

RESEARCH ARTICLES

Characteristics of Doctor of Pharmacy Graduates Entering and Not Entering Residency Training Upon Graduation

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Objectives. This study explored the characteristics of graduating students entering and not entering residencies, along with reasons graduates provided for what affected their decisions.

Methods. Exit surveys administered to 2003 and 2004 graduates included questions about residency plans, demographics, preparedness to practice pharmacy, and reasons for and against pursuing residencies.

Results. Twenty percent of graduates entered residencies. Non-white students were less likely than white students to enter residencies ($p < 0.01$). Motivations for entering residencies included increased clarity of professional opportunities, improved clinical skills, and enhanced job satisfaction. Lack of willingness to train at residency salary and family obligations were cited as reasons for not pursuing residency training.

Conclusions. Pursuit of residency training appears to be motivated by personal and career goals and is independent of age, sex, and level of educational debt. Continued multi-site research should focus on overcoming perceived barriers and identifying motivations for promoting residency training as a professional norm.

Keywords: residency program, post-graduate training, pharmaceutical education, student attitudes, careers

INTRODUCTION

Postgraduate residency programs allow students graduating from doctor of pharmacy (PharmD) programs to further their education and improve their clinical skills. Advantages for completing residency training cited by the American Society for Health-System Pharmacists (ASHP) include improving competitiveness in job markets, increasing professional networking opportunities, increasing clarity of professional opportunities and career goals through exposure to a variety of practice settings, and enhancing vision of the profession of pharmacy through awareness of the range of practice sites.¹ Despite these advantages, the majority of graduates from schools and colleges of pharmacy do not pursue postgraduate residency training. While exact numbers are not tracked on a national level, estimates of the proportion of graduates going on to complete residencies can be made based on data about completed residencies and numbers of graduates. By combining data on completed ASHP-accredited pharmacy practice and specialty residencies with data on the number of pharmacy school graduates, we estimated that approximately 10%-15% of pharmacy school graduates completed postgraduate training between 2000 and 2003.^{2,3}

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Continued study of factors associated with pursuit of residency training is important for 3 reasons. First, little is known about the characteristics and motivations of students who enter residency programs, and even less about students who do not. Bucci et al (1995) conducted a survey of current residents and reported that gaining knowledge and experience and a desire for specialized training were cited most frequently as reasons for pursuing a residency or fellowship.⁴ Professional growth was the most important factor found in a survey of residents completing a mid-career residency (at least 5 years following graduation).⁵ In both of these studies only current residents were surveyed; therefore, the findings do not reflect the characteristics of students not entering residencies. Additionally, these studies were performed prior to implementation of the PharmD degree as the only first professional pharmacy degree program.

Second, a primary advantage cited by ASHP for completing residency training is improving a candidate's competitiveness in the job market. When both baccalaureate (BS Pharm) and doctoral programs were available to students, completion of a PharmD program may have afforded the graduate an automatic competitive edge in the job market. Phasing out of the BS-Pharm degree and adoption of PharmD-only educational programs will lead eventually lead to an all-clinical pharmacy workforce that is primarily PharmD trained. The result may be

increased (or renewed) interest in postgraduate training as a way to gain a competitive edge in the job market by enhancing the candidate's credentials.

Finally, financial support for residency programs was threatened in May 2003 when the Centers for Medicaid and Medicare Services (CMS) proposed to discontinue funding for pharmacy practice and specialty residency programs, noting that completion of a residency program was not required to practice pharmacy in the hospital setting.⁶ In response to a high volume of comments from the professional community, CMS later revised the proposal to continue funding pharmacy practice residencies, but discontinue funding for specialty residencies.⁷

For these 3 reasons, promotion of residency training as a "professional norm" is essential to maintain residency funding as well as for continued growth of the profession of pharmacy. Identifying the advantages of and barriers to postgraduate residency training is necessary to form initiatives at the school and national levels that are designed to promote residency training by fostering interest and participation in residency programs. The objectives of this study were to identify those characteristics associated with graduating PharmD students from the School of Pharmacy at the University of Colorado Health Sciences Center (UCHSC) who chose to pursue postgraduate residency training and determine how they might differ from characteristics of students choosing not to pursue this additional training.

METHODS

Survey Implementation

The UCHSC School of Pharmacy conducted an exit survey of the 2003 graduating class, the initial graduates from the first professional pharmacy degree program. The survey instrument included questions about post-graduation plans including each student's residency intentions. The survey instrument solicited student perceptions about campus and school student services, advanced experiential programs, and the PharmD program, as well as personal and demographic information. Approval for this study was obtained from the Colorado Multiple Institutional Review Board.

Completion of the Web-based survey instrument was a requirement for graduation, a policy approved by University legal counsel. Administrators were able to track completion of survey instruments by student, but were not able to identify any individual student's responses. Students were notified in advance of particular personal information they would need to complete the survey instrument. These variables included items such as grade point average (GPA) after the third professional

year (P3), number of credit hours completed prior to entering the program, and level of educational debt.

Content of the program section of the survey instrument was based on educational outcomes developed by the Center for the Advancement of Pharmaceutical Education (CAPE).⁸ Using 5-point Likert scales, students were asked to:

1. Rate their knowledge in 5 broad areas (insufficient to sufficient);
2. Rate the effectiveness of the curriculum in preparing them to meet 27 specific pharmaceutical care competency standards (ineffective to effective);
3. Rate their level of confidence in 9 areas of general abilities and attributes, including communication, ethics, and critical thinking (strongly disagree to strongly agree);
4. Predict their involvement in professional activities after graduation, such as continuing education and participating in professional organizations (not likely to very likely); and
5. Rate the overall program in preparing them to practice pharmacy (poor to excellent).

The personal section of the survey instrument requested information on demographics, including gender, age, race, previous degree (Bachelor of Arts [BA] or Bachelor of Sciences [BS]), previous credit hours, debt level, and GPA after completing the didactic portion of the program.

Students were asked whether they were entering a residency program after graduation (yes/no), and if so, to provide information in a free-text field about the type and location of the residency program. Additionally, students were asked to provide voluntary, free-text comments about why they chose to complete a residency program.

Based on the limitations of the qualitative data collected from voluntary comments provided by respondents completing the 2003 exit survey, the instrument was amended for 2004 to include 2 sets of questions for students entering and not entering residency or other postgraduate training programs. Students were asked to indicate if specific factors played a role in their decision to pursue (10 items) or not pursue (5 items) residency training. One additional demographic question was added to determine whether English was the student's first language.

Analysis Methods

Data from the program/personal section from the 2003 survey instrument were analyzed to determine the proportion of students entering a residency training program upon graduation. Characteristics of students pursu-

ing residency training were also compared with those of students not pursuing residency training. Variables of interest included the 5 broad knowledge questions, the overall program evaluation, and demographics. Evaluations were also conducted on the items concerning personal attributes and activities after graduation.

Data from the program/personal section of the 2003 survey instruments were pooled with data from the 2004 survey instruments. Data for students indicating they were entering another degree program after graduation were excluded from the analyses. Variables of interest for analyses using the 2003-2004 pooled data were demographics, state of future residence, and desired practice setting for students not entering residency training. Availability of ASHP-accredited pharmacy practice residency positions by state was determined for states of future residence as listed by students not pursuing residency training. Numbers of ASHP-accredited pharmacy practice residency positions were obtained from the ASHP On-line Residency Directory.⁹ If a residency site listed a range for the number of positions offered, the lower estimate was used (eg, 5-7 was counted as 5 positions), and if a site did not specify the number of positions, only one position was counted.

In all analyses, normally distributed continuous variables were analyzed using the *t* test, and categorical variables were analyzed using the chi-square test or Fisher's exact test as appropriate. Responses from students entering formal postgraduate degree or fellowship programs were excluded from analyses concerning pursuit of residency training.

Response categories for 3 variables were collapsed for analysis due to the commonality of response categories or the small number of responses in individual categories. Responses for "previous degree" were grouped into "any degree" and compared to responses of "no degree." "Debt level" responses were divided into "less than \$40,000" and "greater than or equal to \$40,000." The variable "race/ethnicity" was analyzed using all possible responses (American Indian/Alaskan Native, Asian, Asian/Pacific Islander, Black or African American, Hispanic, Multiracial, White, other) and responses were collapsed into 1 of 2 variables, white and non-white. Mean GPA at the end of the 3 didactic years was analyzed using the *t* test. GPA scores were also grouped into "less than 3.0" and "greater than or equal to 3.0" and analyzed using the chi-square test. All statistical analyses were conducted using *SAS*, Version 8 (SAS Institute Inc, Cary, NC).

Comments provided by the 2003 graduates regarding type and location of residency were reviewed manually to classify each residency program as pharmacy practice or specialty, and community or institutional.

Comments about motivation to enter a residency program were grouped by reason. Responses provided by the 2004 graduates to questions about specific factors influencing their decision for or against pursuing residency training were evaluated descriptively.

RESULTS

Response Rates and Pursuit of Residency Training

All 78 students from the 2003 graduating class completed the survey instrument online. Responses and the nature of the comments from 2 students indicated a lack of credibility due to significantly inappropriate or out-of-range responses in the free-text response fields. As a result, all responses from both students were excluded. Of the remaining 76 students, 23 (30%) indicated they would be entering residency programs after graduation, one would be entering a degree program, and none of the students would be entering a fellowship program.

All but one of the 82 students graduating in 2004 completed the survey instrument on time. Data for one student were excluded from these analyses as a result of late completion of the exit survey instrument. A total of 9 of 81 students (11%) indicated they would be entering residencies, 2 would be entering graduate degree programs, and none would be entering a fellowship program.

Review of the comments provided by 2003 graduates indicated that 18 of 23 (78%) students entered pharmacy practice residencies, while 5 of 23 (22%) chose specialty residencies. Residency sites included government facilities (eg, Indian Health Service, Veterans Affairs Medical Centers) hospitals and university-affiliated medical centers, and health care systems such as Kaiser Permanente. Seven of the 9 graduates entering residency programs in 2004 chose pharmacy practice residencies (78%), and 2 of 9 (22%) chose specialty residencies.

2003 Graduates

For the 2003 graduating class, only race (grouped as "white" or "non-white") was significantly associated with pursuit of postgraduate residency training ($p = 0.01$, chi-square test). Non-white students were less likely to enter a residency program than white students (OR = 0.24, 95% CI 0.08, 0.76). Responses to the general knowledge questions and the overall program evaluation were not significantly different between students who did and did not enter residencies upon graduation (data not shown). No significant differences were identified for survey items pertaining to general abilities and attributes or activities after graduation (data not shown).

Reasons for pursuing residencies included improving skills and knowledge levels ($n = 15$); improving overall

career options or increasing competitiveness in the job market ($n = 3$); or gaining qualifications for specialty practice in a specific area such as pediatrics or oncology ($n = 7$). Two students did not provide information on reasons for choosing to enter a residency program. The total number of responses ($n = 25$) exceeded the number of students entering residencies ($n = 23$) as a result of multiple reasons being listed by several of the respondents.

2003 and 2004 Graduates: Pooled Results

Demographic characteristics of students from both the 2003 and 2004 classes entering residency programs and those choosing not to pursue residency training are presented in Table 1. As with the 2003 results, only race (grouped as “white” or “non-white”) was statistically significant ($p = 0.05$) with the pooled results from 2003 and 2004 graduates, indicating white students were more likely to enter residency training than non-white students.

Table 2 lists availability of ASHP-accredited pharmacy practice residency positions for each state declared as a “state of future residence” by students not pursuing residency training. In response to questions about anticipated practice settings, 89 students not pursuing residency training indicated they had secured employment. Of those students, 73% indicated they would be working in independent or chain pharmacies or managed care settings, while 17% said they intended to work in a hospital setting. Other practice settings included long-term care, government settings, consulting, or “unspecified.”

2004 Graduates

Graduates completing the 2004 survey instrument also indicated whether specific factors influenced their decisions to either enter or not enter residency programs. Among students entering residency programs, increasing clarity of professional opportunities and career goals, improving general clinical skills, and enhancing job satisfaction were major factors (Table 3). Among students not pursuing residency training, lack of willingness to continue training at residency salary and family obligations were listed as the major factors in their decisions (Table 4).

DISCUSSION

Thirty percent (23 of 76) of students graduating from the inaugural first-professional pharmacy degree PharmD class (2003) and 11% (9 of 81) of students in the second graduating class (2004) decided to pursue postgraduate residency training. The 2-year average of 20% is higher than the estimated national average of 10%-15%. Of the demographic characteristics examined, only

race group (white versus non-white) was significantly associated with the pursuit of postgraduate residency training. No significant differences were found in any other demographic variable, which was unexpected. These results indicate that pursuit of residency training appears to be motivated by personal career and self-improvement goals, and may be independent of most demographic variables such as age, sex, and level of educational debt.

Improving skills and knowledge and improving career options were listed most often as motivating factors by students entering residency programs in 2003. Influential factors cited by 2004 graduates included increasing the clarity of professional opportunities and career goals, improving general clinical skills, and enhancing job satisfaction. These results are consistent with results published previously for students entering residency programs either immediately after graduation or in mid career.^{4,5} Among those students in the 2004 graduating class not pursuing residency training, a lack of willingness to continue training at residency salary levels and family obligations were reasons most often cited for the decision.

ASHP-accredited pharmacy practice residency positions were available in each of the states indicated by students as their state of residence following graduation. The largest discrepancy between number of graduates and number of positions occurred in Colorado, where students outnumbered available residency positions by approximately 8 to 1. When interpreting this result, the reader should consider that lack of willingness to relocate ranked last among reasons not to pursue a residency program, with only 29% of 122 students indicating relocation was a factor in their decision.

Desired practice setting was also examined for students not entering residencies. The majority of students with jobs indicated they would be working in a chain, independent, or managed care setting. The possibility exists that a portion of these students may have been interested in residency training if more community pharmacy-based residency positions were available. As specific data on the availability of and student interest in community pharmacy residencies nationwide are limited, this potential barrier for residency training merits additional study.

Several factors may have contributed to the high number of students entering residencies upon graduation from the UCHSC School of Pharmacy, including the promotion of residency training by clinical faculty members throughout the academic program. Annual programs such as Professional Opportunities Day and the Residency Forum

Table 1. Demographic Characteristics of 2003-2004 Graduates by Residency Status

Variable	Entered a Residency		P value
	Yes n=32	No n=122	
Age* (years, mean)	28.38 (n=29)	29.93 (n=111)	0.14 [†]
Age group [‡]			
<30 y	20	62	0.20 [§]
≥30 y	9	49	
Sex			
Female	24	90	0.89 [§]
Male	8	32	
Previous credit hours			
<90 hrs	5	23	0.783 [§]
90-119 hrs	10	31	
≥120 hrs	17	68	
Any previous degree [‡]			
AA/AS or BA/BS	12	37	0.37 [§]
No	19	85	
GPA (after third year, mean)	3.26 (n=32)	3.11 (n=121)	0.07 [†]
GPA group [‡]			
< 3.0	8	42	0.30 [§]
≥ 3.0	24	79	
Debt group [‡]			
<\$40 K	9	17	0.08 [§]
≥\$40 K	23	99	
Race/ethnicity [‡]			
No response	1	4	
Asian	4	19	0.05 [¶]
Asian/PI	0	8	
Black/AfAm	3	14	
Hispanic	0	16	
Multiracial	0	5	
White	21	49	
Other	3	7	
Race group [‡]			
Non-white	10	69	0.01 [§]
White	21	49	
Native language [‡]			
English	4	18	0.26 [¶]
Other	5	52	

*140 of 154 students provided age information

[†]determined by *t* test

[‡]non-responders excluded from grouped variable analyses

[§]determined by chi-square test

^{||}153 of 154 students provided GPA information

[¶]determined by Fisher's exact test

AA=Associate of Arts, AS=Associate of Science, BA=Bachelor of Arts, BS=Bachelor of Science, PI=Pacific Islander, Af Am=African American

Table 2. ASHP-Accredited Pharmacy Practice Residency Positions in States Designated as Future States of Residence by 2003-2004 Graduates Not Pursuing Residency Training

State of Future Residence	Students Choosing State (n)	Residency Positions* in State (n)
Alabama	1	9
Arizona	5	26
California	12	130
Colorado	81	10
Florida	3	59
Hawaii	1	6
Illinois	2	36
Kansas	1	4
Louisiana	1	6
Nebraska	1	11
Nevada	1	11
Ohio	1	48
South Dakota	1	4
Texas	4	51
West Virginia	1	15
State not specified	6	-
Total	122	

*Number of positions at ASHP-accredited residency sites as listed in the ASHP Online Residency Directory; lower estimates used for sites listing a range of positions; sites not specifying number of positions listed at 1 position per site

Table 3. Factors Affecting Graduates' Decisions to Pursue Residency Training

Rank	n (%)	Factor
1	9 (100)	Increase clarity of professional opportunities and career goals
2	9 (100)	Improve general clinical skills
3	9 (100)	Enhance job satisfaction
4	8 (89)	Desire to specialize
5	7 (78)	Improve competitiveness in job market
6	7 (78)	Interactions with a preceptor
7	6 (67)	Increase professional networking opportunities
8	6 (67)	Interactions with SOP faculty member
9	5 (56)	Enhance global vision of the profession of pharmacy
10	4 (44)	Greater long term earning potential

conducted at the school provide additional opportunities for faculty members and employers to discuss with students the benefits of residency training. Finally, there is strong school-wide encouragement for students to participate in professional pharmacy organizations at the local and national levels, as well as support for students to attend the national meetings of those professional organizations.

Table 4. Factors Affecting Decisions by 2004 Graduates Not Pursuing Residency Training

Rank	n (%)	Factor
1	39(54)	Unwilling to continue training at residency salary
2	36(50)	Family obligations
3	32(44)	Consider debt level too high
4	30(42)	Do not need post graduate training for desired job
5	21(29)	Unwilling to relocate

While the number of students entering residency training from the 2 graduating classes studied here is above the national average, the percentage dropped from 30% in 2003 to 11% in 2004. No changes were made regarding school-level programs promoting residencies from one year to the next. As the data cover only 2 graduating classes, continuing study will be needed to evaluate trends over time.

Limitations of the analyses presented here include the method of data collection regarding reasons for pursuing residency training for 2003 graduates. Students were asked to respond in a free-text field about their motivations, limiting the ability to evaluate the association of specific factors with residency status. Additionally, students from the 2003 graduating class not choosing residency training were not specifically asked about the reasons for their decisions. This limitation was addressed with the changes made for the 2004 survey instrument whereby students were asked to respond yes or no to specific factors that may have had an impact on their decision to pursue or not pursue residency training. These revisions in data collection methods improved the quality of data; however, these results are limited to only one graduating class at this time.

The small sample size and single study site also limit the generalizability of this study. The results of the current study represent important, albeit, preliminary work that will serve as background data for future collaborative efforts investigating residency training. Further, these results underscore the need for making available funding for this type of research from interested stakeholders.

The results of this study identify areas of focus that can be used to promote the value of residency training. The students in this survey indicated an understanding of the value of postgraduate training, and chose to enter residencies regardless of age or educational debt. Residency forums and professional opportunity programs conducted at the school and national levels and through student associations can focus on these incentives to complete residencies and further enhance exposure of students to the opportunities for residency training.

CONCLUSIONS

The study presented here demonstrates that the desire to improve skills and knowledge and improve job competitiveness remain motivating forces for students to pursue postgraduate residency training. These results are consistent with and support the rationale presented by ASHP for pursuit of postgraduate residency training: improved competitiveness in job markets; increased professional networking opportunities; increased clarity of professional opportunities and career goals through exposure to a variety of practice settings; and enhanced vision of the profession of pharmacy through awareness of the range of practice sites. Continued research is needed to identify motivating factors that can be fostered and perceived barriers that can be addressed and overcome in order to continue to promote residency training as a professional norm.

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