Currents in Pharmacy Teaching and Learning 9 (2017) 683–688

Contents lists available at ScienceDirect

Currents in Pharmacy Teaching and Learning

journal homepage: www.elsevier.com/locate/cptl

Experiences in Teaching and Learning

Educating medical residents through podcasts developed by PharmD students

Andrew R. Miesner[a,*], Wesley Lyons[b,1], Andrea McLoughlin[c,2]

[a] Drake University College of Pharmacy & Health Sciences, 2507 University Avenue, Des Moines, IA 50311, United States
[b] The George Washington University, Milken Institute School of Public Health, 950 New Hampshire Ave, NW, Washington, DC 20052, United States
[c] Tacoma Family Medicine, MultiCare Health System, 521 Martin Luther King Jr. Way, Tacoma, WA 98045, United States

ARTICLE INFO

Keywords:
Podcasts
Medical resident
Pharmacy student
Teaching

ABSTRACT

Background and purpose: Podcasts are increasingly popular in education due to their accessibility, portability, and scheduling flexibility. Pharmacy students often interact with resident physicians during advanced pharmacy practice experiences, but few studies have evaluated their ability to teach medical residents about pharmacotherapy concepts or how these interactions might impact their own development. We sought to evaluate the efficacy of pharmacy student-created podcasts in two areas: the ability to increase medical resident understanding of selected medical topics and the effect on the pharmacy student's confidence in teaching.

Educational activity and setting: Eight fourth-year pharmacy students created enhanced podcasts and assessment questions on a medical topic. The assessment questions were split randomly into pre- and post-podcast assessments to be given to residents. The assessment quizzes and podcast comprised content modules that were delivered to consenting medical residents at two week intervals. Pharmacy student confidence was evaluated with pre- and post-experience surveys, which were administered before they created the podcast and after they viewed the aggregate results of resident assessments of their podcast.

Findings: Overall, 79.3% (23/29) of residents participated with an average of 44% participation on each module. Resident knowledge increased as evidenced by the overall aggregate score, significantly improving from 36% prior to podcasts to 76% following podcasts ($p = 0.001$). When rated on a 1–10 scale, average pharmacy student confidence in teaching their topic also significantly increased from 5.63 to 8.00 ($p = 0.041$).

Summary: Podcasts are an effective method for medical residents to learn from pharmacy students and may also improve pharmacy students' confidence in their abilities.

Background and purpose

Podcasts are becoming increasingly popular in higher education as a way to disperse information to students outside of the classroom.[1] In medical education, podcasts have been used as a teaching tool for subjects as diverse as reviewing heart sounds to advanced dermatology.[2,3] Not only are podcasts accessible on a range of devices, including smartphones, but they also provide the benefit of on-demand availability to the learner and the ability to replay information.[4] Enhanced podcasting combines the auditory

* Corresponding author.
E-mail addresses: andrew.miesner@drake.edu (A.R. Miesner), wesley_lyons@gwu.edu (W. Lyons), a.m.ahrendsen@gmail.com (A. McLoughlin).
[1] BS-Health Sciences Candidate at Drake University College of Pharmacy & Health Sciences at the time research was performed.
[2] PGY-3 Family Practice Resident at Broadlawns Medical Center at the time research was performed.

http://dx.doi.org/10.1016/j.cptl.2017.03.003

component with video, slides, or other graphics.

In graduate medical education, residents must not only work towards mastering the knowledge of long-established medical diagnostics and treatments but must also implement emerging information about new therapies to patient care plans as they become available. Medical residents must combine biomedical, clinical, epidemiological, and social-behavior information to apply directly to patient care.[5] With the accelerating availability of medical information, optimizing methods for learning is important, thus the on-demand accessibility of podcasts provides a unique opportunity. Learning from podcasts may be efficient for medical residents as they can select when it will best fit into their highly variable, demanding schedules. Podcasting has been used in graduate medical education to supplement learning in emergency medicine rotations, improve preparedness for anesthesia residencies, and even reduce surgical site infection rates.[6–8]

In our institution, like many others, pharmacy students commonly interact and learn with resident physicians through advanced pharmacy practice experiences (APPEs). Interprofessional education (IPE) and collaboration with prescribers is a required component of the pharmacy student's education.[9] Interprofessional education occurs when two or more professions learn with, from, and about each other to improve collaboration and the quality of care.[10] The Accreditation Council for Pharmacy Education (ACPE) endorses three key elements regarding IPE in the pharmacy curriculum: demonstration of competence in interprofessional team dynamics, engaging in interprofessional team education activities, and participating in interprofessional team practice for direct patient care.[9] Clear, specific communication is certainly integral to successful achievement of these key elements. In fact, interprofessional communication is also one of four core competency domains necessary to prepare students for successful interprofessional practice.[11] As a result, ACPE also emphasizes effective communication skills throughout its standards. While communication in the clinical setting is extremely important to interprofessional team dynamics, pharmacy students may be hindered by lack of confidence in their ability to interact with resident physicians. This lack of confidence may possibly stem from insufficient practice in communication or inadequate knowledge of the topic being discussed with the physician.[12,13] In pharmacy education, podcasting has been found to enhance the learning experience, but the effect of a pharmacy student developing a podcast on their own learning and confidence has not been studied.[14]

Pharmacy students and resident physicians in our institution interact daily through patient care activities. While there is likely informal, bidirectional teaching occurring in these clinical settings, the ability for pharmacy students to teach resident physicians has not previously been elucidated. We chose podcasts as a mode of instruction because this could supplement the learning of medical residents at a time and place that would be convenient for them. Furthermore, podcasts would allow pharmacy students a “lower stakes” opportunity to practice their communication skills and reflect on abilities while recording and editing a presentation, without the added pressure of a live audience. In addition, an existing archive of podcasts would augment existing IPE at our institution by allowing pharmacy students to continue to teach residents, even after they have rotated off of their five-week APPE.

We chose to examine the effect of podcasts created by pharmacy students on the learning of medical residents, using questions answered correctly by the resident as a surrogate. We hypothesized that medical residents would be able to gain knowledge from the podcasts that pharmacy students created. Secondarily, we believed that the pharmacy students’ confidence level in their ability to teach and communicate with resident physicians would improve through creating podcasts.

Educational activity and setting

Broadlawns Medical Center (BMC) is a publicly-funded community hospital in Des Moines, Iowa. BMC maintains family medicine and transitional residencies accredited by the Accreditation Council for Graduate Medical Education (ACGME). BMC also serves as an experiential rotation site for a number of health professions, including fourth-year pharmacy students from Drake University College of Pharmacy and Health Sciences (DUCPHS). At the time of this study, there were 25 family medicine residents and four transitional residents. Prior to the initiation of this study, the investigators explained the study procedures to the residents and obtained informed consent, and 79.3% (23/29) of the residents elected to participate. This included ten post-graduate year one and transitional year residents, seven post-graduate year two residents, and six post-graduate year three residents.

There were two interconnected components of this study, with separate participants in each (Fig. 1). In the first component, eight pharmacy students from DUCPHS who had been assigned to the BMC Internal Medicine APPE were asked to create an enhanced podcast on a specific medical topic as well as four to six associated assessment questions during the course of their five-week rotation. This activity was in addition to other typical acute care APPE activities, which included daily teaching rounds with BMC's resident physicians. Podcast topics were suggested by residents and teaching faculty at BMC before pharmacy students started their APPE. Prior to creating their materials, the pharmacy students provided informed consent to participate in a survey of the experience. If consented, they received a “Pre-Podcast Student Survey” that examined their baseline attitudes and confidence in teaching medical residents about pharmacotherapy and about communicating with physicians in general. Early in their APPE, pharmacy students received training from the researchers on writing learning objectives, crafting multiple choice questions, and technical aspects of creating a podcast. This training came in the form of pre-recorded videos on Bloom's taxonomy, writing learning objectives, and writing multiple choice questions. This instruction was provided by one of the study investigators. Over the ensuing five weeks, students researched their topic, wrote learning objectives and assessment questions, and created the enhanced podcast content. The pharmacy students also received feedback from their preceptor (who also served as principal investigator) on the content of their podcast and assessment questions; the preceptor also made suggestions for improving materials. Students created their enhanced podcast via screen capture recordings and were asked to limit presentations to ten minutes. Presentations were made as audio over lecture-style slide presentations, and the presenter's face was not visible. Students were able to edit the video file of their presentation prior to posting if they wished. Assessment questions written by the students were checked for factual accuracy by the study

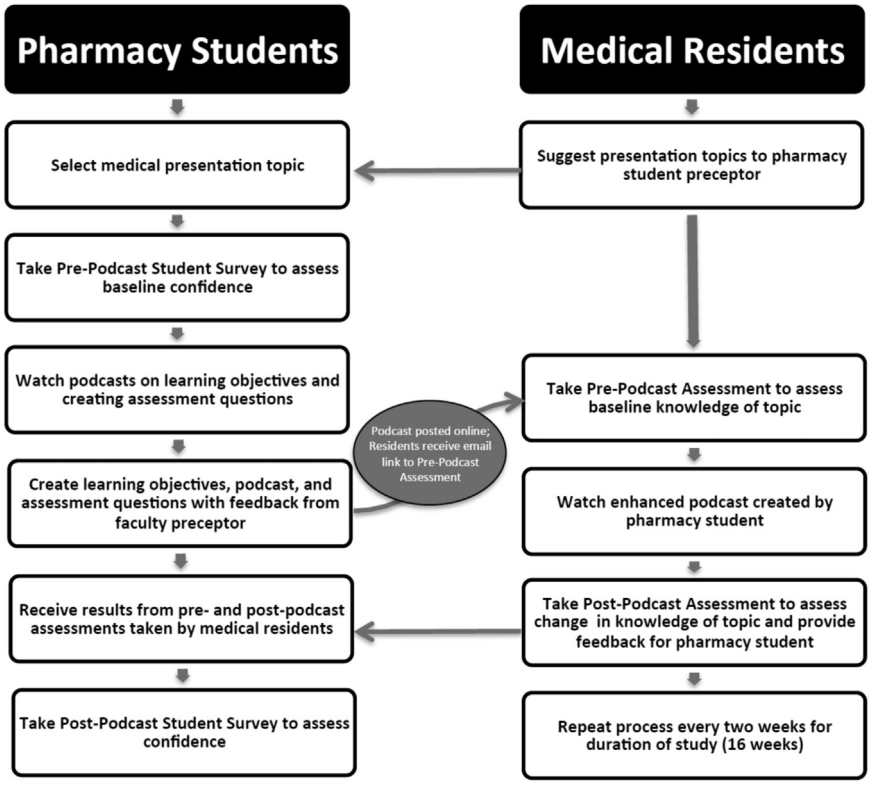

Fig. 1. Outline of procedures.

investigators and removed if inaccurate. Questions were split evenly and randomly by the research team into a "Pre-Podcast Resident Assessment" and a "Post-Podcast Resident Assessment" for each podcast topic. The final versions of assessment questions were uploaded into an online survey software (Qualtrics, Provo, Utah), and the podcast video file was uploaded to the principal investigator's website. The learning objectives, podcast running times, and assessment questions can be seen in the supplement.

In the second component of this study, the content created by the pharmacy students was delivered to the participating medical residents via e-mail. Medical residents received an e-mail linking them to an electronic Pre-Podcast Resident Assessment of two to three questions to test baseline knowledge of the topic. After completing the assessment, the medical residents were automatically linked to a website to view the associated podcast created by the pharmacy student. They were then prompted to take to an electronic Post-Podcast Resident Assessment. This assessment included an additional two to three questions about the content as well as a free text area to give general feedback to the student author. Eight content modules were sent to the residents over a course of 16 weeks from December 2014 to April 2015. A new module was sent out biweekly; reminder e-mails were sent one week later. Investigators were blinded to the participation of individual residents on each assessment, and residents were allowed to choose to participate or skip entire modules. The module topics that were selected are listed in Table 1. Following completion of each module by the residents, the pharmacy students received an aggregate assessment report for their topic and anonymous feedback from the medical residents on the quality of their podcast. In all cases, students had rotated off of the APPE by the time the report was available. After reviewing this report, they received a "Post-Podcast Student Survey" to gauge changes in attitudes and confidence with regards to

Table 1
Results from medical residents' survey responses.

Module title	Aggregate pre-podcast score	Aggregate post-podcast score
Hypertension Treatment	54.5% (18/33)	85.2% (23/27)
Stress Related Mucosal Disease	31% (13/42)	61.5% (24/39)
Superficial Thrombophlebitis	48.5% (16/33)	83.3% (20/24)
Inpatient Hyperglycemia Management	46.7% (14/30)	87.5% (21/24)
Sofosbuvir and the Hepatitis C Guidelines	35% (7/20)	54.2% (13/24)
Fibrinolytics in Pulmonary Embolism	6.3% (1/16)	85.7% (12/14)
Vancomycin Dosing Basics	16.7% (4/24)	85.7% (18/21)
Novel Oral Anticoagulants in Atrial Fibrillation	33.3% (9/27)	77.8% (21/27)
Overall	**36.4% (82/225)**	**76% (152/200)**

All results reported % (n).

their ability to teach medical residents.

The primary outcome of this study was to compare the aggregate proportion of correct answers from medical residents in the Post-Podcast Assessments to the baseline of the Pre-Podcast Assessments. Aggregate scores were calculated as a sum of all correct answers from all residents divided by the number of the sum of all resident attempts on each module's set of assessment questions. Secondary outcomes included changes in pharmacy student attitudes and confidence in their ability to educate other healthcare providers, which was assessed through the two surveys given to the pharmacy students.

All data collection occurred using survey software (Qualtrics; Provo, Utah). Data was analyzed using SPSSv22 (IBM; Armonk, NY). Consistent with the pre-post design, Wilcoxon signed-rank or McNemar's tests were used where appropriate. This study was reviewed by the Institutional Review Board at Drake University and found to be exempt.

Findings

Resident participation for each module ranged from 30.4% to 60.9% (mean = 44% per module). In all eight modules, the aggregate scores of the Post-Podcast Assessments increased from the Pre-Podcast Assessments. The results in Table 1 outline correct responses for each module. The overall aggregate score significantly improved from 36.4% (82/225) prior to the podcasts to 76% (152/200) following the podcasts ($p = 0.001$), demonstrating an increase in overall resident knowledge for the given topics.

Resident free text feedback to the pharmacy students in the Post-Podcast Assessment surveys was only provided for four of the eight podcast modules. Comments were universally positive, but nonspecific (e.g. “good presentation,” “excellent job, thank you”).

Prior to creating their podcast materials, most of the pharmacy students (87.5%) agreed or strongly agreed that resident physicians would be able to learn from them. The most common response of pharmacy students to the survey question “What is your biggest concern about discussing pharmacotherapy topics with a physician?” was an inadequate clinical knowledge base (37.5%). A majority of students (62.5%) felt that their presentation skills were strong, but required improvement; however, 75% felt that they would be more comfortable presenting via podcast than live in front of a large, interprofessional group.

Pharmacy student confidence following the experience significantly increased on a scale of 1–10 (1 = completely unable to complete the task correctly, 10 = completely confident in my ability) from the baseline survey (5.63 vs. 8.00, $p = 0.041$). All participating pharmacy students agreed or strongly agreed that residents were able to learn from them following this experience, as

Table 2
Results from pharmacy students' survey responses.

Pre-podcast response	Post-podcast response
On a scale of 1–10, indicate your confidence in your ability to teach your assigned topic to a physician if asked to do so TODAY.	
Mean: **5.63**	Mean: **8.00**
I believe that a resident physician can learn from me:	
0%: *Strongly disagree*	**0%:** *Strongly disagree*
0%: *Disagree*	**0%:** *Disagree*
12.5% (1/8): *Unsure*	**0%:** *Unsure*
[a]**75% (6/8):** *Agree*	[a]**75% (6/8):** *Agree*
12.5% (1/8): *Strongly agree*	**25% (2/8):** *Strongly agree*
What is your biggest concern about discussing pharmacotherapy topics with a physician?	
[a]**37.5% (3/8):** *My clinical knowledge base is overall inadequate*	**0%:** *My clinical knowledge base is overall inadequate*
12.5% (1/8): *My knowledge base on the topic is inadequate*	[a]**25% (2/8):** *My knowledge base on the topic is inadequate*
0%: *I'm not sure how to approach the physicians (i.e. when, what method of contact, etc.)*	[a]**25% (2/8):** *I'm not sure how to approach the physicians (i.e. when, what method of contact, etc.)*
12.5% (1/8): *My communication skills*	**0%:** *My communication skills*
12.5% (1/8): *I find that physicians are generally intimidating*	**12.5% (1/8):** *I find that physicians are generally intimidating*
0%: *Physicians won't take me seriously because I'm a student*	[a]**25% (2/8):** *Physicians won't take me seriously because I'm a student*
0%: *Physicians don't care what pharmacists think*	**0%:** *Physicians don't care what pharmacists think*
0%: *My input doesn't make a big impact on patient outcomes*	**0%:** *My input doesn't make a big impact on patient outcomes*
12.5% (1/8): *Previous negative experiences*	**12.5% (1/8):** *Previous negative experiences*
12.5% (1/8): *Other – “Worry about harming a patient”*	**0%:** *Other*
I feel my presentation skills are:	
0%: *Generally poor*	**12.5% (1/8):** *Generally poor*
37.5% (3/8): *Appropriate; not inadequate*	**0%:** *Appropriate; not inadequate*
[a]**62.5% (5/8):** *Strong, but may require some improvement*	[a]***87.5% (7/8):*** *Strong, but may require some improvement*
0%: *Strong and beyond expectations of a new graduate*	**0%:** *Strong and beyond expectations of a new graduate*
I feel more comfortable creating an electronic presentation (e.g., podcast with slides) than presenting in front of a large, interprofessional group.	
0%: *Strongly disagree*	**0%:** *Strongly disagree*
0%: *Disagree*	**0%:** *Disagree*
25% (2/8): *Unsure*	**0%:** *Unsure*
[a]**37.5% (3/8):** *Agree*	**37.5% (3/8):** *Agree*
[a]**37.5% (3/8):** *Strongly agree*	[a]**62.5% (5/8):** *Strongly agree*

All results reported % (n).

[a] Mode.

opposed to 87.5% prior to it. More students (87.5%) felt their presentation skills were strong, but still required improvement. Additional detail in changes in pharmacy student perceptions before and after the experience can be found in Table 2.

In the Post-Podcast Student Survey, students were asked if this experience improved their knowledge of their assigned topic, and if it would improve their ability to interact with physicians. All (100%) of the participating pharmacy students agreed or strongly agreed that this experience improved their own knowledge on their assigned topic. However, 75% agreed or strongly agreed that this activity would improve their ability to interact with physicians while 12.5% disagreed with the statement.

Discussion

In this study, the aggregate proportion of correct answers doubled after residents viewed podcasts created by pharmacy students. Much like our study, a number of other studies have also demonstrated that podcasting can improve learning assessment scores for medical residents.[6,7] For example, Branzetti and colleagues[6] created a series of podcasts on emergency medicine-related topics. Pre- and posttests were administered to program residents, and those who had access to the podcasts had a 15.7% greater improvement in their posttest scores. However, these previous studies have not used podcasts created by students and have not considered the impact of constructing a podcast on the learner.

The results of our study support the hypothesis that pharmacy students can teach resident physicians about the pharmacotherapy used to treat various disease states. Despite common clinical interactions, there is surprisingly little data about what practicing resident and attending physicians can learn from pharmacy students. Stebbins and colleagues[15] described an intervention in which four pharmacy students provided live lectures to prescribers about costs of prescription medications and ways to lower costs for underserved patients. Among those that participated were 107 medical residents. Similar to our study, there was a significant increase in correct answers of knowledge-based questions about the content.

Previous studies have demonstrated that medical residents appreciate the availability of podcasts to supplement their learning, but may not necessarily prefer it over traditional clinical teaching.[16] The flexibility for viewing podcasts on demand may be beneficial in teaching medical residents as they often have busy and fluctuating shift schedules that may not be conducive to live lectures. Furthermore, residency programs can adjust podcast topics and learning points to meet the needs of their own programs and address all ACGME core competencies, such as the curriculum described by Chu.[7]

While there was a modest improvement in pharmacy student confidence related to their assigned topic in this study, podcasting may not be the best way to improve pharmacy student confidence in the area of communication with physicians. In fact, one of eight did not feel this activity benefited their ability to interact with physicians. Most clinical interaction between physicians and pharmacists takes place in face-to-face interactions or via telephone. Because podcasting is a unidirectional mode of communication, it may not adequately prepare students for interprofessional interactions seen in the workforce. This effect may be seen elsewhere in our results, as following the podcasts more students felt that they would be more comfortable presenting in electronically rather than with a live, interprofessional audience. Thus, implementing an electronic presentation project for students should serve as additional training from which to build upon more face-to-face communications with physicians.

Moreover, one may reasonably argue that the unidirectional nature of podcasting does not reliably contribute to IPE since it does not necessarily allow for learning with other professions as much as from other professions. In our setting, we viewed the pharmacy student podcast as one piece of the IPE puzzle, as pharmacy students also regularly worked and learned with residents on patient care in the hospital. This activity can augment the student's growth toward achievement of ACPE's key elements of IPE for competence in interprofessional team dynamics (Key Element 11.1) by allowing for practice of professional communication skills and also in interprofessional team education (Key Element 11.2), as it helps establish the pharmacy student as the pharmacotherapy expert on the team.[9] Nevertheless, podcasting cannot on its own achieve these outcomes as interprofessional team practice (Key Element 11.3) was present on the APPE, but external to this project.[9] One should note that this study was not necessarily designed to assess IPE outcomes, and podcasts by this method should serve only as an enhancement of existing IPE.

One of the primary limitations for this study was the small sample size at a single medical center. A larger study may be able to demonstrate how learning from podcasts is applied to actual clinical outcomes, such as that found in one Irish hospital.[8] In our study, we were limited to providing immediate responses as a surrogate marker for increased knowledge. Providing a posttest several weeks later would have been a stronger marker of knowledge retention and integration. However, because of transient scheduling of off-site specialty rotations, timing of resident graduations from the program, and the end of the pharmacy students' academic year, we found that immediate posttesting provided the most pragmatic assessment. Timing of the Post-Podcast Student Survey may have also impacted pharmacy student confidence as their subsequent APPEs may have improved confidence in areas that were related to interactions with physicians or presentation abilities. Another limitation of the study was the inconsistent response rate between the Pre-Podcast Assessment and the Post-Podcast Assessment. As the study progressed, fewer residents completed the Post-Podcast Assessment after watching the podcast. The reduction in Post-Podcast Assessment participation may have been due to residents checking their baseline knowledge and simply not proceeding with the final assessment if they felt their knowledge was adequate. Similarly, because participation on each module was anonymous and voluntary, it is possible that more advanced residents may have completed the Post-Podcast Assessments more often due to greater confidence in their own knowledge, leading to potential inflation of these scores.

To our knowledge, this is the first study in pharmacy education to examine how the creation of podcasts by students influences the learning of other healthcare professionals as well as their own education and communication skills. By producing a podcast, pharmacy students thoroughly research a topic, analyze the available information, and communicate effectively to synthesize a final product. Such a project provides a valuable experience for a pharmacy student to engage several levels of higher learning, and it also

provides tangible end product that may be integrated into a learning portfolio. As opposed to a one-time live presentation during an APPE, a podcast may be used as a piece of evidence to demonstrate a student pharmacist's quality of work to a potential employer. Further studies should be designed to assess the potential benefits and learning outcomes of such projects.

Summary

In conclusion, podcasts are an effective method for medical residents to learn from pharmacy students. This activity has the added benefit of improving pharmacy students' confidence in their abilities. It is likely that many health-systems that maintain residency programs already have pharmacy students interacting with their residents in the clinical setting and should consider collaboration with them to supplement teaching efforts.

Declarations

Conflict of interest

None.

The results of this study were presented in poster format at the 2015 Iowa Academy of Family Physicians Clinical Education Conference.

Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at http://dx.doi.org/10.1016/j.cptl.2017.03.003.

References

1. Cain J, Fox BI. Web 2.0 and pharmacy education. *Am J Pharm Educ.* 2009;73(7):Article 120.
2. Boulos MNK, Maramba I, Wheeler S. Wikis, blogs, and podcasts: a new generation of Web-based tools for virtual collaborative clinical practice and education. *BMC Med Educ.* 2006;6:41.
3. Alikhan A, Kaur RR, Feldman SR. Podcasting in dermatology education. *J Dermatol Treat.* 2010;21(2):73–79.
4. Koo S, Sandars J. Podcasting for undergraduate healthcare education. *Educ Prim Care.* 2008;19(1):13–17.
5. Accreditation Council for Graduate Medical Education. ACGME Common Program Requirements; Published September 2015. Available at: 〈http://www.acgme.org/Portals/0/PFAssets/ProgramRequirements/CPRs_07012016.pdf〉. Accessed May 28, 2017.
6. Branzetti JB, Aldeen AZ, Foster AW, Courtney DM. A novel online didactic curriculum helps improve knowledge acquisition among non-emergency medicine rotating residents. *Acad Emerg Med.* 2011;18(1):53–59.
7. Chu LF, Ngai LK, Young CA, Pearl RG, Macario A, Harrison TK. Preparing interns for anesthesiology residency training: development and assessment of the successful transition to anesthesia residency training (START) e-learning curriculum. *J Grad Med Educ.* 2013;5(1):125–129.
8. McHugh SM, Corrigan M, Dimitrov B, et al. A targeted e-learning program for surgical trainees to enhance patient safety in preventing surgical infection. *J Contin Educ Health Prof.* 2010;30(4):257–259.
9. Accreditation Council for Pharmacy Education. Accreditation Standards and Key Elements for the Professional Program in Pharmacy Leading to the Doctor of Pharmacy Degree ("Standards 2016"); Published February 2015. Available at: 〈https://www.acpe-accredit.org/pdf/Standards2016FINAL.pdf〉. Accessed May 28, 2017.
10. Burning SM, Bhushan A, Broeseker A, et al. Interprofessional education: definitions, student competencies, and guidelines for implementation. *Am J Pharm Educ.* 2009;73(4):Article 59.
11. Interprofessional Education Collaborative. Core Competencies for Interprofessional Collaborative Practice; Published May 2011. Available at: 〈http://www.aacn.nche.edu/education-resources/ipecreport.pdf〉. Accessed May 28, 2017.
12. Lundquist LM, Shogbon AO, Momary KM, Rogers HK. A comparison of students' self-assessments with faculty evaluations of their communication skills. *Am J Pharm Educ.* 2013;77(4):Article 72.
13. Wongwiwatthananukit S, Newton GD, Popovich NG. Development and validation of an instrument to assess the self-confidence of students enrolled in the advanced pharmacy practice experience. *Am J Pharm Educ.* 2002;66(1):5–19.
14. DiVall MV, Hayney MS, Marsh W, et al. Perceptions of pharmacy students, faculty members, and administrators on the use of technology in the classroom. *Am J Pharm Educ.* 2013;77(4):Article 75.
15. Stebbins MR, Frear ME, Cutler TW, et al. Pharmacy students teaching prescribers strategies to lower prescription drug costs for underserved patients. *J Manag Care Pharm.* 2013;19(7):534–541.
16. Alla A, Kirkman MA. PodMedPlus: an online podcast resource for junior doctors. *Med Educ.* 2014;48(11):1126–1127.