Introduction: Medication errors are the most common clinical errors and can lead to serious safety consequences. However, as most medication errors are preventable in nature, a more active approach to medication error management is necessary. As such, adequate training in medication administration has become highly important. In reality, the medication training at nursing training sites is insufficient in providing the necessary medication competency for nurses in a clinical setting. Currently, most segmented training courses implemented in the nursing curriculum, including pharmacology, pharmacokinetics and pharmacokinetic calculation, and medication practice, are not enough to provide safe and accurate medication in a clinical setting. Medication administration in a clinical setting requires the ability to tie one’s medical knowledge to the patient’s conditions while considering current clinical and environmental conditions. Therefore, nursing students need training that enhances medication safety competency and is applicable to real-life clinical situations. This training would combine medication skills and knowledge and the use of realistic situations. Existing medication administration training, such as the “5 rights” and “7 rights,” which emphasizes “the correct principles of conduct,” is not enough to guarantee the competency required in real-life clinical situations. Training that focuses on the correct principles of conduct has its limitations in its inability to anticipate errors or manage errors in clinical situations. To overcome this limitation, error training could come into effect. Error-encouragement training presents possible real-life errors in safe training environments beforehand, and induces errors. Through this training, learners are able to studying how errors were made, determine the reasons behind the errors, and understand the knowledge and technology that are relatively sensitive to errors.

Purpose: This study aimed to examine the effects of error-encouragement training on medication safety confidence and learning motivation among nursing undergraduates. Methods: This was a quasi-experimental study of nonequivalent control group design, aimed at determining the difference in medication safety confidence and learning motivation levels between the experimental group, receiving medication error-encouragement training, and the control group, receiving the currently prevailing training. Medication error-encouragement training consisted of 4 hours of practical training, utilizing clinical scenarios prone to oral medication error, among situations included in the medication procedure from prescription to recording. Students received error-prone scenarios at different stages of medication, including patient and drug identification, prescription explanation, drug preparation, medication, recording, monitoring, and drug safety management, and studied the various medication errors and error-inducing reasons and situations in each scenario requiring medication. After a debriefing, students individually examined various factors that could result in medication errors. Medication error-encouragement training, along with medication management training, was provided to the experimental group (n=47), and medication management training (the currently prevailing training method focusing on the correct principle of conduct) was provided to the control group (n=50). The experimental and control groups
measured their medication safety confidence before and after their relevant training, and learning motivation was measured after the experimental intervention. To control for exogenous variables (i.e., differences in curriculum of individual departments, such as courses or number of credits acquired) that could have had an effect on the dependent variables, convenient sampling was conducted on last-year nursing undergraduates of a domestic university located in a large city. Study subjects were randomly assigned to the experimental and control groups using a random number table after pairing based on their grade point average in the previous semester. The data collection period was from April 2016 to June 2017. A total of 97 subjects participated in the study, with 47 in the experimental group and 50 in the control group. The power (1-β) of the study was 0.78.

The general characteristics, learning characteristics, and main variables of the experimental and control groups were analyzed using the frequency, percentage, mean, and standard deviation. The homogeneity tests of the general characteristics and the learning characteristics between the 2 groups were performed by the χ² test, the independent t-test, and Fisher’s exact test. The independent t-test was used to compare the pre- and post-intervention difference in confidence levels between the 2 groups, and the difference in learning motivation levels after the intervention was analyzed.

**Results:** The medication safety confidence of the experimental group pre- and post-intervention was statistically significantly higher than that of the control group (t = 3.52, p < .001). With regard to individual procedures of medication, medication safety confidence among the experimental group increased significantly after training compared with the control group in patient identification (t=2.51, p=.014), drug information confirmation (t=2.36, p=.021), and drug preparation (t=2.43, p<.017). Analyzing the effects of training on learning motivation showed that learning motivation for the experimental group was significantly enhanced compared with the control group (t=3.95, p<.001). Detailed analysis revealed that learning motivation, attention (t=2.95, p=.004) and relevance (t=6.963, p<.001) were particularly higher in the experimental group compared with the control group.

**Conclusion:** Medication error-encouragement training includes error as an element of the learning process, allowing learners to experience the environment and situations related to medication error, ultimately training learners on the prevention of errors. Through error-encouragement training, learners are able to study through experience, various factors related to medication errors, including medication-related knowledge in existing nursing training, the prescription and transfer of medications, the cooperation of multi-disciplinary departments, failure to control patients, communication, drug management, and environmental problems. The training also provides opportunities to integrate the knowledge of medication and the characteristics of the clinical setting, thereby improving the medication safety confidence of final-year nursing undergraduates. Error training is more effective in areas associated with frequent errors and errors with detrimental consequences. Therefore, it is necessary to conduct error-encouragement training in graduating students in the nursing education curriculum.
Effects of Medication Error-Encouragement Training on Medication Safety Confidence and Learning Motivation Among Nursing Undergraduates

Keywords:
Students, Nursing, medication and patient safety

References:

Abstract Summary:
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