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An Objective Structured Clinical Examination to Assess Pharmacy Resident Performance

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ABSTRACT

Objective: The objective was to utilize an Objective Structured Clinical Examination (OSCE) for assessment of pharmacy residents.

Innovation: Post-graduate year 1 (PGY1) and post-graduate year 2 (PGY2) pharmacy residents completing multiple, local residency programs were invited to participate in an OSCE. A total of eight PGY1 residents and one PGY2 resident completed the OSCE. American Society of Health-System Pharmacists (ASHP) residency program goals were aligned for each case, which were originally developed for a fourth-year pharmacy student OSCE. Station design included outpatient and inpatient settings with patient and physician interactions. Median communication and clinical skills scores were evaluated.

Critical Analysis: The OSCE allows for assessment of all residents on common scenarios. Pharmacy residents met competency requirements and demonstrated excellent communication skills. The OSCE was able to evaluate both physician-pharmacist communication and patient-pharmacist communication. Baseline performance related to the ASHP goals and objectives was not completed; however, the OSCE could highlight resident strengths and weaknesses in communication and clinical skills. The OSCE could simulate independent practice, may reduce bias, and could provide an evaluation of the resident by a patient. However, the OSCE incurs higher resource utilization, specifically monetary and time, than other assessment methods.

Next Steps: The pilot study results provide a beginning for further study of OSCEs for pharmacy residents. Further study should include surveying the residency directors about use of the OSCE, a comparison of performance between the OSCE and preceptor evaluations of residents on ASHP goals and objectives, and an evaluation of OSCE implementation at different time points within the residency.

Keywords: objective structured clinical examination, assessment, pharmacy resident

INTRODUCTION

Pharmacy residents' attainment of competence is currently based on preceptor evaluation of the resident's performance on educational outcomes, objectives and goals. Residency preceptors may benefit from varied assessment tools, such as an Objective Structured Clinical Examination (OSCE), to more objectively assess ability to achieve competency in these educational outcomes. The updated ASHP residency standards describe that residency program directors must initially assess the resident's baseline knowledge and skills related to the ASHP goal and objectives.¹ Deficiencies found on specific ASHP goals and objectives can then be targeted for improvement through formative clinical learning experiences. Employing an OSCE to help evaluate baseline performance could be a valuable and objective way to highlight resident needs and tailor residency learning experiences.

An OSCE consists of multiple, simulated, realistic patient encounters where various clinical tasks are performed by examinees.² The OSCE, as a method of assessment, is increasingly used in pharmacy education,³ Canadian pharmacist licensure,⁴ medical education,⁵ medical resident evaluation,⁶ and certification exams,^{5,6} and complements traditional forms of evaluation,^{6,7} such as direct observation and monthly clinical evaluations.

Several reports in the literature describe pharmacy residency programs using simulation to teach or evaluate residents,⁸⁻¹¹ but no reports of OSCE use in pharmacy residency training exist. Two recent articles demonstrate the use of high-fidelity simulation for Advanced Cardiovascular Life Support (ACLS) training for PGY1 residents. The simulation experiences were conducted after the residents received ACLS certification. One study found an increase in knowledge, confidence, and competency,⁸ while the second study found an increase in confidence and comfort level in residents.⁹ In addition, Marken and colleagues used the combination of human simulator and standardized patients to simulate difficult patient interactions. The purpose was to educate healthcare providers on functioning in an interprofessional team and conducting difficult conversations with patients. Pharmacy residents were included in the interprofessional teams, but evaluation of resident performance was not specifically discussed. Knowledge and skills increased in the majority of participants.¹⁰ Renet and colleagues conducted a management decision-making simulation with Canadian pharmacy residents, demonstrating that residents were consistent in allocation of resources within a hospital pharmacy department.¹¹ Each of these studies contained a component of an OSCE to study a specific task or objective, but none included a comprehensive assessment of pharmacy residents' ability.

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STATEMENT OF INNOVATION

The innovation was a pilot study of the use of OSCEs for assessment of pharmacy residents. OSCEs have been successfully implemented for pharmacy students, but have not been studied for assessment of pharmacy residents. We predicted that the OSCE may serve as a useful, objective assessment tool in pharmacy residency training to evaluate clinical and communication skills.

THE INNOVATION

An invitation to participate in the OSCE was sent to all seven local residency programs in the metropolitan area. Four residency programs participated in the OSCE. A total of eight PGY1 residents and one PGY2 resident completed the OSCE in the spring of 2014. The residents were not provided an incentive to participate, but were provided their results following OSCE completion.

An OSCE task force of four members was created for the development and review of the OSCE cases and clinical and communication checklists. All members were clinical faculty at a school of pharmacy and residency preceptors. Each committee member authored separate cases and accompanying checklists. Our institution routinely has an OSCE at the end of the 4th professional year of the pharmacy curriculum. The cases used were originally written for 4th year pharmacy students. The case checklist consisted of a two-item rating scale noted as complete or incomplete. Clinical checklists included 10 to 15 items with detailed answers to allow for a reliable assessment of performance. Communication checklists consisted of the same nine items for each case and evaluated central components of pharmacy practice, including professionalism, organization, listening, and clear and logical communication. All checklist items were weighted equally with a maximum score of 100% and the passing score was set at $\geq 70\%$. The individual cases were then reviewed and edited by the other members of the task force. Finally, all cases and checklists were reviewed by faculty not involved in the development of the tools.

The OSCE was completed on 3 days, to limit academic dishonesty. Different cases were completed each day. The residents had a choice of which day to attend. Each resident completed four or five OSCE stations that consisted of a simulated task or problem designed to represent real-life scenarios. The number of stations was determined based on our limitations – cost and time.

The cases included a variety of topics and reflected both inpatient and outpatient pharmacy scenarios and were distributed among the clinical curricular outcomes for the program. In addition, cases varied by the type of interaction with a focus on either pharmacist-patient or pharmacist-physician interactions. Each OSCE station assessed specific American Society of Health-System Pharmacists (ASHP) goals

based on the 2008 ASHP education outcomes, goals, and objectives for postgraduate year one (Table 1).¹²

A consistent format was followed for each OSCE station. Each case consisted of a preparation period of 4 minutes to allow the participant appropriate time to review the assigned task. The preparation period was followed by an 8 to 10 minute interaction period between the participant and either the standardized patient or standardized physician. During this time, the participant obtained a focused history, performed a physical examination, or provided a verbal recommendation. The total time for each OSCE station was 14 minutes. The participants were signaled to rotate from station to station through overhead announcements.

The OSCE took place at the local health science center's OSCE facility. There has been a partnership between the school of pharmacy OSCE task force and the health science center OSCE center for over 5 years. The OSCE center provides the facilities and standardized patients at a cost. For an 8 hour day, the facility costs \$1600 and standardized patients are each an additional \$17 per hour. Standardized patients were trained by the OSCE task force in a group setting to ensure consistency. Trained standardized patients graded the interaction based on a rubric that consisted of clinical skill and communication checklists immediately following each encounter. For the physician to pharmacist interactions, standardized patients or medical students were trained to play the role of the physician. During the OSCE, the standardized patient educator periodically reviewed the performance of the standardized patients.

The resident and residency director were sent their OSCE scores based on communication skills and clinical skills one week after receiving the scores and three weeks after the OSCE. Comments provided by the standardized patients and physicians were included for additional feedback.

CRITICAL ANALYSIS

Key Findings

The pilot study was approved by the University of the Incarnate Word Institutional Review Board (IRB#:11-10-002). One-hundred percent of the participating residents consented to be included in the study. Data were analyzed using the statistical program JMP 10.0[®] (SAS Corporation, Cary, NC). Nominal data was analyzed using the chi-square or Fisher's Exact test as appropriate. Continuous variables were tested for normality using the Shapiro-Wilk W goodness-of-fit test. All data were nonparametric data and therefore reported as median and interquartile range (IQR) and analyzed with the Wilcoxon rank sum test.

The median competency score for the residents was 70% or greater on each of the ASHP goals (Table 2). The median OSCE clinical skills score was 87.5%, with a range of 80.9 to 100%. Communication skills scores were high and ranged from a

98.5% to 100% with a median of 100%. Depending on the ASHP goal, scores ranged from 72.2-100%. Clinical skills scores were also assessed by case type and there was not a significant difference in performance among inpatient and outpatient cases, although they did score numerically higher on OSCE stations focused in an inpatient setting (inpatient: 82.7% (IQR 70.5% to 93.8%); outpatient: 77.6% (IQR 74.5% to 78.1%), $p=0.79$).

Reflection

The main objective of this pilot study was to utilize an OSCE for assessment of pharmacy residents. Pharmacy residents met competency requirements and demonstrated excellent communication skills. Demonstration of the ability to execute and apply knowledge and effectively communicate is essential, as these are vital components of clinical pharmacy practice. Furthermore, the OSCE was also able to evaluate both physician-pharmacist communication and patient-pharmacist communication, which can both be difficult to evaluate objectively in other residency experiences.

Managing and improving the medication-use process; providing evidence-based, patient-centered medication therapy management; exercising leadership; demonstrating practice management skills; providing medication-related education; and utilizing medical informatics are the six outcomes postgraduate year (PGY) one residents must achieve.¹² The 2008 ASHP goals R1.3, R1.5, R2.4, R2.6, R2.8, R2.10 and R5.1 were all measured using the OSCE (Table 1). This supplemented the PGY1 residents' evaluations with novel objective data to support achievement of these goals.

Critical Analysis

The resident OSCE was successfully actualized, but the value of the resident OSCE needs to be better studied. Due to funding limitations, residents in our study were assessed later in the residency year at the same time that pharmacy students were assessed. Therefore, the majority of rotation experiences had already been completed by the residents. While this allowed us to evaluate the effect of postgraduate training on clinical and communication skills, it did not allow an assessment of baseline performance for each resident. The new 2014 ASHP goals and objectives have been approved and are being implemented.¹ The updated ASHP standard describes that residency program directors must initially assess the resident's baseline knowledge and skills related to the ASHP goal and objectives. Employment of an OSCE to help evaluate baseline performance could be a valuable and objective way to highlight resident needs and tailor residency learning experiences.

The OSCE is beneficial as it may provide a more objective tool than monthly preceptor evaluations. While the preceptor can provide direct oversight and feedback during the clinical rotation, variation may exist in clinical situations seen on each rotation experience; the OSCE allows for assessment of all

residents on common scenarios that are important learning topics. Additionally, the OSCE can be used to assess resident skills before independent practice with less preceptor oversight on clinical rotations, thus allowing for more resident autonomy. The OSCE may also be a useful assessment tool in the event that any biases already formed between the resident and preceptor affect evaluation. The OSCE may also be used to prepare residents for clinical situations that require immediate decisions or help determine the resident's ability to make quick, logical, clinical decisions. An example of when this might be used for residents is to assess proficiency with the pharmacist's role in ACLS. A series of OSCE stations on different emergent scenarios would allow the program and preceptors to identify areas for growth. The OSCE could be used as a formative learning tool to improve the quality and timeliness of patient care in these situations. Finally, the OSCE is unique in that it formally obtains a patient perspective of critiquing resident performance and providing feedback. Currently, there is no formal evaluation of pharmacy residents by patients or other providers besides preceptor evaluation. The patient perspective is very important in the pharmacist relationship and should be considered to help guide and improve care.

Due to funding constraints and limited availability of the residents, only a small number of pharmacy residents were able to participate in the OSCE. This limited our ability to evaluate its impact on practical experience. While the OSCE has been shown to be an effective assessment tool for multiple health care professionals, this type of assessment incurs higher resource utilization than other assessment methods. This includes higher direct costs and faculty or preceptor time for case development and validation. Our OSCEs are conducted at an off-site location. OSCEs could be conducted on-site and while this would decrease facility costs, faculty time and resources would increase. We provided the residency directors with the resident performance data, but did not verify how they used the information. Our internal school of pharmacy two-year pharmacotherapy residency program used the OSCE as a formative rather than summative assessment. The cases and areas to improve were discussed with the residents, but changes were not made to specific rotations based on the results. The OSCE was helpful for documenting achievement of program outcomes. For the PGY1 residents completing a two-year residency program, they had one year remaining of PGY2 rotations, so more time was available to improve and achieve these program and OSCE outcomes. Residency directors could use these results to tailor training to meet individual resident needs, either on baseline skills deficiencies or on ongoing areas of weakness.

NEXT STEPS

The results of this pilot study demonstrate the use of an OSCE as an objective measurement tool to evaluate clinical and communication skills of pharmacy residents. As the first reported use of an OSCE documented in the United States to

assess pharmacy residents, the information provides a beginning for further study. The OSCE provides initial insight regarding the use of OSCEs in a residency curriculum, potentially leading to an improvement in assessment of postgraduate training. It is important to continue the study of this topic. Further study should include surveying the residency directors, surveying the residents, comparing OSCE data to preceptor evaluations of residents, considering OSCE implementation at different time points within the residency, and evaluation of the OSCE station topics that would be most beneficial.

As we move forward, the first priority is to survey residency directors to determine the use of OSCE data within the residency programs. The OSCE could be used to effectively measure skills that have not received adequate focus or assessment through clinical rotations, experiences depending on rotation availability or timing, or to measure skills systematically in all residents in a program, despite differences in rotation selection. Future studies could compare OSCE scores to the resident preceptor evaluations and survey the residents for their opinions on the usefulness of an OSCE during their training. Additional steps to pursue further development of use of OSCEs to assess resident performance include design of pre- and mid-residency OSCEs.

Disclosures: None

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Table 1: American Society of Health-System Pharmacists Postgraduate Residency Goals¹² and Corresponding OSCE Stations and Description

ASHP Goal Assessed	Station Topic	Interaction Type	Setting
Goal R1.3: Prepare and dispense medications following existing standards of practice and the organization's policies and procedures.	Phenytoin therapeutic drug monitoring and education (Station 1)	Pharmacist – physician	Inpatient
	Opiate dose conversion (Station 2)	Pharmacist – physician	Inpatient
Goal R1.5: Provide concise, applicable, comprehensive, and timely responses to requests for drug information from patients and health care providers.	Blood pressure assessment (Station 3)	Patient – pharmacist	Outpatient
	Hyperlipidemia management (Station 4)	Patient – pharmacist	Outpatient
Goal R2.4: Collect and analyze patient information.	Blood pressure assessment (Station 3)	Patient – pharmacist	Outpatient
	Acetaminophen drug dosing in pediatrics (Station 5)	Patient – pharmacist	Outpatient
Goal R2.5: When necessary, make and follow-up on patient referrals.	Community-acquired pneumonia triage and therapeutic recommendations (Station 7)	Pharmacist – physician	Inpatient
Goal R2.6: Design evidence-based therapeutic regimens.	Osteoporosis drug management (Station 6)	Patient – pharmacist	Outpatient
	Acetaminophen drug dosing in pediatrics (Station 5)	Patient – pharmacist	Outpatient
Goal R2.8: Recommend or communicate regimens and monitoring plans.	All stations assessed effective communication	Patient – pharmacist or pharmacist – physician depending on the station	Both
Goal R2.10: Evaluate patients' progress and redesign regimens and monitoring plans.	Osteoporosis drug management (Station 6)	Patient – pharmacist	Outpatient
	Community – acquired pneumonia triage and therapeutic recommendations (Station 7)	Pharmacist – physician	Inpatient
Goal R5.1: Provide effective medication and practice-related education, training, or counseling to patients, caregivers, health care professionals, and the public.	Osteoporosis drug management (Station 6)	Patient – pharmacist	Outpatient
	Education on Tdap vaccine (Station 8)	Patient – pharmacist	Outpatient

Table 2: Resident Communication and Clinical Skills by Overall Score and by Professional Outcome

	Score ^a (%, n=9)
Total Score	93.8 (89.6-100.0)
Clinical Skills ^b	87.5 (80.9-100.0)
Communication Skills ^c	100.0 (98.5-100.0)
ASHP Goal R1.3: Prepare and dispense medications following existing standards of practice and the organization’s policies and procedures.	85.7 (64.9-95.8)
ASHP Goal R1.5: Provide concise, applicable, comprehensive, and timely responses to requests for drug information from patients and health care providers.	72.2 (66.1-83.2)
ASHP Goal R2.4: Collect and analyze patient information.	72.2 (71.8-86.0)
ASHP Goal R2.5: When necessary, make and follow-up on patient referrals.	83.3 (68.2-89.6)
ASHP Goal R2.6: Design evidence-based therapeutic regimens.	77.0 (71.4-83.2)
ASHP Goal R2.8: Recommend or communicate regimens and monitoring plans.	100.0 (98.5-100.0)
ASHP Goal R2.10: Evaluate patients’ progress and redesign regimens and monitoring plans.	80.8 (76.7-91.0)
ASHP Goal R5.1: Provide effective medication and practice-related education, training, or counseling to patients, caregivers, health care professionals, and the public.	77.0 (71.6-82.7)

^aContinuous data presented as median and interquartile range.

^bThe clinical skills score provided here is the median of the performance by the resident on all clinical checklists in the OSCE.

^cThe communication skills score is the median of the performance by the resident on all communication checklists in the OSCE.