

The Value of Community Pharmacy Residency Programs: College of Pharmacy and Practice Site Perspectives

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Value of community pharmacy residency programs: College of pharmacy and practice site perspectives

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Abstract

Objectives: To describe and compare perceptions of key informants representing U.S. colleges/schools of pharmacy and community pharmacy practice sites regarding (1) value associated with community pharmacy residency programs (CPRPs) and (2) barriers to offering CPRPs.

Design: Descriptive, nonexperimental, cross-sectional study.

Setting: United States, June 13, 2009, through July 13, 2009.

Participants: 554 respondents to a Web-based survey.

Intervention: Key informants representing the following four organizational groups were surveyed: (1) colleges/schools of pharmacy participating in CPRPs, (2) colleges/schools of pharmacy not participating in CPRPs, (3) CPRP community pharmacy practice sites, and (4) non-CPRP community pharmacy practice sites.

Main outcome measures: Value of CPRPs to participating pharmacies, value of CPRPs to participating colleges/schools of pharmacy, and barriers to offering CPRPs.

Results: Overall, 267 key informants from colleges/schools of pharmacy and 287 key informants from pharmacy practice sites responded to the survey (n = 554 total respondents). Of these, 334 responders provided data that were usable for analysis. The most important types of value to the respondents were altruistic in nature (e.g., pharmacy education development, pharmacy profession development, community engagement). However, barriers to offering CPRPs were more practical and included challenges related to accreditation and operational issues. Further, evidence indicated that (1) lack of leadership, (2) lack of revenue generated from such programs, and (3) the cost of reimbursement for residents may be fundamental, multidimensional barriers to implementing CPRPs.

Conclusion: Guidelines for starting and continuing CPRPs, "industry norms" that would require CPRP training for certain types of employment, and creation of models for patient care revenue would help develop and position CPRPs in the future.

Keywords: Residencies, promoting pharmacy's value, community pharmacy, education.

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A recent graduate from a Doctor of Pharmacy (PharmD) degree program has been described by the Council on Credentialing in Pharmacy as “a novice who possesses fundamental knowledge, skills, attitudes, and abilities to provide medication-related patient care, but has limited practice experience.”¹ Because the practice of pharmacy in virtually all settings requires pharmacists to apply advanced, patient-centered patient care roles, professional training and growth beyond the entry-level PharmD degree is needed. Postgraduate pharmacy residency training allows pharmacists to continue developing into clinically mature, functional, capable, and innovative leaders who are ready to meet the challenges of the changing health care system and patient care needs.

Since the early 1970s, residencies offered by in-patient practices have not only focused on preparing individuals for management and leadership within these settings but have also continued to expand into advanced training for pharma-

cists’ clinical role in patient care.^{2,3} However, considerable practice advancement remains to be achieved in all settings where pharmacists provide care to patients. According to the 2009 National Pharmacist Workforce Survey,⁴ more than one-half of all actively practicing pharmacists in the United States work in retail community pharmacy practice sites (54%), with the remaining individuals working in hospital settings (27%), other patient care practice settings (11%), or other non-patient care work settings (8%).

To formalize residency training in community practice settings, the community pharmacy residency program (CPRP) was established by the American Pharmacists Association (APhA) in 1986. In June 1999, APhA and the American Society of Health-System Pharmacists (ASHP) announced a partnership to accredit CPRPs. More than a decade later, growth in CPRPs has been modest, with slightly more than 100 residency sites in the approximately 60,000 community pharmacies employing greater than 100,000 (54%) of the 187,000 actively practicing pharmacists in the United States.⁴ In light of expanded patient care responsibilities (e.g., medication therapy management [MTM], immunization) and health system transitions (e.g., electronic health records, health information technology applications, interprofessional health care) in community pharmacy practices, substantial growth in CPRPs could help advance community pharmacy practice and provide for the current and future needs of the profession within this care setting.⁵

To help examine strategies for developing “clinical maturity” for practitioners in all pharmacy practice settings, a conference titled Pharmacy Residency Training in the Future: A Stakeholders’ Roundtable Discussion was convened by ASHP in collaboration with the Academy of Managed Care Pharmacy, APhA, the American Association of Colleges of Pharmacy (AACP), and the American College of Clinical Pharmacy in January 2005.¹ Two recommendations for advancing residency training and meeting the needs of the profession included (1) increasing the number of preceptors and residency sites and (2) issuing a call to action to demonstrate the value of residency training to residency sites, prospective students, health care providers, patients, employers, and payers.¹

Specific to community-based pharmacy residency programs, attendees of the stakeholders’ roundtable discussion reached the following consensus:

- *The number of community-based pharmacy residency programs must grow significantly by 2015. Today (2005), community pharmacy residencies account for only 8% of programs. Because community pharmacists are so accessible to the public, they have a huge opportunity to make a positive impact on patient care. Current community pharmacy residency programs are pioneering many direct patient care services that can help improve people’s health.*¹

A demonstration of the “value proposition” for community pharmacy residency training may help increase the supply of community pharmacy residency sites, establish the demand for community pharmacy residency-trained pharmacists, and improve patient care and outcomes in community practice

At a Glance

Synopsis: Key informants representing colleges/schools of pharmacy participating in community pharmacy residency programs (CPRPs), colleges/schools of pharmacy not participating in CPRPs, CPRP community pharmacy practice sites, and non-CPRP community pharmacy practice sites were surveyed to determine perceptions regarding the value of CPRPs and barriers to offering CPRPs. The most significant types of value were altruistic in nature and included pharmacy education development, pharmacy profession development, and opportunities for community engagement. Barriers to offering CPRPs were more practical in nature and included challenges related to accreditation, geographic location, patient data, space, human resources, collaborative partnerships, direct physician contact, and technology. Lack of leadership, lack of revenue generated from such programs, and cost of reimbursement for residents may be fundamental, multi-dimensional barriers to implementing CPRPs.

Analysis: *Guidelines that focus on one organization’s goals and capabilities may not be sufficient for establishing successful CPRPs. Instead, guidelines should cover the goals and capacities of both organizational partners. The barriers observed in the current work could be avoided if clear expectations for revenue sharing, cost sharing, and rights and responsibilities for organizational partners are described. Forums for idea exchange, descriptive profiles of successful programs, and mentoring opportunities between new and established programs can aid in developing guidelines and translating them into operation. Also, considering how contemporary, innovative community pharmacy practice will be defined and evaluated in the future U.S. health care system is important when developing guidelines.*

settings. One way to describe the value proposition for community pharmacy residency training includes identifying the perceived value of these programs by key stakeholders such as schools/colleges of pharmacy and community pharmacy practice sites who typically form partnerships for providing CPRPs.

Objectives

To help build effective strategies for expanding CPRPs at a faster rate, the purpose of this study was to describe and compare perceptions of key informants representing U.S. colleges/schools of pharmacy and community pharmacy practice sites regarding (1) value associated with CPRPs and (2) barriers to offering CPRPs.

The information gleaned from this study would be useful for describing the value proposition of CPRPs and for promoting buy-in and participation by key stakeholder groups (colleges of pharmacy and practice sites). Also, the findings would identify barriers to participation in CPRPs and help develop strategies for overcoming them. Information obtained from this survey could be useful for promoting the expansion of CPRPs, leading to an increased number of community pharmacy residency trained pharmacists who are “clinically mature” providers of care to ambulatory patients.

Methods

Measure development

Because no measures regarding the value and barriers associated with offering CPRPs were found, we followed a seven-step process for measure development.⁶

(1) Specify the domain of the constructs (value/barriers). The four authors of the current work comprised an advisory panel (representing experience in residency training, residency directing, program evaluation, and measure development) and met with representatives of the CPRP to discuss and clarify what was meant by “value” and “barriers” in relation to providing these programs. Based on these meetings and published literature,^{1,7,8} an initial list of values and barriers was generated and written down to guide the next steps.

(2) Generate a pool of items for each construct. Interviews were conducted by one author (J. Schommer) with four representatives from pharmacy practice sites and colleges/schools of pharmacy who were familiar with CPRPs, in order to provide insight-stimulating examples, critical incidents, and overall advice for measure construction based on their experiences. The representatives were identified by the advisory panel. Two of the four interviews were conducted in person and the other two via telephone. Two of the individuals interviewed had previous experience with CPRPs but were not currently involved in community pharmacy practice residency program offerings. Based on the interviews, survey items were generated for both the value and barrier domains. An iterative process was used through which members of the advisory panel, members of 11 programs offering community pharmacy residencies, and 15 research colleagues reviewed the list of items and provided feedback. These reviewers were selected

based on their expertise known to the researchers and to APhA staff regarding CPRPs and/or measure development. The process continued for several weeks until saturation was reached and no new items were being suggested for inclusion in the measures.

(3) Have initial pool of items reviewed by experts. The initial pool of items was sent to the four members of the advisory panel, individuals from the 11 participating CPRPs, and the 15 colleagues from colleges/schools of pharmacy for their review and feedback. They were asked to provide feedback about each item’s relevance, clarity, and conciseness. Also, they were asked to identify any other items that might be needed for the measure, in order to ensure completeness.

(4) Consider inclusion of validation items. There was planned redundancy for items in the measures to help improve validity. However, this was kept to a minimum to help reduce the length of the survey. The goal was to accurately capture the characteristics of interest (value and barriers) without creating a survey that was overly burdensome for respondents.

(5) Administer items to a development sample. The measures were administered to the four members of the advisory panel, the individuals from 11 participating CPRPs, and the 15 colleagues from colleges/schools of pharmacy. At this point, we asked for feedback on items that (1) were redundant and not needed, (2) needed to be reworded to be clear, and (3) were not in the pool of items and needed to be added.

(6) Purify the measures. Based on feedback we received, the four-member advisory panel convened and made decisions regarding which items to retain and which to delete from the survey. At the saturation point, the survey had 63 “value to pharmacies” items, 63 “value to schools/colleges” items, and 44 “barrier” items. After the measure purification step, these categories had 35, 35, and 32 items, respectively. The items are shown in Appendix 1. Each item was rated on a Likert-type scale (1, very strongly disagree; 2, strongly disagree; 3, disagree; 4, neither disagree nor agree [neutral]; 5, agree; 6, strongly agree; and 7, very strongly agree).

(7) Optimize the practicality of the measures. The survey was constructed in a Web-based format using Qualtrics online survey software (www.qualtrics.com). Attention was paid to ways that would maximize ease of response to each item and provide a flow of items that would be interesting to respondents.

Study samples

Key informants were surveyed representing the following four organizational groups: (1) colleges/schools of pharmacy participating in CPRPs, (2) colleges/schools of pharmacy not participating in CPRPs, (3) CPRP community pharmacy practice sites, and (4) non-CPRP community pharmacy practice sites. Table 1 provides a summary of our sample selection process. For groups 1, 2, and 3, the relatively small number of organizations that employed potential respondents was identifiable. Thus, we identified the full census of organizations for each group, then selected judgment samples of individuals from each of the organizations using AACP and APhA publications

Table 1. Summary of the selection process for study samples

Group	Description	No. organizations (sample type)	No. individuals (sample type)	No. respondents
1	Colleges/schools of pharmacy currently participating in CPRPs	44 (census)	248 (judgment sample from AACP and APhA data records)	148
2	Colleges/schools of pharmacy not participating in CPRPs	66 (census)	625 (judgment sample from AACP and APhA data records)	116
	Total for 1 and 2	110	873	267
3	CPRP pharmacy practice sites	116 (census)	275 (judgment sample from CPRP data records)	138
4	Non-CPRP pharmacy practice sites	Unknown (NA)	2,504 (simple random sample of member and nonmember pharmacists contained in APhA data records)	146
	Total for 3 and 4	Unknown	2,779	287

Abbreviations used: AACP, American Association of Colleges of Pharmacy; APhA, American Pharmacists Association; CPRP, community pharmacy residency program; NA, not applicable.

and data records. For group 4 (non-CPRP pharmacy practice sites), we did not use the same approach because the population of community pharmacies for this group was relatively large. Thus, for group 4, a simple random sample of member and nonmember pharmacists contained in APhA data records who were not associated with CPRP pharmacy practice sites was selected.

Our goal was to achieve approximately equal numbers of respondents for each of the four groups and to have at least 200 usable responses available for our planned statistical analyses (factor analysis, analysis of variance [ANOVA]). In addition, we sought to receive responses from throughout the geographic United States.

Data collection

Data were collected via a Web-based response methodology following principles outlined by Dillman.⁹ On June 13, 2009, an invitation and a link to the Web-based survey were e-mailed to each key informant. Each recipient of the message was encouraged to forward the invitation and link to the survey form to colleagues who they thought would be interested in participating in the study. One week after the invitation was e-mailed, follow-up e-mails and/or phone calls were used to contact key informants to remind them to complete the survey. Later, a final e-mail and/or phone call was used to inform each non-respondent that the study was coming to a close and that responses would be accepted through July 13, 2009.

Data analysis

Exploratory factor analysis was used to investigate the underlying factor structure of the items used to measure (1) value to participating pharmacies, (2) value to participating colleges/schools of pharmacy, and (3) barriers to offering CPRPs (Appendix 1). A separate factor analysis was applied to each of the three domains. Factor analysis is used to clarify the structure of a correlation matrix. It helps categorize a relatively large number of variables into a few overall factors. In this study,

varimax rotation was used for factor analysis to maintain orthogonality of factors and to minimize the number of variables that had high loadings on a factor. Only items with factor loadings with absolute values greater than 0.50 on one, and only one, factor were included for identifying factors. The number of factors within each domain was determined based on eigen values greater than 1 and scree plot results.

Scores for the overall factors were computed by summing the scores of the items that loaded on the corresponding factor. Each factor was assigned a name based on the items that comprised that particular construct. Means (\pm SD) and measure reliability (Cronbach coefficient alpha) were computed for each factor. For each factor identified, mean scores were compared among the four respondent groups using ANOVA. Statistical significance was set at $P = 0.05$.

Results

Overall, 267 key informants from colleges/schools of pharmacy and 287 key informants from pharmacy practice sites responded to the survey ($n = 554$ total respondents; Table 1). Of the respondents from colleges/schools of pharmacy, 80% reported that they received the invitation to participate in the survey from APhA and 20% indicated receiving the invitation as a forwarded message from a colleague or another third party. Of the respondents from community pharmacies, 75% received the invitation from APhA and 25% received it as a forwarded message from a colleague or another third party. Table 1 shows that the number of respondents in each of the four study groups was similar, with each group having between 116 and 148 responders. Tables 2 and 3 show that the geographic distribution of responders (who provided usable responses for analysis) for each of the four groups was geographically diverse. The tables also show that 334 ($100 + 83 + 83 + 68$) responders provided data that were usable for analysis. Partially completed survey forms were not used for analysis.

Table 2. Distribution of respondents from colleges/schools of pharmacy (n = 183 usable responses)

State/location	No. schools in sampling frame without CPRPs	No. respondents reported without CPRPs	No. schools in sampling frame with CPRPs	No. respondents reported with CPRPs
Alabama	2	5	0	0
Arizona	0	0	2	1
Arkansas	1	3	1	3
California	6	6	2	8
Colorado	1	1	0	0
Connecticut	1	0	0	0
District of Columbia	1	0	0	0
Florida	4	1	0	0
Georgia	1	0	2	3
Hawaii	1	1	0	0
Idaho	1	2	0	0
Illinois	2	4	2	3
Indiana	2	1	0	2
Iowa	1	2	1	3
Kansas	0	0	1	5
Kentucky	1	3	1	5
Louisiana	1	1	1	3
Maryland	0	0	1	2
Michigan	1	6	2	2
Minnesota	1	1	0	0
Mississippi	0	0	1	2
Missouri	1	2	1	4
Montana	0	1	1	0
Nebraska	0	0	2	2
Nevada	1	1	0	0
New Jersey	0	1	1	1
New Mexico	1	1	0	0
New York	5	7	3	3
North Carolina	0	1	3	5
North Dakota	1	3	0	0
Ohio	3	4	3	10
Oklahoma	0	0	1	1
Oregon	1	1	0	1
Pennsylvania	4	3	2	9
Puerto Rico	1	1	0	0
Rhode Island	1	3	0	0
South Carolina	1	0	1	3
South Dakota	1	2	0	0
Tennessee	4	4	1	1
Texas	5	2	2	4
Utah	1	2	0	0
Virginia	2	2	2	3
Washington	0	0	2	1
West Virginia	1	1	1	3
Wisconsin	0	0	1	1
Wyoming	1	0	0	1
Total	66	100	44	83

Abbreviation used: CPRP, community pharmacy residency program.

Table 3. Distribution of respondents from pharmacy practice sites (n = 151 usable responses)

State/location	No. respondents reportedly not participating in CPRP	No. respondents reportedly participating in CPRP
Alabama	9	2
Arizona	0	2
Arkansas	0	0
California	4	1
Colorado	1	0
Connecticut	1	0
District of Columbia	0	0
Florida	9	1
Georgia	1	3
Hawaii	0	1
Idaho	1	0
Illinois	6	9
Indiana	0	1
Iowa	5	4
Kansas	0	2
Kentucky	1	0
Louisiana	3	0
Maryland	13	1
Massachusetts	1	2
Michigan	0	2
Minnesota	0	0
Mississippi	0	0
Missouri	3	1
Montana	0	1
Nebraska	0	0
Nevada	0	0
New Jersey	1	0
New Mexico	0	0
New York	4	0
North Carolina	1	7
North Dakota	0	0
Ohio	5	5
Oklahoma	0	0
Oregon	0	1
Pennsylvania	7	3
Puerto Rico	0	0
Rhode Island	0	2
South Carolina	2	0
South Dakota	0	0
Tennessee	2	2
Texas	0	1
Utah	0	0
Virginia	0	3
Washington	1	3
West Virginia	2	0
Wisconsin	0	8
Wyoming	0	0
Total	83	68

Abbreviation used: CPRP, community pharmacy residency program.

Value to participating pharmacies

Table 4 shows that 32 of the 35 items used to measure value to participating pharmacies met our factor analysis criteria (i.e., exhibited a factor loading with an absolute value greater than 0.50, loaded on one and only one factor). A five-factor solution was selected based on variance explained and interpretability. Each factor was assigned a name based on the items that comprised that particular construct (Table 4).

Table 5 summarizes the five factors (constructs) we identified. Factor 3 (pharmacy education development) had the highest per-item mean among the five factors (5.68), followed by factor 1 (pharmacy profession development; 5.59), factor 2 (pharmacy practice site development; 5.44), factor 5 (pharmacy staff development; 5.03), and factor 4 (monetary benefits; 4.68).

Table 6 provides a description of per-item mean scores for each of the five identified factors among the four study groups. In general, the rank order of per-item means was (from highest to lowest): factor 3 (pharmacy education development), factor 1 (pharmacy profession development), factor 2 (pharmacy practice site development), factor 5 (pharmacy staff development), and factor 4 (monetary benefits). The only exception to this was for respondents from pharmacies participating in CPRPs. That group ranked pharmacy profession development first and pharmacy education development second.

ANOVA showed that for each factor, statistically significant differences existed in scores among the groups ($P < 0.05$). For factors 1 through 3, respondents who were participating in CPRPs had higher mean scores than respondents who were not. For factors 4 and 5, respondents from colleges/schools of pharmacy had higher mean scores than respondents from pharmacies. For all five factors, respondents from a pharmacy not participating in a CPRP had the lowest means of the four respondent groups.

To provide insight for these findings, selected written comments from respondents that were representative of comments overall are presented next.

Selected comments from respondents in group 1 (college/school participating in a CPRP):

- *Community residency programs energize the practice site by bringing in new ideas and innovations. It helps keep the pharmacists and staff current and improves the number and type of patient care services the pharmacy is able to offer.*
- *For the relatively small amount of money provided by the pharmacies, the pharmacies gain much benefit. Pharmacies should pay colleges more money to account for faculty time devoted to advancing their business.*

Selected comments from respondents in group 2 (college/school not participating in a CPRP):

- *There is a benefit to sites if residents and directors can implement and evaluate new programs—especially those that may generate revenue. Unfortunately, the quality of such evaluations is usually low since this work is guided by preceptors and residents.*
- *Community pharmacy residents provide value to pharma-*

Table 4. Factor analysis results for CPRP value to participating pharmacies (n = 334)

Item	Factor loading
Factor 1: Pharmacy profession development	
Improving patients' continuity of care in communities	0.71
Promoting healthier living to communities through community engagement/outreach	0.79
Promoting patient-centered care in community settings	0.75
Promoting the development of community-based health care	0.81
Providing care to underserved populations	0.75
Training pharmacists to provide advanced patient services	0.72
Meeting the pharmacy resident's professional development needs	0.58
Building more community pharmacy leaders	0.74
Developing leaders for the profession	0.72
Fulfilling a responsibility to the profession	0.61
Increasing advocacy for community pharmacy	0.65
Providing a professional image that aids in the recruitment of pharmacists	0.59
Understanding key elements of practice management	0.65
Factor 2: Pharmacy practice site development	
Developing new service offerings	0.69
Evaluating existing services	0.67
Fitting the pharmacy's strategic plan	0.51
Keeping the practice site progressive	0.68
Meeting the pharmacy's primary mission	0.55
Providing extra help to achieve the pharmacy's goals	0.57
Serving as a pilot site for testing patient care innovations	0.72
Serving as a pilot site for testing technological innovations	0.53
Supporting quality improvement efforts for the pharmacy	0.62
Factor 3: Pharmacy education development	
Providing an opportunity for pharmacists to participate in teaching student pharmacists	0.62
Providing visibility for pharmacists at universities in the area of advanced community practice	0.74
Strengthening relationships with colleges of pharmacy	0.77
Factor 4: Monetary benefits	
Overcoming competitive pressures	0.58
Providing direct revenue	0.82
Providing indirect revenue	0.84
Achieving cost savings/avoidance for health care	0.57
Factor 5: Pharmacy staff development	
Enhancing prestige for preceptors	0.78
Increasing pharmacy staff satisfaction	0.64
Providing recognition for preceptors	0.82
Items dropped from analysis due to poor factor loading characteristics	
Conducting practice-based research	No loading >0.50 on any factor
Serving as a pilot site for testing managerial innovations	No loading >0.50 on any factor
Developing promotable services to patients	No loading >0.50 on any factor

Abbreviation used: CPRP, community pharmacy residency program.
Complete factor analysis results are available from the corresponding author upon request.

cies by assisting them in developing and implementing patient care services/programs they might otherwise not be able to (either because of time or skills). However, these services need to be continued after the residency is completed.

Selected comments from respondents in group 3 (CPRP community pharmacy practice site):

- Although residency directors and preceptors all know that the benefits to pharmacies are numerous, many companies cannot see past the financial issues. Residents and their preceptors may not bring in as much revenue as, say, a full-time clinical pharmacist.
- I believe that increasing the number of these and making them the norm would greatly move pharmacy practice for-

Table 5. Factor summaries for CPRP value to participating pharmacies (n = 334)

Factor label	No. items	Per-item mean	Mean ± SD (range)	Cronbach coefficient alpha
Factor 1: Pharmacy profession development	13	5.59	72.7 ± 13.3 (13–91)	0.97
Factor 2: Pharmacy practice site development	9	5.44	49.0 ± 9.4 (9–63)	0.95
Factor 3: Pharmacy education development	3	5.68	17.1 ± 3.1 (3–21)	0.89
Factor 4: Monetary benefits	4	4.68	18.7 ± 4.0 (4–28)	0.83
Factor 5: Pharmacy staff development	3	5.03	15.1 ± 3.4 (3–21)	0.89

Abbreviation used: CPRP, community pharmacy residency program. Factors are listed in order of their contribution to variance explained in the data from most variance explained (factor 1) to least variance explained (factor 5). Each survey item was rated using the following scale: 1, very strongly disagree; 2, strongly disagree; 3, disagree; 4, neither disagree nor agree (neutral); 5, agree; 6, strongly agree; and 7, very strongly agree.

Table 6. Comparison of per-item means for CPRP value to participating pharmacies among the four respondent groups (n = 334)

Factor label	Respondents from college/school participating in CPRP (n = 83)	Respondents from college/school not participating in CPRP (n = 100)	Respondents from pharmacy participating in CPRP (n = 68)	Respondents from pharmacy not participating in CPRP (n = 83)	P (ANOVA)
Factor 1: Pharmacy profession development	5.79	5.64	5.75	5.21	<0.001
Factor 2: Pharmacy practice site development	5.64	5.45	5.51	5.18	0.015
Factor 3: Pharmacy education development	5.95	5.67	5.72	5.39	0.001
Factor 4: Monetary benefits	4.88	4.80	4.54	4.36	0.001
Factor 5: Pharmacy staff development	5.28	5.20	5.07	4.58	<0.001

Abbreviations used: ANOVA, analysis of variance; CPRP, community pharmacy residency program. Each survey item was rated using the following scale: 1 = very strongly disagree, 2 = strongly disagree, 3 = disagree, 4 = neither disagree nor agree (neutral), 5 = agree, 6 = strongly agree, and 7 = very strongly agree.

ward and increase patient awareness of the value of pharmacists.

Selected comments from respondents in group 4 (non-CPRP community pharmacy practice site):

- *Community pharmacy services are an important aspect of health care. This survey has made me feel that it is more important than I thought.*
- *The value provided is minimal from a business perspective. The professional shortage that continues to persist ... is exacerbated by the drive to enroll recent graduates into residency programs.*
- *This program is only beneficial if the upper management of the chain provides proper teaching and time to teach. I have seen summer interns just be cheap, unpaid help.*

Value to participating colleges/schools of pharmacy

Table 7 shows that all 35 items used to measure value to participating colleges/schools of pharmacy met our factor analysis criteria (i.e., exhibited a factor loading with an absolute value greater than 0.50, loaded on one and only one factor). A five-factor solution was selected based on variance explained and interpretability. Each factor was assigned a name based on the items comprising that particular construct (Table 7).

Table 8 summarizes the five factors (constructs) we identified. Factor 2 (serving the college’s/school’s needs) had the highest per-item mean among the five factors (5.51), followed by factor 1 (serving societal needs; 5.50), factor 3 (building mutually beneficial relationships; 5.36), factor 5 (extra help for teaching; 5.18), and factor 4 (monetary benefits; 4.45).

Table 9 provides a description of per-item mean scores for each of the five identified factors among the four study groups. For each group, monetary benefits had the lowest mean score. However, the rank order of means for the other four factors varied among respondent groups. For example, respondents from a college/school participating in a CPRP ranked factor 1 (serving societal needs) as the highest, followed by factor 2 (serving the college’s/school’s needs), factor 5 (extra help for teaching), factor 3 (building mutually beneficial relationships), and factor 4 (monetary benefits). Respondents from a college/school not participating in a CPRP ranked factor 2 (serving the college’s/school’s needs) as the highest, followed by factor 1 (serving societal needs), factor 3 (building mutually beneficial relationships), factor 5 (extra help for teaching), and factor 4 (monetary benefits).

Respondents from a pharmacy participating in a CPRP were unique in that they rated factor 3 (building mutually beneficial relationships) as the highest, followed by factor 2 (serv-

Table 7. Factor analysis results for CPRP value to colleges/schools of pharmacy (n = 334)

Item	Factor loading
Factor 1: Serving societal needs	
Conducting educational scholarship	0.62
Improving student instruction	0.54
Improving student satisfaction	0.53
Meeting residents' professional development needs	0.65
Providing faculty with opportunities for innovative practice	0.60
Promoting healthier living to communities through community engagement/outreach	0.78
Promoting patient-centered care in community settings	0.75
Promoting the development of community-based health care	0.83
Providing care to underserved populations	0.78
Developing leaders for the profession	0.71
Fulfilling a responsibility to the profession	0.63
Improving the health care system in communities	0.79
Facilitating learning with respect to patient care delivery	0.72
Facilitating learning with respect to service management	0.66
Improving service learning	0.61
Meeting a recognized educational need	0.62
Strengthening leadership in postgraduate training outside of a traditional hospital setting	0.68
Factor 2: Serving the college's/school's needs	
Contributing to pharmacy education	0.71
Fitting the college/school of pharmacy's strategic plan	0.78
Meeting a college/school of pharmacy's primary mission	0.77
Providing opportunities for research in community practice	0.75
Providing recognition to the university	0.76
Resident projects providing recognition to the university	0.74
Serving as a pilot site for testing patient care innovations	0.74
Serving as a pilot site for testing technological innovations	0.56
Strengthening relationships with pharmacies	0.64
Factor 3: Building mutually beneficial relationships	
Strengthening relationships with alumni	0.58
Increasing professional satisfaction for preceptors	0.59
Providing more precepting opportunities for pharmacists	0.60
Providing advanced pharmacy practice experience sites	0.52
Factor 4: Monetary benefits	
Providing direct revenue	0.85
Providing indirect revenue	0.77
Serving as a pilot site for testing managerial innovations	0.53
Overcoming competitive pressures	0.58
Factor 5: Extra help for teaching	
Providing extra help for teaching	0.73

Abbreviation used: CPRP, community pharmacy residency program.

No items were dropped from analysis due to poor factor loading characteristics. Complete factor analysis results are available from the corresponding author upon request.

ing the college's/school's needs), factor 1 (serving societal needs), factor 5 (extra help for teaching), and factor 4 (monetary benefits). Respondents from a pharmacy not participating in a CPRP were the same as respondents from a college/school of pharmacy not participating in a CPRP in their rank ordering of the factors (factor 2, factor 1, factor 3, factor 5, and factor 4).

ANOVA showed that for factor 1 (serving societal needs)

and factor 5 (extra help for teaching), statistically significant differences existed for scores among the groups ($P < 0.05$). For factor 1 (serving societal needs), respondents from a pharmacy that was not participating in a CPRP reported lower scores, on average. For factor 5 (extra help for teaching), respondents from a college/school not participating in a CPRP and respondents from a pharmacy not participating in a CPRP had lower mean scores than the other two study groups.

Table 8. Factor summaries for CPRP value to colleges/schools of pharmacy (n = 334)

Factor label	No. items	Per-item mean	Mean ± SD (range)	Cronbach coefficient alpha
Factor 1: Serving societal needs	17	5.50	95.6 ± 16.4 (17–119)	0.97
Factor 2: Serving the college's/school's needs	9	5.51	49.6 ± 9.1 (9–63)	0.94
Factor 3: Building mutually beneficial relationships	4	5.36	21.4 ± 3.7 (4–28)	0.82
Factor 4: Monetary benefits	4	4.45	17.8 ± 3.9 (4–28)	0.78
Factor 5: Extra help for teaching	1	5.18	5.2 ± 1.2 (1–7)	NA

Abbreviation used: NA, not applicable; CPRP, community pharmacy residency program.

Factors are listed in order of their contribution to variance explained in the data from most variance explained (factor 1) to least variance explained (factor 5).

Each survey item was rated using the following scale: 1, very strongly disagree; 2, strongly disagree; 3, disagree; 4, neither disagree nor agree (neutral); 5, agree; 6, strongly agree; and 7, very strongly agree.

Table 9. Comparison of per-item means for CPRP value to colleges/schools among the four respondent groups (n = 334)

Factor label	Respondents from college/school participating in CPRP (n = 83)	Respondents from college/school not participating in CPRP (n = 100)	Respondents from pharmacy participating in CPRP (n = 68)	Respondents from pharmacy not participating in CPRP (n = 83)	P(ANOVA)
Factor 1: Serving societal needs	5.67	5.49	5.56	5.27	0.04
Factor 2: Serving the college's/school's needs	5.59	5.51	5.62	5.35	0.28
Factor 3: Building mutually beneficial relationships	5.31	5.29	5.63	5.26	0.06
Factor 4: Monetary benefits	4.31	4.42	4.58	4.56	0.20
Factor 5: Extra help for teaching	5.37	4.91	5.52	4.94	0.001

Abbreviations used: ANOVA, analysis of variance; CPRP, community pharmacy residency program.

Each survey item was rated using the following scale: 1, very strongly disagree; 2, strongly disagree; 3, disagree; 4, neither disagree nor agree (neutral); 5, agree; 6, strongly agree; and 7, very strongly agree.

To provide insight for these findings, selected written comments from respondents that were representative of comments overall are presented next.

Selected comments from respondents in group 1 (college/school participating in a CPRP):

- *I don't believe it's as much about 'value' to SoPs as it is a vital responsibility to the profession to be involved in leadership at the community pharmacy level of care, as it's where most patients/customers interact with a pharmacist.*

- *Schools/colleges are in a good position for leadership of community pharmacy residency programs because they understand the standards, experiential education, documentation, and monitoring of progress ... all of which are a part of the standards.*

Selected comments from respondents in group 2 (college/school not participating in a CPRP):

- *Colleges cannot financially afford to support community residencies in the current environment without a revenue stream that is created from the effort. Community practitioners need to step up to provide support and create reimbursement opportunities.*
- *I am not sure community pharmacy residencies provide a great deal of value to colleges/schools of pharmacy outside*

of providing additional APPE [advanced pharmacy practice experience] sites. The rest of the value of community pharmacy residencies lies in the benefit to the resident and the pharmacy.

- *I was a CPRP Residency Director for 8 years. We closed the program since recruiting was nearly impossible. These programs have provided many well trained and productive faculty members and pharmacists and it is important that they succeed.*

Selected comments from respondents in group 3 (CPRP community pharmacy practice site):

- *Although we have been working with our college for 11 years and our director is a faculty member there, the college does not provide any monetary support to our company ... thus resulting in some of the financial issues described previously.*
- *Schools of pharmacy need preceptors that can deliver quality instruction both in class and in the pharmacy. CPRPs do this through resident interaction and interaction with residency faculty.*

Selected comments from respondents in group 4 (non-CPRP community pharmacy practice site):

- *After attempting to work with three schools of pharmacy,*

Table 10. Factor analysis results for barriers to offering CPRPs (n = 334)

Item	Factor loading
Factor 1: Organizational/strategic barriers	
Absence of a formal communication network for such programs	0.71
Absence of a formal structure for such programs	0.76
Community practice model not fitting with our organization’s practice model	0.55
Lack of clear standards for such programs	0.80
Lack of expertise for offering such programs	0.61
Lack of fit with our organization’s strategic plan	0.51
Their focus on business models in addition to patient care models	0.66
Too much variability among such programs	0.63
Factor 2: operational/logistic barriers	
Absence of an effective referral network among pharmacists working at different locales	0.70
Geographic location	0.56
Inadequate patient data to support projects	0.65
Insufficient space for such programs	0.62
Lacking human resources for offering such programs	0.59
Lack of a collaborative partner	0.62
Lack of direct physician contact	0.58
Technology barriers	0.66
Factor 3: Accreditation	
Accreditation costs	0.79
Accreditation seen as being redundant with other accreditation	0.81
Site visits required for accreditation	0.80
Application required for accreditation	0.89
Presurvey questionnaire required for accreditation	0.86
Factor 4: Lack of interest or resistance	
Community practice model not fitting with our organization’s staff member interests	0.59
Lack of need seen for such programs	0.71
Lack of student interest	0.75
Resistance from practitioners	0.52
Staff resistance to such programs	0.52
Factor 5: Research issues	
Institutional review board requirements too burdensome	0.81
Limited capacity to do projects/research	0.65
Projects/research required in such programs too burdensome	0.67
Items dropped from analysis due to poor factor loading characteristics	
Our organization’s lack of a director for such programs	No loading >0.50 on any factor
Insufficient revenue generated to support such programs	No loading >0.50 on any factor
Cost of reimbursement for residents	No loading >0.50 on any factor

Abbreviation used: CPRP, community pharmacy residency program.
 Complete factor analysis results are available from the corresponding author upon request.

I don't think their participation in the process should be required. They all agree that the practice site I am showing them is an excellent setup, they just consider it too far away to work with.

- *Although this sounds good on paper, it is a waste of time and money to the new graduate. What was the college doing all those years if you are not trained to go out and work (and pay off your loans)?*
- *In theory, this type of residency benefits the college and individual preceptors more than the community since most often the programs implemented during the resident's*

short stay often are not continued on.

- *There is a clear value to the schools. However, the need for further education raises the question as to the value and relevancy of the curriculum during their professional years.*
- *Emphasis should be on good to community, not serving the politics of the universities.*

Barriers to offering CPRPs

Table 10 shows that 29 of the 32 items that were used to measure barriers to offering CPRPs met our factor analysis criteria

Table 11. Factor summaries for barriers to offering CPRPs (n = 334)

Factor label	No. items	Per-item mean	Mean \pm SD (range)	Cronbach coefficient alpha
Factor 1: Organizational/strategic barriers	8	3.79	30.2 \pm 8.5 (8–56)	0.90
Factor 2: Operational/logistic barriers	8	4.09	32.7 \pm 8.2 (9–56)	0.85
Factor 3: Accreditation	5	4.14	20.7 \pm 5.9 (5–35)	0.92
Factor 4: Lack of interest or resistance	5	3.72	18.6 \pm 5.8 (5–35)	0.83
Factor 5: Research issues	3	3.88	11.6 \pm 3.7 (3–21)	0.83

Abbreviation used: CPRP, community pharmacy residency program.

Factors are listed in order of their contribution to variance explained in the data from most variance explained (factor 1) to least variance explained (factor 5).

Each survey item was rated using the following scale: 1, very strongly disagree; 2, strongly disagree; 3, disagree; 4, neither disagree nor agree (neutral); 5, agree; 6, strongly agree; and 7, very strongly agree.

(i.e., exhibited a factor loading with an absolute value greater than 0.50, loaded on one and only one factor). A five-factor solution was selected based on variance explained and interpretability. Each factor was assigned a name based on the items that comprised that particular construct (Table 10).

Table 11 summarizes the five factors (constructs) we identified. Factor 3 (accreditation) had the highest per-item mean among the five factors (4.14), followed by factor 2 (operational/logistic barriers; 4.09), factor 5 (research issues; 3.88), factor 1 (organizational/strategic barriers; 3.79), and factor 4 (lack of interest or resistance; 3.72).

Table 12 provides a description of per-item mean scores for each of the five identified factors among the four study groups. For the two groups currently participating in CPRPs, each of the per-item means for the five factors was less than 4.0. A score below 4.0 suggests a general “disagreement” with items that comprised the measure (factor). For respondents from a college/school not participating in a CPRP, two of the five factors had per-item means greater than 4.0: factor 2 (operational/logistic barriers) and factor 3 (accreditation).

Respondents from a pharmacy not participating in a CPRP reported per-item means greater than 4.0 for each of the five factors. This suggests that there was overall agreement from this respondent group that each of the five factors we identified were barriers to offering CPRPs at their organization. For this group, factor 3 (accreditation) was the most important barrier (per-item mean = 4.48), followed by factor 5 (research issues; 4.45), factor 1 (organizational/strategic barriers; 4.28), factor 2 (operational/logistic barriers; 4.26), and factor 4 (lack of interest or resistance; 4.11).

ANOVA showed that differences in scores among the four respondent groups were statistically significant ($P < 0.05$). The findings confirmed that for most of the factors, highest mean scores were found for the two groups not participating in CPRPs (Table 12).

To provide insight for these findings, selected written comments from respondents that were representative of comments overall are presented next.

Selected comments from respondents in group 1 (college/school participating in a CPRP):

■ *Dean and faculty at colleges of pharmacy lack understanding of the importance of community pharmacy residency*

programs and do not see the need of community pharmacy residency training. Many seem to feel only hospitals deserve to host residency training.

■ *Funding provided by pharmacy is not adequate to support the program. State schools are in a budget crisis now, so residency responsibilities by faculty are not adequately recognized if at all within the context of recognized workload.*

■ *Need federal funding like medical residencies. Need a larger commitment from chains and universities. Get AACCP and ACPE involved in requiring community residencies as a core measure (postgrad programs should reflect where graduates are going).*

■ *There has to be a commitment on both sides to make it a successful program.*

Selected comments from respondents in group 2 (college/school not participating in a CPRP):

■ *A lot of students have never had a high-quality experience working in a community pharmacy. To such students, the need for advanced training or opportunities in community pharmacy simply seem fictional at best.*

■ *At this time, funding is the primary barrier. Until a business model is implemented that can demonstrate financial benefits from having a community pharmacy residency, practice partners will continue to shy away from participating.*

■ *Community pharmacy does not widely support residency training as a means of advancing practice and preparing leaders for the profession. There is not a consistent vision for residency training that permeates throughout large organizations.*

■ *Funding and patient care opportunities are my biggest challenges to offering a CPRP. Hospital PGY1 programs receive funding through Medicare that community programs do not qualify for, so the pharmacy school must provide the entire salary.*

■ *The primary barrier our school came across (we used to offer a community pharmacy residency) was funding for the residency; then, after completion of the residency, the chain partner was unable/unwilling to continue the patient care service(s) the resident developed.*

■ *We have a great situation that would be a wonderful residency site, but corporate buy-in is not there.*

Table 12. Comparison of per-item means for barriers to offering CPRPs among the four respondent groups (n = 334)

Factor label	Respondents from college/school participating in CPRP (n = 83)	Respondents from college/school not participating in CPRP (n = 100)	Respondents from pharmacy participating in CPRP (n = 68)	Respondents from pharmacy not participating in CPRP (n = 83)	P(ANOVA)
Factor 1: Organizational/strategic barriers	3.57	3.88	3.38	4.28	<0.001
Factor 2: Operational/logistic barriers	3.96	4.31	3.79	4.26	0.003
Factor 3: Accreditation	3.94	4.28	3.83	4.48	0.001
Factor 4: Lack of interest or resistance	3.50	3.88	3.36	4.11	<0.001
Factor 5: Research issues	3.67	3.58	3.83	4.45	<0.001

Abbreviations used: ANOVA, analysis of variance; CPRP, community pharmacy residency program. Each survey item was rated using the following scale: 1, very strongly disagree; 2, strongly disagree; 3, disagree; 4, neither disagree nor agree (neutral); 5, agree; 6, strongly agree; and 7, very strongly agree.

Table 13. Comparison of per-item means for the three items not included in the overall factors regarding barriers to offering CPRPs among the four respondent groups (n = 334)

Factor label	Respondents from college/school participating in CPRP (n = 83)	Respondents from college/school not participating in CPRP (n = 100)	Respondents from pharmacy participating in CPRP (n = 68)	Respondents from pharmacy not participating in CPRP (n = 83)	P(ANOVA)
Our organization’s lack of a director for such programs	2.92	4.35	2.96	4.38	<0.001
Insufficient revenue generated to support such programs	4.58	4.94	4.75	4.78	0.36
Cost of reimbursement for residents	4.33	4.85	4.31	4.75	0.01

Abbreviations used: ANOVA, analysis of variance; CPRP, community pharmacy residency program. Each survey item was rated using the following scale: 1, very strongly disagree; 2, strongly disagree; 3, disagree; 4, neither disagree nor agree (neutral); 5, agree; 6, strongly agree; and 7, very strongly agree.

Selected comments from respondents in group 3 (CPRP community pharmacy practice site):

- *Geographic location—we are in an area heavily impacted by managed care. Therefore, hardly any patients can pay out-of-pocket for services. Getting reimbursed for patient care services has been and still is a huge struggle.*
- *I think we could have another resident if we had more office space and sufficient preceptors with more observation. The only way to get that is by getting granted another FTE so as to place the preceptor in the resident’s practice site.*
- *Shrinking reimbursement rates for community pharmacies, along with the lack of payment for clinical services has made it challenging to financially support a resident.*
- *The dollars for the program costs versus the dollars created by the program has been very challenging to overcome in our organization. The business plan for residency programs is unattractive due to the time and dollars needed to maintain it.*

Selected comments from respondents in group 4 (non-CPRP community pharmacy practice site):

- *Barriers include too high a workload combined with too few staff members willing to actively engage students. In addition to this, the paperwork required for mentoring a resident is tremendous.*

- *I see no barriers to such a program. There are those of us who are eager and ready for such a challenge.*
- *I am not knowledgeable enough in all the requirements of a residency program to be able to answer more intelligently or with any kind of expertise or basis for judgment in them.*
- *Mainly costs and the process for accreditation/getting started would be barriers at my site.*
- *When third parties are insisting on patients using mail order, are we to offer all of these services for the third-party people for free?*
- *Pharmacies need to be set up structurally to provide good patient care before a residency program can happen. This includes a semiprivate/private area for counseling, flu shots, diabetic meter testing, in-person MTM visits, etc.*
- *The inability of some pharmacies to see past the image of “behind the counter” rather than being “in front of the counter” to help patients.*

Discussion

Regarding CPRPs, the results showed that value to participating pharmacies is associated with pharmacy education development and pharmacy profession development. It appears that CPRPs provide value to community pharmacy practice

sites with the goals of contributing to pharmacy education and the pharmacy profession. These goals are more altruistic than other goals such as developing one's practice, providing job satisfaction for pharmacy staff, or creating revenue for the pharmacy practice.

The results showed that the most value to participating colleges/schools of pharmacy is associated with pharmacy education and serving societal needs. CPRPs appear to provide value to colleges/schools of pharmacy with the goals of (1) value-added educational opportunities for community pharmacy practitioners and (2) community engagement through educational and service learning processes. These goals appear to be more altruistic than other goals such as extra help for teaching and creating revenue for the college or school of pharmacy.

The findings related to barriers to offering CPRPs suggest that altruistic goals can go only so far. Barriers related to both start-up and continuation costs were identified and included such things as accreditation costs and logistics (e.g., referral networks, geographic location, patient data, space, human resources, a collaborative partner, direct physician contact, technology barriers) (Table 10). For colleges/schools of pharmacy not participating in a CPRP, the mean averages suggest that these are important barriers. For non-CPRP pharmacies, all five of the categories of barriers we identified posed substantial barriers to program implementation (Tables 10 and 12).

Of note, three items used to measure barriers loaded on multiple factors and were dropped from further analysis of the overall factors (Table 10). These three items loaded moderately on both the operational/logistic and organizational/strategic factors, which suggests that these three items could be viewed as multiple-component barriers. The items (and per-item means) were as follows:

- Our organization's lack of a director for such programs (3.7)
- Insufficient revenue generated to support such programs (4.8)
- Cost of reimbursement for residents (4.6)

In light of their relatively high per-item means and their relevance to the objectives of the study, we conducted a comparison among study groups using each of these three items as the dependent variables. Table 13 shows that lack of a director was viewed as more of a barrier for respondents not participating compared with those who were participating in CPRPs. For the item related to insufficient revenue, all respondent types rated this as a significant barrier (all per-item means >4.50). Finally, cost of reimbursement for residents was rated relatively high as a barrier by respondents from either a college/school or a pharmacy participating in CPRPs (per-item means 4.33 and 4.31, respectively). However, this item was rated higher as a barrier by respondents from either a college/school or a pharmacy not participating in CPRPs (per-item means 4.85 and 4.75, respectively). These findings suggest that these three items (1) are significant barriers, (2) are comprised of multiple components related to both operational/logistic and organizational/strategic barriers, and (3) were not fully articulated in our survey and analysis. It appears that (1) leadership, (2) revenue, and (3)

cost of reimbursement for residents are fundamental barriers to implementing CPRPs and are multidimensional. We propose that these three items (barriers) represent rate-limiting steps that affect the five overall barriers to offering CPRPs we identified in our factor analysis. This is only conjecture, however, and must be investigated further. The verbatim comments from respondents provide further support for our conclusions.

Based on these findings, we propose that the CPRP has established a firm foundation that includes (1) pharmacy education development, (2) pharmacy profession development, and (3) opportunities for community engagement. However, to build on this foundation and expand CPRPs further into community pharmacy practice, the development of guidelines for both start-up and continuation of CPRPs is needed for pharmacies and their partners, such as colleges/schools of pharmacy. Our findings showed that accreditation costs and operational/logistic barriers were significant, especially for organizations that were not participating in CPRPs. Further, evidence suggests that (1) lack of leadership, (2) lack of revenue generated from such programs, and (3) the cost of reimbursement for residents may be fundamental, multidimensional barriers to implementing CPRPs. According to the 2007 Deans' Council Task Force on Post Graduate Pharmacy (Residency) Education, "the most difficult residency program to fund has been community pharmacy residencies."⁷ We propose that efforts to create industry norms that would require community pharmacy residency training as a condition for certain types of pharmacist employment would help position CPRPs for legitimate consideration of graduate medical education funding. Also, creation of models for community pharmacy patient care revenue also would help make the case for CPRPs' contributions to pharmacy organization business models. These are major and somewhat daunting tasks. However, a great deal of effort already has been devoted to these areas for postgraduate year (PGY)1 and PGY2 institutional residencies.^{1,7}

Developing guidelines for offering CPRPs that are only focused on one organization's goals and capabilities may not be sufficient for establishing successful CPRPs. Rather, guidelines that cover both organizational partners' goals and capacities may be needed. Clearer expectations for revenue sharing, cost sharing, rights, and responsibilities for organizational partners that provide CPRPs could help overcome some of the barriers we identified. Based on Rupp's⁸ suggestions regarding a community pharmacy residency support service, we propose that (1) forums for idea exchange, (2) descriptive profiles of successful programs, and (3) mentoring opportunities between new and established programs could be helpful for developing guidelines and for translating them into operation. Finally, considering how contemporary, innovative community pharmacy practice will be defined and evaluated in the future U.S. health care system (e.g., MTM, primary care, pay for performance, vaccines, biologics, electronic health records, health information technology applications, interprofessional health care, practice-based research networks) is important when developing guidelines.

Limitations

The results of the current work are based on respondent self-report, raising questions regarding the extent to which respondents gave socially desirable responses. In addition, this study only addressed value and barriers from the perception of responders. We did not ask questions about return-on-investment estimates for CPRPs or other metrics that may have been calculated for some respondents' organizations.

Results from ANOVA should be viewed with caution. Although we computed post hoc statistics for ANOVA findings, we did not report them in the current work because we did not develop predetermined contrasts as part of our study objectives. Thus, the ANOVA findings should be viewed as exploratory. For readers who are interested, post hoc analysis results are available from the corresponding author.

Nonresponse bias is another limitation. Responders may have been more interested in the study topic or had stronger opinions about the questions asked than those who did not respond. Also, the sampling frame for this study did not contain the full population of individuals who could have served as key informants for our study. Those who were not invited to respond to our survey may have significantly different opinions and experiences than the responders. Further, some respondents may have worked at a common organization and cluster bias may have been present in our findings.

Finally, study participants were encouraged to forward the e-mail invitation to colleagues who they thought might be interested in providing responses to the survey. Allowing this prohibited us from knowing the exact number of individuals invited to participate in the survey, and meaningful response rates were not calculable. However, we suggest that our four groups of respondents met our study purpose in that they were able to serve as key informants for one of our four groups of interest, were dispersed geographically in a similar pattern to colleges/schools of pharmacy and community pharmacy practices, and responded in sufficient numbers per group for us to conduct our planned statistical analyses. In this study, we identified and described value and barriers for CPRPs. In light of the geographic diversity for the key informants who responded in this study, we believe that the findings can be generalized to colleges/schools of pharmacy and to community pharmacy practices throughout the United States.

Conclusion

Findings from this study showed that CPRPs provide value to pharmacies and to colleges/schools of pharmacy. The most important types of value were altruistic in nature and included,

for example, pharmacy education development, pharmacy profession development, and opportunities for community engagement. However, barriers to offering CPRPs were more practical in nature and included challenges related to accreditation, geographic location, patient data, space, human resources, collaborative partnerships, direct physician contact, and technology. Further, evidence suggested that (1) lack of leadership, (2) lack of revenue generated from such programs, and (3) the cost of reimbursement for residents may be fundamental, multidimensional barriers to implementing CPRPs.

We suggest developing guidelines for both start-up and continuing CPRPs for the dyadic partnerships created between community pharmacies and colleges/schools of pharmacy; this would facilitate clear expectations regarding, for example, revenue sharing, cost sharing, and rights and responsibilities for each partner. Creating industry norms that would require community pharmacy residency training as a condition for certain types of pharmacist employment would help position CPRPs for legitimate consideration of graduate medical education funding. Also, creation of models for community pharmacy patient care revenue would help make the case for CPRPs' contributions to pharmacy organization business models.

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Appendix 1. Items for survey assessing value of community pharmacy residency programs**Survey items used to measure value to participating pharmacies:**

1. Conducting practice-based research
2. Developing new service offerings
3. Evaluating existing services
4. Fitting the pharmacy's strategic plan
5. Keeping the practice site progressive
6. Meeting the pharmacy's primary mission
7. Overcoming competitive pressures
8. Providing direct revenue
9. Providing extra help to achieve the pharmacy's goals
10. Providing indirect revenue
11. Serving as a pilot site for testing managerial innovations
12. Serving as a pilot site for testing patient care innovations
13. Serving as a pilot site for testing technological innovations
14. Supporting quality improvement efforts for the pharmacy
15. Enhancing prestige for preceptors
16. Increasing pharmacy staff satisfaction
17. Providing recognition for preceptors
18. Developing promotable services to patients
19. Improving patients' continuity of care in communities
20. Promoting healthier living to communities through community engagement/outreach
21. Promoting patient-centered care in community settings
22. Promoting the development of community-based health care
23. Providing care to underserved populations
24. Training pharmacists to provide advanced patient services
25. Meeting the pharmacy resident's professional development needs
26. Providing an opportunity for pharmacists to participate in teaching student pharmacists
27. Providing visibility for pharmacists at universities in the area of advanced community practice
28. Strengthening relationships with colleges of pharmacy
29. Achieving cost savings/avoidance for health care
30. Building more community pharmacy leaders
31. Developing leaders for the profession
32. Fulfilling a responsibility to the profession
33. Increasing advocacy for community pharmacy
34. Providing a professional image that aids in the recruitment of pharmacists
35. Understanding key elements of practice management

Survey items used to measure value to participating colleges/schools of pharmacy:

1. Contributing to pharmacy education
2. Fitting the college/school of pharmacy's strategic plan
3. Meeting a college/school of pharmacy's primary mission
4. Providing direct revenue
5. Providing indirect revenue
6. Providing opportunities for research in community practice

7. Providing recognition to the university
8. Resident projects providing recognition to the university
9. Serving as a pilot site for testing managerial innovations
10. Serving as a pilot site for testing patient care innovations
11. Serving as a pilot site for testing technological innovations
12. Strengthening relationships with pharmacies
13. Strengthening relationships with alumni
14. Conducting educational scholarship
15. Improving student instruction
16. Improving student satisfaction
17. Increasing professional satisfaction for preceptors
18. Meeting residents' professional development needs
19. Providing faculty with opportunities for innovative practice
20. Providing more precepting opportunities for pharmacists
21. Promoting healthier living to communities through community engagement/outreach
22. Promoting patient-centered care in community settings
23. Promoting the development of community-based health care
24. Providing care to underserved populations
25. Developing leaders for the profession
26. Fulfilling a responsibility to the profession
27. Improving the health care system in communities
28. Facilitating learning with respect to patient-care delivery
29. Facilitating learning with respect to service management
30. Improving service learning
31. Meeting a recognized educational need
32. Overcoming competitive pressures
33. Providing advanced pharmacy practice experience sites
34. Providing extra help for teaching
35. Strengthening leadership in post graduate training outside of a traditional hospital setting

Survey items used to measure barriers to offering community pharmacy residency programs:

1. Absence of an effective referral network among pharmacists working at different locales
2. Geographic location
3. Inadequate patient data to support projects
4. Insufficient space for such programs
5. Lacking human resources for offering such programs
6. Lack of a collaborative partner
7. Lack of direct physician contact
8. Our organization's lack of a director for such programs
9. Technology barriers
10. Accreditation costs
11. Accreditation seen as being redundant with other accreditation
12. Site visits required for accreditation
13. Application required for accreditation
14. Presurvey questionnaire required for accreditation
15. Community practice model not fitting with our organization's staff member interests
16. Lack of need seen for such programs
17. Lack of student interest
18. Resistance from practitioners

19. Staff resistance to such programs
20. Institutional review board requirements, when applicable for projects, too burdensome
21. Limited capacity to do projects/research
22. Projects/research required in such programs too burdensome
23. Absence of a formal communication network for such programs
24. Absence of a formal structure for such programs
25. Community practice model not fitting with our organization's practice model
26. Lack of clear standards for such programs
27. Lack of expertise for offering such programs
28. Lack of fit with our organization's strategic plan
29. Insufficient revenue generated to support such programs
30. Cost of reimbursement for residents
31. Their focus on business models in addition to patient care models
32. Too much variability among such programs

Each survey item was rated using the following scale: 1, very strongly disagree; 2, strongly disagree; 3, disagree; 4, neither disagree nor agree (neutral); 5, agree; 6, strongly agree; and 7, very strongly agree.



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