A total of 49 abstracts were published in *AJHP*, and 42 (85.7%) of these were presented at the ASHP Summer or Midyear Clinical Meeting. Of 21 publications which appeared in *JAPhA*, 19 (90.5%) were presented at the APhA Annual Meeting. *Pharmacotherapy* published 43 abstracts, of which 38 (88.4%) were presented at the ACCP Spring or Annual Meeting.

The majority of full publications were indexed in both *PubMed* and *Google Scholar* (91.9%; n = 353), although a significant percentage were indexed in *Google Scholar* only (7.8%; n = 30). One full publication (0.3%) was indexed in *PubMed* only. The mean time to full publication was 16.8 months (SD ± 11.9;

median 15 months) (Figure 1). The meeting at which an abstract was presented was significantly associated with the likelihood to publish ( $P < .001$ ). Abstracts presented at the ACCP Annual Meeting had the highest rate of full publication (33.2%) (Table 2). The ASHP Midyear Clinical Meeting represented the largest number of abstracts (n = 826) but had the lowest observed rate of full publication (10.3%).

Both the topic category and practice setting of an abstract were significantly associated with the likelihood to publish in full ( $P < .001$ ). Pharmacotherapy topics were the most frequently presented abstract category and had the highest full publication rate (24.5%) (Table 2). Although a small number of abstracts were presented from the categories of drug information/



**Figure 1.** Time in months to full publication of abstracts presented at selected national pharmacy association meetings in 2005.

**Table 2.** Characteristics associated with full publication of abstracts presented at selected national pharmacy association meetings in 2005

Meeting at which abstract was presented	%	n/N
ACCP Annual Meeting	33.2%	(167/503)
ACCP Spring Meeting	28.1%	(61/217)
APhA Annual Meeting	19.6%	(55/281)
ASHP Summer Meeting	14.0%	(16/114)
ASHP Midyear Clinical Meeting	10.3%	(85/826)
<b>Topic category</b>		
Pharmacotherapy	24.5%	(251/1025)
Education	21.6%	(16/74)
Drug information/informatics	16.7%	(7/42)
Sterile compounding/stability	16.0%	(8/50)
Administrative/management	14.6%	(75/513)
Medication safety	7.5%	(10/133)
Other	16.3%	(17/104)
<b>Practice setting</b>		
Research laboratory	32.1%	(25/78)
Pharmacy benefit manager/managed care	31.3%	(15/48)
Ambulatory care	29.8%	(147/493)
Hospital/institution	15.4%	(142/925)
College/school of pharmacy	14.3%	(7/49)
Community/retail	12.6%	(13/103)
Other	14.3%	(35/245)

Note: ACCP = American College of Clinical Pharmacy; APhA = American Pharmacists Association; ASHP = American Society of Health-System Pharmacists.

informatics and sterile compounding/stability, a relatively high rate of publication was observed in these areas (16.7% and 16%, respectively).

The hospital/institutional setting had the largest number of presented abstracts (n = 925) but ranked fourth in the rate of full publication (15.4%) (Table 2). Although research laboratory settings and pharmacy benefit manager/managed care settings represented a small number of abstracts, the highest full publication rates were found amongst these groups (32.1% and 31.3%, respectively). Abstracts from the community/retail setting were relatively infrequently presented (n = 103) and had the lowest rate of publication versus other settings (12.6%).

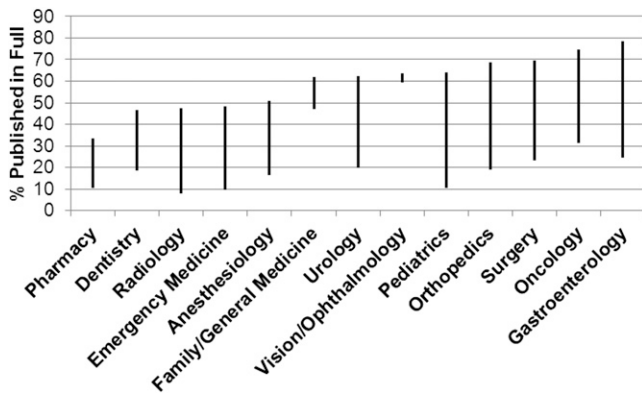
Although the number of abstracts published in *Google Scholar* only was small (n = 30), some interesting trends were observed. Consistent with the overall sample, the most commonly published topic

category was pharmacotherapy (n = 11; 37%). In contrast to the overall sample, the majority of published abstracts were from the hospital/institutional setting (n = 19; 63%) and a larger number were presented at the ASHP Midyear Clinical Meeting (n = 12; 40%). The most common journal in which published abstracts appeared was *Hospital Pharmacy* (n = 13; 43%).

## DISCUSSION

Despite the inclusion of search results from *Google Scholar*, the observed full publication rates of the 2005 ASHP Midyear Clinical Meeting (10.3%) and ACCP Annual Meeting (33.2%) were nearly identical to a previous assessment from the meeting year 1994, which reported rates of 11% and 33%, respectively, for these same meetings.<sup>4</sup> Overall publication rates were also similar at 19.8% for the 2005 meeting year and 17.6% for the 1994 meeting year.<sup>4</sup> Both assessments found lower full publication rates than a prior analysis of abstracts presented at the meetings of the Canadian Society of Hospital Pharmacists (CSHP) between 1992 and 1996, which reported an overall publication rate of 25%.<sup>5</sup> Including the results of the current study, a range of full publication rates of national pharmacy meeting abstracts of 10.3% to 33.2% has been observed, whereas various disciplines in medicine have reported full publication rates from 8.6% to 78%<sup>1-5, 8-56</sup> (Figure 2).

The consistently lower observed rate of full publication of pharmacy meeting abstracts is likely multifactorial. Pharmacy encompasses a diverse range of topics and practice settings, although this is also true for medical specialties such as general or family practice. However, given the increasing degree of clinical specialization within the profession of pharmacy, authors may choose to present abstracts at a specialty medical organization meeting rather than a national pharmacy association meeting. Abstracts presented by pharmacists in such settings may have higher full publication rates and be more likely to appear in a medical journal versus a pharmacy journal. Additionally, many abstracts identified in this study were institution-specific and may not require external publication. Alternatively, such studies may have limitations including small subject numbers or limited generalizability and may be declined publication following the peer-review editorial process. Finally, although a previous meta-analysis has identified basic science research abstracts to be associated with a greater likelihood of subsequent publication, only 4% (n = 78) of the pharmacy meeting abstracts evaluated were conducted in a laboratory research setting.<sup>1</sup>



**Figure 2.** Percentage ranges of abstracts published in full by selected health care discipline: 1978 – 2012.<sup>1-5, 8-56</sup>

There are also a relatively small number of pharmacy-specific journals versus medical journals. An editorial by one of the senior editors at *AJHP* noted that during 2011, 685 manuscripts were reviewed. Of these, approximately 32% ( $n = 219$ ) were accepted for publication.<sup>58</sup> Additionally, a recent survey was conducted to describe the most common barriers associated with the publication of scholarly articles by pharmacists.<sup>59</sup> Among respondents, the most important barriers to publication identified were “lack of time,” “lack of collaboration,” and “rejection of manuscript for publication.” This may illustrate that while pharmacists are attempting to pursue publication, pharmacy journals simply do not have the capacity to publish all of the work received.

Although not directly analyzed in the current study, the ASHP Midyear Clinical Meeting is generally thought to accept a larger number of resident and student abstracts than the other meetings assessed, which may have contributed to the lower publication rate observed for this meeting. Full publication rates following presentations at regional pharmacy residency conferences have been reported at lower overall rates (6.3% to 15.8%) than national pharmacy association meetings.<sup>6,7</sup> Although factors associated with lack of publication by pharmacy residents have not been formally assessed, the low rates of publication by residents may relate to the limited amount of time to complete a project during the residency year and the observed lag time of nearly 17 months between meeting presentation and publication.<sup>6,7</sup> Pharmacy residency programs are generally 12 months in duration, limiting the feasibility and complexity of many types of research studies. Additionally, many residents change employers upon residency completion. These factors may result in logistical challenges during manuscript preparation and

submission and perhaps account for the lower reported rates of publication from regional pharmacy residency conferences versus national pharmacy association meetings.<sup>6,7</sup>

Strengths of the current study include updating the literature regarding publication rates of national pharmacy association meetings, evaluating the largest number of national association meetings to date, and using *Google Scholar* in addition to *PubMed* to conduct literature searches. There were several limitations. Not all national pharmacy associations were included in the analysis, most notably the American Association of Colleges of Pharmacy (AACP). The membership of AACP is primarily pharmacists with faculty appointments, a group which may have more incentive to publish presented research in the pursuit of promotion or tenure. Additionally, abstract publication rates were solely assessed for national pharmacy organizations based in the United States, which may not be representative of international pharmacy organizations. Among the meetings assessed, abstract listings did not consistently identify resident research, which may have a lower publication rate, and residents cannot easily be distinguished from pharmacists based on credentials. Evaluation was conducted for a single meeting year (2005) and may not truly reflect other years, although the consistency of the current findings with previous research from the 1990s makes this unlikely. Also, the search strategy that was used may have inadvertently excluded abstracts published in full prior to January 2005, as ACCP was the only organization to denote whether an abstract had been published prior to presentation. Finally, although some abstracts may have been presented at multiple national pharmacy association meetings, this was not assessed in the current study.

Future research should consider what effect, if any, publication bias (eg, presenting a project with positive or significant results) has on the rate of full publication of pharmacy meeting abstracts, as this has been evaluated for other health disciplines. Assessment of the publication rates of basic science pharmacy organizations and AACP abstracts may also be considered, as these groups may have higher publication rates than the meetings included in the current study. A survey assessing the reasons why pharmacy residents do not pursue publication would also highlight similarities and differences observed from previous evaluations of pharmacists and other medical professions.

## CONCLUSIONS

Despite the inclusion of a greater number of national pharmacy association meetings and publications

indexed in *Google Scholar*, results of the present study were consistent with previously reported full publication rates within the profession of pharmacy. Abstracts presented at national pharmacy association meetings continue to have a lower overall full publication rate than other health disciplines.

### ACKNOWLEDGMENTS

Dr. Prohaska, Dr. Zak, and Dr. Grauer have no conflict of interest. Ms. Generali, currently serving as Editor-in-Chief of *Hospital Pharmacy*, was not in this role during the study period (2005).

This material has been previously published as abstract & poster at University HealthSystem Consortium Pharmacy Council Meeting, December 3, 2011, New Orleans, LA; American Society of Health-System Pharmacists Midyear Clinical Meeting, December 7, 2011, New Orleans, LA; and Kansas Council of Health-System Pharmacists/Missouri Society of Health-System Pharmacists Annual Meeting, April 20, 2012, Kansas City, MO.

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