



Research

# Evaluation of student confidence in influenza immunization administration using a multi-modal teaching approach

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## Abstract

The primary objective of this study was to evaluate changes in student confidence resulting from completion of the American Pharmacists Association (APhA) certification course, an immunization-based simulation, and practical experience in influenza immunization clinics during an Introductory Pharmacy Practice Experience (IPPE). Secondary objectives included evaluation of influences on student confidence such as campus location, prior APhA certification, and prior experience in preparing injectable medications.

**Methods:** An eight-question survey was administered to third-year pharmacy students in Fall 2011 to measure confidence in immunization skills and knowledge at four time points; before APhA certification, after APhA certification, after participation in the simulation, and after 12 hours of practical experience in influenza-based immunization clinics. The simulation consisted of case-based scenarios and a skill assessment.

**Results:** Upon IPPE completion, at least 86.6% of students reported either confidence or extreme confidence for all survey items. Student confidence increased significantly between time points and from baseline to IPPE completion. Students certified prior to Fall 2011 were significantly less confident at baseline in some of the legal issues and response to anaphylactic reactions; however, this difference became non-significant after completion of the simulation.

**Conclusions:** All three training modules are important in preparing students for immunization delivery in their future practice. Schools of pharmacy should consider increasing opportunities for development of student confidence in this area. The lack of initial confidence regarding legal requirements in students certified prior to Fall 2011 may indicate the need for recertification or mandatory immunization-based continuing professional development for immunizing pharmacists.

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## Introduction

Pharmacists in all 50 states, the District of Columbia, and Puerto Rico are able to administer vaccinations, and this

skill has become a job expectation of new pharmacy graduates.<sup>1</sup> Despite this expectation, inconsistencies in immunization education and training in pharmacy schools exist.<sup>2,3</sup> These inconsistencies may result from the lack of requirement of the topic in pharmacy curricula, differences in state-approved vaccination training curricula, the inability of some pharmacy interns to provide vaccinations under pharmacist supervision, or other variances in state regulations regarding

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pharmacist-administered vaccinations, such as patient age limits and type of vaccine administered.<sup>1,2</sup>

A 2009 statement published in the *American Journal of Pharmaceutical Education* called for improvement of immunization education and training in pharmacy schools in order to produce graduates prepared to provide immunization services.<sup>3</sup> Increases in trained pharmacy graduates can potentially improve immunization rates in the United States to attain Healthy People immunization goals.<sup>3</sup> For example, in the area of seasonal influenza vaccination, Healthy People 2020 objectives in ambulatory adults target rates of 80% or higher, depending upon age.<sup>4</sup>

Support exists for incorporating immunization training and delivery in pharmacy curricula. The 2013 Center for the Advancement of Pharmaceutical Education (CAPE) outcomes 2.3 and 2.4 encourage wellness and chronic disease management efforts to resolve public health problems, which include immunization advocacy and delivery.<sup>5</sup> The pre-advanced pharmacy practice experiences (APPEs) core domain 10 of the 2007 Accreditation Council for Pharmacy Education (ACPE) standards version 2.0 maps to this CAPE outcome and provides examples of performance competencies including promotion of the importance of health, wellness, and disease prevention and provision of disease prevention services such as immunizations.<sup>6</sup>

Overall, 39 states and territories currently allow pharmacist interns to administer immunizations following completion of a suitable training course and under direct supervision of a trained pharmacist.<sup>1</sup> In pharmacy schools that offer education in pharmacy-based immunization services (PBIS), the nationally recognized American Pharmacists Association (APhA) Pharmacy-Based Immunization Delivery program has been increasingly used to provide this education and training to students.<sup>7–9</sup> Even with the APhA program requirement for demonstrating competence in intramuscular and subcutaneous vaccine administration, confidence in immunization delivery is further increased with additional opportunities to practice this skill. A positive correlation was found between level of comfort with handling needles and intention to provide PBIS in a recent study. The authors concluded that students should have increased opportunities to practice PBIS in order to build and maintain confidence in this area.<sup>10</sup>

Active-learning laboratories or simulations have also been used in an attempt to increase knowledge and confidence in a controlled environment.<sup>8</sup> These activities provide opportunities to use case-based learning, gain further practice in immunization administration, and expand on topics such as state-specific regulations and management of localized or systemic vaccine reactions, which may or may not have been covered fully during a training course.

At the University of Georgia College of Pharmacy, immunization training and education is provided in the core curriculum during an Introductory Pharmacy Practice Experience (IPPE) in the third professional year. During this IPPE, students are required to complete the APhA

Pharmacy-Based Immunization Delivery course, a case-based simulation, and practical experience in influenza immunization administration. While competency was ensured during each component through faculty observation, student confidence in immunization knowledge and skills was unknown. To date, no studies have assessed the effect of this multi-modal approach to teaching immunization administration on student confidence.

## Objectives

The primary objective of this study was to determine the impact of a newly designed three-component approach, including APhA certification, an immunization-based simulation, and practical experience in influenza immunization clinics, on student confidence during Fall 2011. Secondary objectives included evaluation of various influences on student confidence including student campus location, prior APhA certification, and prior experience in preparing injectable medications.

## Methods

The University of Georgia College of Pharmacy (UGA COP) Doctor of Pharmacy program is a four-year professional degree program consisting of three years of didactic, skills laboratory, and introductory pharmacy practice experiences and a final year dedicated to eight five-week APPE rotations. Students in the first and second years receive instruction on the main campus of the UGA COP, which is located in a non-academic medical center setting. Approximately 20% of the students are enrolled in a “2+2” program, which allows a portion of the class to complete the third professional year curriculum at a satellite campus located approximately 90 miles from the main campus at an academic medical center.

During the third professional year, all students are required to complete an influenza vaccine administration IPPE for course credit in order to ensure they possess the knowledge and skills to successfully provide influenza immunization services upon graduation. The components of this IPPE included APhA certification, an immunization-based simulation, and practical experience in influenza immunization clinics. Intramuscular influenza vaccine was specifically targeted due to the increased opportunities for student practical experience as well as state limitations on prescriber-issued protocols for other vaccine types and formulations.

Of note, the Georgia Board of Pharmacy allows pharmacy interns who have received certification in an approved immunization certification course to administer vaccinations under the supervision of a pharmacist who has also received certification in immunization training. Both pharmacists and interns are required to maintain basic cardiac life support and blood-borne pathogen exposure training. Immunizing pharmacists are also required to enter all vaccinations into

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