

COMMENTARY

Do PharmD Graduates Have the Essential Competencies For Innovative Practices?

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As the pharmacy profession continues to evolve from product-orientation to patient-centered, pharmacy programs have been transitioning from a traditional pharmacy curriculum to a competency-based education (CBE) pedagogy. CBE has been developed to instill the required clinical competencies in graduates to better meet the contemporary role of pharmacists in accordance with the latest scientific knowledge and evidence-based in an ever-evolving health care landscape. Pharmacists-led services resulted in optimizing pharmaceutical care and improving patients' economic, clinical, and humanistic outcomes (ECHO). Based on recent publications, it is integral for public health emergency preparedness and response to be part of the new ACPE Standards and CAPE educational outcomes domains. These updated standards and educational outcomes must be integrated longitudinally in pharmacy curricula to ensure that the graduates will be practice ready health. Care professionals. This commentary highlights the strategic use of workforce development of population health based on two perspectives: 1. Emergency Preparedness and Response and 2. Digital Health.

Keywords: competency-based education, public health, accreditation, educational outcomes, pharmacy curricula

INTRODUCTION

As the pharmacy profession continues to evolve from product-orientation to more patient-centered, pharmacy programs have been undergoing a transition from a traditional pharmacy curriculum to competency-based education (CBE).¹ CBE has been developed to instill the required clinical competencies in graduates to better meet the contemporary role of pharmacists in accordance with the latest scientific knowledge and evidence-based in an ever-evolving health care landscape.¹

Since 1992, the American Association of Colleges of Pharmacy (AACCP) Center for the Advancement of Pharmacy Education (CAPE) in the United States has pioneered the development of educational outcomes. These educational outcomes have been periodically revised to guide curriculum planning, delivery, and assessment within colleges and schools of pharmacy.² Of important note is that the CAPE educational outcomes are included as Standards 1 through 4 in the Accreditation Council for Pharmacy Education (ACPE) 2016 accreditation standards for Doctor of Pharmacy programs.³ However, to remain abreast with the evolving role of pharmacists in public health, as health care professionals especially during the COVID-19 pandemic, the incorporation of new affective domains is essential.

This commentary highlights the strategic use of workforce development of population health based on two perspectives: 1. Emergency Preparedness and Response and 2. Digital Health. The public health focus can help address services needed by patients. The evolving digital health landscape of disruption highlights the need to adapt pharmacy education to render digital literacy for all learners. It is also important to foster competency and build innovators at the forefront who can be proactive in emergency response planning and also embrace change through digital health innovations.

Emergency Response

Throughout the years, many public health emergencies have emerged. In 2002-2003 there was a global outbreak of Severe Acute Respiratory Syndrome (SARS). In 2009-2010, the H1N1 influenza pandemic occurred. In 2013 to 2016, the Ebola virus outbreak happened in West Africa. Recently, the current COVID-19 global pandemic occurred.^{4,5} All these public health emergencies highlight the critical and integral role that pharmacists can play in emergency preparedness and response to pandemics as well as other public health emergencies. Since pharmacists are the most

accessible health care professionals, they can serve as frontline health care workers who prevent primary, secondary, and tertiary public health services.

During public health emergencies, pharmacists in all sectors, including community, hospitals, long-term care facilities, and outpatient clinics, are involved in emergency response planning and execution where they play a vital part of an interprofessional health care team. In fact, pharmacists can improve public health through various services including developing strategies to continue access to medications and supplies, supporting health care needs and services, clinical care of affected patients, educating the community, and serving as reliable information sources.⁵

Pharmacists through operation management can optimize delivered services and warrant continuity-of-care provided to patients, health care teams, and communities during pandemics and emergencies. This can be accomplished by managing inventories, ensuring adequate medications, providing health care products and supplies, addressing medication shortages, and making therapeutic substitutions. In addition, pharmacists are involved in packaging, storing, dispensing, and administering of medical countermeasures such as antivirals, antibiotics, and antitoxins.^{5,6} These services result in optimizing pharmaceutical care to improve patients' quality of life and health outcomes.⁷

Pharmacists are also involved in point-of-care services, including screening, testing, and providing immunizations services.^{4,7} Moreover, pharmacists provide innovative digital health services, including applications of digital communications, telemedicine, clinical services, and education on evidence-based information that counters misinformation during public health emergencies and pandemics.^{5,7}

An effective and strategic response to emergencies and pandemics depends on adequate education, training, and planning. Therefore, pharmacy curricula should incorporate aspects of global public health and emergency preparedness and response to yield pharmacists with the expertise, knowledge, and skills needed to enable them to combat pandemics.^{5,7} In addition, training is specifically important for pharmacists to prepare them for their new roles to effectively respond to emergencies. Specifically, pharmacists need to be trained in planning, supporting, and disseminating evidence-based information. Pharmacists must be equipped with interdisciplinary skills, mental health education, and knowledge on resources management as well as implementation of best practices.^{4,5}

Hannings and colleagues' research has shown that there is a gap of emergency response training of pharmacy students.⁸ Specifically, a call to action for emergency preparedness training was published by the Washington State University's College of Pharmacy based on their experience working with the Metropolitan Medical Response System.⁹ Similarly, the University of Georgia's College of Pharmacy described two emergency preparedness simulations that they conducted as part of their introductory pharmacy practice experiences.⁸ In addition, there are several guides for pharmacists on pandemic response issued by pharmacy organizations, including the influenza pandemic preparedness guide,¹⁰ and the COVID-19 vaccines confident playbook.¹¹

On the global level, in 2020 the International Pharmaceutical Federation (FIP) published a revised Global Competency Framework. This framework included emergency response as one of its competencies which promotes the participation of pharmacists along multidisciplinary health care teams in response to public health emergencies.¹² Additionally, a framework by Aruru and colleagues has been recently published to help expand the pharmacists' roles in emergency preparedness during the pandemic and beyond.⁵ The proposed framework includes 5 areas of competency: "1) Emergency preparedness and response, 2) Operations management, 3) Patient care and population health interventions, 4) Public health pharmacy education and continuing professional education, 5) Evaluation, research, and dissemination for impact and outcomes."⁵

Given these recent publications, it is integral for emergency preparedness and response to be part of the new ACPE Standards and CAPE educational outcomes domains. These updated standards and educational outcomes will be integrated in pharmacy curricula to ensure that the graduates will be equipped with the essential skills needed for the frontline responders to effectively execute the response plans during public health disasters and emergencies.

Digital Health

During the recent COVID-19 global pandemic, digital health has affected the ability to scale, test, coordinate, manage data, contact tracing, and quarantine. The countries who melded these strategies with appropriate policy and health care services had lower per-capita mortality rates and flattening of incidence curves.¹³ In addition, wearable devices have been studied to help track recovery from and predict COVID-19 with self-reported symptoms as demonstrated by the DETECT (Digital Engagement and Tracking for Early Control and Treatment) study.¹⁴

Antwerp and colleagues' report on the future of health that was published by Deloitte, included interviews with industry experts, representing independent pharmacies, payers, providers, large retail chains, technology developers, pharmacy associations, and academia.¹⁵ This report emphasized pharmacists' ability to identify and facilitate digital health tools and diagnostics, interpret data for patients, and "prescribe digital therapeutics".¹⁵ Approximately 40% of Americans wear a form of digital tracking and 30% of patients wear a digital device daily.¹⁶ There is an expansive potential for future

applications of pharmacists to engage in digital health such as enhancing medication adherence through “smart” medication packaging with real-time alerts to help the aging patient be able to stay at home.¹⁵ Pharmacists could assist in population health analytics through developing tools and programs that improve population health as well as interpretation.¹⁵ Thus, pharmacists can hold an instrumental role in remote health monitoring to ensure patients’ safety.¹⁶

There has been a strategic movement to provide students, faculty, and practitioners with opportunities to enhance their skills in digital health. In 2021, AACP held its inaugural Digital Health Institute for pharmacy educators. Recently, the FIP has issued an online “Train-the-Trainer” digital health curriculum series for its members. Notably, the FIP report highlights several innovative digital health didactic activities that incorporate patient experts that help inform digital health curricula and purposeful integration of digital health content throughout the whole program.¹⁷

Similarly, there are innovative global of digital health implementations from various countries. In the FIP Report, the University of Geneva/University of Lausanne’s Institute of Pharmaceutical Sciences of Western Switzerland developed a course that incorporates patient experts as teachers to share their health care experience and use digital health resources with students. At La Trobe University in Australia, digital health is integrated vertically and longitudinally into the curriculum. Basic concepts of digital health and electronic medical records are introduced to first year students. Students learn how to evaluate [digital health] apps and concepts such as big data and artificial intelligence and partake in case studies related to digital health through role play and OSCE (objective structured clinical examination).¹⁷

Lastly, the FIP conducted a global survey on digital health in pharmacy education (n=1060 respondents, 91 countries, pharmacy schools, pharmacists, pharmacy students), which revealed that 57% do not offer digital health education. Competencies of digital health such as patient-centered digital health (58%) and digital health tools (55%) were the most desired subjects in the curriculum. Most practitioners expressed an interest in learning more about mobile applications, electronic health record, telehealth, online pharmacy, and remote patient monitoring. Only 10% of pharmacy students respondents indicated they had learned digital health in the curriculum. The two most common challenges outlined by respondents were the lack of experts (50%) and resources (40%).¹⁷ As a result, FIP shared strategies such as supporting educators in training, sharing best practices from digital health initiatives at pharmacy schools, creating a Global Curriculum and Training Resources Toolkit, and promoting digital health literacy for students through International Pharmaceutical Students Federation (IPSF).¹⁸

The evolution of digital health necessitates countries and stakeholders to consider inclusion of digital health in the health professions curriculum. Some believe that inclusion of reviewing the electronic medical record are sufficient content as digital health concepts in the curriculum. In addition, major large pharmacy chains and payers have not pushed for growing digital health applications at this time.¹⁵ Colleges of pharmacy can lay a foundation of digital health concepts and foster creativity by highlighting ongoing and new digital health applications. This would result in practitioners who can not only navigate, but also innovate to improve population health and positively influence the perception and future of the profession. Rather than being reactive in updating the curriculum, pharmacy education can proactively welcome disruption and innovation that includes pharmacists as key players in digital health applications and not as an afterthought.

A CALL TO ACTION

Based on the evidence provided above, pharmacists are poised to effectively use digital health to expand their roles in public health. Here are some recommendations to integrate Public Health Emergency Preparedness and Response (E-Prep) and digital health in Pharmacy:

1. Include E-Prep and digital health competencies in the 2025 ACPE Standards.
2. Integrate E-Prep and digital health domains in the new CAPE Educational Outcomes.
3. Provide training for pharmacists to expand their services in digital and public health.
4. Educate patients on the skills, knowledge, and competencies of pharmacists to provide primary, secondary, and tertiary services.
5. Collaborate with other health care professionals on using digital health to monitor patients’ outcomes.
6. Provide telehealth to underserved patients in rural, urban, and suburban areas.
7. Advocate on the state, regional, national, and global levels to recognize pharmacists as essential health care providers.

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