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Short communication

Pharmacy student perceptions on the introduction of clinical case studies solved with Apple mobile devices into a basic health science laboratory

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Abstract

Objective: To describe the incorporation of clinical case studies solved with mobile devices into a basic health laboratory and to report student experiences and perceptions of these case studies.

Methods: First-year pharmacy students in a basic health sciences laboratory were given a description of a patient, which included symptoms, medical history, and diagnostic test results. Using only their Apple mobile devices (iPad, iPod Touch, and iPhone) as a resource, the students diagnosed the patient and then explained the symptoms, risk factors, pathophysiology, and common treatments. A paper-based survey was administered to 88 pharmacy students to assess their experiences and perceptions of the use of their mobile devices to solve the case studies.

Results: The response rate of the survey was 100%. Over 80% of the students agreed or strongly agreed that the incorporation of patient case studies solved with mobile devices into the laboratory increased their perceived understanding of the lab material, patient symptoms, pathophysiology, and treatments. Overall, 97% of the students agreed or strongly agreed that the use of mobile devices by pharmacists has the potential to improve patient health care.

Conclusions: The incorporation of clinical case studies solved with mobile devices was perceived as helpful to pharmacy students in a basic science laboratory to increase their understanding of basic science material and related clinical information.

Keywords: iPad; Case studies; Pharmacy education; Mobile devices; Technology

Introduction

The incorporation of mobile devices and associated technologies is helping to transform the fields of health and medicine, especially by improving the delivery of health care to patients.[1–3] Pharmacists are among the many health care providers embracing this new technology as confirmed by studies showing that they have a preference toward using mobile devices over desktop computers or laptops for some aspects of their profession.[4–6] A recent survey of pharmacists revealed that 51% used mobile devices in their practice, and of those that did not, two-thirds saw a future value for these devices within their practice.[7] Mobile devices are also becoming more important to hospital pharmacists as mobile technology is being increasingly utilized and networked among hospital health care providers.[8] A survey of pharmacy preceptors at inpatient, community, and ambulatory care practice sites demonstrated that 50% of the respondents used mobile devices and 96% supported the training of students on mobile devices and compatible drug information software, further supporting the need for the early incorporation of mobile devices into the curriculum of all pharmacy students.[9]

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Valuable aspects of mobile devices are the easy and convenient access to health care information via websites and/or the use of mobile applications (apps) by patients and pharmacists.[10,11] These easily accessed websites and mobile apps are helpful resources for clinical information, drug information, laboratory references, medical calculators, medical news, and continuing education programs.[6,10] Accessing medical information and resources has been reported to be the primary use of mobile devices by clinicians.[12–15] Overall, 44% of pharmacy students using iPads on pharmacy practice experiences wanted access to more app-based patient and drug databases.[16] The availability of mobile apps for health professions is growing at a rapid pace, making it a challenge for clinicians, teachers, and students to learn which apps are available and appropriate.[17–20]

Health professional students and their future patients may benefit significantly by the incorporation of mobile devices into the curriculum. How to best incorporate mobile devices into a health profession curriculum can be a challenge.[21] The majority of students in a class at one school of pharmacy preferred using their iPads for internet research and for daily use of pharmacy-related apps but did not prefer them for accessing e-textbooks or taking notes, and similarly, students at another school of pharmacy found iPads useful for accessing websites and basic web browsing but not useful for note taking and slide annotation.[22,23] One medical school reported the integration of iPads into problem-based learning sessions, with the result showing "students almost unanimously endorsed the iPad as beneficial in medical education."[24] Although touch screen mobile devices are becoming more popular in the educational institutions of health professionals, there are few published examples that detail the different ways that these devices can be successfully incorporated, especially in the early part of the curriculum.

Rationale and objectives

In 2009, the Shenandoah University began providing first-year pharmacy students with an Apple mobile device (the choice of an iPod Touch, iPhone, or iPad) in addition to an Apple MacBook Pro laptop. That same year, the authors of this article initiated a pilot program to incorporate the Apple mobile devices into a course they instructed together. The mobile devices were incorporated into the laboratory section of the Integrated Basic Health Sciences (IBHS) course taken by all first-year pharmacy students. The IBHS course covers cell biology, genetics, anatomy, physiology, and pathophysiology. The weekly laboratory portion of this course involves the traditional use of dissections, physiological experiments, microscopy, and anatomical models. The instructors aimed to incorporate the mobile devices the students received from the university in a way that highlighted the present and future clinical utility of these devices. A series of patient case studies were developed, which the students would solve using only their Apple mobile devices. Apple mobile devices running iOS were the only mobile devices allowed to be used because every student possessed a university-distributed Apple device, technical support was optimized for the Apple devices, and it was important to maintain uniformity of their experiences with a single mobile operating system (iOS) and app store (Apple app store). The instructors termed this novel laboratory assignment the "iSolve Case Studies."

The main objectives of the iSolve Case Studies were to incorporate mobile device technology and clinical application into a basic science lab course and highlight the present and future utilities of mobile devices for pharmacy. These objectives adhere to the Accreditation Council on Pharmacy Education (ACPE) professional competency Guideline 12.1 regarding retrieving, evaluating, and interpreting the literature to improve patient health care and the Center for the Advancement of Pharmacy Education's (CAPE) educational outcomes 2.1 and 2.2, which refer to interpreting evidence to formulate and adjust patient medication plans and the use of technology to improve the medication use system.[25,26]

A survey instrument was utilized to evaluate the students' perceptions of the iSolve Case Studies. The first draft of the survey was created and administered to 56 students in 2009, the first year of the incorporation of the iSolve Case Studies into the laboratory course. The second draft of the survey was created and administered to 55 students in 2011. Based on the feedback from the students about the survey, it was revised by improving the clarity of the question wording. Feedback in the survey from the students resulted in several improvements to the process of the iSolve Case Studies including moving case studies to the start of lab, elimination of peer grading, and elimination of the evaluation of apps for patients. These changes were incorporated into the current iSolve Case Studies and the surveys that were administered in 2012 and reported in this article.

A current survey was administered to the students to assess how they perceived that the iSolve Case Studies affected their understanding of associated basic sciences material, clinical application of the lab, related patient pathophysiology and symptoms, and related treatments of common disorders. Additionally, the survey assessed if they perceived the iSolve Case Studies as enjoyable, educational, and useful for future students in the same course, and it also assessed what they liked the most and least about the iSolve Case Studies. The objective of this article is to describe the implementation of the iSolve Case Studies and to report the student perceptions of these iSolve Case Studies.

Materials and methods

Full approval through the Shenandoah University's Institutional Review Board was obtained before the surveys were administered. This study included 88 first-year pharmacy students enrolled in the IBHS laboratory course at the Shenandoah University's Bernard J Dunn School of Pharmacy in the Fall of 2012. The students consisted of 31