Student Preparation for PGY1 Residency Training by US Colleges of Pharmacy: Survey of the Residency Program Director Perspective

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ABSTRACT

Purpose: To evaluate current residents' level of preparation by US colleges of pharmacy for postgraduate year 1 (PGY1) residency training from the perspective of residency program directors (RPDs). **Methods:** RPDs were asked in an electronic survey questionnaire to rate PGY1 pharmacy residents' abilities in 4 domains: communication, clinical knowledge, interpersonal/time-management skills, and professionalism/leadership.

Results: One hundred ninety-seven RPDs of the American Society of Health-System Pharmacists (ASHP)-accredited PGY1 programs completed the survey. The majority of RPDs strongly agreed or agreed that residents were prepared as students to effectively communicate both verbally and nonverbally, were able to appropriately respond to drug inquiries using drug resources and literature searches, and consistently displayed professionalism. Respondents were more likely to disagree or give a neutral response when asked about residents' understanding of biostatistics and their ability to provide enteral and parenteral nutritional support for patients.

Conclusion: Overall, RPDs agreed that residents were prepared to perform the majority of the tasks of each of the 4 domains assessed in this survey relating to PGY1 training. RPDs may use the results of this survey to provide additional support for their residents in the areas in which residents lack adequate preparation, while colleges of pharmacy may focus on incorporating more time in their curriculum for certain areas to better prepare their students for residency training.

Key Words— PGY1 residency, pharmacy training, survey research

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The American College of Clinical Pharmacy (ACCP) envisions that all pharmacy graduates who pursue health system pharmacy careers will successfully complete a year of clinical pharmacy training in a postgraduate year one residency (PGY1) by 2020.¹ As the year 2020 approaches, there continues to be a disparity in the number of applicants pursuing PGY1 residency training when compared to the number of residency positions available in the United States. The 2015 American Society of Health-System Pharmacists (ASHP) match results indicated that 4,358 applicants participated in the match to pursue PGY1 residency training.² Although over 90% of PGY1 residency positions were filled for the 2015-2016 pharmacy residency year, 35% of PGY1 applicants ($n = 1,547$) did not match with a program through the initial matching process.²

Due to the competitive nature of the residency application process, it is vital for student pharmacists to remain highly marketable in order to successfully obtain a residency position. The 2015 ASHP match results revealed that 88.5% of PGY1 applicants ($n = 3,857$) were ranked by at least one program, indicating that those applicants were deemed “acceptable applicants” suitable for a residency position by one or more residency program directors (RPDs).³ Despite having a large pool of competitive applicants, PGY1 program directors may still be unsure of the level of students’ preparation and readiness for residency training. A recently published study evaluated PGY1 residents’ self-perceived readiness for residency training.⁴ The study revealed that PGY1 residents felt prepared to multitask and to apply principles of evidence-based medicine to clinical situations but felt less prepared to accomplish independent research projects and to practice without supervision.⁴ Self-reflection provides one view of readiness, but RPDs are in a unique position to evaluate new graduates’ preparedness for pharmacy residency training.

METHODS

Vizient University Health System Consortium is a collaboration of 114 academic medical centers (AMC) and affiliate hospitals across the United States. A survey was conducted by the Vizient AMC Pharmacy Network Professional Development and Workforce Committee representing 6 member institutions including Nebraska Medicine, University of Colorado Hospital, University of Cincinnati Medical Center, University of Illinois at Chicago, University of California San Diego Health, and Northwestern

Memorial Hospital. The Vizient Professional Development and Workforce Committee serves as a central coordinating body to promote and conduct practice-based outcomes research related to professional development of the pharmacy workforce. Committee members developed, distributed, and analyzed the results of this survey. The primary purpose of this survey was to evaluate current residents’ level of preparation by US colleges of pharmacy for PGY1 residency training from the RPD perspective. Secondary outcomes of the survey included identifying strategies to better prepare students for their future responsibilities as PGY1 pharmacy residents.

The survey was conducted in the winter of 2015 and was approved by the institutional review board (IRB) at Nebraska Medicine. PGY1 RPDs were identified using both the Vizient and the ASHP residency directors’ listserv. In January 2015, 1,235 residency directors were invited to participate in the survey through an e-mail message containing a link to an electronic questionnaire. SurveyMonkey was utilized to develop the online survey. As requested by the IRB, documentation of assent or declination of participation through the response to the e-mail survey invitation was obtained.

Demographic questions were included in the electronic survey to determine the following: accreditation status, length of accreditation, number of residents in each program, and the tenure of each RPD. Directors were asked to indicate the region of the United States in which their practice site resides (eg, Northeast, Southeast, Midwest, Southwest, or West) and to designate their PGY1 program as community, managed care, or pharmacy practice. Last, program directors were asked to indicate if their practice site was an academic or nonacademic medical center.

The survey was divided into 4 domains: communication, clinical knowledge, interpersonal skills/time management, and professionalism/leadership. Program directors were asked to consider only their current PGY1 residents when answering survey questions. Each question of the electronic survey utilized a 5-point Likert scale, with possible responses ranging from *strongly disagree* (a score of 1) to *strongly agree* (a score of 5). For each prompt, “not applicable” or “n/a” was also available as a response. Program directors were asked to provide open-ended responses offering suggestions for colleges of pharmacy to better prepare students for residency training.

Data were collected and analyzed using descriptive statistics. Open-ended suggestions for colleges

of pharmacy to enhance student preparation for residency training were grouped according to similar responses and themes.

RESULTS

Demographics

Two hundred nineteen RPDs responded to the survey. One hundred ninety-seven of these responses were from directors of ASHP-accredited programs and were included in the analysis, giving a response rate of 15.9% (Table 1). Respondents indicated that their PGY1 residency program had been ASHP accredited for a mean $\pm$ SD of 15.5 ± 13.1 years. The RPD mean $\pm$ SD tenure was 5.9 ± 5.3 years. The majority (90.3%) of respondents indicated that they were program directors of pharmacy practice residencies, whereas 8% ($n = 16$) directed a community residency and 1.5% ($n = 3$) directed a managed care residency. Fifty percent ($n = 98$) of program directors practiced in an academic medical center and 50% ($n = 98$) in a nonacademic medical center. Ninety percent of program directors ($n = 178$) indicated that they serve as a direct preceptor for some of their residents' rotational experiences.

Communication

Program directors were asked 4 questions regarding their residents' communication skills (Table 2).

Most RPDs strongly agreed or agreed that their residents effectively communicate both verbally and nonverbally (93%, $n = 169$), actively contribute to a multidisciplinary health care team (92%, $n = 167$), are able to design and deliver formal and informal presentations (93%, $n = 170$), and can provide effective education to patients and students (90%, $n = 162$). A very small minority of RPDs (less than 3%) strongly disagreed or disagreed with these statements regarding the communication skills of their residents.

Clinical Knowledge

Clinical knowledge comprised the largest section of the survey encompassing 12 questions (Table 3). A majority of RPDs strongly agreed or agreed that they were confident in their residents' ability to identify pertinent medication-related issues via a patient profile review (86%, $n = 154$) and to appropriately respond to drug inquiries using drug information resources and literature searches (85%, $n = 153$). Conversely, respondents were more likely to disagree (31%, $n = 56$) or give a neutral response (22%, $n = 39$) when asked about residents' ability to provide enteral and parenteral nutritional support for their patients. Fifteen percent of program directors indicated that nutritional support was not applicable to their residency program. Many neutral responses (33%, $n = 59$)

Table 1. Demographics of residency program directors of ASHP-accredited programs

Question	Answer	<i>n</i> (%) ^a
Type of PGY1 program (<i>n</i> = 196)	Community	16 (8.2)
	Managed care	3 (1.5)
	Pharmacy	177 (90.3)
Setting of PGY1 program (<i>n</i> = 196)	Academic medical center	98 (50)
	Nonacademic medical center	98 (50)
Does a college of pharmacy contribute to the education and training of your PGY1 residents? (<i>n</i> = 197)	Yes	109 (55.3)
	No	88 (44.7)
Location of PGY1 program (<i>n</i> = 195)	Midwest	77 (39.5)
	Northeast	37 (18.9)
	Southeast	47 (24.1)
	Southwest	13 (6.7)
	West	21 (10.8)
Do residents complete a teaching certificate program? (<i>n</i> = 195)	Yes	150 (76.9)
	No	45 (23.1)
Do you serve as the direct preceptor to your residents for any of their rotations? (<i>n</i> = 197)	Yes	178 (90.4)
	No	19 (9.6)

Note: ASHP = American Society of Health-System Pharmacists; PGY1 = postgraduate year 1.

^aAll respondents did not answer all survey items; data are displayed as *n* (%) of submitted responses for each item.

Table 2. Residents' communication skills

Assessment ^a	Mean (mode) ^b
Effectively communicating verbally and nonverbally when interacting with patients, caregivers, and health care professionals	4.29 (4)
Designing and delivering formal and informal presentations on topics related to their clinical practice	4.28 (4)
Actively contributing to a multidisciplinary team by providing patient-centered, evidence-based recommendations pertaining to medication management	4.26 (4)
Providing effective education to both patients and students that is tailored to each learner's level of knowledge	4.22 (4)

^aRated on a 5-point Likert scale: 1 = *strongly disagree*, 2 = *disagree*, 3 = *neutral*, 4 = *agree*, 5 = *strongly agree*.

^bAll respondents did not answer all survey items; data are a mean (mode) of submitted responses for each item.

Table 3. Residents' clinical knowledge

Assessment ^a	Mean (mode) ^b
Using drug resources and performing literature searches to appropriately respond to drug inquiries	4.19 (4)
Performing a thorough patient profile review and identifying important issues to be addressed	4.11 (4)
Providing clinical staffing support	4.09 (4)
Strong pharmacotherapy knowledge base	4.06 (4)
Assessing pharmacokinetic parameters to make drug therapy recommendations	4.02 (4)
Preparing a drug monograph	4.02 (4)
Critically evaluating the primary literature and applying that information to their clinical practice	4.01 (4)
Providing central staffing support	3.91 (4)
Precepting student activities (eg, topic discussions, lab exercises) with little direction	3.89 (4)
Designing and conducting research projects	3.63 (4)
Baseline understanding of biostatistics, with the ability to apply that knowledge to their clinical practice/research	3.34 (4)
Providing enteral and parenteral nutritional care and support to patients	3.05 (2)

^aRated on a 5-point Likert scale: 1 = *strongly disagree*, 2 = *disagree*, 3 = *neutral*, 4 = *agree*, 5 = *strongly agree*.

^bAll respondents did not answer all survey items; data are a mean (mode) of submitted responses for each item.

were also observed when RPDs were asked about residents' baseline understanding of biostatistics and whether residents were able to apply that knowledge to their clinical practice or research. However, many program directors (49%, $n = 88$) did rate residents' baseline understanding of biostatistics as adequate.

Interpersonal Skills/Time Management

RPDs were asked to answer 5 questions comprising the interpersonal skills and time management

section of this survey (Table 4). The majority of RPDs agreed that the residents were able to multitask efficiently (72%, $n = 127$), prioritize tasks appropriately (73%, $n = 129$), and resolve conflicts (65%, $n = 114$) and knew when to seek support or assistance from the program director or other resources (72%, $n = 127$). Program directors were more likely to give a neutral response regarding the residents' ability to delegate tasks to pharmacy technicians, students, or others as appropriate (38%, $n = 68$).

Table 4. Residents' interpersonal skills and time management

Assessment ^a	Mean (mode) ^b
Knowing when to seek support or assistance from the program director or other resources	3.89 (4)
Prioritizing tasks appropriately	3.84 (4)
Multitasking effectively	3.81 (4)
Confident in their ability to resolve conflicts	3.67 (4)
Delegating tasks to technicians, students, and others as appropriate	3.32 (3)

^aRated on a 5-point Likert scale: 1 = *strongly disagree*, 2 = *disagree*, 3 = *neutral*, 4 = *agree*, 5 = *strongly agree*.

^bAll respondents did not answer all survey items; data are a mean (mode) of submitted responses for each item.

Professionalism/Leadership

Three questions were asked of RPDs regarding their residents' professionalism and leadership (Table 5). The majority of respondents strongly agreed or agreed that their residents demonstrate professionalism consistently (93%, $n = 164$). The same was true when asked if the residents practice leadership skills and function as an active member of a departmental or organizational based committee, with 74% of RPDs in agreement ($n = 130$).

Suggestions for Colleges of Pharmacy

Respondents had many suggestions for colleges of pharmacy to better prepare students for residency training. Some of the more common suggestions included increasing the number of formal presentations students are required to give, increasing exposure to informatics and medication safety techniques, teaching students to review and interpret biostatistics in a journal article, and enhancing student self-directed learning. Program directors expressed the importance of students mastering primary literature searches and how to practice evidence-based medicine rather than recommending treatment regimens just because they are listed in a drug-information handbook. Many RPDs suggested that requiring

students to complete longitudinal projects over the course of their curriculum would help them as future residents in prioritizing tasks and balancing overlapping due dates.

Results Based on Demographics

Survey results were further evaluated by comparing responses of RPDs based on practice setting, geographical region of the residency program, and academic and nonacademic medical centers.

Due to the low number of respondents representing community ($n = 16$) and managed care ($n = 3$) practice settings, no differences could be ascertained when compared to pharmacy practice ($n = 177$) respondents, although 68% ($n = 11$) of community respondents marked "n/a" in regard to residents providing enteral and parenteral nutrition support to patients.

When evaluating survey results based on geographical region, 45% of program directors in the Midwest and 55% in the Southeast regions agreed that their residents were able to delegate tasks to technicians and students as appropriate. Conversely, 60% of RPDs in the Northeast and Southwest regions gave a neutral response to this question, and 40% of RPDs in the West region disagreed. Thirty-seven

Table 5. Residents' professionalism and leadership

Assessment ^a	Mean (mode) ^b
Demonstrating professionalism consistently	4.41 (5)
Functioning as an active member of a departmental or organization-based committee	3.89 (4)
Practice leadership skills	3.89 (4)

^aRated on a 5-point Likert scale: 1 = *strongly disagree*, 2 = *disagree*, 3 = *neutral*, 4 = *agree*, 5 = *strongly agree*.

^bAll respondents did not answer all survey items; data are a mean (mode) of submitted responses for each item.

percent of RPDs in the Northeast and West regions gave a neutral response when asked about residents' baseline understanding of biostatistics, but 45% to 60% of RPDs from all other regions agreed that residents had a good baseline understanding, with the ability to apply this knowledge to clinical practice and research. Finally, 75% of program directors in the West and 50% in the Southeast regions agreed that residents were able to provide enteral and parenteral nutritional support for patients, while 40% to 50% of directors in other regions disagreed with this statement. Program directors from all 5 regions gave similar answers for the remaining 21 questions pertaining to residents' abilities. Directors of programs in academic medical centers ranked residents' abilities similarly to RPDs of programs in nonacademic medical centers across all domains.

DISCUSSION

The pharmacy profession is advocating advanced training to provide a pathway for pharmacists to practice at the top of their license. In December 2012, ACCP specified that "qualified clinical pharmacists will possess credential(s) beyond entry level that are commensurate with the scope of services being proposed for coverage and that assure the clinical pharmacist's ability to contribute to team-based, patient-centered care."⁵ Residency training is an important component in the process of obtaining credentialing beyond entry level, and it is also vital to ensure pharmacy students are adequately prepared at a baseline level to be successful in a residency program.

Survey results demonstrate that program directors perceived their residents to be prepared to perform many tasks related to residency training, including prioritizing and multitasking appropriately and identifying pertinent medication-related issues via patient profile reviews. Directors strongly agreed that their residents have good verbal and non-verbal communication skills and that residents display professionalism on a consistent basis. Although residents' abilities were ranked high (score of 4 or 5) on the Likert scale for the majority of questions, there were a few areas identified for improvement. RPDs perceived residents to be less prepared to provide enteral and parenteral nutrition support, to understand and apply biostatistics to their clinical practice, and to delegate tasks to technicians and students. Colleges of pharmacy may consider focusing on these areas to better prepare students for residency training. In addition, colleges may also

consider creating further opportunities to instruct, model, and facilitate students in practicing evidence-based medicine. Assigning longitudinal projects to complete over the course of their curriculum may help students prioritize tasks and balance overlapping due dates. When separating results based on practice setting or geographical region of the residency program, answers remained consistent for the majority of questions.

There were several limitations to this study. Although all programs assessed were accredited and have the same general requirements, it is important to keep in mind that programs differ in specific requirements of their residents (eg, staffing responsibilities, number of formal presentations required, research). Additionally, the answers of the RPDs are generalizable to their residency class and not specific to each resident, and this may account for many of the neutral responses observed. For example, if an RPD had one resident who performed exceptionally well in a specific area but another who performed poorly, it could lead that RPD to give a neutral response. When comparing RPD responses by geographical region, it must be noted that residents often come from various regions of the country to attend a program. Therefore, differences in scores in one geographical region may be a reflection of the competitiveness for residency programs in that area, rather than the aptitude of colleges of pharmacy. Finally, this study did not capture the perceptions of RPDs whose program is currently in pre-candidate or candidate status.

CONCLUSION

RPDs agreed that US colleges of pharmacy prepared students to perform the majority of the tasks as PGY1 residents in each of the 4 domains assessed in this survey. RPDs may use the results of this survey to provide additional support for their residents in those identified areas of lower preparation, while colleges of pharmacy may want to consider incorporating additional time into their curriculum to teach in those areas to better prepare their students for residency training.

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