

Research

Evaluation of pediatric pharmacotherapy education in a college of pharmacy

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Abstract

Introduction: There is limited information regarding pediatric pharmacy education in the US. The 2005 American College of Clinical Pharmacy opinion document calls for enhanced pediatric topics in pharmacy curricula. This paper describes a pediatric topic-specific curricular mapping process and the creation and evaluation of a pediatric elective course.

Methods: The curricular mapping process was used to identify the topics covered, the number of hours for each topic, and teaching methods. A pediatric elective course was created to introduce some topics and reinforce others. Evaluation of the course consisted of a comparison of examination grades on a pre- and post-test with a control group.

Results: The curricular mapping process revealed 58 hours (21 clinical and 37 basic science) dedicated to pediatrics in the required curriculum. The study design enrolled 19 students in the elective group and 16 students in the control group. There was a statistically significant increase in examination scores between the elective group (mean 30.3) and the control group (mean 17.0) ($p < 0.001$).

Conclusion: This paper describes a curricular mapping process to identify pediatric topics covered in a college of pharmacy. Based on the topics identified, investigation into the instructional design methods allowed the pediatric faculty member to assess the depth of material covered. An elective course was created to enhance the pediatric curriculum. Students enrolled in the pediatric elective showed enhanced knowledge of pediatric topics over their peers. This study is the first to describe a pediatric-specific curricular mapping process and evaluation of an elective course.

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There is a paucity of guidance documents and literature examining pediatric pharmacy education. For instance, the American Council for Pharmacy Education (ACPE) states in the pharmacy school accreditation standards that pharmacists should have the competencies to enter pharmacy practice in a variety of settings.¹ They do not, however, specifically mention pediatric pharmacy. In 2005, the American College of Clinical Pharmacy (ACCP) published an

opinion guidance document for pediatric pharmacy education. The article states that “professional pharmacy curricula should foster a core of knowledge, skills, abilities, attitudes, and values necessary for pharmacists to become well-rounded general practitioners who can provide care to a wide variety of patients, including infants and children.” This document also provides suggestions for the incorporation of pediatric pharmacotherapy into the pharmacy school curriculum via both required and elective courses.²

To date, there are a limited number of studies that have examined the state of pediatric pharmacy education. In 1999, one survey study examining the delivery of pediatric pharmacy education in 55 US schools found that on average 16.7 ± 11.6 hours of pediatric topics were included in required courses. Eighteen percent of the programs offered

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a pediatric elective course and 36% had electives that included some pediatric topics.³ Similar results were found in a study of Canadian Pharmacy Schools. In the nine schools surveyed, the investigators found that 14.7 hours were included in the required curriculum and that only one-third offered a dedicated pediatric elective.⁴ With respect to course-specific information, only one example of a pediatric pharmacy elective course has been described in the literature. Although this paper was published before the 2005 ACCP guidance document, many of the topics remain the same. Student assessment in this course was based on class participation, service-learning activities, and written journal assignments in lieu of written examinations.⁵

There are approximately 74.5 million children living in the US, representing 24.3% of the United States population.⁶ In a study assessing pediatric services in community pharmacies it was found that approximately 30% of all prescriptions in community pharmacies were for pediatric patients.⁷ Those study results parallel the US Census Bureau data on the percent of the pediatric population. Hence, practicing pharmacists will likely encounter medications for pediatric patients because that population represents a large percentage of the US.

Because pediatrics is a large portion of the population in which pharmacists serve,^{6,7} including pediatric education into the pharmacy curriculum would help to produce more knowledgeable graduates. This increased knowledge could potentially assist in lowering medication error rates for pediatric patients. This paper describes a pediatric topic-specific curricular mapping process, creation of an elective course in pediatrics, and an evaluation of that course in a college of pharmacy.

Methods

The purpose of this study is to describe a pediatric curricular mapping process and its use in identifying gaps in the curriculum. As a result of the map, secondary purposes of describing the implementation of a pediatric elective course and its evaluation are presented.

Pediatric curricular mapping process

Xavier University of Louisiana College of Pharmacy currently enrolls approximately 650 students in its four-year Doctor of Pharmacy program. A table of topics from the ACCP opinion paper² was developed and distributed to both the basic and clinical divisions within the college. Faculty members were asked to identify the number of hours spent on the individual pediatric topics in their courses. After identification of the number of hours provided for each topic, an in-depth look into the individual activities assisted the only pediatric clinical faculty member in implementing certain topics into the required curriculum. For instance, because there was a slight gap in discussing renal and hepatic maturation in the required curriculum, the faculty member included this in the Applied Pharmacokinetic

course along with therapeutic drug monitoring for pediatric patients.

After the map had been established, there were core topics identified that were only introduced in the required curriculum. Other topics were identified that were not in place in the required curriculum. These gaps identified a need for more pediatric-based didactic learning experiences for the students. Because of the already intense required curriculum, the inclusion of additional pediatric topics in the existing courses was not possible. To assist in filling in the gaps, a pediatric elective course was created. Appendix 1 lists the topics mapped and the corresponding number of hours in the required and elective curriculum.

Elective description

The Advanced Pediatric Pharmacotherapy elective is a two-credit course offered to third-year pharmacy students by the dual pediatric residency-trained faculty member during the spring semester. Pediatric topics discussed are described in Appendix 2. Although the topics mainly focused on the pediatric population, neonatal pharmacology was also discussed when appropriate. The course incorporated lectures and active learning methods to enhance learning of pediatric pharmacotherapy. Interactive lecturing techniques, such as the Socratic method, were used during the didactic lectures for the introduction of new topics. If the topic was presented in prior courses in the required curriculum, students were given homework assignments to complete before class. The assignments were designed as clinical application assignments of the previously taught material. On that topic day, students would discuss in class with the faculty member the answers and the evidence that supported those answers. To facilitate student self-learning, students worked in small groups (4–5 people) to review one case that included four or five problems covering the multiple disease states from the elective and required curriculum. Each group developed a care plan for the patient case and gave one group presentation to the class at the end of the semester.

In addition to the stated instructional techniques, a multidisciplinary approach to this course was used. Guest lecturers for asthma, medication safety, and drug administration were used to include a pharmacy practitioner in asthma ambulatory care, an assistant director of a children's hospital pharmacy, and a pediatric critical care nurse.

Student performance in the course was determined by grades from four pop quizzes, a midterm and final examination, the care plan presentation, and completion of the homework assignments.

Study description

Institutional Review Board approval was granted for this study. Informed consent was obtained from students enrolled in the elective course. A random voluntary process was used to identify students for the control group from the third professional year who were not enrolled in the elec-

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