Use of web-based learning modules for a general medicine advanced pharmacy practice experience

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Abstract

Objective: To implement and assess web-based learning modules on baseline pharmacy student knowledge prior to a general medicine advanced pharmacy practice experience (APPE).

Methods: Three web-based learning modules were developed for use prior to a general medicine APPE. Students completed pre- and post-assessments specific to each learning module. Additionally, students completed perception surveys at the conclusion of the APPE to determine the utility of these modules and the impact on student learning experiences.

Results: Use of the web-based training (WBT) modules resulted in a statistically significant improvement in post-assessment scores for two of the three modules ($p < 0.001$). Student participants found the modules easy to use and helpful in APPE preparation.

Conclusions: Utilization of a WBT module prior to a general medicine APPE improves baseline knowledge among pharmacy students.

Introduction

The Accreditation Council for Pharmacy Education (ACPE) requires all doctorate of pharmacy students to complete advanced pharmacy practice experiences (APPE). These experiences are structured to provide students with opportunities to apply pharmacotherapy knowledge and develop medication recommendations through direct patient care. Therefore, in order to excel during their APPE year,

pharmacy students must have a sound therapeutic baseline. The ACPE Standards and Guidelines highlight specific skills that students must acquire prior to undergoing the APPE year in the Pre-APPE Performance Domains and Abilities Appendix (Appendix D). Students must be able to accurately dispense medications, perform basic patient assessments, demonstrate medication knowledge, identify and assess drug-related problems, act ethically and professionally, and communicate effectively with patients and other health care professionals.[1] The pharmacy curriculum is geared to prepare students for APPE and the workforce, but as therapeutic disease states are covered throughout the curriculum, long periods of time may exist between didactic lectures and application of the knowledge within the experiential setting.

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Additionally, newly published literature during this time provides additional opportunities to strengthen therapeutic knowledge base prior to APPE. Through reinforcement of didactic coursework before APPE, students will be better prepared for the provision of exceptional patient care with less direct instruction required by preceptors.

To fortify students' clinical knowledge, educators must take into consideration the learning techniques of current pharmacy students. Millennial students, born between 1982 and 2001, are characteristically different from previous generations, but educational techniques have struggled to adapt and create engaging opportunities for this demographic.[2–8] Members of this generation are optimistic young adults, comfortable communicating through social media, e-mail, and texting.[2] In the classroom, Millennials are inviting a dramatic change in educational techniques.[3] These students are active learners who prefer self-directed educational opportunities through interactive environments with immediate feedback.[4] Utilizing a variety of teaching methods, including new technology, students with different learning preferences are able to understand complex material.[4,5] However, this technology does not always transfer to the classroom, potentially leaving students disengaged. In the experiential setting, insufficient knowledge preparation may hinder student's ability to deliver effective patient care. Pharmacy school education must advance to provide interactive and challenging learning opportunities, ensuring the development of Millennial pharmacy students.

To adapt to students of this generation, health care education and ACPE accreditation standards (Guideline 11.2) highlight the need for active learning strategies via computers and other technological tools involving actual or simulated patients.[1,2] These interactive educational techniques engage Millennial students and reinforce previously learned knowledge through application.[1,5] Web-based didactic modules have been effectively evaluated in a variety of health care settings to provide interactive educational opportunities for the new generation of students.[9–18] Within the pharmacy realm, web-based learning has been utilized for ophthalmic and otic patient counseling, pediatric disease states, medication therapy management, pain management, and assessment of critical thinking.[9–13] A recent study of clinical topic modules prior to and during APPE illustrated pharmacy students' positive perceptions to the incorporation of technology into didactic and clerkship experiences.[14] Web-based learning and patient simulations engage students to apply knowledge and synthesize pharmacotherapeutic recommendations, enhancing critical thinking skills vital for APPE.

At Butler University College of Pharmacy and Health Sciences (BUCOPHS), all fourth-year pharmacy students must complete an adult general medicine APPE. Students encounter a variety of disease states on their general medicine rotation that necessitates a well-rounded therapeutic baseline. Despite slight variability between patient populations at each site, students generally encounter patients for whom they must provide therapeutic recommendations for venous thromboembolism (VTE) prophylaxis and treatment, diabetes, acute and chronic kidney disease, and infectious diseases. For the BUCOPHS graduating Classes of 2011 and 2012, VTE and diabetes lectures were covered in the second professional year with three hours of lecture dedicated to each disease state. Acute kidney disease lecture content was delivered over two hours in the second professional year with no formal class time set aside for chronic kidney disease. Infectious disease education occurred over 30 hours during the students' third professional year. With the prevalence of these disease states, it is imperative that pharmacy students be knowledgeable prior to a general medicine APPE to ensure the delivery of optimal pharmaceutical care.

The objective of this study was to evaluate the efficacy of a web-based learning tool to educate and reinforce pharmacotherapeutic knowledge for BUCOPHS pharmacy students prior to an adult general medicine APPE.

Methods

Three web-based training (WBT) modules were developed for use on an acute care general medicine APPE. Topics included in each module are listed in Table 1. The topics were split into three separate learning modules and designed to be approximately 60 minutes in length. Each WBT module contained content specifically created for the practice site and material was reviewed by a content expert prior to study implementation. Panopto©, a presentation capture platform, was used to synch narrative audio recordings with the presentation. WordPress™ web software was used to store the modules, assigning a unique web address

Table 1
Module content

Module 1	Module 2	Module 3
Diabetes and anticoagulation	Disease state review	Review of infectious diseases (emphasis on institution-specific dosing and monitoring)
Goals of therapy	Acute kidney injury	Location of system resources
Treatment strategies	End-stage renal disease	Steps for appropriate literature evaluation
Monitoring parameters	Drug dosing in dialysis	Interpreting statistics in primary literature