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Teaching and Learning Matters

Student perceptions of group examinations as a method of exam review in pharmacotherapeutics

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Abstract

Objective: Evaluate student perceptions of learning outcomes, group dynamics, and team-based skill development during group-retake exams in pharmacy education.

Design: Group-retake examinations utilizing distributed practice were implemented in a pharmacotherapeutics course to serve as a post-individual exam review. A survey was designed to assess student perceptions of these group-retake exams.

Assessment: Students perceived group-retake examinations to be beneficial in respect to retention and application of content. Peer teaching was reported to be effective and occur frequently. Minimal hostility and stress were reported. Consensus answers were reached often and this improved throughout the semester. Overall, 92% of students agreed that group-retake examinations should be continued.

Conclusion: Group-retake examinations were perceived by students to be an effective method for exam review within pharmacy education.

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Keywords: Group testing; Distributed practice; Group dynamics; Learning outcomes; Exam review

Background

Examinations are an important aspect of student assessment in the educational setting and are most commonly administered to assess individual performance. There have been multiple studies reporting positive results on group examinations in a wide variety of professional fields such as medicine, business, and engineering.^{1–3} Collaborative testing allows students to discuss reasoning with peers, fill in knowledge gaps, and promote problem solving in a group

setting. Group examinations have been correlated with improved student performance and retention of content.^{1,4}

As group work is an integral part of pharmacy and other health care professions, the ability for students to work with differing team dynamics and personalities is pertinent.⁵ One strategy for implementing group work within the curriculum is to provide the opportunity for group examinations. The Educational Outcomes set forth by the Center for Advancement of Pharmacy Education (CAPE) prioritize four domains that include foundational knowledge, essentials for practice and care, approach to practice and care, and personal and professional development.⁶ Standard 3 from the 2016 Standards set forth by the Accreditation Council for Pharmacy Education (ACPE) stresses the importance of graduates obtaining the knowledge, communication skills, and problem solving abilities to collaborate effectively with

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a broad range of people.⁷ Group examinations have the potential to promote student growth related to the four CAPE domains in addition to ACPE Standard 3.

In contrast, some studies have shown drawbacks to group examinations. Sinner et al.¹ assessed the impact on exam score as well as student perceptions of group-retake examinations administered in the first and second year of medical school. Immediately following an individual exam, students took a group exam that counted for 5% of the overall exam score. The authors found students achieved consistently higher exam scores on the group exams. In addition, 82% of students reported providing peer teaching; however, only 47% of students were receptive to peer teaching. Many students also reported group-retake examinations lacked any benefit and resulted in additional stress, pressure, or hostility.¹ Enz and Frosch⁸ also examined group assessments in a pharmaceutical calculations course. Students took quizzes either collaboratively, non-collaboratively, or completed half collaboratively and the other half non-collaboratively. The authors found that peer collaboration did not improve performance on mid-term and final examinations when taken independently. Peer collaboration did improve quiz scores and was favorably perceived by students. While this study adds valuable information regarding collaborative assessment in pharmacy education, the model is considerably different than the one described in this article. The model in this article describes more of a team-based learning model for examinations with the individual assessment preceding the group assessment.

With benefits such as peer teaching and improving retention of content and performance, collaborative examinations were implemented in the last course of the pharmacotherapeutics series.^{1,4} The course assessment design consisted of individual examinations followed a week later by a group retake of the most difficult questions. Allowing the gap in time between the exams utilized distributed practice. Multiple studies have shown that retention of content and understanding of concepts is improved when study is spaced or distributed over a period of time, compared to cramming or massed practice.^{9–12}

The purpose of this study was to evaluate student perceptions of group-retake exams in pharmacotherapeutics related to learning outcomes, group dynamics, and team-based skill development. The authors hypothesized that students' perceptions of retention of the material, problem solving in a group setting, and the ability to apply didactic material during advanced pharmacy practice experiences (APPEs) would improve with group-retake examinations. Stress and hostility were expected to be reduced when compared to prior studies. Results of this study will be utilized for curricular design enhancements.

Educational activity

Pharmacotherapeutics IV is a required course for third-year Doctor of Pharmacy students at the University of South

Florida College of Pharmacy. The course integrates medicinal chemistry, pharmacology, and clinical pharmacy practice. The overarching goal of the course is to review and discuss the applied principles of pharmacotherapy and patient management following an organ system process. The primary assessment measures in this course are four individual, non-cumulative multiple choice examinations consisting of 50–70 questions.

Group-retake examinations were implemented in the Pharmacotherapeutics IV course to promote mastery of the CAPE outcome domains through metacognition and to serve as a voluntary form of exam review. The group-retake examinations were administered after each individual exam. Ten-percent of the score achieved on the group-retake exam was added to the individual exam score. Group examinations occurred 1 week after the individual examination in a separate exam block outside of regularly scheduled class time. Self-selected groups consisted of up to five members. The retake consisted of the 40 most difficult questions from the individual exam, determined by item statistics. This number was chosen to ensure the group-retake exam could be completed within the time frame allotted. Faculty members involved in the creation of the original individual exam were asked to evaluate and restructure questions based on exam statistics for the retake exam, and participate in the exam review. The students were given one hour to complete the exam. The group was required to provide a consensus answer for each question. A review occurred immediately following the group-retake exam, also lasting one hour. Each question was displayed at the front of the classroom, and students were expected to raise an audience response card corresponding to the answer choice their group submitted. Faculty facilitated discussion when unanimous responses were not evident. This was beneficial to both students and faculty, as students could fully understand the rationale for the question and faculty could glean insight into the question interpretation from the student perspective. Both the group-retake exam and review were conducted in the same classroom. As this entire process was voluntary, students were not required to stay after the exam retake for the review session.

The group-retake examinations were structured with the intent of capturing the benefits of collaborative testing while reducing deterrents such as stress and hostility. Students were provided a week in between the individual exam and group-retake exam in order to capitalize on distributed practice. This time permitted students to further prepare and obtain a better understanding of content prior to the retake, with the intent of improving the quality of discussion and promoting receptiveness of peer teaching. Requiring each group to reach a consensus answer simulates clinical practice and encourages robust discussions. Stress and hostility may occur when requiring a consensus answer, possibly limiting higher-level thinking, or reducing the effectiveness of peer teaching.¹² To help alleviate these concerns, group-retake examinations were voluntary,

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