



Short communication

# Assessing student confidence and understanding with the immunization process through implementation of an immunization protocol at a school of pharmacy<sup>☆</sup>

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## Abstract

**Objective:** The objectives of this study were to (1) quantitatively evaluate student knowledge of immunization delivery prior to health fair events, (2) assess student perceptions of confidence with the immunization process and understanding of state immunization laws before and after expanded educational opportunities, and (3) qualitatively collect student reflections on the experience.

**Methods:** Student knowledge was assessed through an online health assessment module on immunization delivery with a pre- and post-quiz. Perceptions of understanding and confidence were evaluated utilizing a web-based survey before and after immunization clinics. Students completed post-survey questions to reflect on their overall experience following the immunization events.

**Results:** The median  $\pm$  SD health assessment module pre- and post-quiz scores were  $7 \pm 2$  and  $13 \pm 1$ , respectively ( $p < 0.001$ ), which reflects an 86% improvement from baseline. A total of 108 students (87%) completed the pre-survey and 81 (65%) completed the post-survey. No statistically significant difference was identified for six skills in which students ranked their confidence, yet over 80% of students remained confident on five areas throughout the experience. Student perceptions of their understanding of state immunization laws improved over the course of the experience with the percentage of students ranking “excellent” and “good” understanding increasing from 73.1% to 86.4%, respectively ( $p = 0.003$ ). Student reflections of the experience were positive.

**Conclusion:** Implementation of an immunization protocol allowed us to provide practice opportunities for students and permitted application of knowledge learned through hands-on experience. Participation resulted in students maintaining their confidence with immunization delivery and improving their understanding of state immunization laws.

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**Keywords:** Immunizations; Introductory Pharmacy Practice Experience; Assessment; Knowledge; Confidence

## Introduction

According to Healthy People 2020, the annual influenza vaccination rate was only 25% in 2008 for non-institutionalized adults age 18–64 years, with a goal to increase this to 80% by 2020.<sup>1</sup> Fortunately, many schools of pharmacy are able to support this goal by incorporating immunization training into their curricula. This training is vital to pharmacy education, and it fully supports the future vision of pharmacy practice as outlined by the Joint

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Commission of Pharmacy Practitioners (JCPP) and the recent report to the U.S. Surgeon General in which pharmacists are considered healthcare professionals capable of providing patient care to improve health outcomes.<sup>2,3</sup> Since 2009, pharmacists have been authorized to immunize in all 50 states<sup>4,5</sup> and many allow qualified students to administer immunizations under the direct supervision of a qualified pharmacist.<sup>6</sup> Recent changes in Missouri state law made possible the implementation of a school-wide immunization protocol at the University of Missouri-Kansas City (UMKC) School of Pharmacy (SOP) outside of a traditional pharmacy setting. These changes allow the students at UMKC's two locations to set their training in action. An immunization protocol was implemented in Kansas City and Columbia, Missouri in Fall 2011 to provide influenza vaccinations in affiliation with health fair events.

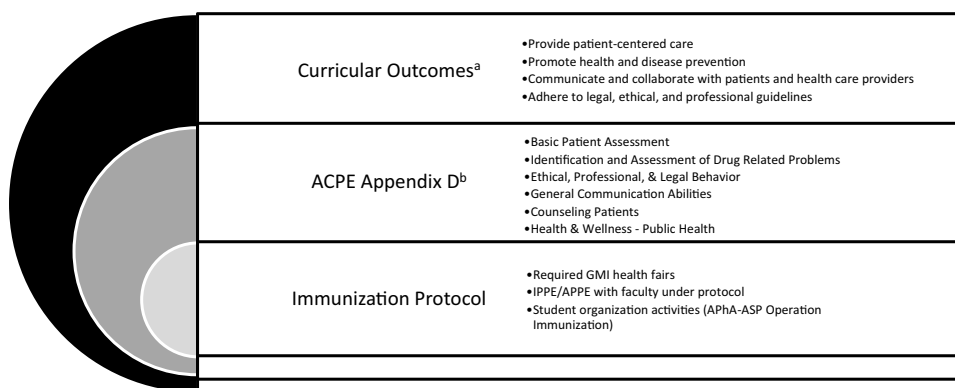
The application of immunization knowledge allows our program to remain consistent with the outcomes presented in the American Association of Colleges of Pharmacy's Center for the Advancement of Pharmaceutical Education (CAPE) document of 2004.<sup>7</sup> Specifically, students are able to engage in population-based care and promote disease prevention by providing influenza immunizations within health fair settings. Multiple Pre-Advanced Pharmacy Practice Experiences Performance Domains and Abilities [Accreditation Council for Pharmacy Education (ACPE) Appendix D] are met as these are "must-have" abilities for students prior to entering their Advanced Pharmacy Practice Experiences (APPE) year (Fig. 1).<sup>8</sup> In addition, these activities support the philosophy of service learning as referenced in Appendix C of the ACPE Accreditation Standards and Guidelines by fostering civic and professional responsibility while meeting

a community need through integration of this real life experience into the curriculum.<sup>8</sup>

The literature involving the implementation of pharmacy-driven immunization protocols is scarce, and it appears absent of the implementation of a school-wide protocol in multiple cities outside of a traditional pharmacy setting.<sup>9–11</sup> One recent article describes the implementation of student-led immunization clinics in collaboration with local health departments.<sup>12</sup> Another study focuses on quantifying standing order programs within long-term care facilities to deliver influenza and pneumococcal vaccinations, which differs from the current study that is specific to pharmacy student education.<sup>13</sup> Two surveys evaluate student knowledge of influenza and readiness to immunize, but these surveys are not in relation to preparedness before and after a skill-based immunization event as described in this design.<sup>14,15</sup>

#### *Implementation of immunization protocol*

Until 2010, pharmacists in the state were prohibited from administering immunizations outside the walls of a licensed pharmacy. In response to the 2009 H1N1 pandemic, the Board of Pharmacy (BOP), in conjunction with the Board of Healing Arts, expanded the pharmacists' reach to allow those practicing outside of pharmacies to administer immunizations by collaborative protocol with a licensed physician.<sup>6</sup> This also allowed qualified pharmacy students to practice vaccine delivery skills beyond the didactic education they received for the certification to administer vaccines. This change created the opportunity for the SOP to implement innovative protocols at both locations in the Fall 2011. By the school not having a traditional, licensed



<sup>a</sup> Curricular Outcomes Expected of Doctor of Pharmacy Graduates. University of Missouri-Kansas City School of Pharmacy. [http://pharmacy.umkc.edu/docs/stuser/Curricular\\_Outcomes\\_Expected\\_of\\_Doctor\\_of\\_Pharmacy\\_Students\\_Sept\\_10.pdf](http://pharmacy.umkc.edu/docs/stuser/Curricular_Outcomes_Expected_of_Doctor_of_Pharmacy_Students_Sept_10.pdf). Accessed July 3, 2013.

<sup>b</sup> Accreditation Standards and Guidelines for the Professional Program in Pharmacy Leading to the Doctor of Pharmacy Degree. Accreditation Council for Pharmacy Education website. <https://www.acpe-accredit.org/pdf/FinalS2007Guidelines2.0.pdf>. Accessed July 3, 2013.

Fig. 1. Linking the immunization protocol to the curriculum. ACPE = Accreditation Council for Pharmacy Education; GMI = general medicine I; IPPE = introductory pharmacy practice experiences; APPE = advanced pharmacy practice experiences; APHA-ASP = American Pharmacists Association—Academy of Student Pharmacists.

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