Research Participation, Protected Time, and Research Output by Family Physicians in Family Medicine Residencies

Richard A. Young, MD; Mark J. DeHaven, PhD; Cindy Passmore, MA; Joane G. Baumer, MD

Background and Objectives: The Future of Family Medicine project concluded that research must become a greater part of the culture of the specialty. We examined the participation of family physician residency faculty in research, their protected time, and their research output and how these varied by program type. Methods: This was a cross-sectional survey of all family medicine residency programs in the United States. The response rate was 66% (298/453). Results: The majority of programs reported at least one family physician who participates in research, though the medical school-based (MSB) programs reported a higher total number of faculty than the community-based, medical school affiliated (MSA) programs (9.53 versus 2.72) and percentage of faculty (56% versus 37%). Substantially more MSB programs reported that they had at least one family physician with significant protected time for research (48% versus 7% for > 25% protected time) or any protected time (69% for MSB versus 45% for MSA). MSB programs and MSA programs reported similar success at producing at least one poster or paper for national meetings within the last 3 years (63% versus 41%) but not for published papers (86% versus 43%). Conclusions: We found that only about half of the family medicine residencies produced any nationally recognized research over a 3-year period and that this represents only a small improvement over the last 10 years. Our findings suggest that more support is needed if research is to become an integral part of the culture of family medicine.

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This study's purpose was to determine the current state of research in the nation's family medicine residencies. Specifically, we wanted to answer the following questions: How many family physician faculty participate in research, how much protected time do they have, and how does that vary by program type? How many programs have any research output, what is that output, and how does that vary by program type?

Methods

We surveyed all family medicine residency program directors in the United States who were listed in the 2004 directory published by the American Academy of Family Physicians (AAFP). Approval for this study was obtained from the Institutional Review Board of the John Peter Smith Health Network.

Instruments

All sections of the survey asked specifically and only about family physician faculty. The questions asked about the number of faculty in each program who participate in research, the amount of protected time they have, their source of funding, the availability of mentors, and the types of grants they received. The question types were a combination of checked responses, fill in the blank, and a 6-point Likert scale (1="impossible" to 6="very likely").

The questions about participating in research mostly required fill-in-the-blank responses about the number of family physician faculty who participated in various research activities. The protected time questions asked about the number of faculty who had protected time, broken down into various time categories. The research output questions asked about the number of papers and posters published or presented in the last 3 years. Questions that asked respondents about how many faculty “participate in research,” have completed “research training,” or have “protected time” did not further define these phrases, and interpretation was left to the respondents. Additionally, the types of projects considered to be “research” were also left to the interpretation of the respondents. Finally, respondents were not asked to break down faculty research time and output according to whether faculty were full-time or part-time.

Survey Methods

Surveys were mailed to all program directors in the United States who were listed in the most recently updated list provided by the AAFP as of April 2004. We used a modified Dillman approach. Specifically, we first mailed a letter to the program directors explaining the rationale of the study and advised them that they would receive a survey 1 week later. The survey was then mailed with a self-addressed stamped envelope by standard post. A second survey was mailed about 3 weeks later. A third survey was mailed about 3 weeks after that by priority mail.

Data Analysis

Categorical data were analyzed using chi-square statistics. Continuous data were analyzed using one-way
ANOVAs. We used SPSS version 11.5 as our statistical software. No attempts were made to impute missing data.

For the section on protected time for family physician research, many of the responses from the unaffiliated programs and the military programs were zero, which caused the expected cell size to be less than five for 30% of the cells. Therefore, the requirements of chi-square analysis could not be met. We decided to exclude these program types for this section of the analysis and only compared the three remaining program types. We felt that this approach would not alter our overall findings, because unaffiliated and military programs comprise only about 8% of all programs.

Contact information for 469 programs was initially obtained from the AAFP. Seven programs had closed or were well into the process of closing and were therefore not included in our analysis. Also, nine programs that were listed as separate entities, but that actually were extensions of another program with the same program director (a rural track, for example), were excluded from analysis. After excluding the programs, there were 453 programs that could have been included in the study. We received responses from 300 of these programs, but two of the responses were unusable. Therefore, 298 out of 453 eligible programs submitted usable data, for an overall usable response rate of 66%.

**Results**

Responding and nonresponding programs did not differ in the number of resident positions offered, the number of family physician faculty, the number of other physician faculty, nor in the number of behavioral faculty, number of total physician faculty, total faculty size, or program structure. No single question had less than a 97% response rate except the open-ended “other” responses.

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### Table 1

Research Participation by Family Physician Residency Faculty

<table>
<thead>
<tr>
<th></th>
<th>Community based, not affiliated (n=12)</th>
<th>Community based, medical school affiliated (n=181)</th>
<th>Community based, medical school administered (n=58)</th>
<th>Medical school based (n=35)</th>
<th>Military (n=12)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;How many of your family physician faculty currently participate in research?&quot;* (Mean # per program)</td>
<td>1.75</td>
<td>2.72</td>
<td>3.75</td>
<td>9.53</td>
<td>3.67</td>
</tr>
<tr>
<td>Percent of programs with any family physician faculty who participate in research**</td>
<td>67%</td>
<td>81%</td>
<td>81%</td>
<td>97%</td>
<td>100%</td>
</tr>
<tr>
<td>Percent of total family physician faculty in each program who participate in research***</td>
<td>31%</td>
<td>37%</td>
<td>48%</td>
<td>56%</td>
<td>36%</td>
</tr>
</tbody>
</table>

Of those (family physician faculty) that participate in research, how many . . .

Mean number of family physician faculty per residency type (Percent of total family physician faculty at each program)

| "Have initiated their own research projects in the last 3 years?"* (Percent of total family physician faculty)* | 0.92 (16%) | 1.67 (21%) | 2.12 (25%) | 6.88 (46%) | 2.67 (28%) |
| "Currently participate in practice-based research networks (PBRNs)?"* (Percent of total family physician faculty)* | 0.58 (12%) | 1.09 (15%) | 1.58 (19%) | 3.27 (24%) | 0.50 (5%)  |
| "Have any formal research training?"* (Percent of total family physician faculty)* | 0.92 (16%) | 1.10 (14%) | 1.44 (15%) | 4.85 (29%) | 2.08 (20%) |

Statistically significant results are in bold font. Quotes indicate the exact wording on the survey instrument.

* P<.0005, one-way ANOVA
** P=.037, chi-square=10.2
*** P=.007, one-way ANOVA
† P=.002, one-way ANOVA
‡ P=.238, one-way ANOVA
¶ P=.004, one-way ANOVA


Research Participation

The majority of programs (range 67%–100%) reported that at least one family physician faculty member participates in research and that typically more than one faculty member participates (range 1.75–9.53 faculty per program) (Table 1). Participation was highest in the medical school-based (MSB) programs on both measures. MSB programs also had the highest percentage of their faculty who participate in research (56%, range 31%–56%). MSB programs reported many more faculty who have initiated their own research projects in the last 3 years (6.88 faculty, range 0.92–6.88), who currently participate in practice-based research networks (PBRNs) (3.27, range 0.58–3.27), and who have any formal research training (4.85, range 0.92–4.85).

Protected Time

Approximately half of the programs reported that their family physician faculty had any protected time for research (range 45%–69%) (Table 2). Significantly more MSB programs had at least one faculty member with more than 25% protected time (48%, range 7%–48%), and reported at least one faculty member with more than 50% protected time (36%, range 3%–36%). MSB programs reported more faculty with protected time for research across all ranges of time. For example, the mean number of family physician faculty with > 50% protected time for research in the MSB programs was 1.50 faculty per program, while it was only 0.04 for the community-based (CB) medical school-affiliated programs.

Research Output

MSB programs were more likely to report at least one published paper in a peer-reviewed journal than the other types of programs in the previous 3 years (86%, range 33%–86%) (Table 3). There was no statistically significant difference between the program types that produced at least one poster or paper at a national or state meeting in the last 3 years, though there was a trend toward greater output by the MSB programs.

The most striking difference between community-based and MSB residencies was the total numbers of papers and posters produced. The MSB programs produced substantially more publications (13.09 publications, range 0.75–13.09, P<.0005) (Table 3) and posters or papers at national conferences (23.5, range 1.4–23.5, P<.0005) over the last 3 years than the CB programs.

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Table 2

<table>
<thead>
<tr>
<th>Protected Time for Family Physician Research*</th>
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<tbody>
<tr>
<td>Community based, medical school affiliated (n=178)</td>
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<tr>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>“How many of your current family physician faculty have any protected time devoted to research?”</td>
</tr>
<tr>
<td>Percent of programs with one or more family physician faculty**</td>
</tr>
<tr>
<td>Any with &gt; 25% protected time†</td>
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<tr>
<td>Any with &gt; 50% protected time‡</td>
</tr>
<tr>
<td>Mean number of family physician faculty who have protected time for research:§ (How much protected time do they have?)</td>
</tr>
<tr>
<td>“Less than 10%”</td>
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<tr>
<td>“10% to 25%”</td>
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<tr>
<td>“26% to 50%”</td>
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<tr>
<td>“More than 50%”</td>
</tr>
</tbody>
</table>

Statistically significant results are in bold font. Quotes indicate the exact wording on the survey instrument.

* Non-affiliated and military programs not included for this table, because many of the cells had a response of 0 and therefore an expected cell count < 5.

** P=.013, chi-square=8.7
† P=.0005, chi-square = 40.0
‡ P=.0005, chi-square = 38.8
§ ANOVA was not performed, because the means were much smaller than the unit of measurement. The denominator in all the ratios of this section was all respondents, not just those who reported some protected time.
This difference was not explained by the CB programs having more unfinished work; there was no significant difference between the program types for research efforts left unfinished (eg, data collected but not analyzed, data analyzed but not written up, etc.).

MSB programs had a slightly higher production per family physician faculty by the measures of publications per total number of family physician faculty (0.72, range 0.14–0.72, $P=.008$) (Table 4), per faculty who participate in research (1.12, range 0.26–1.12, $P=.013$), and per faculty with protected time for research (2.22, range 0.29–2.22, $P=.046$). However, there were no significant differences between the program types for the number of publications per faculty with either > 25% protected time (4.1 for MSB programs, range 4.0–5.2, $P=\text{not significant [NS]}$) or > 50% protected time for research (8.6 for MSB programs, range 5.5–10.4, $P=\text{NS}$). No military or CB non-affiliated programs reported any faculty with > 25% protected time for research.

**Discussion**

How many family physician faculty participate in research, how much protected time do they have, and how did this vary by program type?

The majority of family medicine programs reported at least one family physician faculty member who participates in research. However, family physician faculty in CB residencies reported very little protected time for research. Assuming 40% protected time is necessary to have a successful research effort,20 almost no CB programs had any faculty who met that goal. The MSB programs reported much more protected time for research, with an average of about 2.7 full-time equivalent (FTE) per program with > 26% protected time and 3.3 FTE per program with 10%–15% protected time.
These results are similar to the findings by Hueston, who found that the vast majority of CB residency faculty had 10% or less protected time for research,\textsuperscript{13} suggesting that not much has changed during the last decade. He also found that the variables that were associated with spending 10% or more time on research were employment in a university-based or university-administered program, completion of a post-residency fellowship, and years of academic experience. Our survey did not inquire about the latter two factors, though most of the programs reported at least one faculty with some degree of research training. In contrast to Hueston’s findings, we found that university-administered programs were more similar to the other types of CB programs than they were to university-based programs on almost all of the variables examined.

Overall participation in research at some level may have improved over the last decade. Mills et al reported that approximately 38% of programs had faculty “in research projects,” and approximately 23% had any protected time.\textsuperscript{17} Our survey found that 84% of programs reported at least one family physician faculty who participates in research, and 49% reported at least one family physician faculty with any protected time.

How many programs have any research output, what is that output, and how does that vary by program type?

Only about half of the family medicine residencies reported any publications by the family physician faculty in the last 3 years. MSB programs were much more successful at publishing their work than the other

\begin{table}
\centering
\caption{Research Output Per Family Physician Faculty Produced “. . . in the Last 3 Years . . .”}
\begin{tabular}{|l|c|c|c|c|c|}
\hline
& Community & Community & Medical & Medical & Military \\
& based, not & based, medical & school & school & (n=12) \\
& affiliated & school affiliated & administered & based & (n=12) \\
& (n=12) & (n=178) & (n=57) & (n=34) & \\
\hline
Published papers & & & & & \\
\textbf{Per total number of family physician faculty*} & 0.14 & 0.23 & 0.24 & 0.72 & 0.10 \\
\textbf{Per family physician faculty who participates in research†} & 0.48 & 0.52 & 0.54 & 1.12 & 0.26 \\
\textbf{Per family physician faculty with protected time for research‡} & 0.50 & 0.92 & 1.11 & 2.22 & 0.29 \\
\textbf{Per family physician faculty with > 25% protected time for research†} & N/A & 5.2 & 4.0 & 4.1 & N/A \\
\textbf{Per family physician faculty with > 50% protected time for research§} & N/A & 10.4 & 5.5 & 8.6 & N/A \\
\hline
National posters & & & & & \\
\textbf{Per total number of family physician faculty§} & 0.18 & 0.15 & 0.32 & 0.69 & 0.20 \\
\textbf{Per family physician faculty who participates in research**} & 0.46 & 0.39 & 0.69 & 0.92 & 0.47 \\
\textbf{Per family physician faculty with protected time for research††} & 0.30 & 0.82 & 1.59 & 2.03 & 0.79 \\
\hline
\end{tabular}
\end{table}

Statistically significant responses are in bold font.

* $P=.008$, one-way ANOVA
† $P=.013$, one-way ANOVA
‡ $P=.046$, one-way ANOVA
§ $P=.882$, one-way ANOVA
¶ $P=.573$, one-way ANOVA
** $P=.005$, one-way ANOVA
†† $P=.005$, one-way ANOVA
§§ $P=.077$, one-way ANOVA
program types, both by total publications and publications per family physician faculty. However, there were no significant differences between the program types for the number of publications per faculty with more substantial protected time (by the measures of either > 25% or > 50% protected time). Therefore, our findings suggest that the greater number of faculty with protected time to pursue research interests at the MSB programs probably explains most of the difference between program types in publication success. Other likely reasons for higher publication success among MSB faculty include a culture and mission that more strongly encourages publications, a culture that attracts family physician faculty who have an interest in research, department chairs who value research publications more highly than CB chairs, a more readily available and extensive research infrastructure, and more reliable sources of funding, such as intramural university research grants for pilot projects.

Only about half of the family medicine residencies reported any poster presentations or papers by the family physician faculty in the last 3 years. CB faculty have had some success producing and presenting posters at state and national family medicine meetings, in spite of having little protected time to produce this work. There was no difference in poster output between CB and MSB programs in terms of any poster presented in the previous 3 years, though the MSB programs produced a much larger quantity of posters. CB and MSB faculty produce comparable numbers of national posters when measured as a function of the number of family physician faculty who participate in research and who have protected time. The fact that MSB programs produce significantly more national posters is also likely explained by these programs having a higher percentage of faculty who participate in research and have protected time for research. How does the current status of publications compare to the past? Mills et al found that 41% of programs had no publications in a 1-year period. We found that 50% of programs had no original papers in a peer-reviewed journal over a 3-year period, suggesting that whatever small gains in research time may have been realized over the last decade have not resulted in more publications.

Limitations

Our study has several limitations that should be considered when interpreting the results. First, this was a mailed survey that had a response rate of 66%. This is an acceptable response, and we did not identify any differences between responding and nonresponding programs. Nonetheless, differences could exist. We asked about the environment and output for research among family physician residency faculty. We specifically highlighted the fact that we wanted to know about the physician faculty, not the behavioral science or other faculty. This approach would cause the survey to underestimate the overall research production of programs, since some research may have been conducted by nonphysician faculty. We have no way of knowing if the respondents recognized this distinction. It could be that many of the posters and papers reported to us were substantially produced by nonphysician faculty.

We also made no attempt to measure the quality of research output or the quality of available mentors. We did not explicitly define “participate in research,” “protected time for research,” or “research training;” we left it up to the interpretation of the respondent to define precisely what was meant by these terms. We believe that whatever bias resulted from this lack of precise definition would probably lead to an inflated report of research participation and output. We also did not define what constituted a published paper and did not inquire about order of authorship or how extensive the faculty involvement was for each paper. Finally, we did not inquire about recent job changes by the faculty. We did not ask in what setting the research time and production occurred but assumed that the vast majority of reported research participation, time, and output occurred at the program surveyed.

Future Implications

The findings of our research suggest some areas to be more closely examined by policy makers who are interested in improving the overall status of research within family medicine. First, our results suggest that research at CB programs does not benefit much from the program being affiliated with or administered by a medical school. For the variables of research participation and output we measured, the affiliated and administered CB programs were more similar to non-affiliated CB programs than they were to MSB programs. Perhaps improved collaboration and resource sharing for the explicit purpose of research between the universities and their affiliated or administered programs should become part of the agreements between the universities and their CB programs.

Second, our research suggests that having at least some faculty with significant protected time is important to produce publications. The average family medicine residency has eight to nine family physician faculty and about 22 residents (based on American Academy of Family Physicians data). Perhaps more publications would occur if two of the eight faculty had 40% protected time for research instead of eight faculty with 10% protected time.

Finally, we recognize that more than just time is required to produce meaningful research. Perhaps universities could play a larger role with their associated residencies to encourage collaboration with university-based family physician researchers, spon-
sor mini-research fellowships to help keep CB faculty abreast of developments in the latest methods and statistical techniques, reduce barriers to the CB faculty to access other university resources such as statisticians and information resources, and foster collaboration among the key research personnel of their associated residencies. If universities are unable or unwilling to commit the necessary resources to this kind of effort, another possibility would be to develop regional research centers whose function would be to act as a research department for a network of programs. This type of consortium could be sponsored by some of the national family medicine organizations or perhaps even Health Resources and Services Administration grants could be used to help create these centers.

Conclusions

We conclude that research in family medicine residencies is still struggling. The vast majority of programs do not have any one faculty member with adequate protected time for research. Our findings suggest that altering this reality is the single most important change that must occur to increase research output in family medicine. For the vision of the Future of Family Medicine project to be realized, that there be a “...growth of research and a greater commitment to a culture of ongoing inquiry in family medicine...” meaningful research must occur in the setting where most doctors become family physicians: the community-based residencies.

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REFERENCES