Available online at www.sciencedirect.com

ScienceDirect

Currents in Pharmacy Teaching and Learning 7 (2015) 157–162

Currents in Pharmacy Teaching & Learning

http://www.pharmacyteaching.com

Research

Computer-based clinical simulation cases in oncology pharmacotherapy: Student perceptions from two campuses

Jacqueline L. Olin, MS, PharmD, BCPS, CPP, CDE, FASHP[a,*], Sabrina W. Cole, PharmD, BCPS[a,b]

[a] *Wingate University School of Pharmacy, Wingate, NC*
[b] *Intermountain Healthcare, Murray, UT*

Abstract

Objectives: To describe the development of computer-based clinical simulation cases (CBCSCs) in an oncology pharmacotherapy course and review student perceptions of this learning strategy.
Methods: Hematologic/Oncologic Pharmacotherapy is a two-credit hour course for third-year student pharmacists. It provides students with an understanding and ability to deliver pharmaceutical care to patients with cancer. CBCSCs were prepared in advance using decision simulator technology. Student pharmacists in the 2013 course solved the CBCSCs in teams of three during the class on two campuses. Participants completed an Institutional Review Board-approved survey and rated agreement with statements about the utility of the CBCSCs using a 4-point Likert-type scale (4—completely agree to 1—completely disagree).
Results: The survey response rate was 99% ($n = 77$ main campus and $n = 14$ satellite campus). Overall, the majority of students completely agreed or agreed that CBCSCs helped identify learning needs (89%), promoted understanding of key concepts (93.4%), and should be continued in this course and other courses (90%). The preference of completing the CBCSCs individually, as opposed to a group format, was expressed. In contrast to student responses on the main campus, fewer students on the satellite campus agreed or strongly agreed that the CBCSCs should be continued in this course and others (93.8% vs 69.2%, respectively).
Conclusions: CBCSCs are well-received by students and can be a useful mechanism to apply pharmacotherapy knowledge in a low-risk environment to identify areas for continued improvement and areas of mastery. The differences in perception between the campuses require further study.

Keywords: Interactive learning; Oncology; Simulation; Perceptions

Introduction

Active-learning strategies are used frequently in education to engage students in the learning process. A variety of learner-centered strategies have been incorporated into the classroom environment including think–pair–share, small-group discussions, and student presentations.[1] However, widespread adoption of technology in virtually every facet of students' lives suggests the use of technology could be an effective strategy to further engage students in the learning process. For example, personal response systems are a widely accepted tool in health sciences curricula to facilitate student involvement in a non-threatening environment.[2] Students anonymously respond to questions and are able to view aggregate responses of their peers. The instructor is

* Corresponding author: Jacqueline L. Olin, MS, PharmD, BCPS, CPP, CDE, FASHP, Wingate University School of Pharmacy, 515N. Main Street, PO. Box 159, Wingate, NC 28174.
E-mail: jolin@wingate.edu, jlolinrx@gmail.com

http://dx.doi.org/10.1016/j.cptl.2014.11.012
1877-1297/

able to address the class response and provide immediate feedback and clarification.

The virtual patient simulation platform allows for a more robust approach to difficult and complex decision making in a safe but realistic environment. This platform can be an effective method to further engage learners in knowledge development and application and has been described previously with success in health sciences curricula.[3,4] Simulation platforms have been described in academic and work environments to help learners develop skills and behaviors that will translate into actual skills and behavior in real-life experience. Examples of simulation activities include situational interviewing, role playing, and computer-based mannequins.[5,6] Another simulation format is computer-based case studies that allow learners to independently navigate a patient's case to apply knowledge of patient assessment and pharmacotherapy principles. This learning activity is flexible and can be designed to fit the course culture (e.g., individual vs group assignment) and desired emphasis or outcome (e.g., formal assessment vs student-guided review). This simulation format presents minimal risk to the student, with perhaps the exception of a course grade, yet allows students to explore their knowledge and familiarity with subject material.

This article describes the development and implementation of computer-based clinical simulation cases (CBCSCs) into a large hematology/oncology pharmacotherapy lecture course. Additionally, student perceptions of this learning strategy are reviewed. Challenges to implementation of the CBCSCs in a synchronous distance-learning environment will also be discussed.

Methods

Wingate University School of Pharmacy is a private institution, comprising a main and satellite campus in Hendersonville, NC. Synchronous distance technology is utilized for the satellite cohort to fully participate in didactic courses. The 2014 graduating class was the first composed of students from the main and satellite campuses. Hematologic and Oncologic Pharmacotherapy is a required two-credit hour course for all third-year student pharmacists and is delivered over five weeks. The course is intended to facilitate student pharmacists' understanding and ability to deliver pharmaceutical care to patients with cancer. Relevant course objectives center around the student being able to describe the clinical presentation and pathophysiology of selected diseases, disorders, and/or conditions related to oncology; evaluate pharmacotherapeutic approaches for prevention and management of selected oncologic disorders; and describe or select the uses, major toxicities, and drug interactions of commonly used anticancer drugs. The course is structured with several sessions for discussion of drugs and management of common toxicities, and then organized by specific disease state.

CBCSCs (including breast cancer and colon cancer cases) were authored by the course coordinator using the DecisionSim Version 3.0 platform technology (Decision Simulation LLC, Pittsburgh, PA). This platform allows authors to create case storylines and uses a framework of interconnected nodes to allow learners to make decisions that may lead to different outcomes. Design features in the cases included inquiry nodes, which allowed users to gather patient information, such as laboratory tests; text-response options, which permitted free-text responses from the learners to the instructor; and multiple-choice questions to solidify concepts.[6] For example, one of the CBCSCs required participants to evaluate a patient reporting complaints of abdominal pain and bloating (Fig. 1). The associated CBCSC was designed to align with learning objectives specific for the colon cancer topic. As the student pharmacists progressed through the scenario, situations in the CBCSCs enabled the students to apply the following objectives to the patient: (1) identify colon cancer risk factors, (2) state current screening recommendations, and (3) construct an appropriate treatment plan for colon cancer entailing adjuvant chemotherapy, and subsequently management of metastatic disease. Participants formulated a monitoring plan and provided patient counseling through the free-text option. Third-year student pharmacists in the Hematologic and Oncologic Pharmacotherapy course solved the CBCSCs in teams of three during class time on two campuses designated as review for the examination and as an additional component of course delivery.

To evaluate student perception of the utility of the CBCSCs, participants completed an Institutional Review Board-approved voluntary paper survey a week following the exam with an option to opt out. Demographic information including age, gender, college degree history, and practical work experience with preparation of chemotherapy drugs was obtained. Student pharmacists rated their agreement with statements about the utility and benefit of the CBCSCs using a 4-point Likert-type scale (4—completely agree to 1—completely disagree). Results were categorized for the entire cohort and by each campus separately. Descriptive statistics were calculated using Microsoft Excel 2010.

Results

Of the 93 students enrolled in Hematologic and Oncologic Pharmacotherapy, 92 completed the survey, for an overall response rate of 99%. A single student on the main campus opted out. Demographics of student pharmacists are shown in Table 1. Over half of participants of this single cohort of students earned a previous college degree, with the majority (48%) completing a major in biology. Very few students indicated any background in either oncology education (12%) or pharmacy work experience with chemotherapeutic agents (9.8%).