

## Using a Preceptor Development Series in Writing and Publication to Improve Residency Research Manuscripts

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### Abstract

*Description of the Problem:* Rates of pharmacy residency research projects making it to peer review and publication are low (between two and seven percent). Little is known about the influence of preceptor development on moving projects to peer-review and publication. *The Innovation:* The primary objective was to describe the effect of a preceptor development series on writing and overall manuscript quality leading to submission to a peer-reviewed publisher. Three pharmacy preceptors assigned to a post-graduate year 1 residency project were enrolled in a six-week series focused on writing, peer-reviewed publishing, and advancing resident research to publication. Each preceptor was tasked with implementing development series content in their resident research mentorship. *Critical Analysis:* Resident project manuscripts were assessed using a previously published 34-item evaluation tool. All papers were blinded for independent evaluation by two investigators. Nine papers were evaluated: three from preceptors who participated in the development program and six from preceptors who did not participate. The mean summary scores for papers with preceptors who participated versus those who did not were 5.8 and 5.4, respectively, on a 10-point scale. Additionally, papers from preceptor participants were noted to achieve satisfactory scores on evaluation tool items 85.3% of the time versus 74.7% of the time for non-participants. *Next Steps:* Participation in a six-week preceptor development program on advancing resident writing and research to publication provided preceptors the tools needed to mentor higher quality manuscripts ready for publication. Residency programs may consider designing and implementing such a series to promote preceptor and resident research publication.

**Keywords:** Education, Manuscripts, Peer Review, Preceptorship

### DESCRIPTION OF THE PROBLEM

Across pharmacy residency programs, residency project (research or other) publication rates in the peer-reviewed literature are consistently low. Studies have assessed publication rates for resident projects to be between 1.8 - 7.3%, and over time these rates have continued to trend downward.<sup>1-5</sup> Several reasons for the declining trend have been cited, including poor project conception (e.g., not novel), poor project design, limited timeline to complete the project, lack of post-residency collaboration, and knowledge gaps or inexperience with publishing.<sup>3,6</sup>

Residency program research support and professional organization research certificate programs provide training on study design, statistics, and preparation for presentation. They demonstrate higher levels of resident confidence in their research and presentation skills, but their association with improved peer-reviewed publication is unclear.<sup>7-9</sup> In contrast, resident-focused writing programs have demonstrated an

increased number of publications, although these are not all peer-reviewed.<sup>10</sup> Also described is the association between the experience of project mentors in publishing and resident project publication rates, suggesting that increased mentor experience and training in the writing process may help improve resident publication rates.<sup>11</sup>

### THE INNOVATION

This Note describes the development of a residency preceptor development series aimed at fostering skills and experience in peer-reviewed publication. The following program details were reviewed by the health system's institutional review board and determined not human subjects research. The information presented follows the Standards for Quality Improvement Reporting Excellence in Education (SQUIRE-EDU) guidelines.<sup>12</sup>

The core instruction team consisted of four practicing pharmacists with a history of publishing peer-reviewed research abstracts and manuscripts and involvement in one or several accredited residency programs. The team met initially to formalize goals for the program and map out a curriculum to meet the goals. The six core modules and associated objectives that were identified were: 1) introduction to residency publication and program overview, 2) peer-reviewing abstracts, 3) peer-reviewing manuscripts, 3) writing your background and methods, 4) writing your results and discussion, 5) preparing for peer-review submission. The program was titled *Pathway to Publication*.

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Each module contained 15-20 minutes of preparatory work in the form of a recorded presentation or reading, supplemental material to support the preparatory materials, and a script of topics and questions for a live discussion. The textbook, “*Essential Guide to Pharmacy Residency Research*” by Kauffmann and Witt, was used as a general reference throughout the program.<sup>14</sup> Each discussion was led by the module’s core instructor and served as a forum for participants to ask questions or refine their reviewing and writing skills.

Four pharmacist preceptors from two residency programs were originally selected to participate in the inaugural cohort for *Pathway to Publication*. One preceptor dropped out of the program after the second session due to a conflict between meeting times and clinical responsibilities. Each participant was assigned to a resident and their research project team for the academic year. The decision to invite a preceptor was not randomized or based on their prior experience with research or publication.

Programming began in early September 2021 and continued through December 2021. The core instructional team and cohort met for 60 minutes in a virtual environment every other week. Participants were encouraged to meet with their resident researcher between sessions to share information from the program and use the tools provided to assist their resident in preparing their manuscript. The participant was not provided with a script or instructional tools to formally share with the residents throughout the process. Following the formal training program, the instructional team scheduled 60-minute meetings with the cohort every other month through the end of the residency year to check in on progress, discuss questions, and request feedback about the program.

### Program Evaluation

The primary outcome for the first year of the program was the writing quality of the resident research manuscript submitted at the end of the residency year. At the conclusion of the residency, the quality of the resident manuscripts submitted by residents with a preceptor in the *Pathway to Publication* program was compared to those submitted by residents without a preceptor enrolled in the program. To evaluate quality, two volunteer evaluators with extensive publication experience were asked to read nine manuscripts and score them using the “Manuscript Quality Assessment Instrument” by Goodman and colleagues.<sup>15</sup> The instrument evaluates nine categories (34 items) relevant to writing quality. Readers were blinded to the names of the residents and their research teams as well as if a team member had participated in the *Pathway to Publication*.

Nine postgraduate year 1 residency manuscripts were evaluated. Three manuscripts were from preceptors who completed the *Pathway to Publication* program, and the remaining manuscripts were collected from other programs in

the system to match at a 1:2 ratio. Overall, reviewers noted the average quality of the submissions of the *Pathway to Publication* cohort to be 5.8 out of 10, and those of the non-participant cohort averaged 5.4 out of 10; this resulted in a 0.4-point advantage to the *Pathway to Publication* cohort on a 10-point scale. Additionally, the *Pathway to Publication* cohort’s manuscript summary score was 10.6 percentage points higher than the traditional preceptorship cohort with overall average achievement scores of 85.3% and 74.7%, respectively (Table 1). The *Pathway to Publication* cohort demonstrated an advantage over the traditional preceptorship cohort in 20 of 29 items evaluated. Five items were determined to be not applicable for comparison to the manuscripts presented (Table 2).

### CRITICAL ANALYSIS

Our analysis has some limitations which should be factored into its reliability and validity. First, the preceptors in this pilot program volunteered to participate, which may have had a positive impact on the association between program participation and manuscript quality. Preceptors less motivated to advance their skills and experience in peer-reviewed publication may not be as successful. Second, the manuscript reviewers did not have a training session to standardize expectations, which may explain the differences in scores assigned to each manuscript. However, despite the disagreement in ratings, Reviewer 1 provided consistently more favorable scores than Reviewer 2. The third limitation is whether the results translated into relevant outcomes. The small number of participants did not allow for an accurate assessment to know if the numerical differences were true or not, and we did not have a frame of reference to know if these differences resulted in a higher acceptance rate for submitted manuscripts. We observed a positive difference but were unable to assess if it translated into meaningful change.

Preliminary findings of the *Pathway to Publication* program indicate resident manuscripts with *Pathway to Publication* preceptors had a higher quality score and a higher number of manuscript categories assessed as acceptable, though a formal statistical evaluation is required to show this is a reliable difference. Although preliminary, these findings suggest that the *Pathway to Publication* process could be an effective tool to address a primary barrier to pharmacy residency research publication (inexperience with publication) and improve facilitation through mentor publication experience and confidence.

### NEXT STEPS

We see future opportunities in several places both internal and external to the *Pathway to Publication* program. The first idea is to facilitate a partnership with the committee overseeing the instruction and approval of resident projects. Through this partnership, the projects coming to publication will potentially be of higher quality and of more interest to publishers. The second opportunity is to identify protect time for preceptors

engaging in the writing process. The *Pathway to Publication* program and subsequent writing are all part of a preceptor's personal journey for professional development. If professional time could be protected to allow for participation and writing, more preceptors may be willing to engage and create opportunities for mentorship. Finally, program's instructional team can continue to monitor and mentor those who have completed the program to bring to them opportunities to publish in the peer-reviewed literature. This might include creating their own work, or it could include working with residents who no longer wish to pursue their projects post-graduation and transferring ownership to move the project and publication forward.

**Conflicts of Interest:** None

**Funding/Support:** None

**Disclaimer:** The statements, opinions, and data contained in all publications are those of the authors.

**Acknowledgements:** The study team would like to acknowledge Jove Graham and Mia Lussier for their assistance with assessing publications for the analysis.

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**Table 1.** Individual Manuscript Summary Scale Quality and Percentage of Categories Rated as Achieved

<b>Non-participants in Pathway to Publication</b>			
<b>Manuscript</b>	<b>Reviewer</b>	<b>Summary Scale Quality</b>	<b>Percentage of Categories Achieved</b>
001	R1	8	93.1
	R2	3	66.7
002	R1	8	86.2
	R2	5	76.9
003	R1	8	96.3
	R2	6	86.2
004	R1	6	87.0
	R2	3	28.0
005	R1	8	96.4
	R2	4	68.0
006	R1	4	61.5
	R2	2	43.5
<b>Mean Score</b>		5.4	74.2
<b>Participants in Pathway to Publication</b>			
<b>Manuscript</b>	<b>Reviewer</b>	<b>Summary Scale Quality</b>	<b>Percentage of Categories Achieved</b>
007	R1	8	96.3
	R2	6	96.3
008	R1	3	50.0
	R2	6	88.0
009	R1	4	80.8
	R2	8	96.6
<b>Mean Score</b>		5.8	85.3

**Table 2.** Averages Percentage of Individual Categories Rated as Achieved (%)

Individual Items	Non-participants n = 6	Participants n = 3
<b>INTRODUCTION</b>		
How clear is the background?	88.3	100
How clear are the specific aims?	83.3	100
<b>METHODS: Subjects</b>		
How adequate is the description of the setting?	83.3	83.3
How clear are eligibility criteria?	100	100
Is there enough information to judge suitability of comparison?	70	100
<b>METHODS: Design</b>		
How clear is the study design?	100	83.3
How adequate is the description of masking procedure?	100	N/A
Are operational definitions clear?	90.9	100
How adequate is side effect reporting?	100	100
<b>RESULTS: Subjects</b>		
How complete is information on subjects not included?	50	75
How adequate is the description of the enrolled subjects?	72.7	83.3
How clear are the outcomes?	100	100
<b>RESULTS: Quantitative Reporting</b>		
Are the quantitative methods correct?	75	83.3
Are quantitative results reported in an understandable manner?	81.8	100
How adequate is reporting of denominator?	75	83.3
Are magnitudes of effect reported?	50	66.7
How adequate is summary statistics for diagnostic tests?	N/A	N/A
Are confidence intervals or standard error reported?	27.3	40
How appropriate is the balance of detail and summary?	83.3	83.3
How appropriate are reports for dropout or crossover patients?	N/A	100
How adequate is control for multiple measured variables?	66.7	N/A
How adequate is reporting of multiple variables?	100	N/A
Are clinically relevant subgroups explored?	100	100
Do figured and tables summarize data?	66.7	83.3
<b>DISCUSSION &amp; CONCLUSION</b>		
Is it clear what the study adds to the body of knowledge?	41.7	50
How appropriate is the presentation of supporting evidence?	41.7	66.7
How appropriate is the discussion of limitations?	66.7	83.3
Does generalization occur and is it justified?	100	100
Is strength and tone of conclusions appropriate?	83.3	83.3
<b>TITLE</b>		
How good is the title?	91.7	100
<b>ABSTRACT</b>		
Does the abstract appropriately summarize?	75	83.3
<b>GENERAL EVALUATION</b>		
Is the manuscript concise?	91.7	100
How good is the manuscript's organization?	75	100
How elegant is the style of the manuscript?	75	83.3

N/A = not applicable.