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Experiences in Teaching and Learning

Design and delivery of a new clinical reasoning course

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ABSTRACT

Background and purpose: Teaching students therapeutic knowledge is not the same as teaching them how to reason through clinical problems. It was determined a new approach was necessary to close the gap between classroom learning and clinical application.

Educational activity and setting: A stand-alone clinical reasoning course was developed to enhance students' ability to think about and solve clinical problems. This course involved a variety of active-learning strategies based upon literature regarding clinical reasoning.

Findings: The objective of this study was to determine if a clinical reasoning course influenced student perceptions on evolution of their thinking and learning strategies and ways to improve.

Thematic analysis of midpoint student reflections (n = 133) revealed eight different themes of how students perceived evolution of their thinking. Top themes were approaching a problem (n = 76), evaluating information (n = 62), and efficiency (n = 44). Thematic analysis of final student reflections (n = 138) included two categories: thinking and improvement. Reflections related to evolvement of thinking revealed five themes, the top three of which were approaching a problem (n = 89), holistic (n = 55), and efficiency (n = 46). Reflections of improvement revealed four themes, the top two of which were continue applying (n = 74) and communication (n = 23).

Discussion: The themes indicate that students began to understand clinical reasoning as a set of skills necessary to become an effective practitioner.

Conclusions: A novel course designed to develop clinical reasoning skills can help students evolve their perception of thinking and learning strategies and engage them in a process for the application of knowledge to patient care.

Background and purpose

Clinical reasoning is defined as "thinking through the various aspects of patient care to arrive at a reasonable decision regarding the prevention, diagnosis, or treatment of a clinical problem in a specific patient."[1] While clinical knowledge is of utmost importance, the ability to apply that knowledge in clinical problem solving is a key competence.[2] The changing needs and demands of the 21st century healthcare environment require practitioners to often examine and analyze complex information to make optimal treatment decisions.[3] Clinical reasoning is included in Domain 3 of the Center for Advancement of Pharmacy Education (CAPE) Outcomes 2013 as a fundamental educational outcome for all graduating pharmacists.[4] Most pharmacy students have been very successful at memorizing content, but transitioning them from a mindset of memorization for tests to the development of thinking protocols necessary for practice may be difficult. Teaching content is a relatively easy task, but teaching clinical reasoning skills requires careful attention to educational strategy.[5]

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The literature contains reports of a variety of approaches and methods for teaching clinical reasoning. In Simpson's and Courtney's[6] review of nursing literature, several strategies were identified including writing assignments, dialoging on complex problems, case study discussions, role-playing, debates, and simulations. Simulations also have been used to develop clinical reasoning in pharmacy and nursing students.[7,8] Kassirer[9] proposes an approach that first introduces students to elements of the clinical reasoning process and then uses specifically-designed, interactive case discussions facilitated by a coach. Similarly, various forms and designs of case studies and subsequent discussions have been used for teaching clinical reasoning in medical education.[10–14]

The stand-alone clinical reasoning course described herein was informed from the aforementioned literature. However, whereas previous approaches include instructional interventions embedded within courses addressing particular curricular content, this course is unique because it was developed solely to teach students how to approach, address, and solve patient problems. The resulting design for the course came from an amalgamation of findings and principles in the health professions and health sciences education journals.[6,15,16] Several of the design elements of the course can be attributed to publications developed by the Critical Thinking Institute in educational psychology and strategy. In particular, *The Art of Asking Essential Questions*,[17] and *Clinical Reasoning*[1] provided a fundamental basis for course design. Many of the instructional strategies for encouraging critical thinking as suggested by Kurfiss[18] were used including: writing assignments, questions involving reasoning skills, and activities requiring the ability to articulate knowledge, and dialogue of complex problems.

The course is a foundation for subsequent clinical courses in a newly designed curriculum. The idea for and development of the course spanned over many years of teaching introductory therapeutics. It became clear to the instructor (DW) that students were often unable to explain their reasoning in class and on examinations, especially those with essay questions. Students who appeared to use only a memorization approach for studying performed poorly in the course because therapeutics requires more than content memorization. This observation resulted in a motivation to learn more about critical thinking and its application to health sciences.

The goals of the clinical reasoning course were to prepare students to: (1) apply (versus obtain) knowledge, (2) process and solve patients' pharmacotherapy-related health care issues, and (3) become providers with the ability to evaluate patient data and integrate pharmaceutical sciences, therapeutics and scientific reasoning with the goal of solving pharmacotherapy related health care issues. This paper reports on a study of student reflective activities and perceived outcomes of the clinical reasoning course with regard to student thinking and learning strategies within the domain of patient problem solving.

Educational activity and setting

Course design

Clinical reasoning is a two-credit hour required course offered to pharmacy students at the University of Kentucky in the fall semester of their first professional year. The design philosophy centered primarily on the practice and assessment of students' ability to read, write, think, analyze, and reason. Time and word limits for each assignment encouraged students to adapt thinking strategies to the fast-paced environment of healthcare and documentation to concise levels appropriate for effective communication. The course was designed with several low-risk graded assignments accompanied by immediate written or verbal feedback as opposed to more traditional formats of a few high stakes exams. Grades were determined primarily through performance on multiple low-risk writing and speaking assignments within weekly modules. Custom rubrics were used to grade written and verbal assignments to provide consistency throughout the course (Tables 1 and 2).

The course schedule was designed as a series of weekly modules with a defined structure (Fig. 1). On alternating weeks, the final activity was either a follow-up reading with a writing assignment or a three-part laboratory session. The laboratory session began with a prompt describing a scenario to which students had to respond via writing. Subsequently, they were provided additional information and asked to respond via video recording to a second prompt. To conclude, students were asked to reflect on their performance of their written and recorded responses. The Appendix A contains an example module. The modules were taught by various faculty and guest lecturers, who exposed students to a variety of clinical practice areas.

Students were presented with multiple strategies for assessing a patient including Subjective, Objective, Assessment, and Plan Notes (SOAP Notes)[19]; the Joint Commission of Pharmacy Practitioners Pharmacists' Patient Care Process[20]; and Situation, Background, Assessment, Recommendation (SBAR)[21] among others. These processes were intended to introduce students to various steps of collecting, assessing, planning, implementing and following up on patient information.

Table 1
Verbal rubric.[a]

Criteria	Ratings		
	Satisfactory	Improvement needed	Unacceptable
Clear, audible speech	2 points	1 point	0 points
Appropriate eye contact	2 points	1 point	0 points
Clear articulation/explanation of concepts	2 points	1 point	0 points
Logical flow of reasoning	2 points	1 point	0 points
No distracting mannerisms	2 points	1 point	0 points

[a] Adapted from: Elder L, Paul R. The Art of Asking Essential Questions. 5th ed. Tomales, CA: The Foundation for Critical Thinking Press; 2010.