

INSTRUCTIONAL DESIGN AND ASSESSMENT

Impact of a Residency Interest Group on Students Applying for Residency

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Objective. To determine the impact of a faculty-directed, residency interest group on the knowledge, confidence, and preparedness about residency-related topics of third-year (P3) and fourth-year (P4) pharmacy students.

Design. Faculty members implemented residency interest group sessions on residency and career preparation for P3 and P4 students. Group meetings consisted of four 2- to 3-hour sessions that covered topics such as residency timeline and resources, letter of intent and CV development, proper interview techniques, and navigating the midyear clinical meeting. Residency directors throughout Mississippi, current pharmacy residents, P3 and P4 students, and other faculty members were invited to attend these sessions.

Assessment. Surveys were administered prior to and after completion of the interest group sessions. Students who attended the sessions demonstrated increased knowledge, confidence, and preparedness on residency-related topics. However, non-attendees also demonstrated increased knowledge, confidence, and preparedness from baseline.

Conclusion. The majority of students who accepted a residency position had attended at least 1 residency interest group session, suggesting this program had a positive influence.

Keywords: residency, postgraduate training, career preparation

INTRODUCTION

The American College of Clinical Pharmacy supports requiring residency training as a prerequisite to direct patient care by the year 2020.¹ The American Society of Health-System Pharmacists (ASHP) has a goal that 90% of new pharmacists entering the healthcare system will have completed an accredited residency by the year 2015.² Benefits of completing a residency include enhanced preparation for practice, additional employment opportunities, and increased exposure to a variety of practice situations.³ Students have also realized the benefits of pursuing a residency, which include the expansion of knowledge and experience to better prepare them for a continually evolving career.⁴ As a result, the competitiveness in seeking a pharmacy residency continues to increase. In 2013, 4,480 applicants participated in the ASHP Resident Matching Program and 2,866 applicants matched with programs.⁵ This was a significant increase from 2009 when 2,804 applicants participated and 1,860 applicants matched with programs.⁶

The 2013 educational outcomes and domains established by the Center for the Advancement of Pharmacy Education describe the desired knowledge, skills, and attitudes of graduates from a doctor of pharmacy (PharmD) program.⁷ Domain 4 centers on personal and professional development with emphasis on students becoming self-aware leaders, innovators, and professionals. In the Accreditation Council for Pharmacy Education's Accreditation Standards and Guidelines for the Professional Program in Pharmacy Leading to the Doctor of Pharmacy Degree, standard 6 states that colleges or schools of pharmacy should support the development and enhancement of postgraduate accredited residency and fellowship training.⁸

The 7-year PharmD program at The University of Mississippi School of Pharmacy consists of 3 years of preprofessional coursework; 2 years of professional coursework on the Oxford, Mississippi, campus; and 2 years of additional coursework on the University of Mississippi Medical Center campus in Jackson, Mississippi.

The University of Mississippi School of Pharmacy and local professional organizations offer various student programming to prepare P3 and P4 students for residency programs. The local Student Society of Health-System Pharmacists chapter hosts an annual regional residency

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showcase in the fall that is mandatory for all P3 students and optional for P4 students. More than 20 pharmacy programs from the Southeastern United States participate each year. The showcase consists of approximately 3 hours of classroom and student engagement activities, followed by a 2-hour showcase to advertise residency programs and speak one-on-one with residency directors and current residents. Fourth-year students also attend a mandatory career day assembly in the fall. At this assembly, University of Mississippi Career Center faculty members discuss interview preparation, including proper interview attire as well as common general and behavioral interview questions. Faculty volunteers offer an optional curriculum vitae (CV) review service, where students can submit a CV for review and feedback from at least 2 faculty members. A voluntary mock interview day is also offered prior to the ASHP Midyear Clinical Meeting. During these practice interviews, faculty members review CV tips and interview skills, and then conduct 4 to 5 “speed” rounds of mock interviews (5-minute interview followed by 5-minute critique of interview). Finally, at the annual Mississippi Society of Health-System Pharmacists meeting, students have an opportunity to participate in a 2-hour postgraduate pharmacy residency training panel discussion with statewide residency directors and current residents. Outside of these organized events, The University of Mississippi School of Pharmacy has not offered any formal curriculum solely for residency training preparation, and many students have expressed interest in more focused discussions. Similarly, promotion of residency programs in many colleges and schools of pharmacy includes presentations, online tools, provision of reading materials, and other seminars.⁹

Given the competitive nature of matching with a residency program and students’ increasing desire to pursue additional training, pharmacy students are eager to learn as much as possible about the process early in the curriculum. In response, a residency interest group was formed at the University of Mississippi Medical Center campus in Jackson, Mississippi, to increase students’ knowledge, confidence, and preparedness about residency-related topics. This study describes the implementation of the group at The University of Mississippi School of Pharmacy and provides evidence for improved knowledge and confidence regarding residency-related topics among P3 and P4 students.

DESIGN

The primary objective of this study was to determine the impact of a faculty-directed, residency-specific interest group on student knowledge, confidence, and preparedness about residency-related topics. All students

completing their P3 year and interested students in their P4 year were given a presurvey prior to the implementation of any residency interest group sessions at the beginning of the 2011-2012 academic year. After administration of a presurvey, the residency interest group was implemented by faculty members at The University of Mississippi School of Pharmacy. Residency directors throughout Mississippi, current pharmacy residents, P3 and P4 students, and other faculty members were invited to attend these sessions. Students were given an opportunity to sign up for a resident mentor at the first session, and these groupings were paired based on resident or area of interest. Group meetings consisted of four 2- to 3-hour sessions. Each session was composed of faculty presentations on the topic of the day, discussion from current program directors or residents, and a question and answer session in which students had an opportunity to ask questions of any of the attendees present. Three sessions were held prior to the 2011 ASHP midyear clinical meeting and 1 session was held in the spring of 2012 prior to the match. Sessions included topics on career development and pursuit of a residency (Table 1).

EVALUATION AND ASSESSMENT

The presurvey instrument administered before the residency interest group began included items to gather demographic data and information related to career interests and development, as well as open-ended questions on what students hoped to gain from the group. After completion of the residency interest group sessions, P3 and P4 students were given a postsurvey (at the completion of the 2011-2012 academic year). The postsurvey instrument consisted of the same presurvey questions plus questions on participation in the ASHP match, the midyear clinical meeting, and postmatch process, as well as reflection on the residency interest group sessions.

Knowledge of residency-related topics was evaluated with a 3-question assessment on both the presurvey and postsurvey instruments. There were also questions related to CV preparation, interview attire, and the ASHP match process. Residency-related confidence questions on CV, letter of intent, interview, resource retrieval, and residency application were included on both surveys. Confidence was assessed using a 5-point Likert scale with 5 indicating a higher level of confidence. Residency-related preparedness questions on postgraduate options, letters of recommendation, residency showcase, personnel placement service (PPS), MCM, and the ASHP match also were included on pre- and postsurveys. Preparedness was assessed using a 5-point Likert scale with 5 indicating a higher level of preparedness. Individual Likert-type questions were also evaluated.

Table 1. Residency Interest Group Meetings

Session	Month	Agenda
1	September	Overview of the residency interest group, residency program, residency resources, residency timeline, introduction of residents, and overview of resident mentor-student mentee program.
2	October	Discuss local residency showcase and residency resources (letter of intent, letters of recommendation, business cards, midyear worksheet), considerations for choosing a residency, and resident mentor-student mentee pairings.
3	November	“All About Midyear” (registration, dress code, shuttle service, continuing education opportunities, student programming, poster session, professionalism, residency showcase), residency interviews (how many and scheduling, questions for residency programs, mock interviews; resident question-and-answer session).
4	February	ASHP match program, the “scramble” process.

Secondary objectives were to compare the number of interest group participants and nonparticipants who attended the midyear clinical meeting, entered the ASHP match, matched with a residency program, and obtained a residency. Residency interest group attendance was recorded using sign-in sheets. Survey instruments were excluded from analysis if there was an unmatchable identifier, the survey instrument was considered significantly incomplete (>50%), or if a student completed a survey more than once. Survey instruments were excluded from the primary outcome analysis if there was not a matched presurvey and postsurvey instrument. The University of Mississippi Institutional Review Board (IRB) approved this study.

Primary outcome data on both confidence and preparedness composite scores (Likert-scale data) were analyzed using a paired *t* test. Significance was confirmed with a Wilcoxon signed rank test. Individual Likert questions (Likert-type data) were compared using a Wilcoxon signed rank test. A paired *t* test also was used to evaluate scores on the mini-knowledge assessment. Demographics and rank data were reported descriptively. StatsDirect, version 2.7.9 (StatsDirect Ltd; Cheshire, United Kingdom) was used for all statistical analyses.

One hundred twenty-nine students completed the presurvey instrument. The mean age of respondents was 24.1±2.9 years and 93 of 129 (72%) respondents were female students. Twenty-two (17%) students reported less than 1 month of pharmacy practice experience, 15 (11.6%) reported 1 to 3 months, 17 (13.1%) reported more than 3 months but less than 6 months, and 75 (58.1%) reported more than 6 months of pharmacy practice experience. The majority of students (65.1%) reported experience in community practice. When asked about possible future career choices, 77 (59.7%) reported that they were interested in community pharmacy, 60 (46.5%) in hospital pharmacy, and 68 (52.7%) in clinical pharmacy. Forty-five (34.9%) reported that they were interested in residency, and 41 (31.8%) reported that they might be interested.

Eighty-nine students completed the postsurvey instrument. Respondents' mean age was 25.3±3.7 years, and 61 of 89 (68.5%) were female. The majority of respondents (71.9%) reported having more than 6 months of pharmacy practice experience, and most of this experience was in community practice (67/89, 75.3%). When asked about possible future career choices, 59 (66.3%) reported that they were interested in community pharmacy, 32 (36.0%) in hospital pharmacy, and 41 (46.1%) in clinical pharmacy. Twenty-six (29.2%) reported that they were interested in residency, and 13 (14.6%) reported that they might be interested in a residency.

On both survey instruments, students were asked what characteristics they valued most when considering a residency program. The top 5 choices are listed in Table 2 (n=157). Other characteristics included distribution of dispensing staff members vs clinical staff members (mean=6.7), presence of a postgraduate year 2 residency at the institution (mean=7.1), opportunity to “moonlight” (mean=7.6), and other (mean=8.2). When electing to write in a characteristic, 90% of responses mentioned that location was of high importance.

Sixty-one matched survey instruments were included in the primary outcome analysis (Table 3, Table 4, and Table 5). Eighty-seven percent of matched survey responses were from the class of 2013, while 13% were from the graduating class of 2012. Of matched respondents, 28 (46%) attended a residency interest group meeting, while 33 (54%) did not. Forty-five of 61 respondents (73.8%) were female (22 attended a residency interest group meeting and 23 did not).

There were 120 survey instruments excluded; 10 had an unmatchable identifier, 12 were significantly incomplete, and 1 was repeated. Twenty-nine survey instruments were excluded from the primary outcome analysis because there was not a matched presurvey and 68 were excluded from the primary outcome analysis because there was not a matched postsurvey.

Table 2. Top Five Most Important Residency Characteristics (n=157 responses)^a

Rank	Characteristic	Mean	Median
1	Fits career goals	1.4	1
2	Jobs at institution available upon completion	4.4	3
3	Number and variety of preceptors	5.0	4
4	Staffing requirements	5.2	4
5	Stability and staff	5.9	5

^a No other characteristics reported a median ≤ 6 .

In the graduating class of 2012 (n=101), 19 students (18.8%) interviewed for a residency position and 30 students attended the midyear clinical meeting. Fifteen (50%) of these students had attended a residency interest group meeting prior to the midyear clinical meeting. Eighteen students (17.8%) entered the match. Thirteen of these students (72.2%) matched with a residency program and 1 scrambled into a position following the match. An additional student obtained a residency position outside the match. Of these 15 students, 12 (80%) attended at least 1 residency interest group meeting.

In the graduating class of 2013 (n=90), 32 students (35.5%) interviewed for a residency position and 31 students attended the midyear clinical meeting. Although residency interest group attendance was not tracked during the 2012-2013 academic year, 12 of these students (38.7%) had attended a residency interest group meeting during their third year of the PharmD program. Thirty-two students (35.5%) entered the ASHP match. Two students accepted residency positions prior to the match, and 1 student withdrew. Twenty-three students (79.3%) matched with a residency program and 1 scrambled into a position following the ASHP match. Of these 24 students, 17 (70.8%) attended at least 1 residency interest group meeting.

Attendance at the residency interest group sessions was recorded to track participation. Each session was attended by residency directors, residency preceptors, and current residents. Session 1 was attended by 25 students, session 2 by 18, session 3 by 18, and session 4 by approximately 25 students. Of those who attended any session, 87.5% filled out at least 1 survey instrument.

DISCUSSION

Despite the increased demand for pharmacy residency training, the literature evaluating the education of

pharmacy students about residency is limited. Our study showed that a formalized program based on residency-related topics improved the knowledge, confidence, and preparedness of students who attended residency interest group meetings. The majority of students who accepted a residency attended at least 1 session, suggesting a positive influence of this program.

Residency interest group attendees had numerically higher baseline knowledge scores vs non-attendees, suggesting that non-attendees have more opportunity overall to improve knowledge because of their lower baseline scores. Structured residency-related interventions earlier in the PharmD curriculum may improve P3 students' baseline knowledge as well as their confidence and preparedness scores.

Confidence in resource retrieval for postgraduate positions improved only with residency interest group attendees, while confidence in writing a letter of intent only improved with non-attendees. Unlike baseline knowledge, non-attendees' confidence in writing a letter of intent and interviewing for postgraduate positions were higher at baseline. Previously existing targeted programs, including interview days for community or hospital positions and required practice experience cover letters, may have influenced the baseline confidence scores in non-attendees.

Residency interest group attendees reported higher preparedness for PPS than did non-attendees. All other measures of preparedness for residency-related activities increased significantly in both groups. This was expected as PPS is typically considered specific to residency-related postgraduate positions. In general, preparedness for residency and postgraduate employment improves with experience in our PharmD program.

In a study by Dunn and colleagues, a survey instrument was distributed to colleges and schools of pharmacy to identify activities implemented to prepare pharmacy students for residencies.⁹ Of the 71 institutions that responded, 22.5% stated that a structured, formal program was offered. The activities most commonly listed within the formal residency preparation programs included presentations, online tools, reading materials, ASHP clinical skills competitions within local chapters, involvement in an IRB-approved research project, certificate programs in medication therapy management and immunization, and elective practice experiences that emphasized knowledge

Table 3. Mini-Knowledge Assessment Stratified by Attendance at Residency Interest Group

Residency Interest Group	Presurvey Mean	Postsurvey Mean	Change	P
Attendees (n=28)	64.3	75.0	↑ 10.7	0.05
Non-attendees (n=33)	52.1	70.8	↑ 18.7	<0.01

Table 4. Confidence Scores Stratified by Residency Interest Group Attendance

Residency Interest Group	Presurvey Mean	Presurvey Median	Postsurvey Mean	Postsurvey Median	P ^a
Attendees (n=28)					
CV	3.7	4.0	4.1	4.0	0.04
Letter of intent	2.8	3.0	3.1	3.0	0.13
Interview	3.2	3.0	3.4	4.0	0.34
Resource Retrieval	3.5	4.0	4.1	4.0	<0.01
Apply for Residency	3.8	4.0	4.0	5.0	0.045
Composite ^b	3.4		3.8		<0.01
Non-attendees (n=33)					
CV	3.3	4.0	3.9	4.0	<0.01
Letter of intent	2.9	3.0	3.3	3.5	<0.01
Interview	3.2	4.0	3.5	4.0	0.31
Resource Retrieval	3.3	3.0	3.7	4.0	0.22
Apply for Residency	2.5	3.0	2.1	2.0	0.13
Composite ^b	3.0		3.3		<0.01

Abbreviations: CV=curriculum vitae.

^a p value for presurvey versus postsurvey means.

^b Change in composite confidence scores from baseline between groups did not differ (p=0.50).

attainment regarding residencies. At The University of Mississippi School of Pharmacy, all students, regardless of whether they attended a residency interest group session, had opportunities to participate in most of these activities.

A study by Machado and colleagues compared an intervention group that received faculty interventions regarding assistance in residency preparation vs a control

group of students who graduated the previous year.¹⁰ The intervention group was given pamphlets and provided postgraduate training dinner programs and a booth at the school's career day. Although faculty-mediated interventions were reported as helpful by students, there was no significant difference between students' plans to enter a residency upon graduation (16% vs 14% for the intervention and control groups, respectively). One explanation was

Table 5. Preparedness^a Scores Stratified by Residency Interest Group Attendance

Residency Interest Group	Presurvey Mean	Presurvey Median	Postsurvey Mean	Postsurvey Median	P ^b
Attendees (n=28)					
PostGraduate Options	3.4	4.0	3.9	4.0	<0.01
LoR Authors	3.0	3.0	3.6	4.0	0.02
Residency Showcase	2.9	2.5	4.0	4.0	<0.01
PPS	2.2	2.0	3.0	3.0	<0.01
MCM	2.3	2.0	3.4	3.0	<0.01
Match	2.6	3.0	3.8	4.0	<0.01
Composite ^c	2.7		3.6		<0.01
Non-attendees (n=33)					
PostGraduate Options	3.3	4.0	4.0	4.0	<0.01
LoR Authors	2.9	3.0	3.6	4.0	<0.01
Residency Showcase	2.3	2.0	3.2	3.0	<0.01
Residency Showcase	2.0	2.0	2.3	2.0	0.15
PPS	2.4	2.0	2.8	3.0	<0.01
MCM			3.1	3.0	<0.01
Match			3.2		<0.01
Composite ^c					<0.01

LoR=letter of recommendation; PPS=Personnel Placement Service; MCM=Midyear Clinical Meeting.

^a Attendees were asked if they felt informed/an understanding/prepared for the items listed.

^b p value for presurvey vs postsurvey means.

^c Change in composite preparedness scores from baseline between groups did not differ (p=0.45).

that because the interventions occurred during the final year of the PharmD program, students already interested in residency programs may have been more likely to attend the interventions. Conversely, faculty interventions were not as likely to influence students who were not already interested in postgraduate training.

A survey was conducted by Jacobs and colleagues before and after a 1-hour seminar on residency training.¹¹ Although the seminar did not significantly increase the percent of students who were considering a residency, the authors noted that students with the following characteristics were more likely to consider a residency: having a grade point average greater than 3.5, having a previous career, being in the first year of a PharmD program, being involved in multiple student organizations, or being office holders. In our study, these specific student factors could have, likewise, affected the results and cannot be ruled out.

Phillips and colleagues developed a 2-credit-hour elective course on postgraduate residency training.¹² A knowledge and confidence survey revealed an increase in scores after completion of the elective course compared to the pre-elective course survey. The percentage of students who planned to complete a postgraduate year 1 residency after graduation also increased. However, because the students were self-assessing their abilities, they may have had the tendency to overestimate their skills in a particular area.

The previous studies identify components that colleges and schools of pharmacy commonly include in residency preparation programs, with no significant difference in student plans to pursue residencies after limited interventions. In contrast, an elective course designed to increase knowledge and confidence in pursuing postgraduate residency training was effective. Our study combined many components that colleges and schools of pharmacy included in such preparation programs. However, all students graduating from The University of Mississippi School of Pharmacy experienced many of these components without participating in the residency interest group. Although the residency interest group intervention consisted of 4 separate sessions with students interested in residencies, previous studies consisting of only a 1-time intervention or limited interventions resulted in no significant change in the number of students interested in pursuing postgraduate residencies. Also, students not attending the residency interest group could have overestimated their abilities, resulting in higher confidence, while students who attended the residency interest group could have underestimated their abilities because of their knowledge of the rigors involved in the process for attaining a residency upon graduation.

Limitations in this study include assessment of knowledge using a 3-question mini-assessment. The com-

posite confidence score for students who did not attend the residency interest group sessions was not significant when using the *t* test but did reach significance when using the Wilcoxon signed rank test. The *t* test would have been the more appropriate test, but the lack of congruence could have resulted from the limited number of questions used in this assessment parameter.

SUMMARY

A formalized program based on residency-related topics was implemented and its impact on knowledge, confidence, and preparedness of P3 and P4 students was evaluated. Residency interest group attendees demonstrated increased knowledge, confidence, and preparedness. However, non-attendees also demonstrated increases in knowledge, confidence, and preparedness from baseline, which may indicate an overestimation of ability for this comparator group. The residency interest group program at the University of Mississippi has been expanded to include more residency topics and events, and has been opened to students in the first and second years of the PharmD program.

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