

RESEARCH ARTICLES

Survey of Colleges of Pharmacy to Assess Preparation for and Promotion of Residency Training

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Submitted August 6, 2009; accepted September 7, 2009; published April 12, 2010.

Objective. To assess the prevalence of curricular programs or other structured activities designed to prepare students for and to promote residency training.

Methods. An electronic survey instrument containing 12 questions regarding institutional demographics and activities related to pharmacy student preparation for residency training was sent to administrators of all US colleges and schools of pharmacy.

Results. Ninety-one survey instruments were e-mailed to US colleges and schools of pharmacy administrators, and an overall response rate of 78% was attained. Twenty-two percent of respondents identified a structured curricular program to prepare students for postgraduate training. In addition, informal programs or informational sessions varying in scope and content were offered by many colleges and schools to prepare students for residency training.

Conclusion. Many of the US colleges and schools of pharmacy reported structured activities or programs that promote residency training to students. Ten programs had a designated clinical-track curriculum.

Keywords: students, curriculum, residency, survey

INTRODUCTION

The number of pharmacy students opting to enter postgraduate training programs has continued to increase over the past few years.¹ According to the American Society of Health-System Pharmacists (ASHP), approximately 14% of students enter residencies after graduation. The number of residency programs also has grown steadily since ASHP began accrediting these programs in 1962, doubling since 1994. There are over 800 accredited residency programs in 49 states and Puerto Rico.

ASHP's goal for all graduates who pursue health-system pharmacy careers to complete a PGY1 residency is achievable only with continued growth of college-affiliated residencies and sustained growth in the United States Department of Veterans Affairs.² Residency training is beneficial to the individual and to the profession of pharmacy for several reasons. In addition to preparing pharmacists to meet the needs of patient populations with

a variety of disease states, residency training gives the individual a competitive advantage in the job market, provides networking opportunities, and facilitates a professional vision.¹ Pharmacy organizations such as ASHP as well as the American College of Clinical Pharmacy (ACCP), the American Association of Colleges of Pharmacy (AACP), and the American Pharmaceutical Association (APhA) promote postgraduate training. In 2005, several organizations, including those listed above, discussed the future of pharmacy residency training, agreeing that accredited residencies were necessary for advancing the clinical maturity of pharmacy school graduates so that they may affect changes within health care.^{3,4} In 2006, ACCP proposed that residency training be required for all pharmacy school graduates as a prerequisite for direct patient care responsibilities.⁵ ACCP has been working with ASHP and other organizations to advance the principle that accredited residency training should be a requirement for clinical practitioners. Six recommendations are given in this position statement, defining the methods to achieve the goal of residency training as a prerequisite for direct patient care practice. In addition, AACP published a separate white paper on the subject, stating that colleges and schools should provide formal programming at

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repeated intervals throughout the PharmD curriculum to introduce students to academia and encourage them to pursue graduate pharmacy education programs targeted at preparing them to become faculty members after graduation.⁶ Fourteen recommendations are given for achieving these goals, including the promotion of residencies to qualified pharmacy students, and mentoring students and residents who show an interest in becoming faculty members. The purpose of this study was to identify the prevalence of activities intended to prepare and encourage students to pursue residency training.

METHODS

In October 2007, a 12-question survey instrument was e-mailed to associate and/or assistant deans from each of the US schools and colleges of pharmacy for online completion via SurveyMonkey (Menlo Park, CA). The list was obtained from the American Association of Colleges of Pharmacy Web site (www.aacp.org). The survey instrument was developed and approved by a committee of faculty members involved in the clinical track program at our institution. In addition to demographic data, information regarding activities that promote or prepare students for residency training was solicited. Activities included, but were not limited to, panel discussions, small group discussions, free-standing lectures, lectures as part of a course and/or seminar, or interactive workshops. Information on number of clinical rotations available/required is included, as it is clear that many residency programs use this number as a marker for screening applicants. If a formal curriculum existed, a program description was requested. Follow-up e-mails and telephone calls were made over the course of 2 months to those who did not respond initially. Descriptive statistics were used for data analysis. This study was approved by the Institutional Review Board for Research with Human Subjects at the Medical University of South Carolina. The content of the survey instrument is in Appendix 1.

RESULTS

Ninety-one survey instruments were e-mailed to US colleges and schools of pharmacy. Of the 82 responses received, 11 were discarded due to incomplete data or duplicate entries, resulting in a response rate of 78%. Demographic data for the respondents can be found in Table 1. The majority of participants (n = 55) did not report a formalized curriculum designed to prepare students for post-graduate training; however, many of the colleges and schools offered informal programs or information sessions to prepare students for residency training. In addition, these institutions stated that they strive to prepare all

Table 1. Demographic Information and Results of Survey to Assess Preparation and Promotion of Residency Training (n = 71)

Type of College/School	No. (%)
Private, No. (%)	23 (32)
Public, No. (%)	48 (68)
Information About Each College/School	
Part of a medical or health sciences campus, No. (%)	38 (54)
No residency program, No. (%)	7 (10)
PGY1 pharmacy practice residency, No. (%)	61 (86)
PGY2 specialty residency, No. (%)	41 (58)
Number of clinical rotations, mean (SD)	5 (1.8)
Number of elective rotations, mean (SD)	3 (1.0)
Number of doctor of pharmacy degrees awarded in 2007, mean (SD)	114 (49)
% of Graduates that entered residency/fellowship training, mean (SD)	19 (10)
% of Graduates that entered hospital-based employment, mean (SD)	15 (6.7)
% of Graduates that entered community-based employment, mean (SD)	57 (12.6)

students for advanced clinical training, as some individuals decide to complete a residency or other advanced training later in their careers. Table 4 provides the prevalence of the various types of activities employed by colleges and schools of pharmacy across the United States. These sessions vary in scope and content. Examples include a residency “club” or career pathways program, elective courses, one-on-one mentoring during advanced pharmacy practice experiences (APPEs), promotion by student professional organizations, financial support to attend the American Society of Health System Pharmacists (ASHP) midyear meeting, and a required residency program visit at the end of the second or third professional year.

Of the 71 college and school administrators who responded, 16 stated that they offered a structured, formal clinical program: Albany College of Pharmacy, Campbell University, Ferris State University, Florida A&M, Southern Illinois University Edwardsville, Touro University, University of Arkansas, University of Kansas, University of Kentucky, University of North Carolina, University of Southern California, University of Washington, Washington State University, Wayne State University, and the Medical University of South Carolina and University of South Carolina (now the combined South Carolina College of Pharmacy). Nine of the 16 provided information regarding their program (Table 2). Additional information and comparisons to all respondents is included in Table 3.

Table 2. Description of Formalized Programs Reported by Survey of Pharmacy to Emphasize Clinical Training

College of Pharmacy	Program Description
Albany College of Pharmacy	<ul style="list-style-type: none"> ● Elective rotations (Antimicrobial Management, Clinical Toxicology and others)
Campbell University	<ul style="list-style-type: none"> ● 6 hours of didactic elective hours (Certification in Asthma Treatment, Immunization, Lipid Management, Infectious Disease, HIV Treatment, Smoking Cessation, and others)
Florida A&M	<ul style="list-style-type: none"> ● 3 elective APPE options to define a specialty practice ● Elective rotations (Nutritional Support, Family Medicine, Surgery, Anesthesiology, and others)
Medical University of South Carolina (now SCCP-MUSC), Advanced Clinical Track	<ul style="list-style-type: none"> ● Advanced Therapeutics ● “Clinical Skills” checklist ● Participation in ASHP Clinical Skills Competition ● 8 clinical rotations (out of 10) ● Track Conference course (3 semesters; 1 hour per week devoted to case studies, SOAP notes, ASHP Midyear prep, etc.)
Southern Illinois University Edwardsville	<ul style="list-style-type: none"> ● Elective courses (Critical Care Pharmacotherapy, Application of Clinical Guidelines in Ambulatory Care, Advanced Infectious Diseases Pharmacotherapy)
University of Kansas	<ul style="list-style-type: none"> ● Co-curricular programming ● 4 out of 6 rotations in General Medicine ● 3 Elective rotations
University of Kentucky, Pre-Residency Pathway	<ul style="list-style-type: none"> ● Goal: Introduce students to the concept of residency training; provide a foundation in critical-thinking skills and career planning; serve to enhance the student’s clinical abilities and increase competitiveness for positions ● Complete 3 out of 7 offered elective courses ● 5 elective APPE options to define a specialty practice
University of North Carolina, Clinical Scholars Program	<ul style="list-style-type: none"> ● Goal: Provide a challenging combination of clinical experiences that will prepare those students who plan to complete postgraduate training ● Drug Information Rotation ● Mentor Program ● Research Project (attend IRB meeting)
University of South Carolina (now SCCP-USC)	<ul style="list-style-type: none"> ● Independent study elective to complete a research project

DISCUSSION

No information existed in the literature at the time of this study regarding formal, organized pharmacy school curricular programs designed to prepare students for residency training. However, there was information on informal activities related to this goal.⁷⁻¹¹ We found that many colleges and schools of pharmacy have structured activities or programs that promote residency training to students, but the majority do not have a designated curricular program.

A previous survey found that the most common methods of promoting residency and fellowship training were formal and informal instruction, referral to preceptors, and involvement of residents and fellows in clerkship teaching.⁷ This study also found that the majority of schools offered information in the last year of the pro-

gram, and 63% of pharmacy school administrators were satisfied, very satisfied, or extremely satisfied with students’ exposure to residencies and fellowships. Examples of informal activities noted in the literature included online tools,⁸ brochures and presentations at career days,⁹ mandatory 1-hour seminars,¹⁰ a combination of presentations, and reading materials.¹¹

Despite an overall good response to the survey, we were able only to obtain program information from 9 colleges. Additional details would have made it easier to report and assess the most widely used and effective tools. The descriptive data reported here were affected by reporting bias and may not have reflected accurately the true prevalence of activities or curricula designed to prepare students for advanced clinical practice or promote postgraduate residency training. In addition, the definition

Table 3. Information Regarding Sixteen Formalized Clinical Programs in US/All Respondents to Survey of Colleges of Pharmacy to Assess Preparation and Promotion of Residency Training

College of Pharmacy	% of Students Who Enter Residency	No. of Clinical Rotations ^a	No. of Elective Rotations ^a	Private or Public	Health Science Campus	PGY1 Residency	PGY2 Residency
Albany College of Pharmacy	No info	3	2	Private	No	Yes	No
Campbell University	16	6	3	Private	No	Yes	No
Ferris State University	15	5	3	Public	No	Yes	No
Florida A&M	No info	6	3	Public	No	Yes	No
Medical University of South Carolina (now SCCP-MUSC)	25	4	3	Public	Yes	Yes	Yes
Southern Illinois University Edwardsville	No info	5	3	Public	No	Yes	No
Touro University	No info	4	4	Private	Yes	No	No
University of Arkansas	No info	5	2	Public	Yes	Yes	Yes
University of Kansas	19	7	1	Public	Yes	Yes	Yes
University of Kentucky	No info	3	5	Public	Yes	Yes	Yes
University of North Carolina	24	5	3	Public	Yes	Yes	Yes
University of South Carolina (now SCCP-USC)	20	5	3	Public	No	No	Yes
University of Southern California	No info	6	2	Private	Yes	Yes	Yes
University of Washington	No info	5	3	Public	Yes	Yes	Yes
Washington State University	No info	2	3	Public	No	Yes	Yes
Wayne State University	15	3	2	Public	Yes	No	No
Average of Clinical Programs	19	5	3	75% Public	56% Yes	81% Yes	56% Yes
Average of All Respondents	19	5	3	66% Public	54% Yes	86% Yes	56% Yes

^a Note that colleges may have 4-, 6-, or 8-week rotations

of “clinical rotation” could have been clarified better in the survey instrument, based upon feedback from respondents. Although assessing the long-term value of these clinical experiences was not the intent of this study, future studies should evaluate the impact of these curricular changes on residency opportunities and career advancement postgraduation.

CONCLUSION

Many of the US colleges and schools of pharmacy surveyed offered structured activities or programs that promoted residency training to students, but the majority of them did not have a structured curricular program. The

majority of institutions stated that they strive to provide all students with the skills necessary to be advanced generalist clinical practitioners. Concerted efforts should be made to promote residency training within colleges of pharmacy and continue to assess long-term outcomes of such programs.

REFERENCES

1. American Society of Health-System Pharmacists: Why Should I Do A Residency. www.ashp.org. Accessed March 25, 2010.
2. Knapp KK, Shah BM, Kim HBH, Tran H. Visions for required postgraduate year 1 residency training by 2020: a comparison of actual versus projected expansion. *Pharmacotheapy*. 2009;29(9):1030-1038.
3. American Society of Health-System Pharmacists. Pharmacy residency training in the future: a stakeholders’ roundtable discussion. *Am J Health-Syst Pharm*. 2005;62:1817-1820.
4. Ray MD. Clinical maturity in pharmacy. *Pharmacotheapy*. 2006;26(6):594-596.
5. Murphy JE, Nappi JM, Bosso JA, et al. American College of Clinical Pharmacy’s vision of the future: postgraduate pharmacy residency training as a prerequisite for direct patient care practice. *Pharmacotheapy*. 2006;26(5):722-733.
6. Lee M, Bennett M, Chase P, et al. Final report and recommendations of the 2002 AACP task force on the role of colleges and schools in residency training. *Am J Pharm Educ*. 2004;68(1):Article S2.

Table 4. Prevalence of Activities that Promote Residency Training to Students (n=71)

Activity Type	Prevalence, %
Free-standing lecture	46
Lecture as course	45
Seminar	56
Small group	46
Panel discussion	58

American Journal of Pharmaceutical Education 2010; 74 (3) Article 43.

7. Bucci KK, Knapp KK, Ohri LK, Brooks PJ. Factors motivating pharmacy students to pursue residency and fellowship training. *Am J Health-Syst Pharm.* 1995;52(23):2696-2701.
8. Burkiewicz JS, Sincak CA. Online tool for pharmacy students seeking residency positions. *Am J Health-Syst Pharm.* 2008;65(22):2091-2092.
9. Machado C, Zapantis A, Singh-Franco D, Marsh WA, Beckey C. Effect of faculty-mediated interventions on pharmacy students' pursuit of postgraduate training. *Am J Health-Syst Pharm.* 2008;65(2):158-163.
10. Jacobs TF, Manor SM. Effect of a seminar on pharmacy student attitudes toward residency training. *Am J Health-Syst Pharm.* 2008;65(14):1358-1362.
11. Bruce SP, Burkiewicz JS. Program for guiding pharmacy students through residency selection. *Am J Health-Syst Pharm.* 2005;62(14):1488-1490.

Appendix 1. Survey of Colleges of Pharmacy in the United States to Assess Preparation and Promotion of Residency Training

1. I would like to receive the tabulated results of this survey (YES or NO)
2. Please enter the name of your School or College of Pharmacy
3. In what state are you located?
4. Is your School or College of Pharmacy considered Public or Private? (PUBLIC or PRIVATE)
5. Is your School or College of Pharmacy part of a medical or health sciences campus? (YES or NO)
6. Is your School or College affiliated with any pharmacy residency programs? Select all that apply. (None, PGY1, PGY2)
7. How many clinical rotations do you require each student to complete?
8. How many elective rotations are required of each student?
9. How many Doctor of Pharmacy degrees will you award in 2007?
10. Indicate the number of graduates who entered each of the following employment settings. (Residency or Fellowship Training, Hospital-based positions, Community-based positions)
11. Does your School or College have any structured activities or programs that promote residency training to students? If so, please select any of the following that apply. (Free-standing lecture, Lecture as part of a course, Seminar or interactive workshop, Small group discussion, Panel discussion, None offered, Other)
12. Does your School or College have an elective/voluntary curricular track or program whose purpose is congruent with one of the following? (YES or NO)
 - A. Develop patient care skills & knowledge (beyond what is required of all students)
 - B. Prepare students for residency training
 - C. Train students to provide direct patient care (beyond what is required of all students)