Clinical Pharmacists as Educators in Family Medicine Residency Programs: A CERA Study of Program Directors

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BACKGROUND AND OBJECTIVES: The clinical pharmacist’s role within family medicine residency programs (FMRPs) is well established. However, there is limited information regarding perceptions of program directors (PDs) about clinical pharmacy educators. The study objectives were (1) to estimate the prevalence of clinical pharmacists within FMRPs and (2) to determine barriers and motivations for incorporation of clinical pharmacists as educators.


RESULTS: The overall response rate was 50% (224/451). Seventy-six percent (170/224) of the responding PDs reported that clinical pharmacists provide pharmacotherapy education in their FMRPs, and 57% (97/170) consider clinical pharmacists as faculty members. In programs with clinical pharmacists, 72% (83/116) of PDs reported having a systematic approach for teaching pharmacotherapy versus 22% (21/95) in programs without. In programs without clinical pharmacists, the top barrier to incorporation was limited ability to bill for clinical services 48% (43/89) versus 29% (32/112) in programs with clinical pharmacists. In both programs with and without clinical pharmacists, the top benefit of having clinical pharmacists was providing a collaborative approach to pharmacotherapy education for residents (35% and 36%, respectively).

CONCLUSIONS: Less than half of FMRPs incorporate clinical pharmacists as faculty members. Despite providing collaborative approaches to pharmacotherapy education, their limited ability to bill for services is a major barrier.

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An interprofessional approach to patient care and education has been a cornerstone of family medicine for decades. The level of involvement of clinical pharmacists in medical education, particularly in family medicine residency programs (FMRPs), has been studied. The first documentation of clinical pharmacists as clinical educators was in 1977, noting limited, mostly inpatient, functions. Studies from the early 1980s reported that clinical pharmacists were active providers in less than 30% of family medicine residency programs. However, physicians’ attitudes in those programs with clinical pharmacists were positive. Review of family physicians’ perceptions of clinical pharmacists’ drug therapy recommendations has been overwhelmingly positive, yet not well studied. Subsequent surveys of FMRPs reported in 1990 and 2002 identified lack of significant growth of clinical pharmacist involvement in the Unites States with rates of 24% and 27% respectively, with similar rates in Canada.
Pharmacotherapy and interprofessional education as core curricula in FMRRPs has only recently emerged in the last decade, with suggested guidelines published by the Society of Teachers of Family Medicine Group on Pharmacotherapy. Bajcar and colleagues detailed a formalized pharmacotherapy curriculum in Canada with clearly delineated tasks to help residents address basic pharmacotherapy principles on an individualized basis with patients. Although many FMRRPs have clinical pharmacists within their programs, specific information about their roles as resident preceptors is limited. A resident evaluation of a pharmacist preceptor in an FMRP showed the pharmacist to be an effective teacher and useful patient care resource. Impact of a clinical pharmacist-precepted pharmacotherapy rotation demonstrated significant improvement in resident knowledge. The value of interprofessional education is acknowledged in the 2014 Accreditation Council on Graduate Medical Education (ACGME) Program Requirements for Graduate Medical Education in Family Medicine in standard IV.A.5.f.(5) which focuses on working in interprofessional teams to enhance patient safety and quality of care.

Pharmacy education and training have evolved to meet the clinical and scholastic needs of the health care environment. The Doctor of Pharmacy (PharmD) degree was adopted as the entry level degree for pharmacists in 1997, with full implementation by the academic year 2004–2005. Pharmacy residency training and board certification specialties have become widely available, allowing pharmacists to prepare for specialized clinical and educational roles outside of a traditional dispensing model. Recent synopses and comparisons of pharmacists’ scopes of practice have valued this additional training and certification as helpful in building a contemporary scope of pharmacy practice and faculty development.

With advancements in pharmacy education and training over the past 15 years and emerging importance of pharmacotherapy in FMRRPs, there is a need to determine perceptions of program directors (PDs) about clinical pharmacy educators. The objectives of this study were (1) to estimate the prevalence of clinical pharmacists within FMRRPs and (2) to determine the barriers and motivations for the incorporation of clinical pharmacists as family medicine resident educators from the perspective of PDs.

Methods
Survey questions were developed to determine PDs’ perceptions of clinical pharmacists as educators. The questions addressed issues of formalized pharmacotherapy education, the incorporation of clinical pharmacists in educator roles, and top barriers and benefits of clinical pharmacists in FMRRPs. The survey questions were part of a larger omnibus survey conducted by the Council of Academic Family Medicine Educational Research Alliance (CERA). The CERA steering committee evaluated questions for consistency with the overall subproject aim, readability, and existing evidence of reliability and validity. Pilot testing was done on family medicine educators who were not part of the target population. Questions were modified following pilot testing for flow, timing, and readability. Demographic information, including gender, type and location of residency program, year program began, size of community, and years served as PD, was collected as part of the larger survey.

The population for the survey was all US PDs as identified by the Association of Family Medicine Residency Directors. E-mail invitations to participate were delivered with the survey via an Internet-based survey instrument (Survey Monkey). Two follow-up e-mails to encourage nonrespondents to participate were sent after the initial e-mail invitation. Data were collected from March to June of 2014.

Results
The survey was completed by 224 out of 451 targeted PDs, for an overall response rate of 50%. Not every PD answered every question, consequently total denominators for the questions varied accordingly. Demographics are shown in Table 1. The majority of PDs were men (64%) from community-based, university-affiliated residency programs (66%).

Basic statistics (means, frequency distributions, cross-tabulations, proportions) were used to describe responses from the survey. Statistical comparisons were done using either Fisher’s exact test or the chi-square test. Statistical analysis was performed using SAS version 9.1 (SAS Institute, Cary, NC).

The project was approved by the American Academy of Family Physicians Institutional Review Board.

The survey was completed by 224 out of 451 targeted PDs, for an overall response rate of 50%. Not every PD answered every question, consequently total denominators for the questions varied accordingly. Demographics are shown in Table 1. The majority of PDs were men (64%) from community-based, university-affiliated residency programs (66%). The mean years served as PD were 6.2 ± 5.8 (SD). The mean years of personal experience working with clinical pharmacists as family medicine faculty members, either in their own family medicine training or as a faculty member was 8.1 ± 7.8 (SD).

Seventy-six percent (170/224) of the responding PDs reported that clinical pharmacists provide pharmacotherapy education in their FMRP, and 57% (97/170) of those PDs consider those clinical pharmacists as faculty members. The frequency in which residents receive education (lectures, case-discussions, precepting) from clinical pharmacists is shown in Figure 1.

Table 2 describes the responses of PDs in residency programs with, 45% (95/211), and without, 55% (116/211), a clinical pharmacist. Significantly more programs with a clinical pharmacist reported having a systematic approach to teaching pharmacotherapy compared to those without a clinical pharmacist (72% versus 22%, P < .01). In programs without a clinical pharmacist, the top barrier to incorporation was limited ability to bill for clinical services, 48% (43/89), compared to 29% (32/112) in programs with a clinical pharmacist.
The top benefit of having a clinical pharmacist is providing a collaborative approach to pharmacotherapy education for residents. These rates were statistically similar for programs with and without a clinical pharmacist (35% and 36%, respectively). Programs with a clinical pharmacist were similar across program type: community based, non affiliated (54%), community based, university affiliated (53%), and university based (60%).

Table 3 describes PD responses on clinical pharmacists’ funding and responsibilities. Regarding funding for a clinical pharmacist, 37% of PDs report that funding is provided through an outside source while 18% of FMRPs fund the position. PDs believe a clinical pharmacist is able to provide feedback to residents (86%), provide feedback on residents (74%), co-precept residents
(62%), and coordinate and provide a rotation for family medicine residents (47%).

**Discussion**

Clinical pharmacists as medical educators within FMRPs, as reported by PDs, have grown significantly in the last decade. The collaborative approach to pharmacotherapy education is the main motivator for their role in FMRPs. However, clinical pharmacists’ limited ability to bill for clinical services remains the major barrier to incorporating them into FMRP faculty. Even though many PDs report no barriers to clinical pharmacist incorporation and have positive attitudes toward their abilities, less than half of FMRPs currently recognize clinical pharmacists as faculty members.

Regardless of whether PDs reported having a clinical pharmacist or not, they saw educational and program benefits for clinical pharmacist incorporation into FMRPs. The majority believed clinical pharmacists can provide feedback to and on residents and precept residents. These abilities by clinical pharmacists translate into educational and preceptor roles, essentially performing the functions of an FMRP core faculty member. In November 2014, the ACGME provided approval to the Council of Academic Family Medicine (CAFM) for inclusion of nonphysician members, including clinical pharmacists, as core faculty members within family medicine residency programs. This approval allows nonphysician members’ scholarly and clinical activities to be included in the overall program review and accreditation by the ACGME. The clinical pharmacists’ roles reported in this survey may now be more beneficial to the residents and overall programs alike. However, PDs noted that residents receive education, including precepting, from clinical pharmacists most often on a monthly basis. This frequency of interaction lends to clinical pharmacists being used as a sporadic resource, rather than true incorporation into the program.

The percentages of programs with a clinical pharmacist did not vary greatly based on type of residency program (community based, university affiliated, or university based). This is a surprising finding given most PDs reported that funding for a clinical pharmacist is provided through an outside source and not by the programs. These findings match other reports that the majority of funding for a clinical pharmacist has been from colleges of pharmacy and hospital pharmacy departments, rather than by the residency programs themselves. Within university-based or university-affiliated programs, which may have more opportunity to partner with colleges of pharmacy, one may have expected these programs would be more likely to have clinical pharmacists. The ability to fund clinical pharmacists, particularly in community-based, non-affiliated programs is unclear, especially in light of the

![Figure 1: Frequency Program Directors Report Residents Receive Education From Clinical Pharmacists*](image-url)
perceived limited ability to bill for clinical pharmacist services.

Many PDs reported that there were no barriers to incorporation of a clinical pharmacist within their FMRPs. However, while fewer PDs answered the survey question regarding the second barrier to clinical pharmacist incorporation, it is unknown how many PDs selected no barriers to both questions. Nonetheless, if a barrier was identified, it was the limited ability to bill for clinical pharmacist services. Limited compensation for their services is a common theme within the pharmacy profession due to the lack of provider status as deemed by Medicare under the Social Security Act. Currently under Medicare, it is permissible for clinical pharmacists to bill their services as incident-to-physician services. However, some states have passed laws giving provider status on a state level where provisions allow clinical pharmacists to receive compensation for their services. As value-based payment becomes more prevalent, cost-benefit equations will likely shift with clinical pharmacists as part of the team and the increased revenue from higher quality will lead to them being more ubiquitous. While the ability to receive compensation for services is important regardless of the source of funding, this barrier would likely be more significant for programs who need to internally fund a clinical pharmacist compared to programs who have outside funding sources.

An additional barrier identified was the uncertainty of the added value of a pharmacist as faculty. However, there are many studies

Table 2: Program Director Responses in Residencies With and Without a Clinical Pharmacist

<table>
<thead>
<tr>
<th>Top barrier to incorporation of a clinical pharmacist as a part of your family medicine residency program (n=201)</th>
<th>Programs With a Clinical Pharmacist n (%)</th>
<th>Programs Without a Clinical Pharmacist n (%)</th>
<th>Total n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No barriers to incorporation of a clinical pharmacist</td>
<td>72 (64.3)</td>
<td>24 (27.0)</td>
<td>96 (47.8)</td>
</tr>
<tr>
<td>Limited ability to bill for clinical pharmacist services</td>
<td>32 (28.6)</td>
<td>43 (48.3)</td>
<td>75 (37.3)</td>
</tr>
<tr>
<td>Uncertainty of the added value of a pharmacist as faculty</td>
<td>4 (3.6)</td>
<td>16 (18.0)</td>
<td>20 (10.0)</td>
</tr>
<tr>
<td>Other*</td>
<td>4 (3.6)</td>
<td>6 (6.7)</td>
<td>10 (5.0)</td>
</tr>
</tbody>
</table>

Second barrier to incorporation of a clinical pharmacist as a part of your family medicine residency program (n=169)

<table>
<thead>
<tr>
<th>Second barrier to incorporation of a clinical pharmacist as a part of your family medicine residency program (n=169)</th>
<th>Programs With a Clinical Pharmacist n (%)</th>
<th>Programs Without a Clinical Pharmacist n (%)</th>
<th>Total n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No barriers to incorporation of a clinical pharmacist</td>
<td>73 (72.3)</td>
<td>24 (35.3)</td>
<td>97 (57.4)</td>
</tr>
<tr>
<td>Limited ability to bill for clinical pharmacist services</td>
<td>10 (9.9)</td>
<td>10 (14.7)</td>
<td>20 (11.8)</td>
</tr>
<tr>
<td>Uncertainty of the added value of a pharmacist as faculty</td>
<td>5 (5.0)</td>
<td>12 (17.6)</td>
<td>17 (10.1)</td>
</tr>
<tr>
<td>Other*</td>
<td>13 (12.9)</td>
<td>22 (32.4)</td>
<td>35 (20.7)</td>
</tr>
</tbody>
</table>

Top benefit of having a clinical pharmacist as a part of your family medicine residency program faculty (n=211)

<table>
<thead>
<tr>
<th>Top benefit of having a clinical pharmacist as a part of your family medicine residency program faculty (n=211)</th>
<th>Programs With a Clinical Pharmacist n (%)</th>
<th>Programs Without a Clinical Pharmacist n (%)</th>
<th>Total n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provides a collaborative approach to pharmacotherapy education for residents</td>
<td>40 (34.5)</td>
<td>34 (35.8)</td>
<td>74 (35.1)</td>
</tr>
<tr>
<td>Improvement in patient outcomes</td>
<td>32 (27.6)</td>
<td>17 (17.9)</td>
<td>49 (23.2)</td>
</tr>
<tr>
<td>Promotes interprofessional patient care</td>
<td>26 (22.4)</td>
<td>21 (22.1)</td>
<td>47 (22.3)</td>
</tr>
<tr>
<td>Provides medication utilization and drug information expertise</td>
<td>13 (11.2)</td>
<td>14 (14.7)</td>
<td>27 (12.8)</td>
</tr>
<tr>
<td>Improvement in patient satisfaction</td>
<td>1 (0.9)</td>
<td>0 (0.0)</td>
<td>1 (0.5)</td>
</tr>
<tr>
<td>No response</td>
<td>4 (3.4)</td>
<td>9 (9.5)</td>
<td>13 (6.2)</td>
</tr>
</tbody>
</table>

* Includes: limited scope of clinical pharmacist practice, limited education and training of clinical pharmacist, physician faculty resistance.
that have yielded valuable clinical and economic outcomes by clinical pharmacists.\textsuperscript{28-30} Perhaps this barrier is related to the finding of one-third to half of PDs not indicating belief that a clinical pharmacist is able to provide direct patient care in the outpatient or inpatient settings, co-precept family medicine residents, provide direct observation, or coordinate and provide a rotation for residents. It is unclear if these results are reflective of what services clinical pharmacists are not currently providing in their programs, if they are related to a negative perception of pharmacists’ abilities or are reflective of the recognition that pharmacists have limited ability to bill for patient care services in general. Perhaps this highlights a barrier within the pharmacy profession itself. Clinical pharmacists may need to recruit physician champions as well as be stronger advocates for themselves to demonstrate their professional abilities and value within the health care team, both as clinicians and educators. In turn, if faculty and resident physicians see value in clinical pharmacists, they would advocate for inclusion of clinical pharmacists into their practices. This could also provide further justification and impetus to FMRPs who may not realize the full scope and role of clinical pharmacists.

There are limitations to this evaluation. The survey response rate was less than 50%, which limits the overall generalizability to all FMRPs. Selection bias should also be considered, as PDs in programs with a clinical pharmacist may have been more likely to answer questions regarding pharmacists. In addition, these questions were a subset of the larger CERA survey, and question fatigue may have limited the response rate and results. This study demonstrated higher prevalence rates of clinical pharmacists in all FMRPs in the United States. However, due to the low response rate of programs in this survey and differences in survey methods used, there are significant limitations to comparisons with the previous literature.\textsuperscript{5,7} This finding warrants further research to determine true prevalence of clinical pharmacists in FMRPs.

While most FMRPs regularly work with clinical pharmacists for direct patient care, their value as educators is less understood. Future directions would include studying and documenting the educational contributions that clinical pharmacists make to residency training as well as developing faculty development activities that focus on interprofessional education collaborations that enhance resident education. This growth in interprofessional relationships and education will better prepare residents to practice within the patient-centered medical home paradigm of care.

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\section*{References}

\begin{table}[h]
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\begin{tabular}{|l|c|}
\hline
\textbf{Question} & \textbf{n (%)} \\
\hline
Funding is provided through an outside source (eg, department of pharmacy or a pharmacy school) & 83 (37.1) \\
My FMRP has not pursued funding for a clinical pharmacist position & 63 (28.1) \\
My FMRP funds a clinical pharmacist position & 40 (17.9) \\
My FMRP pursued funding for a clinical pharmacist position but has been unable to obtain & 14 (6.3) \\
No response & 24 (10.7) \\
\hline
I believe a clinical pharmacist is able to (check all that apply): & \\
Provide feedback to family medicine residents & 193 (86.2) \\
Provide feedback on family medicine residents & 165 (73.7) \\
Provide direct patient care in the outpatient setting & 143 (63.8) \\
Co-precept family medicine residents & 139 (62.1) \\
Provide direct patient care in the inpatient setting & 120 (53.6) \\
Do direct observation of family medicine residents & 111 (49.6) \\
Coordinate and provide a rotation for family medicine residents & 105 (46.9) \\
\hline
\end{tabular}
\caption{Program Director Responses on Clinical Pharmacists’ Funding and Responsibilities*}
\footnotesize{* n=224}
\end{table}


