

Classroom Incorporation and Students' Perceptions of Preparedness for Oral Examination in a Therapeutics Course

Lisa M. Lundquist, PharmD, BCPS, Clinical Assistant Professor, Mercer University, College of Pharmacy and Health Sciences, Department of Pharmacy Practice, Atlanta, Georgia

Justine S. Gortney, PharmD, BCPS, Clinical Assistant Professor, Mercer University, College of Pharmacy and Health Sciences, Department of Pharmacy Practice, Atlanta, Georgia

Abstract

Objective: To describe the incorporation of an oral examination in a therapeutics course and to determine students' perceptions of preparedness.

Methods: A case-based oral examination was administered to all second professional year students enrolled in a Cardiovascular / Renal therapeutics course. Prior to the oral examination students completed a survey to assess their perceptions of their preparedness, and the results were compared to performance. Students were asked to rate the adequacy of their preparedness on a 4-point Likert scale with 1 = extremely unprepared, 2 = unprepared, 3 = prepared, and 4 = extremely prepared.

Results: One hundred forty-one students (96%) completed the survey. Mean perception of preparedness for the oral examination was 3.41 ± 0.34 . Students that achieved 90 – 100 on their oral examination perceived preparedness as 3.45 ± 0.34 ; 80 – 89 perceived preparedness as 3.34 ± 0.34 ; 70 – 79 perceived preparedness as 3.17 ± 0.32 . Students who scored less than 70 had the lowest perception of preparedness at 3.15 ± 0.49 .

Conclusion: The case-based oral examination represents an additional tool that may contribute to the development of a student's connection between knowledge, effective communication, and pharmacy practice.

Key words: oral examination, assessment, therapeutics, student perception

Background

Pharmacy education should concentrate on preparing students to provide patient-centered, evidence-based medication therapy management.¹ Pharmacists must be able to contribute to the care of patient and to the profession by practicing with competence and confidence in collaboration with other healthcare providers.¹ To achieve these outcomes, students must be given curricular opportunities to develop and strengthen oral communication skills. Although there are many opportunities for improving communication skills in our College of Pharmacy and Health Science's curriculum, a patient case-based oral examination had not been a component.

Traditionally, the majority of testing in colleges of pharmacy has been written or online. This is likely due to studies showing that predictors of success in pharmacy school are based on such examinations in both the pre-pharmacy and basic science arena.^{2,3} In health profession schools, especially among medical schools and specialty residency programs, multiple choice questions have been supplemented by the use of oral examinations.^{4,5} To date, very little literature has been published on the utilization of oral examinations in pharmacy schools. Studies describing other types of oral assessment, objective structured clinical examinations (OSCEs) and oral presentations have been published.^{6,7} It has been suggested that oral examinations are needed to assess a clinician's ability to analyze controversial clinical situations where more than 1 answer may be considered reasonable.⁸ In addition to understanding and applying cumulative knowledge, students in the profession of pharmacy must develop high level communication skills in order to succeed in their career.

Oral clinical skills examinations in a nonprescription medication course were described as a reinforcing strategy to foster active learning and problem-solving skills in pharmacy students.⁹ Students viewed these examinations as a useful tool to assess communication skills and knowledge. In a nurse practitioner curriculum, oral examinations were utilized to teach concepts of evidence-based practice through critique of research articles.¹⁰ Although the oral examinations produced stress, students viewed the experience as positive, reporting that the positive outcomes outweighed the negatives. In a law school setting, Burman concluded that some students who performed well on written examinations performed well on oral examinations.¹¹ The conclusion was that oral and written examinations test different skills and attributes. Law students viewed oral examinations as a stressful, but positive learning experience.¹¹

To strengthen oral communication skills, knowledge, and the connection to pharmacy practice, the authors developed and implemented a patient case-based oral examination in the second professional year Cardiovascular/Renal therapeutics course. With this new educational objective, students' perceptions of preparedness were examined.

The purpose of this study was to describe the development of oral examination for a therapeutics course and determine students' perceptions of preparedness.

Methods

During the structural development of a five-credit hour, second professional year, 6-week cardiovascular and renal therapeutics course, instructors decided to incorporate an oral examination into their testing methodologies. The oral examination was strategically scheduled approximately half-way through the course so it could incorporate a patient case with multiple disease states and corresponding pharmacotherapies that the students had studied and on which they had completed their written examinations within the previous 3 weeks. The case centered on a patient with comorbid disease states of heart failure, hyperlipidemia, hypertension, and venous thromboembolism. (See patient case.)

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Patient Case

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MC is a 48 year old Hispanic female admitted with a chief complaint of shortness of breath and leg pain. Her shortness of breath started yesterday and the leg pain has been increasing over the past week. She is 5'5" and weighs 119 kilograms. Her vitals are:

Blood pressure 159/85 Heart rate 74 Respiratory rate 22 Temperature 97.5

PAST MEDICAL HISTORY: heart failure, hypertension, obesity, gastroesophageal reflux disease, diabetes

FAMILY HISTORY: mother died of a heart attack at age 33

SOCIAL HISTORY: patient is disabled. She cannot ambulate secondary to weight. Quit smoking 6 years ago.

ALLERGIES: none

MEDICATIONS

Carvedilol 25 mg by mouth twice daily
 Furosemide 20 mg by mouth once daily
 Pantoprazole 40 mg by mouth once daily
 Potassium 20 mEq by mouth every morning
 Pioglitazone 15 mg by mouth once daily

PHYSICAL EXAMINATION

HEAD, EARS, EYES, NOSE, THROAT: eyes tired, jugular venous distension

CHEST: rales and rhochi

HEART: S3 heart sound; regular rate and rhythm

ABDOMEN: non-tender, non-distended

EXTREMITIES: 2+ pitting edema bilaterally, right calf larger than left

LABS (4/18/07)

136	95	20	206
3.7	31	1.1	

Total Cholesterol 176 mg/dL

Triglycerides 79 mg/dL

HDL 43 mg/dL

Hemoglobin 133 g/dL

Hematocrit 39%

PT / INR 13.9 / 1.1

CKMB 1%

Troponin 0.1 ng/mL

BNP 1105 pg/mL

Tests

RD Chest: cardiomegaly

ECHOCARDIOGRAM: ejection fraction 35%

Venous Doppler: right lower extremity ultrasound reveals decreased flow in right femoral vein

V/Q scan: low probability for pulmonary embolism

ELECTROCARDIOGRAM (ECG): normal sinus rhythm, previous septal infarct, abnormal ECG

Impression: right lower extremity deep vein thrombosis of right femoral vein, no evidence of pulmonary embolism

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The time that elapsed between distribution of the patient case utilized for the oral examination and the actual oral examination process itself was 48 hours. The case was posted on the Web-based course instruction system (Blackboard) and students were allowed access approximately 36 hours prior to the oral examination. By posting the case early, the instructors gave the students the responsibility of fully evaluating the patient case using any reference they desired. At the oral examination, students were given an unmarked copy of the patient case, but were not allowed to utilize notes. A 4-hour time period was allotted for examination administration by 4 faculty members. Each of the 147 students was assigned to meet individually with a faculty examiner for the oral examination in 5 minute increments.

A perceptions questionnaire (see Table 2) was distributed to the students prior to their taking the actual oral examination. Participation in this survey was voluntary for the students, and data collection for this study was approved by the University's Institutional Review Board. The instrument used was a 1-page questionnaire consisting of questions related to cardiovascular and renal therapeutic topics that directly reflected the topics included on the oral examination. Students were asked to rate the adequacy of their preparedness on a 4-point Likert scale with 1 = extremely unprepared, 2 = unprepared, 3 = prepared, and 4 = extremely prepared. The Perception of Preparedness Questionnaire was each student's self-assessment of their ability to perform the stated task. Student names were required on the questionnaires in order to compare perceptions of preparedness with actual performance on the oral examination.

The oral examination process proceeded in a stepwise manner. At the beginning of the student's time slot, the voluntary questionnaire was distributed to the student. After completion of the questionnaire, the student chose 5 questions from a container that did not allow them to see the questions during the selection process. The numbers chosen by each student corresponded to a standardized list of 9 questions developed by examiners to directly reflect course objectives of the therapeutics topics covered. The examiner asked questions from the prespecified list in order to assess the student's learning. The oral examination counted for 3% of the student's overall course grade. Credit to be awarded for each question was standardized by a grading rubric to decrease the potential for inter-rater variability (see Table 1).

Results

One hundred and forty-one students completed the survey for a response rate of 96%. Mean overall perception of preparedness for the oral examination was 3.41 ± 0.34 . Students who achieved 90 – 100 on their oral examination ($n=113$) perceived their preparedness as 3.45 ± 0.34 ; 80 – 89 ($n=19$) perceived preparedness as 3.34 ± 0.34 ; 70 – 79 ($n=7$) perceived preparedness as 3.17 ± 0.32 . Students who scored less than 70 ($n=2$) had the lowest perception of preparedness at 3.15 ± 0.49 . Students felt most prepared in their ability to calculate cholesterol values, identify goals and stages of hypertension, and identify objective evidence to support diagnosis. Students' perception of preparedness in the ability to identify disease-drug interactions was the lowest rated item (see Table 2).

When numerically comparing oral examination grades to written examination scores and overall course grades, a slight trend was seen showing a higher oral examination score corresponding to a higher average written examination score and overall course grade. Students who achieved 90 – 100 on their oral examination had a written examination average of 79.46 ± 6.72 ; students with 80 – 89 had a written examination average of 77.36 ± 6.32 ; and students with 70 – 79 had a written examination average of 75.85 ± 5.34 . Students with 90 – 100 on their oral examination had an overall course average of 80.01 ± 6.04 ; students with 80 – 89 had a course average of 78.09 ± 5.87 ; and students with 70 – 79 had a course average of 75.93 ± 5.06 .

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Table 1: Oral Examination Grading Rubric

Question	Answer	Points
Name 4 objective pieces of evidence that support heart failure diagnosis and symptoms in this patient. (1 point each)	EF 35% JVD rales/rhonchi BNP 1105 pg/mL SOB Cardiomegaly S3 heart sound 2+ pitting edema	_____ 4
What is the equation used to calculate LDL? (2 points) What is the patient's LDL goal? (2 points)	LDL = total cholesterol – HDL – TG/5 LDL goal <100 mg/dL	_____ 4
What would your recommended outpatient regimen of enoxaparin for this patient be? (2 points for dose, 2 points for frequency)	120mg subcutaneously twice daily	_____ 4
Which of the patient's medications should be discontinued based on disease / drug interaction? Why? (2 points for drug, 2 points for reasoning)	Pioglitazone – contraindicated in heart failure	_____ 4
What are your two recommendations to optimize the patient's heart failure regimen? (2 points each)	Increase furosemide dose Add ACE inhibitor	_____ 4
The physician states that he wants to add lisinopril 40mg by mouth daily to the patient's regimen. Is this appropriate? Why? (2 points for "no", 2 points for reasoning)	No. Not an initial dose of lisinopril for heart failure management.	_____ 4
What is the patient's blood pressure goal? (2 points) What stage of hypertension does the patient have? (2 points)	Goal <130/80 Stage 1	_____ 4
What are the important enoxaparin patient counseling goals for this patient? (4 points total)	Inject into the abdominal area; do not remove bubble from syringe; pinch skin; insert entire length of needle at 90°; alternate from side to side	_____ 4
What monitoring would you recommend for this patient after warfarin is initiated? What is the goal for the monitoring parameter? (2 points for INR, 2 points for goal)	INR in 3 days INR goal of 2 – 3 for DVT	_____ 4
Total points		_____ 20

Abbreviations: ACE, angiotensin converting enzyme; BNP, brain natriuretic enzyme; DVT, deep vein thrombosis; EF, ejection fraction; HDL, high density lipoprotein cholesterol; INR, international normalized ratio; JVD, jugular venous distension; LDL, low-density lipoprotein cholesterol; mg, milligrams; SOB, shortness of breath; TG, triglycerides

Discussion

The strength of oral examinations is that they not only require students to display proficiency in clinical judgment and problem-solving skills based on their understanding of a patient case, but they also require students to articulate their decisions and evaluation regarding the patient case. Oral presentation is a vital skill that is necessary to all pharmacists regardless of area of practice. Another advantage to this kind of examination is that, because the students are evaluating the same patient case, faculty are given

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additional opportunities to identify potential problems in the understanding and application of previously taught disease states and pharmacotherapy.

Table 2: Students' Perceptions of Preparedness Questionnaire

How prepared do you feel in your ability to:	Mean ^a n = 141
Identify objective pieces of evidence that support a diagnosis of heart failure	3.45
Calculate low-density lipoprotein cholesterol values	3.81
Recommend regimens of low molecular weight heparin in the treatment of deep vein thrombosis	3.43
Identify disease / drug interactions	3.20
Recommend therapeutic regimens for heart failure management	3.38
Identify initial and target doses of angiotensin converting enzyme inhibitors	3.30
Identify goals and stages of hypertension	3.57
Counsel a patient regarding low molecular weight heparin injection	3.38
Identify monitoring parameters for anticoagulants	3.33

^a 4 = extremely prepared, 3 = prepared, 2 = unprepared, 1 = extremely unprepared

To date, limited literature has been published on the utilization of oral examinations in pharmacy schools. The lack of documentation of oral assessments being used in the pharmacy profession needs to be addressed given several facts. First, the incorporation of oral examinations across the other health professions is being used to assess student's critical thinking ability as well as the ability to express thoughts orally in a correct, concise, and effective manner. As the pharmacist regularly interacts with such providers, pharmacy educators need to ensure that our students are developing a comparable communication skills set. The need for communication abilities for the pharmacist is clearly documented in the Center for the Advancement of Pharmaceutical Education (CAPE) 2004 Outcomes which focus heavily on the need for skills in communicating and collaborating with patients, prescribers, care givers and others involved healthcare providers.¹² Second, oral examinations can be used as graded tools to promote patient case evaluation and learning. Educators have observed that graded assignments and examinations seem to drive learning to a great extent.¹³ Finally, oral examinations in 1997 and 1998 were listed on the American Association of Colleges of Pharmacy Institute's "Innovations List" as part of the assessment activities.¹⁴ Ten years later, based on published literature, these have not been met with any apparent widespread use.

One of the challenges of incorporating oral examinations into colleges of pharmacy may be related to examination administration time and faculty workload. In this particular course, 16 hours of faculty time was dedicated solely to the administration of the oral examinations for 147 students. Additional time was required to develop the case utilized for the examination and the examination grading rubric, and to review the examination results for consistency among examiners. A major reason given by faculty leaving colleges of pharmacy is excessive workload.¹⁵ Developing and implementing oral examinations could contribute to increased administrative and teaching responsibilities and could potentially impact faculty retention.

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Based on this first time experience in utilizing an oral examination in our cardiovascular and renal therapeutics course, several changes are recommended for the next academic year. First, student preparation time will be shortened. The original 36 hours of time from the posting of the patient case on Blackboard to the actual oral examination may have given students too much time to discuss the case among themselves prior to their oral examination. Second, questions with greater clinical depth should be administered with the next oral examination in order to encourage the student's critical thinking and fact application. Finally, the percentage value of the oral examinations proportion of the course will be increased to greater emphasize application of material and the students' oral communication skills. Although this patient case and students' perceptions of preparedness for the oral examination specifically related to a cardiovascular and renal therapeutics course, the incorporation and usefulness of oral examinations could apply equally to other therapeutics areas.

Limitations

Our study had several limitations. Responses were measured on a 4-point scale and results obtained about students' perceptions could be due to forced choice rather than reflecting students' actual thoughts. The oral examination encompassed global patient assessment and patient case-based questions utilized on the written examination were streamlined cases focusing on individual disease state assessment. The material covered on the corresponding written examination included all topics covered on the oral examination, but was not exclusive to those topics. The oral examination was given to pharmacy students in the second professional year and our results may not be generalizable to first, third, and fourth professional year students.

Conclusion

Students' perceptions of preparedness for the oral examination were consistent with their actual examination scores. Students were less confident in preparedness in areas of critical thinking and problem-solving as compared with basic knowledge. The approach of patient case-based oral examinations provides another way to evaluate students' ability to communicate about complex pharmacotherapeutic topics and is a complementary method to the traditional written examination. The oral examination represents an additional tool that may contribute to the development of a student's connection between knowledge, effective communication, and pharmacy practice.

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