Development of a communication-based virtual patient counseling objective structured clinical examination (OSCE) for first year student pharmacists

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ABSTRACT

Objective: This text seeks to describe a framework for delivering and executing a virtual patient counseling OSCE and compare student performance to the in-person alternative.
Methods: A communication-based virtual patient counseling objective structured clinical examination (OSCE) was created to fulfill the educational outcomes of a previously held in-person OSCE in response to the COVID-19 pandemic. The virtual nature of this OSCE simulated a telehealth encounter, which has increased in utilization since the beginning of the COVID-19 pandemic. This OSCE was offered twice in one semester – once as a formative assessment and once as a summative assessment. Student performance was mapped to learning outcomes and compared the previous year's in person performance.
Results: The described virtual framework for executing the OSCE successfully decreased the time required and saw <1% change in overall performance from students when compared to the previous year in person which was not statistically significant.
Conclusion: This framework for a virtual communication-based OSCE reduces time with a negligible impact on student performance compared to the in person alternative.
Innovation: This work describes a telehealth virtual patient counseling model to replace the traditional patient counseling OSCE in pharmacy education with comparable outcomes.

1. Introduction

Patient counseling activities and assessments have long been a mainstay of American Doctor of Pharmacy curricula [1]. Due to the COVID-19 pandemic, many face-to-face assessments have shifted to a virtual environment requiring a reimagination of these assessments [2,3]. Logistics, content, and student preparation must accommodate this new modality of delivering clinical simulation assessments known as objective structured clinical examinations (OSCEs) [4]. This was especially difficult when the focus of the assessed content was communication-based rather than drug information retrieval or clinical knowledge. The purpose of this text is to describe the development and execution of a virtual communication-based OSCE that is traditionally performed in an in-person environment.

Other literature exists from colleges and schools of pharmacy who have successfully completed similar assessments. Many other previously published works make use of recorded or digital standardized patients – not real-time patient actors [6-9]. One previous work described by Deville and colleagues does use a live standardized patient during a virtual patient counseling assessment, but does so as a single station of a capstone OSCE for third professional year student pharmacists [10]. Other work by VanLangen and colleagues described a virtual communication-based OSCE that took the form of a case presentation, an in-service presentation, and a patient consultation [11]. Savage and colleagues performed a virtual OSCE as a, two-day assessment. The first day consisted of a simulated telehealth patient interview and the second day was a case presentation to a simulated preceptor and providing medication education. This assessment was one component of a larger assessment and was not described in detail as the focus of the manuscript was on student feedback. Student feedback is reported in their work and

the most cited "liked" aspects of the OSCE were logistics and the remote communication opportunity [12].

Lastly, a study from Scoular and colleagues performed a similar assessment (communication-based patient counseling OSCE) and found that the cohort who completed the virtual OSCE performed about as well as those who completed the in-person OSCE [13]. The study analyzed about 250 first professional year students in their second semester. One OSCE was formative and another was summative – both completed by each cohort. Each OSCE was delivered in two parts: a medication history and a counseling assessment. The primary outcome was change in examination performance overall and for each domain. The virtual OSCE performance was significantly higher with a median score of 99% for the virtual OSCE compared to 96.47% for the in-person OSCE. Of note, the two components of the OSCE were split into two components performed separately, this study housed one OSCE component outside of a course, and the focus of Scoular and colleagues' work was analytical and not descriptive. To date, no standalone, single-assessment, communication-based virtual patient counseling OSCE for first semester student pharmacists has been described in the literature. The aim of this text is to describe a framework for delivering and executing a virtual patient counseling OSCE and compare student performance to the in-person alternative. This framework is accompanied by a performance analysis of each assessment for comparison.

Patient counseling is a vital component of pharmacy education. The Accreditation Council for Pharmacy Education's considers the counseling of patients to be a "required element of the didactic Doctor of Pharmacy curriculum." [5] Patient counseling sessions give an opportunity to provide clinical information to a patient whilst utilizing the communication skills learned in the didactic curriculum. In the authors' Doctor of Pharmacy curriculum, the didactic teaching of the patient counseling took place in a pharmacy communication course and the skills-based component took place in skills labs during the first and second semester of the first professional year. Both patient counseling components have OSCEs with live, trained standardized patients and faculty evaluators to assess performance. The first skills-based component was communication-based and content was provided ahead of time. The second OSCE in the following semester is content-based with a reduced focus on communication and a significant emphasis on accuracy of the counseling points.

2. Methods

2.1. Virtual patient counseling OSCE

This communication-based virtual patient counseling OSCE was designed to be performed twice – once as a formative assessment and once as a summative assessment and took place using Zoom video conferencing software. The course proficiencies fulfilled by this assessment were as follows:

a. Demonstrate the ability to communicate with patients, caregivers and other healthcare professionals utilizing interpersonal skills in both orally and written formats.
b. Counsel patients and caregivers utilizing cultural competency and empathy.
c. Demonstrate how to take a patient history.

Two separate training sessions were held for the evaluators and two were held for the standardized patients – each for ninety minutes the week prior to the assessment via Zoom. The standardized patient role was assumed by PhD student teaching assistants who signed up to participate in the OSCE. Standardized patients attended a presentation to share logistics and background information of the patients they were to role play during the OSCE. The standardized patients were also required to role play the encounter with a trainer during the training session. Evaluators attended a presentation that focused on logistics and

grading criteria. Evaluators were also required to assess a video of a patient counseling assessment performance during the training session that was also shown to the student pharmacists during their practice lab activities as an example.

The scenario that the student pharmacists were given during the assessment was to counsel a patient on a new medication that was being dispensed in a community pharmacy setting.

The communication-based assessment was designed to have several components: introduction, patient history, patient education, teach back, and a communication barrier.

The introduction began with the student pharmacist introducing themselves to the patient by stating their name and role. It was then followed by explaining the encounter and its estimated duration. It concluded by obtaining verbal consent from the patient to continue the counseling session.

The patient history began with patient identity confirmation via name and date of birth or address. It then transitioned to profile review of medication history, problem list, medication allergies, and social history.

During the patient education component, the student pharmacist conveyed relevant and previously provided information regarding the new drug being dispensed. The name, strength, regimen, quantity, and refills were communicated. The student pharmacist also used the three prime questions as outlined in the Indian Health Services model of patient counseling. These three open-ended questions were as follows: 1) "What did your doctor tell you this medication is for?" 2) "How did the doctor tell you to take this medication?" and 3) "What did the doctor tell you to expect from this medication?" [13] The student pharmacist provided drug-drug interactions, special instructions (ie. take on an empty stomach, etc.), missed dose instructions, adverse effects, and storage information.

The teach back component, as part of the Indian Health Services patient counseling model, was designed to have the student pharmacist instruct the standardized patient to repeat back important counseling points to ensure understanding [13]. When repeating back the important information, the standardized patient was instructed during training to repeat one component back incorrectly so the student pharmacist could practice active listening and correct the misunderstanding during the assessment. This incorrect information was standardized across all patients to ensure fairness among all student pharmacists. If the intended incorrect information was not mentioned by the student pharmacist during the patient education component, the standardized patient was instructed to default to the wrong indication.

The communication barrier component was designed to have the standardized patient interrupt the student pharmacist in some way such as talking on their cell phone during the patient education. The student pharmacist would then address the concern or event empathetically and effectively, then return to the patient education.

The student pharmacists had the following preparation opportunities prior to their summative assessment in the following sequence: 1) three practice sessions 2) formative assessment 3) individual video and rubric-based feedback 4) general feedback session and 5) one additional practice session. These practice opportunities took place in person in 2019 and virtually in 2020, but the content of each offering was the same.

The practice sessions involve a prelab activity where students gather basic drug information for one of the drugs that would be used during the summative assessment and submit via the Blackboard learning management system prior to the beginning of lab. An answer key was provided to the students during the activity that remained accessible to them via the learning management system after the conclusion of the lab. Student pharmacists used the key and the rubric to practice counseling in groups of three in role-play scenarios where student pharmacists alternated role-playing the pharmacist, patient, and observer. These groups of three participated in these role-playing scenarios in breakout rooms (BORs) using Zoom with a setup made to mimic the

patient education component of the assessment. The student pharmacists were given feedback by faculty facilitators. Each facilitator of which rotated between a small number of BORs. The lead facilitator provided debriefing with general feedback given to the cohort at the end of the activity.

Prior to the start of the assessments, student pharmacists reviewed the drug information provided to them from the four practice sessions in lab – each of which was for a different drug. There was also a list of student-specific arrival times posted in the Blackboard learning management system for the cohort that student pharmacists were told to review. The formative assessment took place similarly to the summative assessment which will be described in a later section. Afterwards, the student pharmacists had access to their video recordings to improve on verbal and non-verbal communication. They also received their completed rubric with evaluator comments. A general feedback session then took place during the lab time where the lead facilitator gave common feedback to the student pharmacists and clarified misconceptions. The student pharmacists then had an additional practice lab prior to their summative assessment.

The grading rubric contains components of the Indian Health Services model of patient counseling and the American Society of Health-System Pharmacists guideline for pharmacist-conducted patient education counseling [13,14]. The Center for the Advancement of Pharmacy Education (CAPE) outcomes in Table 1 were assessed in the rubric. The rubric was weighted for emphasis on key communication concepts. Therefore, the rubric items intended to assess the 3.2 or 3.6 CAPE domains ranged from 3 to 5% per rubric item and were consistent throughout the rubric. One exception is the professionalism section that was split up into multiple dimensions to hold the student accountable for specific components within what otherwise could be one 3% or 4% item. For example, the professionalism section consists of items to assess for 1) the student wearing their nametag, 2) the student being "well-groomed," and 3) the student wearing their College-issued white coat. This method holds them accountable for each specific element in a manner that isn't all-or-none for professionalism as a CAPE domain. The other exception is the final verification (CAPE Outcome 3.2.6 – Assess audience comprehension) where 10% of the assessment's weight is placed. This item represents the ultimate deliverable of the assessment which is, did the patient understand what the student presented and includes an active listening component. This was weighted much greater than other sections of the rubric such that students who could not complete this deliverable could not receive an "A" grade ($\geq$ 90% score) on the assessment.

On the day of the assessment, student pharmacists signed into a Zoom link at their specific arrival time to prevent any delay in their assessment time, to standardize start times for each wave of student pharmacists, and to control which student pharmacists were receiving instructions. Their posted arrival time was ten minutes prior to their assessment time. The student pharmacists were kept in the virtual waiting room until their assessment time – at which point they were let into the main Zoom room.

The main Zoom room contained two instructors, an informational technology team member, and nine student pharmacists. Once admitted, the student pharmacists were given brief instructions for no >2 min. Then, the patient information was shared on the screen. The patient information contained the following: 1) prescription 2) patient intake form 3) prescription vial label and 4) image of dispensed drug. All four components of the patient information were displayed on one screen using the screen share function which is available in Fig. 1. The student pharmacists had 5 min to work up and write down notes regarding this patient and their medication. Resources other than the patient information available on the screen (Fig. 1) and the note paper were not allowed. Student pharmacists were stopped after their 5-min workup time. A list of the current student pharmacists and their assigned BORs were posted in the Zoom chat box. Student pharmacists then proceeded to their assigned BOR by self-selecting their assigned room. IT pushed

Table 1
CAPE outcomes associated with rubric*.

CAPE Outcome	Rubric Dimension Examples	Number Rubric Line Items (%)	Total Weightage (%)
3.2 – Educator – Educate all audiences by determining the most effective and enduring ways to impart information and assess understanding.			
3.2.4 – Ensure instructional content contains the most current information relevant for the intended audience.	Indication Prescription information Drug interactions Special instructions Missed dose instructions Efficacy expectations Adverse effects Storage information	9	22.0
3.2.5 – Adapt instruction and deliver to the intended audience.	Use of layman's language	1	4.0
3.2.6 – Assess audience comprehension.	Final verification	1	10.0
3.6 – Communication – Effectively communicate verbally and nonverbally when interacting with an individual, group, or organization.			
3.6.1 – Interview patients using an organized structure, specific questioning techniques, and medical terminology adapted for the audience.	Confirm patient Patient profile review Social history (closed-ended)	3	12.0
3.6.2 – Actively listen and ask appropriate open and closed-ended questions to gather information.	Indian Health Services model of counseling three prime questions (open-ended)	3	15.0
3.6.4 – Use effective interpersonal skills to establish rapport and build trusting relationships.	Introduction Explain encounter Duration of encounter	4	5.0
3.6.5 – Communicate assertively, persuasively, confidently, and clearly.	Sequence organization Verbal communication Non-verbal communication Eye contact	5	20.0
3.6.6 – Demonstrate empathy when interactive with others.	Express gratitude Acknowledge and address barrier	3	9.0
4.4 – Professionalism – Exhibit behaviors and values that are consistent with the trust given to the profession by patients, other healthcare providers, and society.			
4.4.2 – Display preparation, initiative, and accountability consistent with a commitment to excellence.	Name tag White coat Well-groomed	3	3.0

* All rubric items assigned to no more than one CAPE outcome.

the student pharmacists into the rooms if they had technical difficulty or otherwise did not enter their assigned room.

The census of each BOR included one student pharmacist, one evaluator, one standardized patient, and one pager. The pager refers to an informational technology account that was logged into the meeting and placed in the breakout room for the purpose of making pre-programmed announcements for instructions. The instructions verbalized by the pager were set to a timer so they would be simultaneously delivered to each BOR. Once all student pharmacists entered their assigned BOR, the pages began as described in Table 2. The same screen of patient information from the main Zoom room was displayed again for the student pharmacists (Fig. 1). Once the counseling sessions ended, the students left the meeting. The Zoom meeting settings were set so that
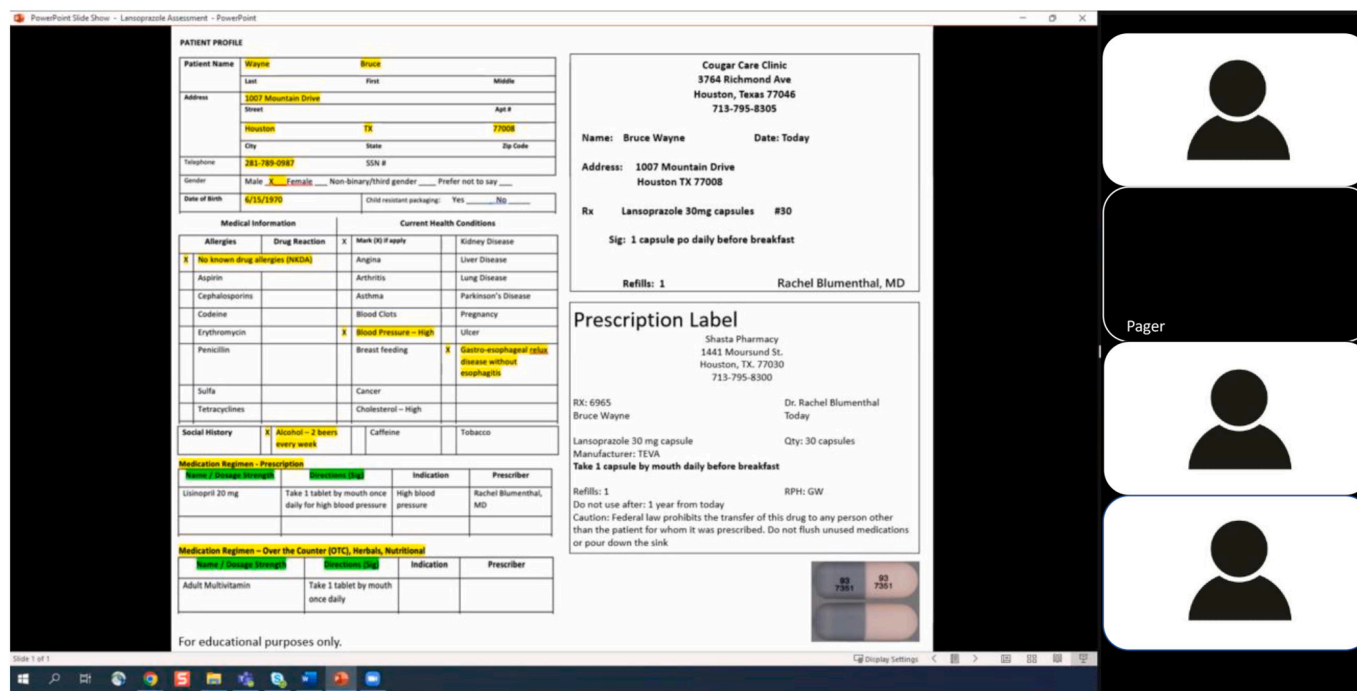
Fig. 1. Sample patient counseling encounter screen.

Table 2
Public address pages for assessment.

Elapsed Time (min: sec)	Page	Action
0:00	"The medication that you will be counseling on will be displayed on the screen"	Student examines assigned medication on the evaluator's shared screen and prepares for the counseling session
0:05	"The session will begin in 1 min. You will have 5 min to complete your counseling session. You will receive a 1-min warning."	Evaluator: Ready to begin assessing student's counseling encounter Student: Prepare to counsel SP: Prepare to begin role-playing
1:05	"Students, please begin your session"	SP to initiate the counseling session
5:50	"You have 1 min remaining"	Student reminded they have 1 min remaining
6:50	"The encounter has ended. Please exit the virtual meeting"	Student stops counseling and exits meeting

student pharmacists could not simply leave the BOR to return to the main room to avoid additional peer interaction.

The informational technology time and effort greatly increased when using the virtual version of this assessment. During the in-person offering of the assessment, students would have their sessions recorded into Simulation IQ (SimIQ) – an education simulation management software platform. It would require setting a blueprint of the students' encounters beforehand but would do the paging and recording real time. The virtual offering of the assessment required the use of Zoom and in-room recording. All encounters were recorded by the Pager as one assessment-long recording. Then the IT team trimmed the video into individual encounters and uploaded each student's recording into the SimIQ software manually. The evaluators scored the students in an on-line rubric. The rubric was housed in Examsoft which is assessment software the college of pharmacy uses for the provision of written exams and rubric-based assessments. It also serves as an analytical tool to evaluate psychometrics and student performance.

2.2. Retrospective Comparison with In-Person OSCE

Aggregate rubric analysis was performed in using descriptive statistics between the 2019 (in-person assessment) and 2020 (virtual assessment). The 2019 assessment was used as a comparator since this was the last time the assessment was conducted prior to the virtual offering and was the institution's established method of conducting the OSCE. A Kolmogrov-Smirnov test was conducted to determine normality of distribution; however, only the 2019 formative assessment passed the normality test. As a result, a Wilcoxon-ranked sum test was used to compare median formative and summative overall performance changes based on the assessments' sum-of-it's-parts as opposed to a Mann-Whitney U test which would be used if analyzing at the student-level. This analysis was retrospective in nature using only deidentified, aggregate data. A similar Wilcoxon-ranked sum analysis was conducted to detect median change in performance based on CAPE outcome rather than rubric item. Unweighted averages were used for purposes of reproducibility. The deidentified, aggregate rubric data was provided by ExamSoft. The descriptive statistical analysis was performed by Microsoft Excel version 16.69. The related-samples Wilcoxon-ranked sum test was performed using IBM© SPSS Statistics version 28.0.1.0.

3. Results

The mean weighted and unweighted performance were similar for the formative assessment and summative assessment from 2019 to 2020. The change in mean item performance ranged from −26.25% to 30% for the formative assessment and − 22.49% to 23.17% for the summative assessment. The performance per individual rubric item can be found in Table 3. The change column shows the difference from 2019 to 2020. For example, Δformative = 2020 formative − 2019 formative. Changes in median component performance by rubric item from 2019 to 2020 were not statistically significant for the formative ($p = 0.638$) nor for the summative ($p = 0.845$). Performance was also assessed by CAPE outcome and reported in Table 4. Changes in performance per outcome ranged from −26.25% to 12.85% for the formative assessment and − 7.54% to 7.24% for the summative assessment. Changes in median component performance by CAPE outcome from 2019 to 2020 were not

Table 3
Mean change in performance by rubric item.

Rubric Dimension	2019 Formative n = 124	2020 Formative n = 121	Δ Formative	2019 Summative n = 124	2020 Summative n = 121	Δ Summative
Introduction	97.60	94.21	−3.39	96.77	95.87	−0.9
Explanation of encounter	89.60	95.87	6.27	98.39	97.52	−0.87
Duration of encounter	89.60	93.39	3.79	98.39	95.04	−3.35
Profile Review – identifier	96.80	99.17	2.37	97.58	98.35	0.77
Profile Review – medication	89.60	80.99	−8.61	92.74	70.25	−22.49
Profile review – social history	84.00	90.08	6.08	97.58	96.69	−0.89
IHS first prime question	82.40	95.87	13.47	94.35	95.87	1.52
States or confirms indication	94.40	98.35	3.95	99.19	99.17	−0.02
IHS second prime question	74.40	91.74	17.34	87.90	97.52	9.62
Medication regimen	70.40	82.64	12.24	87.90	84.30	−3.6
Refill information	99.20	88.43	−10.77	96.77	97.52	0.75
Drug-drug interactions	89.60	86.78	−2.82	91.94	91.74	−0.2
Special instructions	81.60	73.55	−8.05	87.10	83.47	−3.63
Missed dose instructions	93.60	88.43	−5.17	97.58	76.86	−20.72
IHS third prime question	84.00	91.74	7.74	95.16	97.52	2.36
Efficacy expectations	95.20	90.91	−4.29	98.39	95.04	−3.35
Side effects	92.00	93.39	1.39	91.13	94.21	3.08
Storage instructions	96.00	89.26	−6.74	99.19	97.52	−1.67
Final verification	80.80	54.55	−26.25	86.29	80.17	−6.12
Thank you	82.40	61.98	−20.42	92.74	94.21	1.47
Organization of information	84.0	93.39	9.39	91.94	95.87	3.93
Appropriate language	92.80	97.52	4.72	91.13	97.52	6.39
Conversation flow	57.60	87.60	30	67.74	90.91	23.17
Nonverbal communication	91.20	96.69	5.49	90.32	96.69	6.37
Verbal communication	80.00	85.12	5.12	85.48	88.43	2.95
Eye contact	90.40	85.95	−4.45	91.94	91.74	−0.2
Patient concerns	98.40	98.35	−0.05	88.71	99.17	10.46
Barrier	99.20	96.69	−2.51	100.00	99.17	−0.83
Name tag	100.00	98.35	−1.65	99.19	98.35	−0.84
White coat	100.00	98.35	−1.65	99.19	100	0.81
Grooming and presentation	97.60	99.17	1.57	100.00	100	0
Weighted average	86.38	86.87	0.49	91.71	92.01	0.3
Unweighted average	88.85	89.63	0.78	93.31	93.44	0.13
Standard deviation	9.71	10.37	10.58	6.57	7.27	7.94

IHS = Indian Health Services model of counseling.
Δ Formative = change in formative assessment performance from 2019 to 2020 offering.
Δ Summative = change in summative assessment performance from 2019 to 2020 offering.

Table 4
Unweighted mean performance by CAPE outcome.

CAPE Outcome	2019 Formative	2020 Formative	Δ Formative	2019 Summative	2020 Summative	Δ Summative
3.2.4	90.22	87.97	−2.25	94.35	91.09	−3.26
3.2.5	92.8	97.52	4.72	91.13	97.52	6.39
3.2.6	80.8	54.55	−26.25	86.29	80.17	−6.12
3.6.1	90.13	90.08	−0.05	95.97	88.43	−7.54
3.6.2	80.27	93.12	12.85	92.47	96.97	4.5
3.6.4	92.27	94.49	2.22	97.85	96.14	−1.71
3.6.5	80.64	89.75	9.11	85.48	92.73	7.24
3.6.6	93.33	85.67	−7.66	93.82	97.52	3.70
4.4.2	99.20	98.62	−0.58	99.46	99.45	−0.01

3.2.4 – Ensure instructional content contains the most current information relevant for the intended audience.
3.2.5 – Adapt instruction and deliver to the intended audience.
3.2.6 – Assess audience comprehension.
3.6.1 – Interview patients using an organized structure, specific questioning techniques, and medical terminology adapted for the audience.
3.6.2 – Actively listen and ask appropriate open and closed-ended questions to gather information.
3.6.4 – Use effective interpersonal skills to establish rapport and build trusting relationships.
3.6.5 – Communicate assertively, persuasively, confidently, and clearly.
3.6.6 – Demonstrate empathy when interactive with others.
4.4.2 – Display preparation, initiative, and accountability consistent with a commitment to excellence.

statistically significant for the formative ($p = 0.953$) nor for the summative ($p = 0.859$).

There were notable findings from the analyses whose impact will be described in the discussion section but will be summarized here. First, there was a difference of 3 students from the 2019 to the 2020 cohort. From 2019 to 2020, the formative assessment showed no statistically significant changes in overall performance based on rubric item or CAPE outcome, a decrease of 45 min of assessment time, and a 10.58% standard deviation for change in item performance. The summative assessment showed no statistically significant changes in overall performance based on rubric item nor CAPE outcome, a decrease of 24 min of assessment time, and a 7.94% standard deviation for change in item

performance.

4. Discussion and conclusion

4.1. Discussion

Several lessons learned from the formative assessment were corrected and adjusted for in the summative assessment. Below are the identified issues that were fixed.

a. Original one-minute warning was a chime. The background noise reduction function in Zoom canceled the chime sound in some of the rooms. This was changed for the summative assessment to an announcement that read "You have one minute remaining."

b. A few of the students encountered connections issues. For the summative, we made sure to communicate to them to test their connection prior to their arrival time.

c. The students were confused by the concept of arrival time compared to assessment time. Prior to the summative assessment, messaging in this regard was clarified and reinforced to the students.

d. The traditional, in-person offering of this assessment has additional time between encounters to rotate students in-and-out of the physical OSCE rooms accounted for in the logistics ahead of time. During the virtual formative assessment, no such time was added, and evaluators commented on the lack of down-time between encounters to finish the electronic rubric or take notes. Additional time between encounters was added for the summative assessment.

e. Evaluators were surprised by the entrance of the students into the breakout rooms. During the summative assessment, messages were provided to the evaluators via Microsoft® Teams chat to alert them to the incoming students to remedy this.

f. Many students did not finish the assessment on time. An extra 45 s was added into the summative assessment before the one-minute warning to account for the cumulative pauses in virtual conversation.

There were several advantages to offering this assessment virtually as described. The first advantage was improved efficiency. The formative virtual OSCE logistics in 2020 for 121 student pharmacists required 141 min and the extra time added between rounds increased the summative assessment time to 157 min. This is a decrease from the 2019 offering for 124 student pharmacists' 186-min formative and 181-min summative in-person OSCE. By reducing the assessment time, a shorter time commitment on the day of the assessment was required of the evaluators, IT team members, and standardized patients. The standardized patients gave a realistic, humanized feel to the encounter. They were able to respond to and interact with the students virtually as a real patient would. Additionally, the virtual offering does not require the coordinator of the assessment to reserve physical space to complete the OSCE activity. This is a huge advantage because lab space is limited and is shared with other courses.

The assessment may also be useful for normalizing a telehealth encounter to students. Most health systems in the United States are currently using the telehealth modality for patient care in some capacity [15]. According to the American Society of Health-System Pharmacists national survey of pharmacy practice in hospital settings, 18.7% of hospitals newly implemented or expanded their current telehealth operations in response to the COVID-19 pandemic [16]. The practice of telehealth has become quite accepted by patients [17]. As a result, it may become the preferred method of healthcare for situations where it would be appropriate. Thus, the creation of the virtual patient counseling OSCE would further prepare students for the future of healthcare delivery.

The virtual offering of this assessment brings about some disadvantages as compared to the traditional in-person offering. Of note, eye contact and vocal qualities were affected by the virtual environment.

Some of the evaluators commented that they had a difficult time determining if the student was making eye contact with the patient on screen when they were not looking into the camera. Other distracting behaviors such as fidgeting, leg tapping, etc. were unable to be assessed due to the platform used. This also creates uncertainty with academic honesty as evaluators were unable to determine if students were accessing prohibited materials such as the rubric. Lastly, the training sessions for the evaluators and standardized patients were held for ninety minutes the week prior to the assessment via Zoom and it was difficult to assume understanding when attendees had their camera's off during training leading to lack of confidence in the evaluators and standardized patients by the assessment coordinators going into the assessment.

Another disadvantage was that technical difficulties at times affected the patient counseling sessions when students, evaluators or standardized patients lost internet connection during the assessment, which resulted in the student having to re-do the encounter. Approximately 5 students total between the formative and summative OSCE encountered such difficulties. This was not an issue during the in-person offering, since all parties (student, evaluator, patient) were in the same room being recorded. Also, while using Zoom as the recording method for the virtual OSCE gave the team freedom to accommodate late arriving students or instantly reschedule students with technical difficulties, the human resource cost for this was much greater. This method also delayed the release of videos to the students.

The rubric analysis showed only small overall changes in performance from the 2019 to the 2020 offering of the OSCE with weighted and unweighted mean performance of <0.8% for the formative and summative assessments. While performance by rubric item varied from 2019 to 2020, the performance by CAPE outcome varied less so. Schoular and colleagues found a statistically significant difference in performance from 2019 to 2020 with the virtual cohort scoring higher for each rubric item assessed [13]. This study's sample showed no statistically significant difference from 2019 to 2020 per rubric item nor CAPE outcome. This indicates that the virtual nature of the OSCE did not impact the overall performance. Additional statistical analysis beyond descriptive statistics at the rubric item level would have been helpful, but the authors did not have access to the more granular data needed to complete such statistical analysis.

The rubric item mean standard deviation for change in item performance was 10.58% for the formative and 7.94% for the summative assessment. The increased consistency of the scores in the summative assessment is consistent with the increase in performance from the formative to summative assessment as expected which was also the case for Schoular and colleagues [13,18]. Overall, the virtual patient OSCE performance was like that of the in-person OSCE.

4.2. Innovation

Although virtual patient counseling OSCEs have been described, there are no descriptions of such an OSCE in first-year Doctor of Pharmacy students as a communication-based, standalone assessment [6–13]. This text adds to the available work evaluating virtual patient counseling OSCEs in Doctor of Pharmacy education. This study describes a virtual patient counseling model with novel methods in the context of student overall performance and efficiency.

4.3. Conclusion

This communication-based virtual patient counseling assessment succeeded in evaluating 121 student pharmacists in 157 min. The design of execution of a virtual OSCE requires input and assistance from IT personnel, supportive online platforms, and technical savvy considerations of the students, evaluators, and standardized patients. Inclusion of multiple training sessions allowed skill proficiency and increased ease for all stakeholders. The authors' experience conducting this assessment

may be of use to those who lack the space or time to perform this assessment in-person. The authors believe that this format could work well for other OSCE assessments or other skills-based telehealth activities. Ultimately, the outcomes were favorable in terms of students meeting the learning objectives and performing on par with the in-person delivery of the OSCE.

Declaration of Competing Interest

We declare no conflicts of interest or financial interests that the authors or members of their immediate families have in any product or service discussed in the manuscript, including grants (pending or received), employment, gifts, stock holdings or options, honoraria, consultancies, expert testimony, patents, and royalties. The authors have no use of generative artificial intelligence (AI) to declare.

We confirm that this work is original and has not been published elsewhere, nor is it currently under consideration for publication elsewhere. This paper has not been previously submitted to *Patient Education and Counseling* for consideration.

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