






RESEARCH ARTICLE

A survey of post-graduate pharmacy residency graduates involved in a team-based research programme: Involvement and confidence in research and scholarship activities

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Abstract

Background: The University of Oklahoma College of Pharmacy (OUCOP) team-based residency research programme was established in 2011 and includes a skill development programme and an individualised research committee. The purpose was to assess the impact of the OUCOP team-based residency research programme on research and scholarship after graduation. **Methods:** Seventy-three residency graduates were issued a 26-item questionnaire to assess their involvement in research and scholarship, employment, and confidence in research and scholarship statements. Descriptive statistics were employed. **Results:** Forty-four (60.3%) graduates responded, with 24 (54.5%) having published at least one residency project. After graduation, 31 (70.5%) participated as an investigator on more than one research project, and 36 (81.8%) published more than one subsequent publication. Twenty (45.5%) respondents were required to precept students and residents on research, but the majority (n=29; 65.9%) mentored a student or resident on more than one research project. Half of the respondents expressed a “very high degree” or “high degree” of confidence in serving as an investigator or mentor of a student/resident on a research project. **Conclusion:** Although not required for their position, half of the former residents were involved in research and scholarship after graduation. The OUCOP team-based research programme aids in the skill development of research and scholarship and confidence in mentoring trainees in research and scholarship.

Introduction

There is an increasing number of residency-trained pharmacists whose advanced skills in clinical care, clinical research, and scholarly activities are essential to improving patient care. The line between research and scholarly activity is difficult to distinguish. Boyer (1990) defines research as part of scholarship and outlines four areas of scholarship, including (1) discovery or traditional research, (2) integration or connection of information across disciplines or within one’s research, (3) application

or translation research, and (4) scholarship of teaching and learning. Kehrer and Svensson (2012) took this definition one step further and noted that scholarship includes three components, i.e., innovation, peer review, and communication. The current American Society of Health-System Pharmacists (ASHP) competency areas do foster some aspects of scholarship skills by requiring postgraduate year one (PGY1) and postgraduate year two (PGY2) pharmacy residents to conduct a practice-based research and/or quality improvement project, present their findings via a platform presentation, and prepare a final manuscript that would be suitable for publication

(American Society of Health-System Pharmacists, 2023a; American Society of Health-System Pharmacists, 2023b). These standards focus on innovation through a new project, communication of findings via oral presentation, and the “development” of a manuscript. However, aspects missing from these requirements include submitting the manuscript for peer review and developing other types of scholarship, such as review articles or case reports. There is variability within residency programmes regarding the requirement to submit residency projects for peer review, as evidenced by the residency publication rates ranging from 2-86% (O'Dell & Shah, 2012; Olson *et al.*, 2012; Irwin *et al.*, 2013; Olson *et al.*, 2015; Cabanas, Bridgeman & Hermes-DeSantis, 2018; Morbitzer *et al.*, 2019; Weathers, Ercek & Unni, 2019; Miller *et al.*, 2021; Bennett *et al.*, 2022; Swan *et al.*, 2022).

Potential barriers to scholarship and research training during the residency year include inadequate mentorship, inadequate protected time for projects, and the one-year timeframe of the residency programme itself (O'Dell & Shah, 2012; Irwin *et al.*, 2013; Weathers, Ercek & Unni, 2019). In addition, there also may be a perceived lack of support from the pharmacy department and/or institution, and the role of pharmacy residents and clinical specialists in research and scholarship may not be valued. Hence, although clinical specialists could significantly contribute to the generation of new knowledge, they may not have the time, incentive, or proper training and resources to devote to scholarship and research activities, resulting in missed opportunities for publication. Previous studies (Miller *et al.*, 2021; Bennett *et al.*, 2022) have shown that graduates who took a faculty position were more likely to have subsequent publications after residency graduates than those who took a clinical specialist position. A few different strategies have been implemented to provide development of research and scholarship skills for residents, including the flipped-research model, increased research skill development sessions, multi-site resident research projects, dedicated research time, and the establishment of research committees (Dagam *et al.*, 2017; Shafeeq *et al.*, 2019; Adeosun & Haines, 2020; Frederick *et al.*, 2020; Darko *et al.*, 2021; Johnson *et al.*, 2021; Morbitzer *et al.*, 2021; Bennett *et al.*, 2022; Olson *et al.*, 2015; Weeda *et al.*, 2021; Weeda & Weant, 2021).

The University of Oklahoma College of Pharmacy (OUCOP) developed a team-based research programme to address these concerns. An in-depth summary of this programme has been previously published (Bennett *et al.*, 2022). This programme was intended to improve the level of mentorship of residents and foster their growth in research and scholarship with the objective of increasing publication rates of resident research projects. The publication rate of resident research projects in a previous

study was 52.1%, with 74.0% of residents having other subsequent publications (Bennett *et al.*, 2022). This study aimed to evaluate research and scholarship productivity after graduation, confidence with these skills, and perceptions of the OUCOP team-based research programme. Specifically, the focus was to determine if residency graduates felt the programme provided them with adequate research and scholarship activities for skill development and the confidence to apply these skills after graduation and incorporate learners in related activities when appropriate.

Methods

This study was approved by the University of Oklahoma Health Sciences Center Institutional Review Board (IRB). The OUCOP team-based research policy was developed and first implemented for the graduating class 2011. Table I provides an overview of the programme components. As part of this policy, research committees were formed for each resident and included a primary content mentor, residency programme director (RPD), biostatistician, and >1 content/practice expert (e.g., clinical pharmacist and/or physician). Before the residency year, incoming residents select a research project from a list of proposed topic ideas from primary content mentors. These potential topics are vetted by the OUCOP's oversight committee and the Residency Review Committee (RRC) and finalised by June 30 of each academic year. As part of this vetting process, the RRC reviews project submissions to determine the feasibility of completion in a one-year timeframe and suitability for publication.

As part of the programme, residents participated in longitudinal educational topic discussions ranging from 7.5-12 hours to help them develop research skills to ensure the successful completion of their projects (Table I). These sessions cover various topics, including working with the research team, biostatistics, and best practices for writing a manuscript/abstract and are led by members of the RRC, biostatistical staff, and preceptors. The timelines and duties of the resident, RPD, content mentor, committee, and RRC have been published elsewhere (Bennett *et al.*, 2022). However, it is essential to note that the research policy has specific guidance for each party over the one-year timeframe. The project is completed as a longitudinal rotation over 12 months and includes a one-month dedicated research rotation for data collection. The content mentor completes the evaluations through PharmAcademic (McCreadie Group, Ann Arbor, MI), and RPDs present updates on residents' progress at quarterly RRC meetings.

Table 1: Overview of the OUCOP team-based research programme for pharmacy residents

	Components	Description
Team-based programme	Submission and selection of topics	<ul style="list-style-type: none"> • Topics are submitted by primary content mentor and vetted by RRC[#] to determine feasibility • Topic list disseminated by RPD[‡] to incoming residents in May of each academic year • Topics are selected by resident and committee is finalised by June of each academic year
	Committee composition	<ul style="list-style-type: none"> • Individualised research committee is developed for each resident and consists of a primary content mentor, residency program director (RPD), ≥1 additional content/practice expert (e.g., clinical pharmacist and/or physician), and a faculty/staff member with expertise in study design and/or biostatistics • Primary content mentor guides the resident in every phase of the research project and provides formative and summative feedback longitudinally through PharmAcademic • Committee provides additional support and guidance to the resident throughout the process
Research Discussions	Structured skill development topics	<ul style="list-style-type: none"> • Education research discussion range from 7.5-12 hours throughout the residency year • Topics include: <ul style="list-style-type: none"> • CITI[†]/IRB[§] training • Working with research team • Biostatistics refresher • Manuscript writing • Setting up spreadsheets for data analysis • Writing abstracts • Choosing a journal and overview of manuscript submission

[#]RRC = Residency Review Committee (oversight committee); [‡]RPD = Residency program director; [†]CITI = Collaborative Institutional Training Initiative; [§]IRB = Institutional review board

Following IRB approval, 73 PGY1 and PGY2 OUCOP residents from classes graduating from 2011 to 2019 were contacted via email for participation in this survey and were provided with a link to an anonymous questionnaire via Qualtrics® (Qualtrics, Provo, UT). The questionnaire consisted of 26 questions broken into four sections (Appendix A). A reminder email was sent three and six weeks following the initial email. Graduates were deemed lost to follow-up if no response was received eight weeks after the initial email.

The type of programme completed at OUCOP (PGY1, PGY2, or both PGY1 and PGY2) was collected for each resident. Data collected included the initial position obtained following completion of residency training (i.e., graduation from OUCOP or another residency programme), including full-time faculty position, clinical pharmacist position (i.e., health-system or community setting), or if they pursued additional training (i.e., research fellowship and/or graduate school). Residents were asked whether they submitted and published their PGY1 and/or PGY2 OUCOP research project. Research and scholarship activities after residency graduation were collected and comprised the number of peer-reviewed publications, book chapters, and poster presentations/published abstracts per year. The number of original research projects where residency graduates served as students and/or resident mentors were also collected.

Residency graduates were asked to rate their confidence in research and scholarship activities. Their levels of confidence as research mentors for a resident/student

or as authors were evaluated using a 5-point Likert scale ranging from 1 (very high degree) to 5 (not at all) (Appendix A). Residency graduates were also asked several open-ended questions, including the least and the most beneficial aspects of the OUCOP longitudinal research programme.

The development of the survey question was reviewed and revised by all investigators to ensure face validity of the survey instrument. In addition, informal feedback on the questionnaire was provided by 2020-2021 OUCOP residents, which included one PGY1 and two PGY2 residents. These residents were chosen because they were currently participating in the OUCOP research programme and were not among the residency graduates surveyed.

The primary objective was to determine the number of original research projects and poster presentations/published abstracts completed by former OUCOP residency graduates after graduation. Secondary objectives included the identification of the number of OUCOP residency projects published, types of job positions secured after residency graduation, research mentorship roles for residents/students, book chapter publications, and self-reported levels of confidence in research and scholarship activities of OUCOP residency graduates. The themes and sub-themes of the most and least beneficial components of the OUCOP research programme were also analysed.

Data were analysed and summarised via Qualtrics (Qualtrics, Provo, UT). Descriptive statistics were employed to summarise responses.

Results

Of the 73 residency graduates from 2011-2019, 44 (60.3%) completed the survey. This response rate differed based on graduation year, ranging from 36.4% to 77.8%. Of the 44 respondents, 6 (13.6%) completed their PGY1 residency at OUCOP and did not complete a PGY2 or additional training, 3 (6.8%) completed only their PGY1 residency at OUCOP and completed their PGY2 at another programme, and 23 (52.3%) completed their PGY2 only at OUCOP. The remaining 12 (27.3%) completed both their PGY1 and PGY2 at OUCOP.

Respondent publication rates, employment status, and research requirements

Twenty-four (54.5%) respondents published an OUCOP residency research project manuscript, and 20 (45.5%) did not publish. Of the 12 participants who completed both PGY1 and PGY2 residencies at OUCOP, 6 (50.0%) published both residency project manuscripts. In total, 28 graduates submitted their research manuscripts for publication in a peer-reviewed journal, including 4 (21.1%) whose submissions to a peer-reviewed journal were not accepted for publication. Of the 16 who did not submit their OUCOP manuscript, 6 (37.5%) reported maintaining contact with the OUCOP research team following residency graduation.

Of the 44 respondents, 13 (29.5%) were initially employed as a faculty member and 31 (70.5%) as a clinical specialist. One graduate, initially employed as a faculty member, transitioned to a clinical specialist position, leaving 12 faculty members and 32 clinical specialists responding at the time of the survey.

Of the 44 respondents, 20 (45.5%) stated that their current position required involvement in research, with 9 holding a faculty position and 11 holding the position of clinical specialists. Of the 20 respondents with research requirement in their position, only 5 (11.4%) reported the requirement of precepting students in research, with a median number of precepted students of 4 [interquartile range (IQR), 1-7]. Sixteen (36.4%) of 44 respondents indicated they were required to precept residents in research in their current position, with an overall median number of residents precepted of 3 (IQR 2-4).

Research and scholarship activities following residency graduation

Table II provides an overview of research and scholarship activities after residency graduation. Thirty-one (70.5%) respondents participated as investigators on one or more original research projects, with the median total number of original research projects being 4 (IQR, 1-8). Moreover, 29 (65.9%) mentored one or more students or residents in an original research project, with the overall median number of students and residents mentored being 3 (1-4) and 2 (2-4), respectively.

Most (n=36; 81.8%) participants reported having more than one subsequent publication after residency graduation, with an overall median number of subsequent publications of 3 (IQR 2-7). Eleven (25.0%) published a book chapter, and 33 (75%) had poster presentation(s)/published abstract(s) at a professional conference [median number of 3 (IQR 2-7)].

Table II: Research and scholarship activities of OUCOP pharmacy residency graduates (n=44)

Variables	Number (%) or Median (IQR#)
Original research projects:	
Participated as an investigator on ≥ 1 original research project	31 (70.5)
Total number of original research projects	4 (1-8)
Mentorship on original research projects:	
Mentored ≥ 1 student or resident on original research	29 (65.9)
Total number of projects with students mentored	3 (1-4), n=19
Total number of projects with residents mentored	2 (2-4), n=23
Subsequent publications after residency graduation:	
Published ≥ 1 subsequent publication(s)	36 (81.8)
Total number of subsequent publications	3 (2-7), n=36
Book chapters:	
Published ≥ 1 book chapter(s)	11 (25.0)
Total number of subsequent book chapter	1 (1-2), n=11
Subsequent poster presentations/published abstracts:	
Published ≥ 1 poster presentation(s)/published abstract(s)	33 (75.0)
Total number of poster presentation(s)/published abstract(s)	3 (2-7), n=33

#IQR = Interquartile range

Ratings in confidence of OUCOP graduates in research and scholarship

Figure 1 provides an overview of the confidence ratings for research and scholarship activities. There were three statements for which $\geq 55\%$ of respondents expressed “very high degree” or “high degree” of confidence, including serving as a primary investigator

on a research project, serving as a mentor for a student research project, and serving as a mentor for a resident on a research project. For the remaining statements related to authorship of a peer-reviewed manuscript, 41-48% of respondents expressed a “very high degree” or “high degree” of confidence, including authoring an original research, review, or case report manuscript.

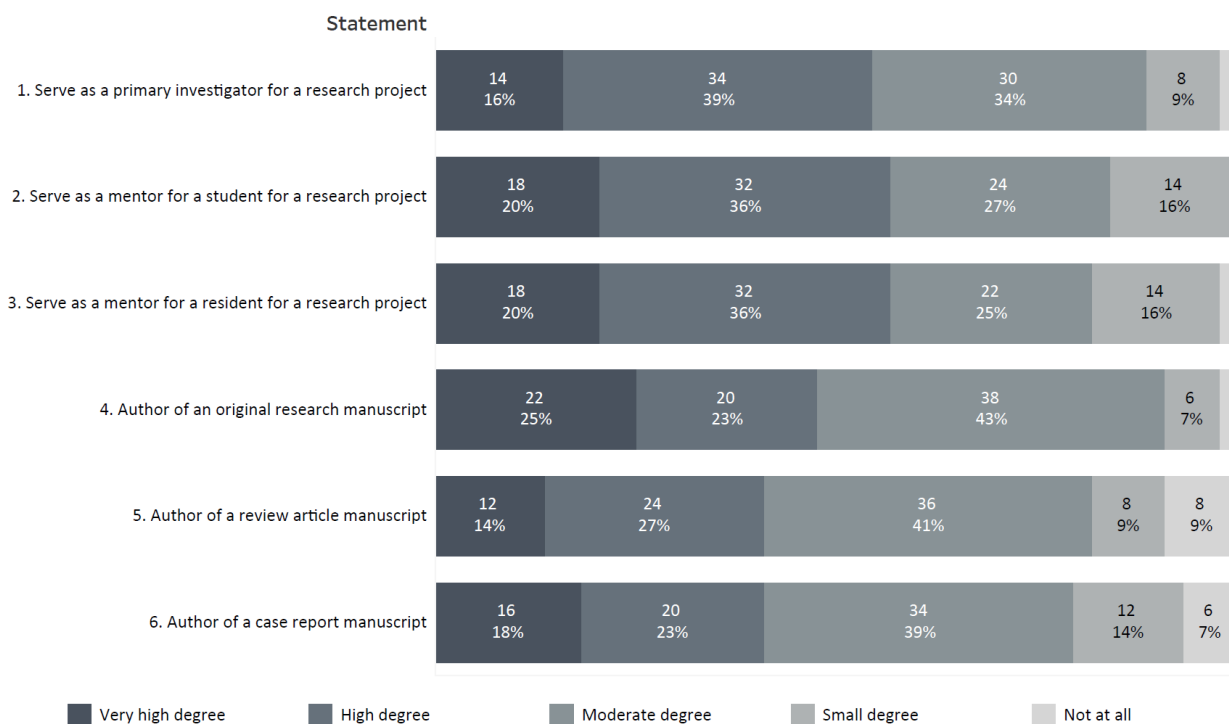


Figure 1: Confidence in research and scholarship skills of OUCOP residency graduates (n=44)

Perceptions of the OUCOP team-based research programme

Respondents were asked questions regarding their perceptions of the OUCOP team-based research program. More faculty members than clinical specialists indicated that the programme had an impact on selecting their initial position, 8 (66.7%) versus 6 (18.9%), respectively. Additionally, more graduates employed as faculty members than clinical specialists reported that participating in the OUCOP team-based programme gave them a competitive advantage for their initial position, 9 (75.0%) versus 7 (21.9%), respectively. Due to the small sample size, statistical analyses were not performed for these findings.

Responses to open-ended questions helped identify five themes for the most and least beneficial components of the OUCOP team-based research programme. The three most beneficial themes were

mentorship, structure of the team-based research programme, and protected research time residents had on their dedicated research month. The two least beneficial themes were the lack of communication with the content mentor, research team, and resident following graduation and involvement of students in resident research projects.

Discussion

In this study, half of the respondents published more than one of their OUCOP resident research projects and maintained active involvement in research and scholarship after residency graduation. The OUCOP team-based programme was developed as a method to help foster the skill development of pharmacy residents and increase publication rates of resident research

projects. As part of continuous quality improvement (CQI), members of the RRC had previously evaluated the publication rates of the 73 residents from 2011-2019, showing that half of them published their research projects (Bennett *et al.*, 2022). The current project is an extension of the previous CQI project seeking additional information that could help substantiate continued support for the programme and determine if further modifications may be needed.

Several strategies (e.g., the flipped research model) have been implemented across programmes to provide the development of research and scholarship skills and eliminate barriers to project completion for pharmacy residents (Morbitzer *et al.*, 2019; Johnson *et al.*, 2021; Morbitzer *et al.*, 2021). While these strategies may help meet the goal of timely completion of the research project, they may not necessarily foster skill development. For example, with the flipped research model, residents are not able to carry forward a project from beginning to end (Morbitzer *et al.*, 2019). Our program included educational topic discussions with members of the RRC, biostatistical staff, and preceptors. Other programmes have also implemented similar education sessions for residents (Olson *et al.*, 2012). Although the respondents were not asked about their perceptions of these sessions, it is believed that the latter also contributed to the success of the projects, as one of the most beneficial components of the programme was the overall structure.

Mentorship was believed to be a fundamental aspect of the programme contributing to some findings. Respondents indicated that mentorship was one of the most beneficial components of the programme. Post-PGY2 mentorship support by the resident research team was found to be independently associated with publication success (odds ratio 3.3; 95% CI: 1.1-9.8) Shafeeq *et al.*, 2019). In a previous study evaluating publications and subsequent publications of OUCOP residency graduates, the H-index score and number of co-authors on published projects were assessed as surrogate markers for mentorship (Bennett *et al.*, 2022). A statistically significantly higher median H-index score and a higher number of co-authors on published projects were found among those who had subsequent publications versus those who did not. So, it is feasible that interaction with a high number of research mentors, specifically with mentors who have more experience with publication requirements, such as those with high H-index, could further develop research and scholarship skills.

In this study, 55% of respondents published more than one OUCOP project. Although this study included responses from only 60% of the programme graduates, the percentage of respondents who published their

research project was similar to the publication rate reported in a previous study that included all 82 projects from the 73 graduates during the same timeframe, as the present study, and comprised an extensive literature search of MEDLINE, EMBASE, Google Scholar, and Scopus (Bennett *et al.*, 2022). This review revealed that 43 of the 82 projects (52.4%) were published by 38 of the 73 residents (52.1%). Therefore, the present survey is representative of the overall cohort of residency graduates from 2011-2019.

In this study, 71% of respondents participated as an investigator on more than one original research project, and 82% published more than one subsequent publication after residency. To our knowledge, few studies have assessed the scholarship and research metrics of pharmacy residency graduates after completion of their programme. A survey of 124 PGY2 critical care pharmacy residency graduates from 2011 and 2012 showed that 24 (25.5%) out of 94 respondents published their residency research project and that 60 (63.8%) published more than one subsequent publication after graduation (Shafeeq *et al.*, 2019).

Half of the respondents in the present study expressed a “very high degree” or “high degree” of confidence as primary investigators. To the best of the authors’ knowledge, no studies have yet assessed the perceived confidence in research and scholarship skills following graduation. In a survey of 53 PGY1 and PGY2 pharmacy residency graduates over 12 years, the investigators asked questions regarding residents’ perceptions of research-related skills at the end of their residency year before graduation (Swan *et al.*, 2022). However, it is hard to compare their study to ours, given that their respondents may have verbalised confidence but had not yet started a post-residency position, so they would not have been required to implement these skills independently. Another study surveyed PGY1 RPDs on several questions regarding publication rates, residency research policies, and perceptions of their programme (Weathers, Ercek & Unni, 2019). Out of the 1220 RPDs, 369 (30.2%) responded, and 48% of those who responded reported perceiving their resident research programme as “extremely ineffective” or “ineffective” at preparing residents to publish in a scientific journal. In contrast, only 9% of our residency graduates in this study indicated “not at all” or a “small degree” of confidence in publishing an original research manuscript (Figure 1).

As previously noted, other studies have suggested that pharmacy residency graduates entering the workforce as clinical specialists had fewer publications than those who took a faculty position. In this study, most residency graduates were initially employed as clinical

specialists, similar to previous studies evaluating residency research programmes (Shafeeq *et al.*, 2019; Miller *et al.*, 2021; Bennett *et al.*, 2022). In this study, only 45.5% of the respondents had a required research component in their current position; while most of these respondents took a faculty position, one-third were employed as clinical specialists. Despite the limited number of respondents with a research requirement as part of their position, the majority (66%) indicated that they mentored more than one student or resident on an original research project. Although these graduates were not required to precept students or residents for research, the vast majority did. Additionally, half of the respondents reported a “very high degree” or “high degree” of confidence in serving as a mentor for a student or a resident on a research project. To our knowledge, no other studies evaluating residency research programmes have yet assessed these outcomes.

Limitations

This study has several limitations. First, the response rate was only 60%, and it is possible that the remaining 40% who did not respond were not involved in research activities. However, this study included respondents from each year of graduation, and the response rate was comparable to that of other programmes that have surveyed graduates on pharmacy residency research programmes, ranging from 76-87% (Shafeeq *et al.*, 2019; Swan *et al.*, 2022). Second, although tested and refined, the survey instrument used was not formally validated. However, because the OUCOP team-based residency research programme is unique, questionnaires from other studies could not be utilised, and face validity was performed by obtaining feedback from current residents during the 2021-2022 academic year. Third, it was not possible to determine whether participation in this programme was responsible for residents engaging in research and scholarship activities after residency graduation. Research experiences during the Doctor of Pharmacy programme training or research requirements that residents may have completed during other residency programmes were not examined. The publication rates of residents who only completed their PGY1 or PGY2 at OUCOP were explored to address this limitation. Of the 45 PGY2s who completed a PGY1 elsewhere, only 2 (4.4%) published their PGY1 project. Additionally, out of the three PGY1s who completed their PGY2 at another programme, one published their PGY2 project. A final limitation is that this study could not quantify additional resources that residency graduates may have in their institutions for training and mentorship of research and scholarship. Hence, the impact of these additional training programmes after residency

graduation on their scholarship and research productivity could not be determined. Nevertheless, the questions in the survey were phrased to assess the impact of the programme on their confidence in the required elements of the OUCOP team-based research programme.

Conclusion

Half of the OUCOP team-based research programme graduates were involved in research and scholarship activities, even though these activities were not necessarily required in their position. Fifty-five per cent of the respondents expressed confidence in participation as an investigator and mentor of students and/or residents on an original research project. The OUCOP team-based research programme appears to aid in the publication rates of research projects and contribute to the skill development of research and scholarship of residency graduates, while improving their confidence in mentoring their trainees.

Conflict of interest

The authors declare no conflicts or financial interest in any product or service mentioned in the manuscript, including grants, equipment, medications, employment, gifts, and honoraria.

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Appendix A: Questionnaire**Part 1: Research and Scholarship Section**

INSTRUCTIONS: For Questions 1-6 enter the number for each statement per year since completing residency. Leave blank if year is prior to finishing residency. Enter 0 for a year in which none were performed.

1. Number of original research projects

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
------	------	------	------	------	------	------	------	------	------	------	------

2. Number of original research projects serving a student mentor

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
------	------	------	------	------	------	------	------	------	------	------	------

3. Number of original research projects serving as a resident mentor

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
------	------	------	------	------	------	------	------	------	------	------	------

4. Number of peer-reviewed publications

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
------	------	------	------	------	------	------	------	------	------	------	------

5. Number of book chapters

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
------	------	------	------	------	------	------	------	------	------	------	------

6. Number of poster presentations/published abstracts per year

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
------	------	------	------	------	------	------	------	------	------	------	------

7. Did you complete your PGY1 residency with the OU College of Pharmacy (OUCOP) OUCOP? Yes or no
- If yes, did you publish your PGY1 residency research project: Yes or No
 - If no, did you submit your residency project for publication? Yes or no
 - If no, did you maintain contact with your research/content mentor and/or research team regarding your manuscript if publication was not completed at the end of residency? Yes or no
8. Did you complete your PGY2 residency with the OUCOP? Yes or no
- Not applicable (did not complete a PGY2 residency)
 - If yes, did you publish your PGY2 residency research project: Yes or No
 - If no, did you submit your residency project for publication? Yes or no
 - If no, did you maintain contact with your research/content mentor and/or research team regarding your manuscript if publication was not completed at the end of residency? Yes or no

Part 2: Confidence in performing research and scholarship activities

INSTRUCTIONS: For Questions 9-14, please indicate how confident you are at this time in performing the following functions. Indicate your current level of confidence with the following scale: 1= Very high degree; 2 = High degree; 3 = Moderate degree; 4 = Small degree; 5 = None at all.

9. Serve as a primary investigator for a research project.
10. Serve as a mentor for student for a research project.

11. Serve as a mentor for a resident for a research project.
12. Author an original research manuscript.
13. Author a review article manuscript.
14. Author a case report manuscript

Part 3: Reflections on the residency research program

INSTRUCTIONS: For questions 15-19, provide a brief response.

15. What was (were) the most beneficial portion(s) of the OUCOP longitudinal research program?
16. What was (were) the least beneficial portion(s) of the OUCOP longitudinal research program?
17. In what ways(s) do you feel your experiences in the OUCOP longitudinal research program has influenced your current position?
18. In what way(s) could the OUCOP residency programs have better prepared you for research and scholarship activities?
19. Would you recommend the OUCOP residency programs based on your experiences with the longitudinal research program? Why or why not?

Part 4: Post-Residency Graduation Training and Employment Activity

20. Year of graduation of the OUCOP residency program (If you completed two years of residency, select the year of completion of your PGY2 program)_____
21. Select from the following what best describes your initial position obtained after your residency?
 - a. Clinical pharmacist in health-system
 - b. Full-time academia with clinical practice site
 - c. Additional post-graduate training (e.g., PGY2 residency, fellowship, grad student)
 - d. Community pharmacist/clinical pharmacist in an independent or retail setting
 - e. Other_____
22. If you took a position as a clinical specialist in a health-system or community setting, have you obtained an adjunct position with a college of pharmacy? No___ Yes___
23. Does your current position require you to be involved in conducting research projects? No___ Yes___
24. Does your current position require you to be involved in precepting students on research projects?
 - a. No___ Yes___
 - b. If so, how many students have you precepted?
25. Does your current position require you to be involved in precepting residents on research projects?
 - a. No___ Yes___
 - b. If so, how many residents have you precepted?
26. Do you believe your participating in the OUCOP longitudinal research program:
 - a. Influenced the type of position you took after residency graduation?
 - i. No___ Yes___
 - ii. If yes, please describe how
 - b. Gave you an advantage over other candidates for your first position?
 - i. No___ Yes___
 - ii. If yes, please describe how?