Clinical Research in Family Medicine: Quantity and Quality of Published Articles

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Background and Objectives: Publication of clinical research in peer-reviewed journals is an important measure of scholarly productivity. This study determined the quantity and quality of original clinical research published by family physicians. Methods: We surveyed clinical research papers published in the year 2000 in four leading family medicine research journals and research originating in a family practice institution but published in 16 non-family medicine journals. All were selected on the basis of relevance to family physicians and “impact factor.” The relevance and validity of papers was assessed using previously established criteria. Results: The survey of family medicine journals revealed a total of 170 original research articles. Ninety-eight were from academic family practice programs, and the remaining 72 were from other medical specialties or health care institutions. Most of the papers were cross-sectional surveys. There were seven qualitative studies, six randomized controlled trials, and no systematic reviews from family practice programs in these journals. Eight of the articles were from practice-based research networks. A total of 79 articles were considered relevant or highly relevant, and 22 of these were also considered valid (Patient-oriented Evidence That Matters or POEMs). The survey of 16 non-family medicine journals revealed 37 clinical research papers: 16 surveys, nine prospective cohort studies, seven randomized controlled trials, three systematic reviews/meta-analysis, one qualitative study, and one case-control study. There were nine “highly relevant” papers—seven could be classified as POEMs. Conclusions: Most clinical family medicine research uses less-rigorous study designs, such as the cross-sectional survey. The majority of papers do not meet established criteria for relevance and validity. There are no standards or comparable studies to compare these results to prior years or to other disciplines.

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A recent report by Weiss indicated that the number of publications by Society of Teachers of Family Medicine (STFM) members is declining.1 This decline, Weiss believes, if sustained “would threaten the academic viability of our discipline.” Weiss also questioned the need for additional family medicine journals—“Where would we get the high-quality family medicine-authored articles necessary to fill other journals? . . .” STFM leaders in an accompanying editorial proposed that producing high-quality relevant research is difficult but must remain part of our mission.2 By contrast, Dickinson noted that the quality, if not the quantity, of family medicine research submitted for the STFM Annual Spring Conferences is improving.3

Ewigman believes that we are on track in developing research in our discipline.4 Such contrasting opinions must also take into account the cessation of publication of the Archives of Family Medicine because “The current quantity and quality of scientific research by family physicians is simply not yet sufficient to support three research-based family medicine journals”5 and the recent announcement by the editor of the Journal of Family Practice that the journal would no longer publish original research. In an editorial in the last issue of the Archives, Weiss stated that “We need good family medicine research to identify the best way to practice, and unless family medicine research defines the best way for family physicians to practice, the standard of care for family physicians will be determined by someone else.”6

Opinions about the state of family medicine research are clearly numerous, and there are reports of the productivity of research in family medicine,7,8 but a
systematic assessment of both published research quantity and quality is lacking. Our paper aims to fill this void. Our feeling is that clinical or patient-oriented research is most relevant to practicing family physicians. This, therefore, is the focus of our assessment. A critical review of publications in our own journals and publications by family physicians in other journals should provide a valuable gauge of the state of research in our specialty and, indirectly, whether our own research guides the way we practice. Our study, therefore, identified the number of clinical research articles published by family medicine researchers in family medicine journals and non-family medicine journals and assessed the relevance and validity of those articles.

Methods
Retrieval of Articles
The principal US family medicine research journals that were in print in the year 2000 were the Journal of Family Practice, the Journal of the American Board of Family Practice, the Archives of Family Medicine, and Family Medicine. All clinical research articles published in these four journals in the year 2000 were retrieved.

We defined “clinical research” in the following way: the study of actual human patients or the records of actual human patients or theoretical models that deal primarily with patient care or decisions that affect patients directly (e.g., decision analysis). By this definition, for example, studies dealing with the practice patterns of physicians, the effect of public policy on outcomes, or educational interventions for medical students or residents were excluded.

The titles, authors, and institutional affiliation of papers were collected and entered into a database. Papers were classified as originating in a family practice institution if at least one of the authors was affiliated with a family medicine department, division, residency, health center, or private practice. The number of papers originating in a practice-based research network was recorded separately.

We also retrieved articles originating in family medicine institutions but published in non-family medicine journals. Since it would be impossible to survey all non-family medicine publications, we selected those journals most likely to have content relevant to family physicians and with the highest “impact factor”—a measure of the average frequency with which articles in a particular journal are cited each year. It is a gauge of the importance or “impact” of a journal. Using the criteria of relevance to family physicians and highest impact factor, the 16 non-family medicine journals listed in Table 1 were selected and searched by hand for the year 2000.

Table 1
Non-Family Medicine Journals From Which Family Medicine-authored Papers Were Identified

- New England Journal of Medicine
- Journal of the American Medical Association
- Lancet
- Annual Reviews of Medicine
- Annals of Internal Medicine
- Archives of Internal Medicine
- American Journal of Medicine
- British Medical Journal
- American Journal of Obstetrics and Gynecology
- British Journal of Obstetrics and Gynecology
- Obstetrics and Gynecology
- Pediatrics
- Journal of Pediatrics
- Journal of the American Geriatrics Society
- American Journal of Sports Medicine
- Journal of General Internal Medicine

Evaluation of Articles
The study design used in each paper was determined independently by two of the authors. Disagreements were settled by the third author, a biostatistician. Each paper was put in one of the following categories: randomized controlled trials, prospective cohort studies, case-control studies, meta-analyses/systematic reviews, case series, surveys, and qualitative research. Case reports were excluded.

The relevance and validity of each paper was assessed independently by two authors using the evidence-based medicine worksheets designed by Slawson and Shaughnessy that are based on the work of Sackett et al. Articles were classified as “highly relevant” if they met all three relevance criteria, “relevant” if they at least described a problem frequently encountered by family physicians (second relevance criterion), and otherwise “irrelevant” (Table 2). Articles were classified as “valid” if they met the key validity criteria of the appropriate

Table 2
Classification of and Criteria for Relevance

<table>
<thead>
<tr>
<th>Relevant criteria</th>
<th>Highly relevant</th>
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<tbody>
<tr>
<td>#2 only</td>
<td>all three criteria</td>
</tr>
</tbody>
</table>

1. Did the authors study an outcome patients would care about?
2. Does the article address a specific clinical question that you encountered frequently in your practice?
3. Will this information, if true, require you to change your current practice?
worksheet without any “fatal” flaws. Lack of proper
blinding, for example, would make a randomized-con-
trol trial fatally flawed. A complete description of va-
idity criteria can be found elsewhere.12

Disagreements about relevance or validity were
settled by consensus in discussions with the third au-
thor. Highly relevant and valid papers were classified
as Patient-oriented Evidence That Matters (POEMs).12

Results

Papers From Family Medicine Journals

A total of 170 clinical research articles were found
published in the four family medicine journals during
2000. Ninety eight (58%) originated from family prac-
tice departments or residences. Of these, eight involved
practice-based research networks. The remaining 72
articles (42%) were from family medicine researchers,
other academic departments, or other health care insti-
tutions. The Journal of Family Practice published 57%
of the 98 papers originating from family medicine pro-
grams. (Table 3).

Cross-sectional surveys were more common than
other designs (Table 4). The majority of the 20 ran-
domized-controlled trials were from non-family prac-
tice institutions.

Among the 170 clinical studies, 79 (46%) were rated
as either relevant or highly relevant. Twenty-two (13%)were considered highly relevant and valid, ie, POEMs
(Table 5).

Discussion

Only 58% of clinical research papers published in
the four leading family medicine journals originated in
family practice institutions. Are family physicians send-
ing their best papers elsewhere? The answer is prob-
ably no, since only 37 clinical research papers were
found in 16 non-family medicine journals with a high-
impact factor. Nineteen percent of these were classi-
fied as POEMs, compared with just 12% of clinical
research papers published by family physicians in fam-
ily medicine journals.

The majority of published papers we reviewed used
a survey design, the least sophisticated of research
methodologies. Qualitative research14 has been pro-
posed as an ideal design, and practice-based research
networks3 have been proposed as an ideal vehicle for

<table>
<thead>
<tr>
<th>Research Design</th>
<th>Total</th>
<th>Family Medicine</th>
<th>Non-Family Medicine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Survey/cross section</td>
<td>96</td>
<td>60 (61%)</td>
<td>36 (50%)</td>
</tr>
<tr>
<td>Cohort</td>
<td>30</td>
<td>19 (63%)</td>
<td>11 (37%)</td>
</tr>
<tr>
<td>Randomized trial</td>
<td>20</td>
<td>6 (30%)</td>
<td>14 (70%)</td>
</tr>
<tr>
<td>Qualitative</td>
<td>10</td>
<td>7 (70%)</td>
<td>3 (30%)</td>
</tr>
<tr>
<td>Case-control</td>
<td>6</td>
<td>5 (83%)</td>
<td>1 (17%)</td>
</tr>
<tr>
<td>Systematic review</td>
<td>6</td>
<td>1 (16%)</td>
<td>5 (84%)</td>
</tr>
<tr>
<td>Case series</td>
<td>1</td>
<td>0 (0%)</td>
<td>1 (100%)</td>
</tr>
<tr>
<td>Decision analysis</td>
<td>1</td>
<td>0 (0%)</td>
<td>1 (100%)</td>
</tr>
<tr>
<td>Total</td>
<td>170</td>
<td>98 (58%)</td>
<td>72 (42%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Research Design</th>
<th>Total</th>
<th>Family Medicine</th>
<th>Non-Family Medicine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relevance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Irrelevant</td>
<td>91</td>
<td>43 (44%)</td>
<td>48 (67%)</td>
</tr>
<tr>
<td>Relevant</td>
<td>34</td>
<td>22 (65%)</td>
<td>12 (35%)</td>
</tr>
<tr>
<td>Highly relevant</td>
<td>45</td>
<td>33 (73%)</td>
<td>12 (27%)</td>
</tr>
<tr>
<td>Highly relevant and valid (POEM)</td>
<td>22</td>
<td>12 (12%)</td>
<td>10 (42%)</td>
</tr>
</tbody>
</table>
family medicine research. Few papers in our survey included either.

It is encouraging, on the other hand, that about half of the articles published in family medicine journals were relevant for family physicians and that there were 22 POEMs. Unfortunately, only 12 of these articles came from family practice institutions.

**Comparative Studies**

There are no compatible standards for comparison of our results to determine if the number of publications was appropriate or how our results compare to the numbers in other disciplines. We only have data on non-primary care disciplines. Specifically, Powner and Kellum studied the research productivity of critical care physicians by looking at the three leading journals of that specialty. In 1999, critical care specialists published a total of 408 research articles; 169 were from US institutions.

A number of previous reports, however, do address the issue of research productivity among family physicians. Geyman and Berg reviewed articles published in the *Journal of Family Practice*’s first 15 years and described a subset for the 5 years from 1984–1988. There were an average of 150 papers published per year from 1984–1988. Of these, 63 per year would meet our criteria for clinical research, and six of these would be randomized trials. We do not know how many of these were from family practice programs. By comparison, our study revealed that in the year 2000, the *Journal of Family Practice* published 74 clinical research articles, including five randomized controlled trials (three from family practice institutions). Unlike during 1984–1988, there were, of course, two additional family medicine journals in 2000. Only an additional 42 clinical articles, however, were published outside of the *Journal of Family Practice*. It is interesting that in an editorial accompanying a similar article by Geyman and Berg, Pellegrino asserted that:

A more-detailed analysis of content of the *Journal of Family Practice* and other journals, together with some objective assessment of quality and significance, is definitely in order. Were family practice to undertake such a study a few years from now, formally and in detail, it would do itself a service.

Muncie et al reviewed the designs and methods of the North American Primary Care Research Group abstracts for 1977–1987. Then, as now revealed by this paper, cross-sectional surveys were the most-common research design. Frey expressed concern at that time about the preponderance of the less rigorous survey design:

Such trends may produce research that lacks the methodologic strength to move medicine forward with as much certainty as is necessary to change the practice of medicine and the delivery of medical care.

In an analysis published in 1992, Ingram noted that half of the publications by family medicine faculty were published in non-family medicine journals. Clinical research was not specifically studied. A more-recent paper revealed that neither family practice departments that made research a high priority nor those that made it a low priority published a significant number of papers.

The editors of “Evidence-based Practice” found that only 2.6% of the 8,085 articles they reviewed in a 6-month period could be classified as POEMs. This is a much lower percentage than in our study but cannot be compared because of their very large denominator and broad selection of journals.

**Limitations**

This study has a number of limitations. First, no single measure can encompass all the research being conducted by family physicians, and there may be an increasing body of research in progress that is yet to be published. Second, there is the possibility, though unlikely, that the year 2000 was a notably weak year for family medicine research. Third, we looked specifically at clinical research using a definition some may criticize as too “narrow.” Fourth, it is possible that family physicians are doing a considerable amount of good-quality research in the fields of medical education, health policy, practice management, etc, and we did not include such research. Fifth, we only searched the four leading family medicine research journals and 16 important journals that family physicians are likely to read. It is possible that there is a large volume of high-quality clinical research published in other journals.

Finally, the evidence-based medicine tools we used in our relevance and validity assessment have their own shortcomings. While all papers meeting POEM criteria are of practical importance to practicing family physicians, papers that do not meet POEM criteria are often still valuable. We came across many papers that addressed important questions that may not apply to the immediate care of patients. Further, important clinical questions are often first addressed through less-rigorous and less-expensive research designs such as the case-control methodology. These often form the basis for more-intensive study through randomized-controlled trials, etc. The POEM criteria do not take this progression into account. According to the criteria, for example, no case-control study about a new therapy can ever be considered a POEM.
Conclusions
We can conclude that some family medicine researchers are asking appropriate, relevant questions. There is, however, a lack of research that uses high-quality designs and is highly relevant and valid. With 129 departments and 466 family practice residency programs, we should be able to sustain more than one clinical research journal and produce more patient-oriented clinical research studies in 1 year.

Let us also keep in mind that concerns about the quantity and quality of research are not unique to family medicine. Whatever one’s perspective on the quantity and quality of family medicine research, it is hoped that this paper encourages family physicians to take a critical look at the research activities of our discipline. Few would argue that there is no room for improvement.

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References