Publication of Results of Abstracts Presented at Medical Education Conferences

Conferences represent an important forum for presentation of scholarly activity; however, dissemination beyond meeting registrants is limited. Peer-reviewed publication facilitates knowledge translation, and failure to publish may lead to unnecessary duplication and publication bias that can compromise future scholarship. This study aimed to determine the rate and time course of peer-reviewed journal publication of abstracts presented at the 2 largest North American medical education conferences (Research in Medical Education Conference [RIME] and the Canadian Conference on Medical Education [CCME]) and to identify characteristics associated with publication.

Methods | All 455 abstracts from the 2005 and 2006 RIME and CCME conferences were reviewed. Six were excluded (4 withdrawn, 1 missing, 2 published before abstract deadline). Blinded to publication status, 2 investigators (C.M.W. and M.F.) extracted the following information: format (oral or poster), type of scholarship (research, evaluation of a program or innovation, or other), methods (quantitative, qualitative, or mixed), completion status (completed or work in progress), number of centers involved, and degrees and institutions of the authors.

MEDLINE, EMBASE, ERIC, and Google Scholar were searched (from inception through November 2012) using the names of the first, second, and last author, followed by keywords from the title, abstract, or both. Retrieved peer-reviewed publications were compared with the corresponding abstract to ensure it represented the same work. Two investigators recorded journal type (educational or other), funding source, publication type (full-length or abbreviated article), and publication date.

Associations between publication status and all other parameters were analyzed by simple logistic regression using SPSS version 16.0 (SPSS Inc). Multivariable analysis was conducted using all variables from bivariable screening with \( P < .10 \). Statistical significance was set at \( P < .05 \) (2-sided).

Results | Of the 449 abstracts, 156 (34.7%) were subsequently published (RIME: 86/232; CCME: 70/217); 149 (95.5%) were full-length articles. Funding was acknowledged in 81 (51.9%). Median time to publication was 20 months (interquartile range, 10-30 months), ranging from 9 months pre-conference (but after the submission deadline) to 76 months postconference. More than 90% were published within 4 years (Figure). Publications appeared in 46 different journals and 73.1% were in educationally focused journals.

In bivariable analysis, publication was more likely for findings from abstracts describing research studies compared with other scholarly activities (38.9% vs 19.4%, respectively; odds ratio [OR], 2.64 [95% CI, 1.38-5.06]; \( P = .003 \)), and those including a last author with a PhD (44.3% vs 31.6%; OR, 1.73 [95% CI, 1.00-2.97]; \( P = .049 \)). In multivariable analysis, subsequent publication was more frequent for oral abstracts (48.5% vs 26.8% for poster abstracts; OR, 2.29 [95% CI, 1.45-3.61]; \( P < .001 \)) and those outlining completed work (41.7% vs 22.0% for work in progress; OR, 1.99 [95% CI, 1.05-3.76]; \( P = .03 \)) (Table). Quantitative studies were published less frequently than mixed-methods studies (35.8% vs 55.6%, respectively; OR, 0.41 [95% CI, 0.19-0.87]; \( P = .02 \)) and least frequently overall. Multi-institutional authorship also predicted publication (50.8% vs 29.0% for single center; OR, 2.12 [95% CI, 1.29-3.48]; \( P = .003 \)).
The subsequent publication rate of abstracts presented at medical education conferences was 34.7%, well below the mean (44.5%) reported for biomedical research. One reason may be that educational scholarship is conceptualized more broadly than traditional research and presentation at conferences may obviate the need for journal publication because it already constitutes dissemination by making innovations visible and available for others to build on. Many of the significant predictive variables, such as oral presentation format and completed works, may be surrogate markers for study quality. We were surprised that quantitative abstracts were least likely to be subsequently published because quantitative methods are most common.

**Discussion**

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### Table. Characteristics of Abstracts Associated With Publication of Results

<table>
<thead>
<tr>
<th>Format</th>
<th>Total No.</th>
<th>Published</th>
<th>Not Published</th>
<th>Unadjusted Bivariable Analyses</th>
<th>Adjusted Multivariable Logistic Regression[^a]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poster</td>
<td>284</td>
<td>76 (26.8)</td>
<td>208 (73.2)</td>
<td>1 [Reference] 2.58 (1.72-3.85)</td>
<td>1.99 (1.38-2.58)</td>
</tr>
<tr>
<td>Oral</td>
<td>165</td>
<td>80 (48.5)</td>
<td>85 (51.5)</td>
<td>1 [Reference] 2.58 (1.72-3.85)</td>
<td>1.99 (1.38-2.58)</td>
</tr>
</tbody>
</table>

**Type of scholarship[^b]**

| Research   | 283       | 110 (38.9) | 173 (61.1)    | 1 [Reference] 0.79 (0.49-1.27)  | 1 [Reference] 0.79 (0.49-1.27)  |
| Evaluation of program or innovation | 99        | 33 (33.3)  | 66 (66.7)     | 1 [Reference] 0.79 (0.49-1.27)  | 1 [Reference] 0.79 (0.49-1.27)  |
| Other scholarly activities | 67        | 13 (19.4)  | 54 (80.6)     | 0.38 (0.20-0.73)  | NA[^c]  |

**Method[^d,e]**

| Mixed          | 36        | 20 (55.6)  | 16 (44.4)     | 1 [Reference] 1 [Reference] 1 [Reference] 1 [Reference]  |
| Quantitative   | 69        | 32 (46.4)  | 37 (53.6)     | 0.69 (0.31-1.56)  | 0.68 (0.29-1.62)  |
| Quantitative   | 254       | 91 (35.8)  | 163 (64.2)    | 0.45 (0.22-0.90)  | 0.41 (0.19-0.87)  |

**Completion status[^f,g]**

| Work in progress | 82        | 18 (22.0)  | 64 (78.0)     | 1 [Reference] 2.54 (1.44-4.50)  | 1 [Reference] 1.99 (1.05-3.76)  |
| Completed       | 300       | 125 (41.7) | 175 (58.3)    | 1 [Reference] 2.54 (1.44-4.50)  | 1 [Reference] 1.99 (1.05-3.76)  |

**No. of centers at which the work was carried out[^g]**

| Single center  | 301       | 110 (36.5) | 191 (63.5)    | 1 [Reference] 1.19 (0.72-1.97)  | NA[^c]  |
| Multicenter    | 81        | 33 (40.7)  | 48 (59.3)     | 1.19 (0.72-1.97)  | NA[^c]  |

**Multicenter authorship (collaborative study)**

| No (single center authorship) | 331       | 96 (29.0)  | 235 (71.0)    | 1 [Reference] 2.53 (1.64-3.90)  | 2.12 (1.29-3.48)  |
| Yes                      | 118       | 60 (50.8)  | 58 (49.2)     | 2.53 (1.64-3.90)  | 2.12 (1.29-3.48)  |

**Last author with PhD[^h]**

| No          | 133       | 42 (31.6)  | 91 (68.4)     | 1 [Reference] 1.73 (1.00-2.97)  | NA[^c]  |
| Yes         | 97        | 43 (44.3)  | 54 (55.7)     | 1.73 (1.00-2.97)  | NA[^c]  |

**Any author with PhD[^h]**

| No          | 54        | 16 (29.6)  | 38 (70.4)     | 1 [Reference] 1.54 (0.80-2.97)  | NA[^c]  |
| Yes         | 178       | 70 (39.3)  | 108 (60.7)    | 1.54 (0.80-2.97)  | NA[^c]  |

**Any author with MD[^h]**

| No          | 41        | 17 (41.5)  | 24 (58.5)     | 1 [Reference] 0.80 (0.40-1.59)  | NA[^c]  |
| Yes         | 191       | 69 (36.1)  | 122 (63.9)    | 0.80 (0.40-1.59)  | NA[^c]  |

* Abbreviations: NA, not applicable; NI, characteristic not included in logistic regression model; OR, odds ratio.

[^a]: The logistic regression model included all variables from bivariable screening with P < .10. The Hosmer-Lemeshow goodness-of-fit statistic was acceptable for the model (P > .05).

[^b]: Classified as research if it tested or generated hypotheses; evaluation of program or innovation if it used a method for collecting, analyzing, and using information to answer questions about a specific program or educational innovation; and other scholarly activities if it did not meet the criteria for either of the 2 aforementioned categories.

[^c]: Many variables were missing; therefore, excluded from the multivariable regression analysis.

[^d]: Classified as quantitative if the results were based on numeric analysis and making innovations visible and available for others to build on; qualitative if focused on the analysis of interviews, focus groups, or texts, but without the use of numbers; and mixed if both quantitative and qualitative methods were used.

[^e]: Data from abstracts describing research or evaluation of a program or innovation only.

[^f]: Classified as work in progress if the abstract clearly indicated that data collection was not complete or if no results were included.

[^g]: Classified as single center if the work was conducted at a single institution (eg, university, hospital, etc); and multicenter if the work was conducted according to a single protocol but at more than 1 institution.

[^h]: Data from Research in Medical Education Conferences in 2005 and 2006 only. These cases were excluded from the multivariable regression analysis because their inclusion would have substantially decreased the sample size.
In terms of limitations, our results cannot be generalized beyond the 2 conferences included. Given the word constraints of abstracts, potential misclassification of studies may have occurred and other important predictors (eg, education level) may have been missed. Additionally, author degrees were not available for CCME and therefore could not be included in multivariable analysis. To move the field forward, it is important to develop a robust literature to document emerging innovations and elevate the relevance and value of educational scholarship. Future research is planned to determine barriers to publication to help mitigate them.

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Analysis and interpretation of data: Walsh, Ginsburg.

Drafting of the manuscript: Walsh.

Critical revision of the manuscript for important intellectual content: Walsh, Fung, Ginsburg.

Statistical analysis: Walsh.

Administrative, technical, or material support: Fung, Ginsburg.

Study supervision: Ginsburg.

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Clinical Performance of Medical Students With Protected Disabilities

The Americans with Disabilities Act requires accommodations for students with protected disabilities. To inform conversations about the effect of disabilities and accommodations on performance by medical students, we sought to determine if clinical performance during the clerkship year and graduation rates differed between students with and without protected disabilities.

Methods | We conducted a retrospective cohort study at the University of California, San Francisco (UCSF). The UCSF institutional review board approved the research protocol and consent waiver. Between 1987 and 2009, approximately 3000 medical students matriculated to UCSF.

The director of student disability services elicits a detailed history of the student’s disability to determine qualification for accommodations. Students who matriculated with protected disabilities did so based on mental or physical impairment. Each student with a protected disability was matched to 3 students without protected disabilities based on sex, age, and year of matriculation for power of 80% and moderate effect size ($\eta^2 = 0.09$, $\alpha = 0.05$).

Measures included demographics, bases for disability, Medical College Admission Test (MCAT) scores, graduation rate, first-attempt scores or pass rates on US Medical Licensing Examination (USMLE), and residency match rates. Clerkship directors submitted 13-item assessments at the end of 6 core clerkships. Each item was scored as 1 = inadequate; 2 = fair; 3 = good (passing); and 4 = outstanding. Data from 8 of the items were used to calculate mean composite clerkship assessment scores representing medical knowledge, data gathering, communication skills, and professionalism across clerkships. Data collection was completed September 2013.

We examined statistical relationships by using $\chi^2$ and Fisher exact tests, 1-way analysis of variance, and multivariable analysis of covariance. All tests were 2-sided with $P < .05$ used as the significance threshold. We used SPSS version 19 (SPSS Inc.).

Results | The study sample consisted of 59 students with protected disabilities and 171 students without protected disabilities. Demographics were similar for students with and without protected disabilities (Table 1). Of students with disabilities, 29 (49.2%) had mental impairment (22 [37.3%] learning; 5 [8.5%] attention-deficit/hyperactivity disorder; 2 [3.4%] psychological), 25 (42.4%) had physical impairment (7 [11.9%] mobility; 2 [3.4%] hearing; 1 [1.7%] vision; 15 [25.4%] other), and 5 (8.4%) had other impairments. The graduation rate was 86.4% (51/59) for students with protected disabilities and 99.4% (176/177) for students without protected disabilities ($P = .001$).

Students without protected disabilities performed better than those with protected disabilities on MCAT physical sciences scores (mean difference, 1.2 [95% CI, 0.6-1.8]; $P = .001$), MCAT biological sciences scores (mean difference, 0.9 [95% CI, 0.3-1.4]; $P = .002$), MCAT verbal reasoning scores (mean difference, 0.7 [95% CI, 0.2-1.1]; $P = .01$), first-attempt USMLE step 1 scores (mean difference, 16.0 [95% CI, 9.2-23.0]; $P = .001$), and USMLE step 2 clinical knowledge scores (mean difference, 12.4