

INSTRUCTIONAL DESIGN AND ASSESSMENT

Impact of a Lecture on Pharmacy Students' Interests in and Perceived Barriers to Residency Training

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Objective. To assess whether providing a short informative lecture regarding pharmacy residencies has an impact on student interest in residencies; to determine whether internship experience influences the decision to pursue residencies; and to identify barriers to pursuing residency training.

Methods. Three classes (N=235) from 2 schools of pharmacy were surveyed regarding internship experience and future plans. A lecture on pharmacy residencies was then presented to the students, immediately followed by a second survey to determine whether this information affected their interest in residency training.

Results. Following the lecture, the percentage of students considering a residency increased by 9.4% ($p=0.07$). Previous completion of a hospital internship was a positive predictor ($p=0.01$) of interest in pursuing a residency, while previous completion of a community internship was a negative one ($p=0.034$). The most commonly reported barriers were perceived availability of a job upon graduation (58.1%), financial obligations (56.6%), feeling "burned out" on school (51.2%), and lack of interest (48.8%).

Conclusion. Providing information on residencies to pharmacy students resulted in an increase in the percent of students interested in pursuing a residency ($p = 0.07$). Students with hospital internships may be more likely to pursue a residency. The most common barriers to pursuing a residency were identified.

Keywords: residency, pharmacy students, postgraduate training

INTRODUCTION

A pharmacy residency is an organized, directed, postgraduate training program in a defined area of pharmacy practice.¹ Residency programs are designed to accelerate the professional development of pharmacists to attain the skills necessary to perform as expert clinicians. If a goal of the profession is to provide rational and safe use of medications, then residency training as a "bridge between theory and practice" can prepare pharmacists to achieve this.²

Because residency training is an important contributor to professional development, it is worthwhile to look at the number of graduating students pursuing residencies. The American Society of Health-System Pharmacists (ASHP) estimates that 15% of students complete residency training after graduation from pharmacy school.³ The *ASHP 2003 Communiqué* noted that 21% more students submitted rank order lists in 2003 for programs participating in the National Matching Program than in 2002.⁴ Even with this increase, a major-

ity of graduating students are opting not to pursue residency training. Therefore, examining the factors influencing the pursuit of postgraduate residency training is worthwhile.

As part of a study by Knapp et al,⁵ senior students from the University of the Pacific (years 1993-1994) were surveyed to determine interactions with pharmacy residents, plans for residency training, and reasons for not pursuing residencies. The survey by Bucci et al⁶ of representatives (not students) from 65 pharmacy schools and 723 residents/fellows in September 1993 identified motivating factors and barriers for students pursuing residency training. The surveys performed by Knapp et al⁵ and Bucci et al⁶ were comprehensive and provided important information regarding factors that influenced the pursuit of postgraduate training.

This study expanded on the efforts of these authors and updated information in the era when the PharmD is exclusively the first professional degree. The primary objective of this study was to assess whether providing one short, informative lecture to students prior to the final year of pharmacy school had an impact on students' interest in residency training. This study also determined whether internship experience played a role in students'

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decisions to pursue residency training and determined the barriers to pursuing postgraduate residency training as pharmacy students perceived them.

The primary author selected this as her residency project because she wanted to help students become familiar with residency programs.

METHODS

Permission from the appropriate personnel at the University of Pittsburgh (Pitt) School of Pharmacy and the Lake Erie College of Osteopathic Medicine (LECOM) School of Pharmacy was obtained in the fall of 2002. The study was determined to be exempt from review by an investigational review board.

Two survey instruments (pre- and post-lecture; 12 questions each) were prepared in the fall of 2002. Survey instrument items included questions on basic demographic information, previous internship experience (defined as hours worked in a pharmacy to meet state board of pharmacy requirements), sources of other information regarding residency training, plans to pursue a residency, and the 3 most important reasons for or barriers to pursuing residency training from a list of identified possibilities. Students had the opportunity to add other items to this list. Residency preceptors from the Erie Veterans Affairs Medical Center reviewed all questions on the survey instruments for clarity. A brief (15-20 minute) lecture was prepared and presented by a pharmacy resident along with a corresponding handout for the students. *PowerPoint* slides were used for the presentation. The main topics covered by the lecture were definitions of residency and accreditation; the history of residency training; general residency information (number of existing programs, annual range of stipend, benefits); types of residencies available, including specialty residencies; residency experiences; benefits of residency training; and the application process. (Copies of the survey instruments as well as an outline of the lecture content can be obtained from the corresponding author.)

Arrangements to speak with the first-professional year students at LECOM (this was the only class available at the time because LECOM was a new pharmacy school) and the first- and third-professional year students at the University of Pittsburgh in early 2003 were made. The 3 classes were surveyed on separate occasions. A pre-lecture hardcopy survey instrument was distributed to all students, completed, and then collected. When all survey instruments were returned, a 15- to 20-minute lecture on residency training was given. Following the lecture, students were permitted to ask questions. At this time, (immediately following the lecture and question-

and-answer session), the post-lecture survey instrument was distributed, completed, and collected prior to the end of the class session. Students were asked but not required to complete the anonymous pre- and post-survey instruments as described. Assuring the students of anonymity precluded a within-subjects study design.

The effect of the lecture on residency interest was analyzed using a Fisher's exact test. Logistic regression was then used to identify independent variables predictive of residency interest. These included gender, age group, degree, or career prior to pharmacy school, and location of internship (ie, hospital, community, work experience, etc).

RESULTS

A total of 235 students were surveyed from the University of Pittsburgh and LECOM Schools of Pharmacy. The numbers of pre- and post-lecture survey instruments collected respectively for each class were 66 and 67 for the third-professional year (P3) students at Pitt, 91 and 91 for the first-professional year (P1) students at Pitt, and 78 and 77 for the P1 students at LECOM School of pharmacy. The overall response rate was 99.6%.

Baseline characteristics of the surveyed students are shown in Table 1. The majority of the students (74.9%) were between the ages of 18 and 24 years, although the age distribution among the LECOM students was more diverse than that for the University of Pittsburgh students. For most of the students (64.3%), the PharmD was their first degree, and 83% had not had a previous career. Internship experience in general was more common in the P3 students. At the time the survey instruments were administered, 39% of the University of Pittsburgh P1 students and 21% of the LECOM P1 students did not have internship experience.

According to results from the pre-lecture survey instrument, 34% of the 235 students would consider pursuing residency training (Table 2). Following the residency lecture, the percentage of students considering residency training increased to 43.4%, a difference of 9.4% ($p=0.07$). The breakdown of each class is illustrated in Figure 1. More P1 students (Pitt and LECOM) were affected by the residency lecture than P3 students. Overall, 24.3% of students stated that the residency lecture affected their decision to pursue residency training; 5% for the Pitt P3 students, 25% for the Pitt P1 students, and 40% for the LECOM students.

With regard to internship experience (hours required by the state board of pharmacy), 58.6% of students with hospital internship experience planned to pursue residency training, compared to 41.3% and 50% of students

Table 1. Demographic Data of Pharmacy Students Completing a Pre-Lecture Survey Instrument Concerning Attitudes Toward Completing a Residency

	Pitt P3 N=66	Pitt P1 N=91	LECOM N=78	Total N=235
Sex				
Male	26 (39)	26 (29)	32 (41)	84 (36)
Female	40 (61)	65 (71)	46 (59)	151 (64)
Age				
18-24	58 (88)	80 (88)	38 (49)	176 (75)
25-34	7 (11)	9 (10)	29 (37)	45 (19)
35-44	1 (2)	2 (2)	7 (9)	10 (4)
45-54	0	0	4 (5)	4 (2)
>54	0	0	0	0
PharmD 1st degree				
Yes	55 (83)	72 (79)	24 (31)	151 (64)
No	11 (17)	19 (21)	54 (69)	84 (36)
Previous Career				
Yes	5 (8)	6 (7)	29 (37)	40 (17)
No	61 (92)	85 (93)	49 (63)	195 (83)
Internship Experience				
Community	55 (83)	43 (47)	50 (64)	148 (63)
Hospital	26 (39)	15 (17)	15 (19)	56 (24)
Research	6 (9)	1 (1)	1 (1)	8 (3)
Other	6 (9)	1 (1)	2 (3)	9 (4)
Unknown*	3 (5)	1 (1)	1 (1)	7 (3)
No experience	0	35 (38.5)	16 (20.5)	51 (21.7)

*Students did not respond to the question

with community and research experience, respectively. Hospital internship experience was a positive predictor of residency interest ($\beta=0.632, p=0.001$), while community internship experience was associated with less interest ($\beta=-0.391, p=0.034$). Other variables such as gender, age category, and prior degree or career exerted no significant effect on interest in pursuing residency.

The most common reasons for students planning to pursue residency training were to enhance their existing knowledge base (85.3%), to improve their self-confidence (43.1%), to obtain a competitive advantage in the job market (58.8%), and believing that completing a residency is necessary/valuable based on career plans (53.9%). The most common barriers to pursuing residency training were perception of availability of a job upon graduation (58.1%), financial obligations (56.6%), feeling “burned out” on school (51.2%), and not being interested in doing a residency (48.8%). These were the most common barriers across all 3 classes; however, an additional barrier of family obligation was also listed by a majority of the LECOM students (45%). Feeling “burned out” on school was most frequently identified by the Pitt P1 students (63%) and least frequently identi-

fied by the LECOM P1 students (37%). Financial obligations were more common among the Pitt P3 students (62%) and the LECOM P1 students (58%). The majority of students (P1 and P3) from the University of Pittsburgh (55% and 55%) identified “no interest in pursuing residency” as a barrier to pursuing residency compared to 34% of the LECOM students.

DISCUSSION

The entry of students into the new program at LECOM created an opportunity to look at the perceptions of a student population that may differ from the average. The first LECOM class had 78 students, with 29 having previous careers. The program at LECOM is an accelerated schedule to be completed in 3 years through year-round scheduling as opposed to the typical 4-year program. For this reason, students from the University of Pittsburgh were also included in the study. The demographic data does show that LECOM students may be older and have more previous education and non-pharmacy work experience.

Only 1 hour was available to provide the information regarding residencies and collect the data. The data were

Table 2. Results of a Post-Lecture Survey of Pharmacy Students Concerning Their Attitudes Toward Completing a Residency

	Student Responses	
	Pre-survey N=235	Post-survey N=235
Consider residency?		
Yes	80 (34)	102 (43.4)
No	144 (61.3)	129 (54.9)
Unknown (student failed to answer)	11 (4.7)	4 (1.7)
Reasons for considering residency if answered "yes" to above.	N=80	N=102
Desire to enhance existing knowledge base	68 (85)	87 (85.3)
Improve self-confidence	35 (43.8)	44 (43.1)
Competitive advantage in job market	41 (51.3)	60 (58.8)
Believe residency is necessary/valuable based on career plans	50 (62.5)	55 (53.9)
Networking opportunities	14 (17.5)	25 (24.5)
Faculty/school of pharmacy stressing importance	10 (12.5)	8 (7.8)
Talking to other students, residents, non-faculty pharmacists	16 (20)	11 (10.8)
Other	0	0
Barriers to pursuing residency training if answered "no" to above.	N=142*	N=129
Job available upon graduation	88 (62)	75 (58.1)
Financial obligations	81 (57)	73 (56.6)
Family obligations	32 (22.5)	27 (20.9)
Location/geographic constraints	11 (7.7)	11 (8.5)
Burn out with school	75 (52.8)	66 (51.2)
Believe yourself to be unqualified/afraid of competition	6 (4.2)	6 (4.7)
Lack of information on residency training/application procedures	12 (8.5)	3 (2.3)
Not interested in doing residency	57 (40.1)	63 (48.8)
Do not believe a residency is necessary/valuable based on career plans	35 (24.6)	29 (22.5)
Do not feel residency is necessary because will graduate with PharmD	12 (8.5)	14 (10.9)
Plan to do a residency later	8 (5.6)	4 (3.1)
Other	4 (2.8)	6 (4.7)
Did lecture clarify what residency training involves as well as advantages?		N=235
Yes	NA	228 (97)
No	NA	7 (3)
Did lecture affect whether or not you plan on pursuing a residency?		
Yes	NA	57 (24.3)
No	NA	177 (75.3)
Unsure	NA	1 (0.4)

* Two students who answered "no" to pursuing a residency did not identify barriers.

collected at the time of the lecture to improve the potential response rate. Therefore, the lecture was limited to 15-20 minutes, highlighting the important points. Individuals needing more information could follow up with the College at a later time. An excellent response rate was achieved. One pre-lecture and one post-lecture survey instrument were not returned. The reason for this was not clear, but students' participation was voluntary. The excellent response rate can be partly attributed to the administration of the survey instruments during a class period and the collection before the students left the classroom. The presentation by a pharmacy resident who could relate to the students on their level also may have

been a contributing factor. When the response rate is lower, as was the case in the other studies in the literature, the possibility that a selection bias existed should be considered.

Based on our survey results, the residency lecture did influence some students with regard to desire to pursue residency training. Though the number did not reach statistical significance, approximately 10% more students stated they would consider residency training following the lecture and 24.3% stated that the lecture affected their decision. Interestingly, the lecture was found to influence those students at an earlier point in their education (Pitt P1 and LECOM P1) more than those

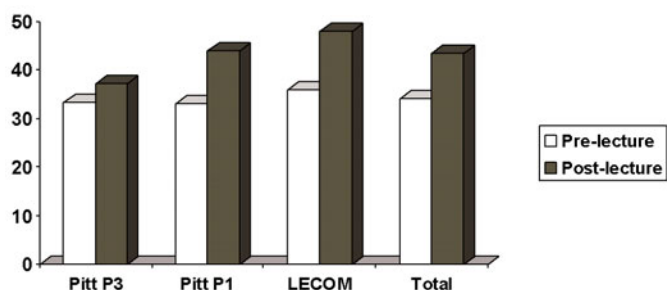


Figure 1. Percentage of students considering residency.

in the later years of the pharmacy curriculum (Pitt P3). Whether all of the P1 students who expressed interest in pursuing a residency will actually pursue residency training remains to be determined since that decision was still 2 to 3 years in the future for those students at the time this study was completed. However, the level of interest in residency training increased for the P1 students as a result of having more information on this topic.

Bucci and Teat⁷ described a 3-hour residency forum at Campbell University at the beginning of the fourth-professional year. They reported that 52% of the students indicated that the forum did influence their decision to pursue residency training. Thirty-three percent of the charter class and 14% of the second class completed residencies. Nineteen percent of the third class were scheduled to do residencies at the time of their report. Seventy-three percent of the students indicated that the information was provided at a useful time. However, some students suggested that it would be beneficial to have the program at the end of the third-professional year. The results of our study also suggested that earlier exposure to information about residencies is important. Overall, the most common reasons for and barriers to pursuing residency paralleled those identified by earlier studies.^{5,6} Differences identified among the classes with regard to this outcome are likely attributable in part to the varying compositions of each of the classes. For instance, the P1 students from LECOM also identified family obligations as a major barrier to pursuing residency, while the Pitt students did not. This is understandable given that more LECOM students than University of Pittsburgh students were over 24 years of age or entering their second career.

Another interesting difference between the classes was that fewer students from LECOM identified “not interested in pursuing residency” as a barrier compared to both P1 and P3 students from the University of Pittsburgh. The LECOM pharmacy students surveyed were from the first class enrolled in a new, accelerated, year-round program. Perhaps this population was attracted to innovative approaches to education and therefore more likely to be interested in pursuing a unique post-

graduate experience in the form of a residency. Since pharmacy education in Erie had not been available prior to this time, the class may have been motivated by opportunity and recognized the value and took advantage of training.

McNulty et al⁸ did a survey of senior pharmacy students to glean information about positions and training sought after graduation. Reasons noted for not pursuing a residency included lack of money, belief that their formal education was complete, uncertain of professional goals, and intent to pursue a residency at some other time. However, 71% of his sample received a BS degree in pharmacy prior to pursuing the PharmD degree and 50% of them had an average of 3 years' experience as a pharmacist.

As part of a study by Knapp et al, senior students from the University of the Pacific (years 1993-1994) were surveyed to determine interactions with pharmacy residents, plans for residency training, and reasons for not pursuing residency.⁵ Overall, the authors found that having contact with a resident did not appear to correlate with students pursuing a residency, but that having at least one rotation in which a resident served as a preceptor was significantly associated with the desire or plans to pursue residency training. The most common reasons for not pursuing a residency were financial or family obligations, feeling “burned out” on school, no desire for residency activities, and plans to do a residency later. These were similar to those identified in the current study.

Bucci et al surveyed representatives (not students) from 65 pharmacy schools and 723 residents/fellows in September 1993 in an effort to ascertain among other outcomes, motivating factors and barriers for students in pursuing residency training.⁶ The authors found that important motivating factors for pursuing a residency were the pursuit of knowledge and experience and a desire for specialized training. Financial responsibilities and availability of a job upon graduation were found to be common barriers to entering residency training.

Financial obligations were also a barrier in our study. This might be more common at a privately vs. a publicly funded school. However, financial barriers were noted more frequently by P3 Pitt and LECOM P1 students. Possible explanations for the apparent discrepancy might be that P3 students had more years of accumulated debt and LECOM P1 students had a higher frequency of family obligations, were older, and may have had more financial responsibilities related to these factors, in addition to the cost of attending a private school.

Unterwagner et al⁹ called for more effective mentoring by faculty members because results of their survey showed that neither current nor former community prac-

tice residents indicated that a faculty member had advised them to pursue residency training. Gourley et al¹⁰ emphasized the importance of students being aware of residency opportunities. They suggested ongoing explanations and exposure to residency programs through faculty members and residents serving as teaching assistants. Gourley and colleagues also noted the contribution that residents and fellows make to faculty research productivity. They believed that colleges can and should be more supportive, both philosophically and financially, of postgraduate training programs. Both the University of Pittsburgh and LECOM faculty members were supportive of this study. Perhaps their support reflects their understanding of the need to provide the students with information as noted by Unterwagner⁹ and Gourley.¹⁰

Because the level of interest in residency training increased for P1 students as a result of having more information, it may be worthwhile for pharmaceutical educators and practitioners to ensure that detailed residency information is presented to all students, not just to those in the later years of their education.

Of particular importance for pharmaceutical educators, 10.9% of the surveyed students did not feel residency was necessary because they will graduate with a PharmD degree. Surprisingly, this percentage increased between the pre- and post-lecture survey instruments for all classes, despite presentation of the opposite message during the lecture. Further education for students is warranted regarding this issue, given that a vast majority of clinical pharmacist positions identify residency training as a prerequisite for consideration.

With regard to internship experience, students with hospital internship experience were more likely to show an interest in pursuing a residency, while those students with community internship experience were less likely to show an interest in pursuing a residency. A plausible explanation is that pharmacy interns in hospitals may have a greater exposure to the role of the clinical pharmacist compared to those completing an internship in the community setting. Furthermore, this may also reflect experience in a more academic environment compared to a community setting, especially if the internship was completed in a teaching hospital.

A formal survey of the backgrounds of faculty members and preceptors was not undertaken as part of this study, but residency and/or fellowship training is generally required for pharmacy practice faculty members and preceptors. At the time of the survey, pharmacy students' exposure to faculty members/preceptors was primarily in the classroom. Exposure to preceptors/clinicians in practice sites was minimal since students were not yet in their

advanced practice rotations. P3 students at the University of Pittsburgh had completed their introductory and intermediate professional practice experiences, while P1 students from both the University of Pittsburgh and LECOM had only their classroom and work experiences on which to base their residency decisions at the time of this study.

Opportunities for exposure to residents and residency programs may have been different among the classes studied. The University of Pittsburgh had 6 university-sponsored pharmacy residency programs at the time of this study. LECOM did not have any school-sponsored residencies at the time of this study. However, there were 3 residency programs in the local area with a total of 5 residency positions. It was not possible to determine the general exposure to the residents or familiarity with programs, but the responses on the survey instruments did show that information was generally not obtained from residents.

There are several limitations to this study. First, only 2 schools of pharmacy (of more than 80 accredited programs nationwide) were surveyed. This limits the ability to extrapolate the findings to other pharmacy curriculums. A further limitation of this study is the heterogeneous nature of the sample due to differences between the 3 classes that compose the sample. However, this is also the reason that these colleges and classes were chosen for the study. The major differences between students in the 2 classes at the University of Pittsburgh were the differences in age and amount of education. There were also dissimilarities between the University of Pittsburgh and LECOM programs. The University of Pittsburgh had a publicly funded traditional 4-year program leading to the PharmD, while LECOM offered a private, year-round, 3-year program leading to the PharmD; the University of Pittsburgh's School of Pharmacy was originally organized in 1878, while LECOM's school of pharmacy enrolled its first class in the fall of 2002. Furthermore, LECOM's student population was more diverse with regard to age, history of prior degree, and/or previous career experience compared to the students at the University of Pittsburgh.

An additional limitation to this study is that students were given the post-lecture survey instrument immediately after the lecture; thus, they were not given time to contemplate the information provided. Furthermore, the pre-lecture and post-lecture survey instruments were not matched, making it impossible to determine whether a particular student's response changed from the first to the second survey instrument.

Despite these limitations, this study is relevant for pharmaceutical educators, practitioners, and residency

program directors. It updates and expands upon information already available in the literature. Providing detailed residency information to students earlier in the course of their pharmacy education may increase their interest in and subsequent decision to pursue residency training. The study demonstrated increased interest in residencies with the provision of information and determined current reasons students plan to complete residency training and barriers to pursuing this training. Two of the most common barriers identified were perceived availability of a job upon graduation and financial constraints. When informing students about residency training, educators and program directors might address these barriers by emphasizing that while residency salaries are lower than those for practicing pharmacists, the investment of 1 or more years of additional training is likely to result in more opportunities for career advancement. Information on loan deferment should also be provided (it was not included in the lecture presented for this study). A follow-up study is needed to determine the impact on actual pursuit of residency training.

CONCLUSIONS

Providing detailed information on residency training resulted in an increase in the number of students interested in pursuing a residency. The information provided was more likely to influence students when presented earlier in their pharmacy education compared to later in their education. Students with hospital internship experience may be more likely to pursue residency training than those students with community internship experience. The most common barriers identified for pursuing residency training were the perception of availability of a job upon graduation, financial obligations, feeling "burned out" on school, and not interested in doing a residency.

This study also corroborates the comments of other authors who noted that it is important for schools to provide information regarding advanced training opportunities and emphasize the impact of providing this education early in pharmacy school programs.

Follow-up studies will be needed to determine the impact of the information regarding residencies on decisions that students actually make.

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REFERENCES

1. Definitions of pharmacy residencies and fellowships. *Am J Hosp Pharm.* 1987;44:1142-4.
2. Smith JE. The future of postgraduate pharmacy training programs. *Am J Hosp Pharm.* 1990; 47:98-105.
3. The American Society of Health-System Pharmacists. Residency and Accreditation Information. Available at: <http://www.ashp.org/rtp/index.cfm?cfid=13696138&CFTOKEN=53659904>. Accessed June 3, 2005.
4. The Communique. Accreditation Services Division, American Society of Health-System Pharmacists. May 2003; 5(1).
5. Knapp KK, Carr-Lopez SM. Influence of pharmacy residents on pharmacy students' pursuit of residency training. *Am J Health-Syst Pharm.* 1995; 52:1552-4.
6. Bucci KK, Knapp KK, Ohri LK, et al. Factors motivating pharmacy students to pursue residency and fellowship training. *Am J Health-Syst Pharm.* 1995; 52:2696-701.
7. Bucci KK, Teat DW. Promoting postgraduate programs in a residency forum. *Am J Hosp Pharm.* 1992; 49:1396.
8. McNulty RM, Mirtallo JM; Postgraduate academic desires: Senior doctor of pharmacy students. *Drug Intell Clin Pharm.* 1988; 22:422-4.
9. Unterwagner WL, Zeolla MM, Burns AL. Training experiences of current and former community pharmacy residents, 1986-2000. *J Am Pharm Assoc.* 2003;43:201-6.
10. Gourley DR, Solomon, DJ, Brown RO; Integrating postgraduate pharmacy training programs into colleges of pharmacy. *Pharm Pract Manage Q.* 1995;15:20-9.