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Research

A case-based approach for teaching medication safety to pharmacy students

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Abstract

Objective: To determine if a three-hour interactive case-based laboratory experience improves attitudes about medication errors and systematic approaches to improve medication safety among pharmacy students in their third professional year.
Design: A modified version of the Attitudes to Patient Safety Questionnaire was used to assess the attitudes of pharmacy students toward medication errors before and after the lab.
Assessment: The results of 49 matched surveys indicate that students' attitudes significantly improved in response to 15 out of 20 questions. These questions assessed students' attitudes of medication safety as related to the students' confidence in understanding and preventing medication errors, the effectiveness of pharmacy school training, the human nature of errors, the role of inter-professional teamwork and patient involvement, and inclusion of patient safety issues in the pharmacy curriculum. Students' attitudes did not change significantly for five questions that assessed student willingness to report medication errors.
Conclusions: This three-hour laboratory experience was partially effective at improving students' attitudes about medication errors and systematic approaches to improving medication safety. Efforts to improve error reporting require further study. This class introduced the fundamental concepts of medication safety and was effective at changing students' attitudes about the genesis and prevention of errors.

Keywords: Medication safety; Curriculum; Medication error; Patient safety; Pharmacy

Introduction/background

Medical errors remain the eighth leading cause of death in the United States, with as many as 98,000 deaths annually.[1,2] Medication errors account for approximately one-third of all medical errors.[3] Medication errors are defined as any preventable event that may cause or lead to inappropriate medication use and patient harm.[4] A "near miss" is an event that could lead to an error if not identified and corrected.[5] Near misses are essential components of error reporting because they occur more frequently than actual medication errors and can provide essential data for understanding error prevention.[6]

Intuitively, many pharmacists conceptualize errors as an event such as preparing an incorrect dose or medication. Errors that occur when something is done incorrectly are known as errors of commission. Equally important are errors of omission, or not doing something that should be done. Both the types of errors can lead to preventable

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medication-related problems. Examples of errors of commission that are not typically considered as errors include prescribing a medication without an appropriate indication or failing to consider a medication contraindication. Errors of omission can include failure to consider a medication that is known to improve patient outcomes or a lack of appropriate monitoring and subsequent therapy adjustment. These examples can all lead to preventable medication-related problems.

Understanding the genesis of medication errors is the first step in prevention. "To Err Is Human," a report from the Institute of Medicine, suggests that errors are inherent to human nature.[1] Accordingly, health systems have created mechanisms to identify and prevent errors by creating multiple checks in the medication use process.[7] These constructs aim to identify, understand, predict, and prevent errors. Improvement of the medication use process, however, depends on responses to errors and near misses that still occur in lieu of current preventive practices.[1,2]

Root-cause analysis, an approach designed to uncover causes of problems, can be useful to unveil vulnerabilities in a medication use process. The "Learning from Defects" tool follows a root-cause analysis structure to analyze medication errors and identify both aggravating and remitting factors that contribute to errors.[8] In identifying remitting factors, strengths of a system can be identified and further explored. This tool can be used to guide the process for determining the cause of errors and identifying opportunities for process improvement. As such, the "Learning from Defects" tool can be used to educate students about the importance of understanding the medication use process and how it can be reengineered to improve patient safety.

Monitoring and reporting medication errors can help prevent future errors. Unfortunately, the additional time needed as well as perceived negative repercussions of reporting can be a deterrent to the quality improvement process needed to prevent future errors. It is estimated that 50% of medication errors are not reported due to fear of reprisal.[9] Under-reporting limits opportunities to understand process defects and address factors leading to errors. To reverse this trend, a culture of safety is needed. This is one in which error reporting is encouraged and used to understand and improve the process. Instead of targeting the individual making an error, the process flaws that allow errors to occur should be analyzed and addressed. In doing so, the paradigm shifts from a focus on blame to learning from errors and using prior experience to prevent future errors.

In addition to the adaptation of a culture of safety, approaching medication safety with an inter-professional team can further enhance the quality improvement process. This approach involves health care professionals from different disciplines working as a team toward a common goal of improving patient care and safety. Subsequently, the medication use process is evaluated from different perspectives. Strengths and vulnerabilities of the medication use process can be identified through a multifactorial approach considered across professional disciplines. The application of inter-professional teamwork in both direct patient care and quality improvement initiatives can lead to improved workflow and communication, which are fundamental precursors to improving patient safety.[5] The collaborative environment that is the mainstay of inter-professional care harbors better working relationships across health care disciplines. Improved inter-professional teamwork could potentially reduce the fear of individual punitive practices in the event of a medication error, thus minimizing barriers to reporting errors. Promoting inter-professional learning in the pharmacy curriculum prepares students for an inter-professional work environment.

Pharmacists in all settings need to make medication safety a priority. In health systems, pharmacists have taken leadership roles in improving the medication use process by developing a non-punitive reporting system that is integrated with continuous quality improvement activities.[2,10] By improving reporting behavior, opportunities for system improvements can be identified, corrected, and re-assessed. It is important for pharmacists to emphasize to administrators that an increase in error reporting is not reflective of a decrease in quality, but rather an improvement in capturing existing data related to weaknesses in the medication use process. In addition to system-wide error prevention, pharmacists' participation in inter-professional patient care rounds has also been shown to prevent medication errors.[11] Pharmacists can also participate in the development of policies designed to improve medication safety. Policies can be developed as a result of error reporting and the quality improvement process, observations during patient care rounds, current recommendations for evidence-based practice, and information published about external sources of error. Lastly, is the need for pharmacists to document a reduction in the financial burden of medication errors as a result of quality improvement initiatives, providing justification for health systems to further invest in resources to improve medication safety.

Rationale/objectives

In order to recognize and prevent errors, educating health care professionals about medication safety becomes increasingly important. Principles of a culture of safety need to be integrated into the pharmacy curriculum to prepare new practitioners to actively participate in improving medication safety.[12] Incorporation of specific tools to identify, understand, explain, and prevent medication errors into the pharmacy curriculum can be beneficial.[13–15] In addition, effective teaching strategies need to be developed and tested to determine if learning objectives are achieved. This study describes the integration of a case-based model into a care laboratory (lab) course to help pharmacy students develop their knowledge, skills, and attitudes in identifying and preventing medication errors. Students assessed factors