Full-Text Publication of Abstract-Presented Work in Physical Therapy: Do Therapists Publish What They Preach?

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Background and Objective. Professional meetings, such as the American Physical Therapy Association’s (APTA’s) Combined Sections Meeting (CSM), provide forums for sharing information relevant to physical therapy. An indicator of whether therapists fully disseminate their work is the number of full-text peer-reviewed publications that result. The purposes of this study were: (1) to determine the full-text publication rate of work presented in abstract form at CSM and (2) to investigate factors influencing this rate.

Methods. A systematic search was undertaken to locate full-text publications of work presented in abstract form within the Orthopaedic and Sports Physical Therapy sections at CSM between 2000 and 2004. Eligible publications were published within 5 years following abstract presentation. The influences of APTA section, year of abstract presentation, institution of origin, study design, sample size, study significance, reporting of a funding source, and presentation type on full-text publication rate were assessed. Characteristics of full-text publications were explored.

Results. Work presented in 1 out of 4 abstracts (25.4%) progressed to full-text publication. Odds of full-text publication increased if the abstract originated from a doctorate-granting or “other” institution, reported findings of an experimental study, reported a statistically significant finding, included a larger sample size, disclosed a funding source, or was presented as a platform presentation. More than one third (37.8%) of full-text publications were published in the Journal of Orthopaedic and Sports Physical Therapy or Physical Therapy, and 4 out of 10 full-text publications (39.2%) contained at least one major change from information presented in abstract form.

Conclusions. The full-text publication rate for information presented in abstract form within the Orthopaedic and Sports Physical Therapy sections at CSM is low relative to comparative disciplines. Caution should be exercised when translating information presented at CSM into practice.
Evidence-based practice (EBP) is a current ideal within health care and refers to the integration of the best available scientific evidence with individual clinical expertise. In order for physical therapy to meet this ideal, there is a need to not only conduct research, but also to make it readily available to the widest possible audience. Recent work suggests that physical therapists conduct research,1,2 yet the extent to which they broadly disseminate the acquired knowledge remains largely unknown.3,4 Also, previous reports on scholarly productivity in physical therapy1,2 were limited to analyses of productivity in academia, which does not account for the important contributions of therapists working in nonacademic settings. One way to further explore scholarly productivity in physical therapy, as well as to determine the contribution of therapists working in nonacademic settings, is to assess the rate of full-text publication of work presented in abstract form at physical therapy meetings and conferences.

Physical therapy meetings and conferences, such as the American Physical Therapy Association’s (APTA’s) Combined Sections Meeting (CSM), provide important forums for the rapid dissemination of research findings and clinical observations relevant to the profession. These meetings allow for the informal exchange of ideas, with immediate feedback from peers, and form a critical component to the development of the profession. However, work presented in abstract form is limited in its contribution to EBP as it often is preliminary in nature, limited in details of study methods, not typically subjected to rigorous peer review, and limited in its availability to those not attending the meetings. In addition, observations in other health care fields suggest that there are often major discrepancies between data presented in abstract form and subsequent full-text publication.5–9 Consequently, therapists are ill-advised to make EBP decisions based upon information available in abstract form alone.

The dissemination of knowledge by way of full-text publication in peer-reviewed indexed journals forms the cornerstone of EBP. Publication in full-text format requires maximal disclosure of work of a certain standard in order to pass the rigors of peer review, whereas publishing in journals indexed in databases such as PubMed and the Cumulative Index to Nursing and Allied Health Literature (CINAHL) facilitates the retrieval of work previously presented at CSM and included APTA section, year of abstract presentation, institution of origin, study design, sample size, study significance, reporting of a funding source, and presentation type. Secondary purposes of this study were: (1) to document the features of the resulting full-text publications and (2) to explore discrepancies between the information presented in abstract form and its full-text publication.

**Method**

**Abstract Inclusion**

All abstracts presented within the Orthopaedic and Sports Physical Therapy sections at the 2000 to 2004 APTA CSMs were included. Work presented at the CSM was chosen because this is the largest annual meeting devoted to physical therapy in the United States, with a typical attendance of more than 5,000 therapists. The Orthopaedic and Sports Physical Therapy sections were chosen because these are the largest sections within APTA and abstracts presented at the CSM in these sections are readily available because of their publication in the *Journal of Orthopaedic and Sports Physical Therapy*.

**Abstract Data Extraction**

Each abstract was entered into a database by 2 independent investigators (H.D.S. and E.D.B.) with the following basic data recorded: authors’ names, abstract title, year of presentation, type of presentation (platform or poster), section in which the abstract was presented (Orthopaedic or Sports Physical Therapy section), funding source reported (yes or no), and the institution of origin of the abstract (as indicated by the primary/first-listed institutional affiliation). Discrepancies in recording basic data from presented abstracts were resolved by consensus with a third investigator (S.J.W.).

The institutions of origin were searched within the 2005 edition of the Carnegie Classification of Institutions of Higher Education to acquire their “basic classification.”10 This
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The Carnegie Classification was the most current available at the time of searching and was based upon data from up to 2004, matching the years of presentation of the included abstracts. Institutions of origin listed in the Carnegie Classification database were recorded as either “doctorate-granting” or “non-doctorate-granting,” with the latter category including institutions listed as granting “master’s,” “baccalaureate,” or “special focus” degrees. Institutions of origin not located in the Carnegie Classification database were recorded as either “international” (ie, not originating within the United States) or “other” (ie, nonaccredited, non-degree-granting hospitals, clinical practices, and other institutions within the United States that are not represented in the National Center for Education Statistics Integrated Postsecondary Education Data System).

Each presented abstract was reviewed by 3 independent investigators (A.J.B., P.A.A., and S.J.W.) to determine study design. Study design was categorized as: (1) meta-analysis/systematic review, (2) randomized controlled trial (RCT), (3) quasi-experimental, (4) validation of tests and measures, or (5) nonexperimental. To be categorized as an RCT, the abstract needed to state that participants were randomly allocated to study groups (ie, randomized clinical trial) or that repeat test conditions were introduced in random order (ie, randomized crossover trial). Quasi-experimental study designs did not report or lacked random assignment of participants or test conditions, and included cohort, prospective case-control, and cross-sectional studies. Abstracts solely assessing the reliability and validity or the diagnostic accuracy of tests and measures were allocated to the validation of tests and measures category. Abstracts categorized as being nonexperimental presented work in the form of a case study or series, outcomes research, expert opinion piece, or general overview or review. Discrepancies in categorizing study design were resolved by consensus among the 3 investigators (A.J.B., P.A.A., and S.J.W.).

Sample size per experimental group and study significance (significant or not significant) were recorded for RCT and quasi-experimental study designs by 2 independent investigators (H.D.S. and E.D.B.). Abstracts were categorized as significant when a statistically significant finding for the primary outcome variable was reported, irrespective of the direction of the effect or magnitude of the effect size. Abstracts not reporting the results of statistical comparisons (ie, P values or whether statistical significance was obtained) were classified as not significant. Discrepancies in determining sample size per experimental group and whether an experimental abstract reported a significant finding were resolved by consensus with a third investigator (S.J.W.).

Systematic Search for Full-Text Publication

Systematic searches of PubMed, CINAHL, and Evidence-Based Medicine Reviews were conducted by 2 independent investigators (H.D.S. and E.D.B.) to establish whether the work presented in abstract form had been published in full-text format in the 5 years following presentation, with discrepancies in search results being resolved by consensus with a third investigator (S.J.W.). The databases were chosen based upon their accessibility and high rate of indexing of journals relevant to physical therapy and because they demonstrated maximal retrievability of physical therapy–related publications in a previous systematic review.11 A 5-year publication window was chosen, as work presented in abstract form should be disseminated in a timely manner to maintain its relevance, and previous studies indicate that more than 90% of full-text publications occur in the 5 years following presentation of work in abstract form.12–17 Full-text publications published before or more than 5 years after abstract presentation at CSM were recorded, but not included in analyses.

Potential articles were initially sought by searching for the name of the abstract’s first author and a broad key word from the abstract title. If no corresponding article was found, the search was repeated up to 5 times in each database using alternative authors and key words. Repeating searches 5 times with varying search terms was deemed sufficient to locate full-text publications if they were indexed in the respective database. All full-text publications were retrieved, and concordance between the information contained in the presented abstract and full-text publication was verified to ensure that they represented the same body of work.

Full-Text Publication Data Extraction

Each full-text publication was reviewed by 2 independent investigators (H.D.S. and E.D.B.), and the following basic data were recorded: authors’ names, publication title, journal name, and date of publication. When a specific date of publication was not available, the date was set as the first day of the respective month for journals publishing 12 annual issues, or the first day of the respective season for journals publishing quarterly issues. Time to full-text publication was subsequently calculated in months as being the time between the date of abstract presentation and the date of full-text publication. Discrepancies in recording basic data from full-text publications were resolved by consensus with a third investigator (S.J.W.). Impact factors for the journals in which full-text publications
appeared were obtained by searching the Institute of Scientific Information’s Journal Citation Reports Science Edition for 2008. Impact factors provide a measure of the frequency with which an average article published in a journal in the preceding 2 years has been cited, with journals with higher impact factors within their discipline being deemed to be more influential than those with lower impact factors. The 2008 edition of the Journal Citation Reports was the most recent edition available at the time of searching. The journal impact factor during the specific year of each full-text publication was not searched, as impact factors were not available for articles published after 2008 and numerous journals in which full-text publications appeared were not listed until more recent editions of the Journal Citation Reports.

Information contained in each full-text publication was compared to that in its corresponding presented abstract for the presence of minor and major changes by 2 independent investigators (H.D.S. and E.D.B.), with discrepancies being resolved by consensus with a third investigator (S.J.W.). Minor changes were those not considered to influence conclusions derived from the disseminated information and included title and author changes. Major changes were those considered as having the potential to influence conclusions derived from the disseminated information and included changes in the study design, number of study groups, sample size, reported data, and direction of the primary finding. Changes in study design were assessed by collapsing RCT, quasi-experimental, and validation of tests and measures study designs into a single “experimental” design group and comparing full-text publications and previously presented abstracts for changes from experimental to nonexperimental designs, or vice versa. A change in the direction of the primary finding was recorded as a change from a negative or neutral finding to a positive finding, or a change from a positive finding to a neutral or negative finding. Studies reporting positive and negative findings were those reporting an effect of the primary independent variable that was in or against the direction of a perceived health benefit, respectively. Studies reporting a neutral finding were those reporting the absence of an effect of the primary independent variable.

Statistical Analyses
All analyses were performed using PASW Statistics software (version 17.0.2*), with a level of significance set at .05. Counts and percentages were used to summarize nominal data, whereas interval and continuous data were summarized using means and 95% confidence intervals (CIs) or medians and interquartile ranges (IQRs).

The influences of APTA section, year of abstract presentation, institution of origin, study design, sample size, study significance, reporting of a funding source, and presentation type on the impact factor for journals in which full-text publications appeared.

Discordance rates (%) between information presented in abstract form and full-text publication were determined in terms of minor and major changes, with logistic regression used to determine the influence of APTA section, year of abstract presentation, institution of origin, study design, sample size, study significance, reporting of a funding source, and presentation type on the odds that work published in full-text contained at least one major change.

Results
Full-Text Publication Rate
Eight hundred twenty-three abstracts were presented within the Orthopaedic and Sports Physical Therapy sections at CSM between 2000 and 2004 (Tab. 1). One quarter (25.4%; 209 out of 823) of presented abstracts were published in full text during the 5 years following presentation, with a mean (SD) time to publication of 22.7 (15.3) months (median [IQR] = 19.3 [10.1, 33.5] months). An additional 20 abstracts (2.4%) were published outside the 5-year publication window, with 8 published an average (SD) of 3.7 (2.8) months before and 12 published an average (SD) of 72.9 (9.9) months after their presentation. These premature and delayed publications were not included in subsequent analyses.

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* SPSS Inc, 233 S Wacker Dr, Chicago, IL 60606.
Factors Contributing to Full-Text Publication

No collinearity was detected among factors contributing to full-text publication, as indicated by variance inflation factors less than 1.1 and tolerances greater than 0.9.

**APTA section and year of abstract presentation.** There was no effect of APTA section (Fig. 1A) or year of abstract presentation (Fig. 1B) on publication rate (all $P=.36$–.51). Based upon visual trends suggesting increased publication rates for abstracts presented at more recent meetings, abstracts were dichotomized into 2 groups based upon year of presentation (2000–2001 and 2002–2004). There was no significant difference in publication rate between abstracts presented in 2000–2001 and those presented in 2002–2004 ($P=.08$) (Fig. 1C).

**Institution of origin.** The institution of origin of the abstract was unknown (not published) or international for 1.5% and 0.9% of abstracts, respectively (Tab. 1). These abstracts were not included in analyses of the effect of institution of origin because of the inability to accurately categorize them and the fact that they were few. Abstracts from doctorate-granting and “other” institutions were 5.18 (95% CI=3.28, 8.20) and 4.13 (95% CI=2.46, 6.92) times more likely to be published in full text than were abstracts from non–doctorate-granting institutions (all $P<.001$) (Fig. 1D). There was no difference in publication rate between abstracts from doctorate-granting and “other” institutions ($P=.25$).

**Study design.** One abstract was of unknown design as it contained only the title, authors’ names, and institution of origin, but no body text. The study designs of the remaining abstracts are shown in Table 1. As only 7 abstracts (<1.0%) were systematic reviews or meta-analyses, these abstracts were not included in analyses of the impact of study design. Abstracts presenting RCT, quasi-experimental, and validation of tests and measures data were at 1.83 (95% CI=1.08, 3.10), 1.67 (95% CI=1.13, 2.46), and 1.69 (95% CI=1.01, 2.61) greater odds of being published in full-text format than were nonexperimental abstracts (all $P<.05$) (Fig. 1E).

**Sample size and study significance.** Abstracts presenting RCT and quasi-experimental data that went on to be published in full-text format had 29% more participants per study group than did those not progressing to full-text publication (mean [95% CI]=39.9 [22.8, 57.0] versus 30.9 [25.9, 35.9], respectively) ($P=.04$). Similarly, study
Figure 1.
Influence of (A) American Physical Therapy Association (APTA) section, (B) year of presentation, (C) dichotomized year of presentation, (D) institution of origin, (E) study design, (F) study significance, (G) reporting of a funding source, and (H) presentation type on full-text publication rate during the 5 years following abstract presentation at Combined Sections Meeting. Odds of full-text publication increased if the abstract originated from a doctorate-granting or “other” institution, reported findings of an experimental study, reported a statistically significant finding, disclosed a funding source, or were presented as a platform presentation, as determined by logistic regression. The APTA section and year of presentation had no effect on the odds of full-text publication. Data are presented in survival curves, which graph the probability of publication as a function of time from abstract presentation.
significance influenced the rate of full-text publication, with abstracts presenting significant RCT and quasi-experimental data being 2.38 (95% CI =1.53, 3.71) times more likely to result in full-text publication than abstracts presenting data that were not significant (P<.001) (Fig. 1F).

**Reporting of a funding source and presentation type.** Abstracts reporting a funding source were 1.51 (95% CI =1.01, 2.30) times more likely to result in full-text publication than were abstracts not reporting a funding source (P<.05) (Fig. 1G). There also was a significant effect of presentation type on publication rate, with abstracts awarded a platform presentation being 2.69 (95% CI =1.93, 3.73) times more likely to be published than abstracts awarded a poster presentation (P<.001) (Fig. 1H).

**Full-Text Publication Features**

Journals publishing work previously presented in abstract form are shown in Fig. 2. The *Journal of Orthopaedic and Sports Physical Therapy* and *Physical Therapy* published 24.4% (51 out of 209) and 13.4% (28 out of 209) of the abstract-presented work. Work from an additional 37.8% (79 out of 209) of presented abstracts was published in 14 other journals, each publishing 3 to 13 full-text versions of work previously presented in abstract form. The work from the remaining 24.4% of presented abstracts was published in 42 other journals, each publishing 1 to 2 full-text versions of work previously presented in abstract form. There was no significant difference among the journals for study design of the work previously presented in abstract form (P=.23).

One hundred seventy-seven (84.7%) of the full-text versions were published in journals with an impact factor. The median (IQR) impact factor of these journals was 1.40 (0.98,
There was no influence of APTA section, year of abstract presentation, institution of origin, study design, reporting of a funding source, or presentation type on impact factor (all $P=.15-.76$); however, abstracts presenting significant experimental data were published in journals with a median impact factor 27.8% higher than that of the journals publishing abstracts presenting data that were not significant (median [IQR] = 1.47 [1.04, 1.91] versus 1.15 [0.86, 1.65], respectively) ($P=.02$).

Discrepancies Between Information Presented in Abstract Form and as Full Text

Minor and major changes within full-text publications derived from work previously presented in abstract form are shown in Table 2. Ninety-three percent (194 out of 209) of full-text publications contained at least one change from information presented in abstract form. Many of these changes were minor (title and author changes), with 90.4% (189 out of 209) of full-text publications containing at least one minor change. However, major changes were not uncommon, with 39.2% (82 out of 209) of full-text publications containing at least one major change. In 2 full-text publications, the direction of the study finding was changed from that previously presented in abstract form. In both instances, the change was from a negative or neutral finding to a positive finding for the primary variable of interest.

<table>
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<th>Variable</th>
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<tr>
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<td>Order of authors changed</td>
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<tr>
<td>Major changes</td>
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<td>Study design changed</td>
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<td>Direction of primary finding changed</td>
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<tr>
<td>Changed from negative or neutral finding to positive finding</td>
<td>2</td>
<td>1.0</td>
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<tr>
<td>Changed from positive to neutral finding or negative finding</td>
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*No studies changed their design from experimental to nonexperimental, or vice versa; however, one abstract presented a case study and published a case series, and another abstract presented a case series and published a case study.

**Ten abstracts failed to report study data; thus, the denominator for this calculation is 199.

Discussion

**Full-Text Publication Rate**

The full-text publication of work presented in abstract form at physical therapy meetings and conferences indicates the extent to which therapists publish their work, including therapists working in nonacademic settings. Data in the current study indicate that 1 out of 4 (25.4%) abstracts presented within the Orthopaedic and Sports Physical Therapy sections at APTA CSMs between 2000 and 2004 were published in full-text format during the 5 years following presentation. These data complement previous reports of journal publication productivity in physical therapy by providing a quantitative measure of productivity that can be contrasted to those obtained using similar methods in comparative disciplines.

A recent systematic review combined data from 79 individual reports to provide an overall benchmark of 44.5% for the publication rate of nearly 30,000 biomedical research studies presented in abstract form at professional meetings and conferences. This rate may not be representative of that in clinical fields such as physical therapy, as the review included numerous reports of publication rates in basic science fields. However, compiling data from 16 reports of publication rates in clinical disciplines comparable to physical therapy (including orthopedic sports medicine, trauma and surgery, spine and occupational health, and rehabilitation sciences) yields an abstract-to-full-text publication rate of 45.8% for information presented in more than 7,000 abstracts at 47 individual professional meetings.
(average = 159 abstracts per meeting). As no individual report among this group indicated an abstract-to-full-text publication rate below 30%, the full-text publication rate of 25.4% for the 823 abstracts presented in sections of physical therapy at 5 individual CSMs (average = 164 abstracts per meeting) is low relative to that observed in comparative clinical disciplines.

Reasons for the low abstract-to-full-text publication rate in the current study were not explored. Abstract features increasing the likelihood of full-text publication were identified; however, these do not adequately explain why presentation at CSM was the terminal level of dissemination for information contained in nearly 3 out of 4 abstracts. There can be only 2 explanations for this low publication rate—a large proportion of the work presented in abstract form at CSM either: (1) is simply not submitted for full-text publication or (2) does not meet the rigors of peer review associated with full-text publication. As these 2 factors are common across all disciplines, there must be specific influences within physical therapy that contribute to the comparatively low publication rate of information presented at CSM. A potential contributing influence may be the ongoing evolution of physical therapy toward becoming a more evidenced-based profession.

There have been increasing efforts over recent decades to enable physical therapy to make the transition from being a profession based solely on clinically developed theories, beliefs, and experiences toward being one that also develops, incorporates, and embraces scientific evidence. The drive toward such EBP has originated from both external and internal sources. Externally, the rise in health care costs along with the decrease in reimbursement has required the profession to justify its relevance within the global health care arena. At the same time, internal changes within the profession stimulated by the academic integration of the entry-level doctorate degree and the development of Vision 2020 established a level of professional practice formulated by scientific evidence. The combination of external and internal changes has resulted in a need to increase scholarly scientific activity within the profession.

A primary source for scientific exploration is the academic setting, and accreditation changes in this setting require each core physical therapy faculty member to engage in scholarship. However, physical therapy historically does not have a strong research culture, fitting with its traditional focus on clinical practice. Also, there are numerous barriers to scholarship within physical therapy, including issues of knowledge and experience in the research enterprise, and level of support in terms of research mentoring and infrastructure. These barriers are somewhat unique to physical therapy, given our immaturity as an academic discipline, and have been extensively discussed in recent work. Because of the barriers to scholarship in physical therapy, at the same time that there exists the requirement that academic faculty engage in some form of scholarly activity, it is possible that many faculty meet their scholarly requirements by performing work with the sole purpose of presenting it at a professional meeting such as CSM. Presentation at a national meeting currently is sufficient to meet scholarship standards for accreditation, and there is no requirement for faculty to take the next step to full-text publication. As a result, the same directives designed to increase scholarly activity within the profession may contribute to the limited translation of information observed in the current study.

Factors Contributing to Full-Text Publication

The underlying reasons for the low abstract-to-full-text publication rate observed in the current study are speculative and require further investigation. The current study identified numerous factors associated with greater odds that information presented at CSM would be translated into full-text publication within 5 years. A central factor was the primary institution of origin, with abstracts originating from doctorate-granting and “other” institutions having 4 to 5 times greater odds of progressing to full-text publication than those originating from non-doctorate-granting institutions.

The high full-text publication rate of abstracts originating from doctorate-granting institutions matches previous data indicating higher publication rates for physical therapists working at research-intensive institutions and is consistent with those institutions providing the resources and support that favor scholarly work. Additional analyses indicated that abstracts originating from non-doctorate-granting institutions were more likely to present work with an experimental study design than were those originating from “other” institutions, to report more significant RCT and quasi-experimental findings than did abstracts from non-doctorate-granting institutions, and to report a funding source more often than did abstracts from non-doctorate-granting institutions. The underlying reasons for the low abstract-to-full-text publication rate observed in the current study are speculative and require further investigation. The current study identified numerous factors associated with greater odds that information presented at CSM would be translated into full-text publication within 5 years. A central factor was the primary institution of origin, with abstracts originating from doctorate-granting and “other” institutions having 4 to 5 times greater odds of progressing to full-text publication than those originating from non-doctorate-granting institutions.
confirms a contribution of clinical investigators to advancing the body of knowledge. Abstracts categorized as having come from the “other institutions” group originated from institutions not listed in the Carnegie Classification database and were essentially abstracts from clinical settings (ie, hospitals and private practices). The relatively high full-text publication rate of abstracts from these settings confirms that the profession needs to continue encouraging the reporting of clinical studies and observations, consistent with its valuing of clinical practice.

Study design of the work presented in abstract form at CSM significantly influenced the odds of full-text publication, with abstracts presenting experimental (RCT, quasi-experimental, and validation of tests and measures) data having greater odds of progressing to full-text publication than nonexperimental abstracts. This observation was expected, considering the scientific nature of work published by most journals; however, an interesting observation was the absence of differences in full-text publication rates among abstracts presenting the 3 different types of experimental data. Previous studies in other disciplines have demonstrated that abstracts presenting RCT data have a higher rate of full-text publication, fitting with their higher ranking on the hierarchy of scientific evidence. This finding was not observed in the current study, with only 31 out of 103 (30.1%) abstracts presenting RCT data progressing to full-text publication. Reasons for the non-publication of more than two thirds of RCT data presented within the Orthopaedic and Sports Physical Therapy sections of the APTA at CSM are currently unknown.

Abstracts reporting a significant finding from a study with an RCT or quasi-experimental design were more than twice as likely to be translated into a full-text publication as those not reporting a significant finding. This indicates the presence of publication bias wherein some studies are selectively published for reasons solely related to their findings. The selective full-text publication of abstracts presenting significant findings is well established in the literature and presents consequences to EBP. For example, as published studies may not truly represent all studies undertaken on a particular topic, bias toward publishing studies reporting significant findings has the potential to influence the findings and conclusions of meta-analyses and systematic reviews on which EBP is increasingly based.

It may be hypothesized that sample size contributed to the observed publication bias. Sample size per experimental group was significantly larger in RCT and quasi-experimental studies that ultimately progressed to full-text publication. As there is a positive relationship between sample size and statistical power, an increase in sample size increases the likelihood of detecting a statistically significant effect. However, sample size per experimental group did not differ between RCT and quasi-experimental studies that reported a significant or not significant finding, indicating that sample size does not satisfactorily explain the publication bias observed (P=.19, Mann-Whitney U test; data not shown).

Presentation type was one of the single strongest predictors of full-text publication, with information presented in platform form being more than twice as likely to be published in full-text format as information presented in poster form. This is a consistent finding in studies of this type and is explained in the current study by the fact that the same factors that increased the odds of full-text publication also increased the odds of platform presentation. For example, abstracts were at greater odds of being accepted for a platform presentation if they originated from a doctorate-granting or “other” institution, reported findings of an experimental study, reported a statistically significant finding for the primary outcome variable, included a larger sample size, or disclosed a funding source (all P<.05, logistic regression; data not shown). The association between the factors that predict both presentation type and full-text publication demonstrates that reviewers of abstracts submitted for presentation at CSM judiciously award those more likely to progress to full-text publication with a platform presentation.

Full-Text Publication Features

The features of full-text publications originating from information presented in abstract form at CSM were explored. More than one third of full-text publications were published in either the Journal of Orthopaedic and Sports Physical Therapy or Physical Therapy. The high rate of publications in the Journal of Orthopaedic and Sports Physical Therapy fits with analyses in the current study being limited to abstracts presented at CSM within the Orthopaedic and Sports Physical Therapy sections of APTA. The Journal of Orthopaedic and Sports Physical Therapy is the official journal of these sections and publishes the abstracts presented at CSM in these sections. The journal Physical Therapy published the second-largest number of full-text versions of work presented in abstract form at CSM, consistent with its position as the leading international journal for research in physical therapy and related fields. The remaining full-text publications (130 out of 209) were published in 56 other individual journals spanning a broad range of disciplines. This large number indicates the breadth of journals available that publish work relevant to physical therapy and the
Discrepancies Between Information Presented in Abstract Form and as Full Text

The final component of this study was to explore discrepancies between information presented in abstract form and resultant full-text publication. Four out of 10 (39.2%) full-text publications contained at least one major change from information presented in abstract form. Major changes are a concern, as they have the potential to influence conclusions derived from the work, and their frequency in the current study indicate that data presented in abstract form at CSM often are incomplete or preliminary. The incomplete status of some studies at the time of CSM presentation may delay subsequent full-text publication and, therefore, contribute to the observed low 5-year abstract-to-full-text publication rate. However, the observed rate of major changes to information presented in abstract form prior to full-text publication in the current study matches rates reported in comparative disciplines (orthopedic surgery and sports medicine) that have higher abstract-to-full-text publication rates. Therefore, the preliminary nature of some studies at the time of CSM presentation does not adequately account for the comparatively low abstract-to-full-text publication rate observed in the assessed sections of physical therapy.

The most common major changes observed in the current study were changes in sample size and reported data values, with changes in the former probably being responsible for many of the changes in the latter. Sample size increased in 19% of full-text publications compared with that in their corresponding abstract, consistent with some studies presented at CSM being preliminary or incomplete. However, it is interesting to note that sample size decreased in 10% of all full-text publications expanded from work presented at CSM. Decreases in sample size between information presented in abstract form and its full-text publication have been reported in previous studies of this type and is of concern, as it indicates that some participants are completely removed from studies prior to full-text publication. There are probably valid reasons for the removal of these participants, and it is unlikely that their removal was an attempt to generate a significant study finding. Supporting the latter premise, there were only 2 instances in the current study in which the direction of the primary finding changed from negative or neutral within the abstract-presented work to positive within the resultant full-text publication. In both instances, there was no change in sample size between the information presented in abstract form and in full-text publication.

Study Strengths and Limitations

The current study adds to recent work investigating publication productivity within physical therapy. Its strength was its systematic search for full-text publications of work previously presented in abstract form. This approach provided a quantitative measure of productivity in physical therapy that could be contrasted to those obtained in comparative disciplines. However, the study is not without limitations. Abstracts searched were limited to those presented over a 5-year window at 1 conference type within a limited number of sections of APTA. It is possible that the derived abstract-to-full-text publication rate is not representative of rates for alternative conference years, APTA sections, or physical therapy meetings. It also is possible that the derived abstract-to-full-text publication rate was influenced by publication of some full-text publications in journals indexed in databases other than those searched. However, the databases searched are commonly utilized to locate information about physical therapy, and works published in journals indexed in less frequently searched databases have uncertain contributions to EBP because of their reduced retrievability. Finally, the current study is limited to the analyses performed, and does not address important questions such as reasons for the non-publication of work presented in abstract form, or whether abstract-to-full-text publication rates differ according to highest academic degree, position within the profession (student versus faculty member versus clinician), or specialty certification or APTA membership, to name a few. These factors were not assessed in the current study as their data were not available from the published abstracts of the work presented.

Conclusions

The current study indicates that approximately one quarter of work presented in abstract form within the Orthopaedic and Sports Physical Therapy sections at CSM progresses to full-text publication. This abstract-to-full-text publication rate is low relative to comparative clinical disciplines, indicating that physical therapy has a distance to go as a profession before better embodying a culture of scholarly activity and suggesting that it is still a profession in transition. It would be important to track progress over the next decades by replicating this study at future time points. The anticipation is that the abstract-to-full-text publication rate within the profession will increase over time as therapists develop a better appreciation of the research enterprise and become more ingrained in academic settings. The latter should facilitate the translation of information presented in abstract form into full-text publication, which is a requirement for promotion and tenure at most academic institutions. In the meantime, attendees at CSM should exercise caution when translating data
presented at the meeting into their EBP because of the low rate of peer-reviewed and full-text publication of the information.

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