Development and implementation of a writing program to improve resident authorship rates

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Both the American College of Clinical Pharmacy and the American Society of Health-System Pharmacists have established a goal that by 2020, all pharmacists providing direct patient care will have completed a postgraduate year 1 (PGY1) residency. During their residency, trainees participate in longitudinal projects and monthly clinical experiences, perform research and medication-use evaluations, and create monographs and newsletters, among numerous other tasks. Residents have opportunities to participate in the development and publication of research-related papers, review articles, case reports, drug information questions and answers, and letters to the editor.

Historically, however, the proportion of pharmacy resident research projects published has been low. The publication rates of resident projects presented at the Southeastern Residency Conference in 1981, 1991, and 2001 were 20%, 16%, and 13%, respectively, with a median time to publication of 22.8 months. The publication rates of resident projects presented as abstracts at the Western States Conference in 1995, 2000, and 2005 were 4%, 5%, and 8%, respectively, with a median time to publication of 24 months.

Hasegawa reported that during the 2010–11 residency year, the American Journal of Health-System Pharmacy received 685 manuscripts that required a decision by the editors, 113 of which listed a resident or

Purpose. The development, implementation, and evaluation of a writing program with a formalized writing project as a component of postgraduate year 1 (PGY1) and postgraduate year 2 (PGY2) pharmacy residencies are described.

Summary. The writing program at Georgia Regents Medical Center/University of Georgia College of Pharmacy, a collaborative and jointly funded program, was initiated in the 2010–11 residency year. The goals of the program are to teach residents to communicate effectively, apply leadership skills, employ project management skills, and provide medication- and practice-related education and training. The program combines both writing experiences and mentorship. At the beginning of the residency year, trainees are presented with opportunities to participate in both research projects and writing projects.

Specifically, opportunities within the writing program include involvement in review articles, case reports, drug information rounds, book chapters, letters to the editor, and high-quality medication-use evaluations for potential publication. The writing project is highly encouraged, and completion of a manuscript to be submitted for publication is expected by graduation. Nine papers were published by 8 of 18 PGY1 and PGY2 residents in the four years before program implementation. A total of 23 publications were published by 18 (72%) of the 25 PGY1 and PGY2 residents in the four years after implementation of the writing program.

Conclusion. Implementation of a formal writing program increased the overall publication rate of residents.
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The small proportion of pharmacy resident publications may be partly due to barriers to the pursuit of scholarly endeavors and manuscript publication. For instance, a resident’s research may be important on an institutional level yet may lack originality or the scientific rigor (e.g., low number of patients, lack of randomization, low generalizability) needed for publication. Additional obstacles include pharmacy residents’ time constraints, lack of knowledge and experience, and need for mentorship.

We aimed to improve resident authorship by creating and implementing a writing program with a formalized writing project as a component of our residency programs. Georgia Regents Medical Center/University of Georgia College of Pharmacy (GRU/UGA) is a collaborative and jointly funded program that offers PGY1 pharmacy practice residency training and PGY2 specialty training in pediatric, oncology, and critical care pharmacy. This writing program was consistent with the 2010 strategic plan of the University of Georgia College of Pharmacy and the appointment of residents as graduate teaching assistants within the college. The purposes of this program are to develop an appreciation for professional involvement and to foster a lifelong interest in the dissemination of information within the pharmacy and medical literature. This article describes the development, implementation, and evaluation of this formalized writing program.

Development and implementation of the program

The writing program, initiated with the 2010–11 residency year, was developed to teach residents to communicate effectively, apply leadership skills, employ project management skills, and provide medication- and practice-related education and training. All of these goals are consistent with the ASHP Residency Learning Standards that are required or elective within the individual residency programs. The program combines both writing experiences and mentorship. At the beginning of the residency year, trainees are presented with opportunities to participate in both research projects and writing projects. Specifically, opportunities within the writing program include involvement in review articles, case reports, drug information rounds, book chapters, letters to the editor, and high-quality medication-use evaluations for potential publication. The writing project is highly encouraged, and completion of a manuscript to be submitted for publication is expected by graduation. Each resident is mentored by at least one designated advisor and given feedback throughout the writing and editing processes. The project provides residents opportunities to refine their scientific writing skills and increase the likelihood of publication.

Evaluation of the program

To assess the impact of the formalized writing program, the number and types of writing projects for all GRU/UGA residency graduates were quantified for the four years before and after implementation of the writing program. Specifically, a MEDLINE search for the name of each residency graduate from 2006 through 2014 was performed to determine the number of publications before (2006–10) and after (2010–14) implementation of the writing program. To ensure that all publications were captured, each residency graduate was contacted to ask about the status of his or her manuscript as well as research project publications. Residency graduates were asked to provide any information about publication not included in the author search of MEDLINE (i.e., book chapters). Residents were specifically queried to determine if the publications were peer reviewed and if any manuscripts were still under review. Manuscripts were included if they were published, accepted for publication, or in press. Residents were also asked about ongoing submissions (i.e., pending resubmission or editorial review). The publication rate was calculated...
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by dividing the number of residents with one or more publications by the number of residency graduates. For each publication, author number, number of resident coauthors, and type of article were determined. For residents who completed both PGY1 and PGY2 residencies at our institution, a writing project was expected each year at the discretion of the residency program director.

In the four years before implementation of the writing program, 18 residents participated in the postgraduate residency training program at GRU/UGA (16 PGY1 and 2 PGY2 residents) (Table 1), 8 (44%) of whom had successfully published a paper.

A total of 9 publications were identified from these residency years, 5 of which appeared in pharmacy journals. One publication had two resident authors. Of the 9 publications, 6 were based on research projects, and four residents appeared as the first author. Four publications (three case reports and one survey research project) were not related to a research project, and one resident appeared as the first author. Two residents published the results of a research project and an additional manuscript on a topic of interest. None of the publications authored by residents were published during the residency year. The median times to publication were 17 months (range, 13–50 months) for research projects and 17.5 months (range, 4–26 months) for other manuscripts.

In the four years after implementation of the formal writing program, 25 residents participated in the postgraduate training program at GRU/UGA (15 PGY1 and 10 PGY2 residents) (Table 1). A total of 23 publications were identified from these residency years, with 18 residents appearing as authors. Three of these publications were based on research projects, and 2 of the 3 residents appeared as the first author. Five residents had 2 publications (3 residents

### Table 1. Resident Publications Before and After Implementation of Writing Program, by Academic Year

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| Type(s) of articles                           | 1                 | 5                  | 2       | 2       | 2       | 2       | 2       | 2       | 2       |
| Case report                                   | 1                 | 1                  | 1       | 1       | 1       | 1       | 1       | 1       | 1       |
| Letter to editor–case report                  | 0                 | 1                  | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Research, book chapter, introduction to book  | 0                 | 0                  | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Research, review, introduction to book chapter | 0                 | 0                  | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Research, review, report                      | 0                 | 0                  | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Research, book chapter report                 | 0                 | 0                  | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Research, brief report                         | 0                 | 0                  | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
| Research, book editor                          | 0                 | 0                  | 0       | 0       | 0       | 0       | 0       | 0       | 0       |
published 2 writing projects and 2 residents published 1 writing project and 1 research project), and 1 resident had 3 publications (2 writing projects and 1 research project). A total of 19 different writing projects were published by residents, 11 of whom were listed as the first author. Eleven publications appeared in pharmacy-related journals or books. These writing projects included 8 review articles, 5 research articles, 3 letters to the editor, 2 medication-use evaluations, and 1 case report. Two additional writing projects are pending editorial review (a case report and a case series), and 7 research projects are pending data analysis or editorial review. Five writing projects were published during the residency year. One of these publications had two resident authors, and 1 publication was written by a resident who began the project as a Pharm.D. student before beginning a residency at the same institution. For the articles published after the end of the residency year, the median time to publication were 14 months (range, 8–20 months) for research projects and 7 months (range, 1–26 months) for writing projects.

Discussion

Overall, there was an increase in the proportion of pharmacy resident publications after implementation of the formal writing program. Our evaluation demonstrated that the most frequently published manuscript types after implementation of the writing program were reviews and research articles. Fifty percent of residents who successfully published were the primary author of the publication. Research-based articles were completed and published by residents in collaboration with departmental colleagues who performed translational research in the areas of oncology and vascular biology. We have observed a change in the culture of the residents related to scholarship and motivation for publication after the idea of the writing project was proposed.

Resident participation in the writing program cultivates scientific writing skills, increases time-management capabilities, and cultivates a commitment to professionalism. Publication, particularly in pharmacy journals, furthers education and inspires collaboration in all areas of pharmacy practice. Residency program directors and preceptors play a critical role in increasing pharmacy resident publication by encouraging residents to publish and by providing residents with opportunities to become involved in research studies and scholarly activities.

The preceptors involved in the writing program have expressed support for continuing the program. It provides another opportunity for preceptors to be involved in resident training and an avenue to distribute the workload of publishing with mentees. Implementation of the writing program enhanced the number of preceptors involved in resident projects. In the four years before implementation of the writing program, 6 preceptors were coauthors on 10 articles written by the 8 residents who published; in the four years after program implementation, 17 pharmacists (14 practitioners and 3 researchers) were coauthors of the 23 published articles written by 18 residents. Another perceived benefit of the resident writing program has been the enhanced collaboration with other disciplines. Moreover, the writing projects have included student coauthors, which allows residents to develop their own mentoring skills and further broadens the impact of the program on new pharmacists to contribute to the literature. Furthermore, the reduced time to publication of writing projects, with several residents publishing during their residency year, was seen as a benefit.

The implementation of the writing project was not without challenges. Despite the expectation that the writing project be completed by graduation, only one academic year (2012–13) resulted in a 100% resident publication rate. Reasons given for the delays in publication included rejection on first or second submission and delays in the peer-review process.

Moving forward, our program will remain focused on improving the proportion of pharmacy resident publications by emphasizing the importance of both the writing project and the research project. The GRU/UGA pharmacy residency will continue to mentor residents throughout the writing and editing processes. In addition, with the incoming 2015–16 residency class, a learning experience and formal quarterly evaluation of each resident will be implemented to allow for continual feedback throughout the residency year. The research committee associated with the GRU/UGA pharmacy residency will continue to thoroughly evaluate each project for relevance to the institution, generalizability, and feasibility. Furthermore, GRU/UGA has contracted a biostatistician to assist in developing robust study designs and analyzing data. These mechanisms will enhance the quality of resident work and may further improve publication rates.

Conclusion

Implementation of a formal writing program increased the overall publication rate of residents.

References

4. Olson KL, Holmes M, Dang C et al. Publication rates of abstracts presented by


