



Clinical Pharmacy education in the United States and its application to integrative health care

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[Abstract] Clinical pharmacists are considered medication experts and important members of the patient care team in the United States. Pharmacists have been ranked among the most trusted professionals for many consecutive years. In recent years, there has been rising interest among Americans in integrative health care, an approach that brings together conventional and complementary medicine in a coordinated way. The emergence of integrative health care presents new opportunities and challenges for patient-centered pharmaceutical care. Clinical pharmacy education in the United States incorporates pharmaceutical science and therapeutic knowledge along with social and cultural value, and ethical principles into the curriculum. Graduates of the curriculum are able to integrate therapeutic knowledge with social-cultural context into the clinical practice, make meaningful clinical interventions in the interprofessional team, and provide patient-centered care in a variety of settings including community and health-system based practices. With the solid educational foundation, the pharmacy profession can adapt quickly within the integrative health care setting and continue to optimize patient experience and patient outcomes in the ever-changing health care world.

[Key words] Pharmacy education; Clinical training; Integrative health care

1 Introduction

In the United States, pharmacists are considered medication experts and have been ranked among the most trusted health care professionals by Americans for many consecutive years according to the Gallup's annual surveys^[1]. Pharmacists are also the most accessible health care professionals in certain primary care settings^[2]. According to the American Society of Health-

System Pharmacists (ASHP) Pharmacy Practice Model Summit, pharmacists are "responsible for the provision of safe, effective, efficient and accountable medication related care"^[3]. In the 21st century, with the increased complexity of patient medication needs and the adaptation of an interprofessional approach to health care, pharmacists have become increasingly important members of the health care team. Additionally, the advancement in automated technology and utilization of pharmacy technicians provide opportunities to redirect pharmacist resources

from the non-judgmental distribution tasks to the advanced direct patient care^[4]. Pharmacists now routinely make therapeutic recommendations to optimize patient outcomes, provide evidence-based drug information to the interprofessional team, and conduct medication reconciliation and patient education at the transition of care.

Integrative health care brings together conventional and complementary medicine in a coordinated way according to the definition by National Institutes of Health (NIH). This approach is holistic and patient-centered and often involves the use of natural products along with mind and body practices^[5]. Over the last decade, integrative health care as a field has grown in the current US health practice; from 2012 to 2017, there was increased interest among consumers and patients in complementary and integrative approaches for health (a non-traditional health care approach, one not originating from traditional Western medicine) according to the National Health Interview Survey (NHIs) by the National Center for Complementary and Integrative Health (NCCIH) and Center for Disease Control and Prevention (CDC)^[6]. Typical complementary approaches include herbal supplements, vitamins, minerals, probiotics, traditional Chinese medicine, meditation, chiropractic services, homeopathy, naturopathy, and functional medicine, etc. Pharmacy practice has also evolved to adapt to changes in the health care modalities chosen by patients. In the integrative health care setting, like in other settings, pharmacists provide patient-centered pharmaceutical care through interprofessional collaboration. They perform medication management related to the disease states, provide safety information on the complementary medicines, check for potential drug-herbal/drug-drug interactions, educate patients on lifestyle changes, and ensure appropriate follow-up. Skills and knowledge gained from the current clinical pharmacy education and training in the

United States are transferrable across different health care settings^[7]. The purpose of this article is to give a general overview of the clinical pharmacy education in the United States and how it sets a foundation to provide pharmaceutical care in the integrative health care setting.

2 Clinical pharmacy education in the United States

2.1 PharmD degree education

Most pharmacists have completed a university clinical degree program at the Doctor of Pharmacy (PharmD) level in the United States. In 2000, PharmD level education became the entry-level degree to practice clinical pharmacy. PharmD degree is typically a 4-year professional education program that combines didactic lectures and experiential curriculum. In order to enter the professional PharmD program, prospective students have to meet university-level prerequisites that typically take at least 2 years to complete or have graduated from a relevant baccalaureate degree program. Multiple criteria, including standardized exam such as the Pharmacy College Admission Test (PCAT), Grade Point Average (GPA) and interviews may be utilized during the admission process^[8]. PharmD programs in the United States are typically accredited by the Accreditation Council for Pharmacy Education (ACPE), which is the nonprofit national organization that sets the PharmD education standards through initial and subsequent periodic evaluations. According to the ACPE Standards 2016, the didactic lectures should include topic areas in biomedical sciences, pharmaceutical sciences, social/ administrative/ behavioral sciences, and clinical sciences^[9]. Courses in complementary and alternative medicine (CAM) are often available as electives in 79% of state and 86% of private institutions^[10]. Experiential education includes Introductory Pharmacy Practice Experiences (IPPE) and

Advanced Pharmacy Practice Experiences (APPE) rotations. IPPE rotation, which is 2-4 weeks' long, serves as an introductory experience into the community and health-system pharmacy practice in the middle of the didactic curriculum. APPE rotation is a progressive, in-depth, structured practice experience in the last year of the PharmD curriculum after the completion of the didactic curriculum. Students have the opportunities to provide pharmacy service in a variety of settings, including ambulatory care, acute care, long term care, community practice, industry research and academia. Learning activities include direct patient care, interprofessional interaction and practice, medication dispensing, distribution, administration and system management, and professional development^[9]. Fig. 1 shows the general framework of the PharmD curriculum. In both the didactic and experiential curriculum, much emphasis is put on interprofessional and interdisciplinary collaboration. Ethical principles of respect for autonomy, nonmaleficence, beneficence, and justice are rooted in the didactic educational effort as well as the clinical rotations^[11]. Under the guidance of the clinical preceptors, students learn to care for patients for their physical comfort as well as emotional well-being. They provide evidence-based information to help patients make informed decisions and optimize patient health outcomes. These activities are helpful learning experiences for students with respect to the integrative health care settings, where patients choose to take an additional approach complementary to their mainstay treatment, and pharmacists need to take this preference into consideration when

providing care. In some experiential rotations, students work with innovative pharmacies that specialize in the integrative medicine, where they have the opportunities to provide specialty pharmacy services, such as bioidentical hormone replacement counselling. Upon completion of the PharmD curriculum, students are ready for the pharmacy licensure process and entry-level pharmacy practice. The PharmD curriculum has, at this point, prepared students with a therapeutic foundation and human social background for a variety of clinical practice settings (Fig.1).

2.2 Post-graduate training

Post-graduate residency programs and fellowships are available for more advanced clinical practice training. Currently, the United States has the Post-Graduate Year One (PGY-1) residency program for general advanced clinical practice training and Post-Graduate Year Two (PGY-2) residency program for specialized area clinical training. Fellowships are for candidates who are interested in the pharmaceutical industry or academia setting. Even though integrative pharmacy is not yet available as an accredited pharmacy residency option, many pharmacy residency programs give residents the opportunities to expand on their clinical programs and integrate different elements into their clinical practice. As part of the residency program, residents work with professionals from a variety of disciplines and gain skills, knowledge and networking opportunities that will be beneficial to them should they need to respond to integrative health care needs from their patients or decide to expand clinical pharmacy practice to integrative medicine.

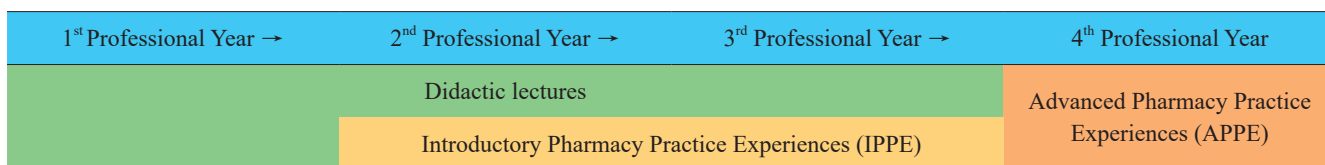


Fig. 1 General Framework of the PharmD Curriculum in the United States (arrangement of each component may vary depending on the specific PharmD program)

2.3 Continuing education

Pharmacists receive on the job training via continuing education and have many certification opportunities. Licensed pharmacists are required to complete annual continuing education (CE) credits in order to keep their professional license active. The CE requirement is specific to the state where the pharmacy license is obtained, but generally involves knowledge and skill update on therapeutic areas, compounding and legislation. Integrative health care is often an available option for CE credits as well. Moreover, clinical pharmacists can obtain advanced certification, such as the board certification through the Board of Pharmaceutical Specialties based on their area of practice. Board certification is generally preferred in the advanced pharmacy practice settings. Current available board certification areas include ambulatory care, cardiology, compounded sterile preparations, critical care, geriatric, infectious disease, nuclear pharmacy, nutrition support pharmacy, oncology, pediatric, pharmacotherapy, psychiatric pharmacy and solid organ transplantation^[12].

3 Clinical pharmacy practice in the integrative health care

Integrative health is an emerging field in the current US health practice. There are many different pharmacy practice models based on the geographic and social-cultural needs of the population. In community and ambulatory pharmacy practice, there are pharmacy models where integrative pharmacy services and specialty products are provided in collaboration with other health care disciplines. For example, a pharmacy in Texas, US takes an approach that integrates both traditional pharmacy practice and alternative medicine modalities. In addition to the traditional dispensing and compounding functions, the pharmacy offers specialty food for patients with food sensitivities and works with a nutritionist and lifestyle educator to provide dietary planning

and nutritional counseling. The pharmacists also maintain a close relationship with the providers and provide ambulatory care drug therapy follow-up. Equally importantly, the pharmacists act as patient liaisons to connect the dots between patients and various health disciplines in the health care system^[13]. Other pharmacies have acupuncturists on staff to provide patients with CAM options. In hospital practice, clinical pharmacists take into account complementary medicines that patients use at home when doing medication reconciliation, making clinical recommendations, performing therapeutic monitoring and conducting patient education. Integrative health care approaches, if used under the appropriate social-cultural context, can provide opportunities for patients to work on lifestyle changes and improve overall disease management, and therefore proactively improve their own health. Furthermore, with rising utilization of integrative health approaches among Americans, NCCIH has created evidence-based resources on integrative medicine for health care providers, including information on randomized controlled trials, systematic reviews and Cochrane reviews. Pharmacists could then interpret these studies and provide information to patients on the integrative approaches.

4 Conclusion

The current pharmacy education in the United States equips pharmacists with the essential tools for the care of patients in this ever-evolving health care world. Within the integrative health care setting, pharmacists should feel confident that they can serve as the patient advocate while working with multiple disciplines to optimize patient experience. Pharmacists play key roles in patient-centered care, which encourages active collaboration, shared-decision making and individualized comprehensive care plan management^[14]. Integrative health care settings differ from many of the more traditional settings, but fundamentally, both traditional and

new pharmacy practices are based on the principles of patient-centered pharmaceutical care. Therefore, a pharmacist who has been successfully trained in the United States and is willing to pursue lifelong learning will be prepared to take on new and exciting roles for maximizing patient outcomes.

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