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Pharmacy Students' Perception and Evaluation of Objective Structured Clinical Examination: Near East University Experience

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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Short Research Article

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ABSTRACT

Background: Pharmacy educators have always been desirous of the best methods for formative and summative evaluation of trainees. The Objective Structured Clinical Examination (OSCE) is an approach for student assessment in which aspects of clinical competence are evaluated in a comprehensive, consistent, and structured manner. Though recently become popular in pharmacy schools globally, its use in North Cyprus and Turkey pharmacy schools appears limited.
Objectives: To assess pharmacy students' evaluation and overall perception of OSCE.
Methods: A cross-sectional survey was conducted on pharmacy students, who participated in the final OSCE examination in 2015-2016.The study sample consisted of fifth-year Pharmacy students who took the OSCE assessment during their studies. A24-item self-administered structured questionnaire was employed to obtain relevant data on OSCE evaluation in terms of content reliability and structure of the examination. Students' responses were based on a 4-point Likert

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scales ranging from disagree to no comment. The data were analyzed using SPSS, version 22.
Results: Of 81 eligible students, 74 completed self- administered questionnaire representing 91.35% response rate. A total of 68(90.7%) students agreed that wide knowledge area and clinical skills were covered in the exam. Over 80% of the students saw that OSCE besides it provided them with an opportunity to learn real life scenario, it was well administered and run in the faculty and better organized compared to a previous pilot OSCE (68%). Around 77% of the students saw that 7 minutes time allocated per station was adequate, while a close percentage also agreed that standardized patients were competent in their role playing. Majority of students though they identify that OSCEs highlighted areas of weakness in their skills and knowledge but still disagree with incorporating OSCEs marks into final marks and thus prefer it as an formative assessment.
Conclusions: Students highly perceived the exam feeling that it is more resembles actual practice providing them with self-confidence, and more clearly their defects and what they need to improve regarding both skills and knowledge. They saw OSCEs as being a beneficial formative assessment that should not be included as marks into finals.

Keywords: Assessment; clinical competence; North Cyprus; OSCE; pharmaceutical care; pharmacy students; students' perception.

1. INTRODUCTION

Training and education of pharmacy students in Turkey and North Cyprus in preparation for their careers as pharmacists is undergoing change [1, 2,3]. Pharmacy undergraduate programs should prepare graduate pharmacist with adequate knowledge, skills and attitudes to obtain their role in rational medication use and pharmaceutical care in a variety of settings, including community and hospital pharmacy environment. Core competences to achieve that goal should be well assessed and evaluated within curricula to provide accountability for the goals of pharmacy education [4].

The Objective Structured Clinical Examination (OSCE) is an approach to student assessment in which aspects of clinical competence are evaluated in a comprehensive, consistent, and structured manner with close attention to the objectivity of the process [5]. This technique not only makes the process of objective but also it addresses the assessment of all 3 domains (cognitive, affective, and psychomotor) at one point [6]. Since its inception in the1970s, OSCE has been increasingly used to provide formative and summative assessment in various medical and nonclinical disciplines worldwide [7-9].

It was first developed by Ronald M. Harden, and since the first publication of his work in the British Medical Journal in 1975, OSCEs became universally adopted for many medical schools and professional bodies as a standard approach to assessment of clinical competence in a planned, objective and structured way [10]. It is an approach to the assessment of clinical competence in which the components of competence are assessed in a planned or structured way with attention being paid to the objectivity of the examination [10].

It was proven as an effective tool for students and practitioner assessment, therefore it has been adopted in disciplines other than medicine, like dentistry, nursing, midwifery, pharmacy and even engineering and law. Although OSCEs are performed in many settings in regard to the exam purposes, the organizing institution, and available facilities, they all share similar procedures [11].

Yet carrying OSCEs has many barriers including cost and increase of workload on faculty members, as also many OSCEs loose reliability and validity due to critiques of measures taken before and during exam setting [12]. students perceptions and evaluation of learning activities guide in assessing achievement of learning goals and outcomes, and forms a form of feedback that contribute in enhancement of future OSCEs as in our case, leading to development of a more robust, feasible, reliable, and valid examination [13].

Despite general acceptance of this method, there is debate over the value of OSCE testing compared with more traditional methods. To use OSCEs in a valid and reliable way, attention must be paid to test content, test design, and implementation factors, especially when the results will be used for high-stakes decision making. Students' feedback is regarded as a key indicator for successful implementation of the process and also provides an impulse for improvement. The Department of clinical Pharmacy, University of Near East, Northern Cyprus, implemented the OSCE examination at

the final examination, for final-year Pharmacy students in June 2016. This study was conceived with the objective of evaluating students' perception about the acceptability of OSCE process and to provide feedback to be used to improve the assessment technique.

In this report, the authors describe student experience and perception of OSCEs as an assessment tool for an experiential clinical pharmacy practice course adopted by a pharmacy school in Northern Cyprus after acquiring of an international certification provided by Accreditation Council for Pharmacy Education (ACPE).

2. METHODS AND SETTINGS

2.1 Design and Setting

This cross-sectional survey was conducted on fifth year Pharmacy students who participated in OSCE at the final (exit) examination of Near East University in North Cyprus.

Clinical pharmacy department in Near East University was established in 2015 as one of the departments in faculty of pharmacy accredited to train pharmacy students and conduct final examination at the end of year 5. The "traditional" format of clinical examination that included long cases, short cases, and examination was being used until recently when due to desire to improve the validity and fairness of the examination, OSCE was introduced as an objective method of assessment for the final examination in clinical pharmacy practice courses.

Sampling: The questionnaire was administered to all of 5th year undergraduate pharmacy students (n =81)immediately after their OSCE exam following a clinical pharmacy practice course delivered in the same semester of fall 2015-2016.Minimum sample size required for quantitative studies was calculated [14], based on 95 % confidence level, 5 % margin of error and 50% response distribution. At least 68 (83.9%) responses were required to yield a representative sample.

2.2 OSCE Organization

The OSCE comprised 13 blueprint guided stations with 13 active stations and has no "rest" stations each lasting 5 minutes. The stations were grouped in two shifts i.e. shift A, and shift B (see Table 1). The active stations were equipped with standardized patients (healthy volunteers trained to act / behave according to a given clinical scenario) and the examiners who evaluate the candidates. The aspects of competence was assessed in a structured manner involving drug information retrieval & interpretation, systems based client assessment, management of Drug Therapy problems (DTPs) in patients' prescriptions, and pharmacotherapy knowledge. Also response to symptoms & history taking was assessed along patient education; general health advice providing and finally communication skills with patients with different attitudes was also tested (Table 1 shows case details of each station). Scoring was done by a single examiner and trained simulators at manned stations based on a prepared checklist.

Table 1. Simulated cases detail for each station in shift A and B

Station	Description of task
Shift A	
1A	Clinical prescription management in pregnancy
2A	Systematic approach to patient medication history and symptoms of drug toxicity in pregnancy
3A	Inspecting an adverse reaction to antihypertensive medication
4A	CVD risk assessment and providing medical information
5A	Systematic approach to patient medication history and symptoms for a paediatric patient with URTI
6A	Compliance to an MDI drug regimen for a paediatric asthmatic patient
Shift B	
1B	Pain assessment and management in geriatric patients
2B	Clinical prescription management in a patient on levothyroxine with multiple chronic diseases.
3B	Inspecting DTP in a pregnant woman on antihypertensive medications
4B	Educating a hypertensive patient on misconceptions about his medication.
5B	Counselling an asthmatic patient on PDI inhalation techniques
6B	Managing the drug related problems of a sinusitis patient on decongestants who developed Rhinitis Medicamentosa.

Inside exam candidates pass through the following steps respectively:

1. Registration
2. Orientation
3. Escorting to exam position
4. Station Instruction Time
5. The Encounter
6. Post Encounter Question Period
7. Repeat Steps 4 to 6 to complete all stations
8. Exam ended / Escorting to dismissal area (area in which survey was delivered).

2.3 The Survey Tool

A 24-item self-administered structured questionnaire was employed to obtain relevant data on demographics of respondents and questions evaluating the OSCE stations. The questionnaire was developed based on a comprehensive literature review and modified from previously validated instrument used to evaluate a group of students [15]. After face validation, Cronbach alpha was calculated yielding 0.741 reflecting a satisfactory internal consistency for the format used.

The questionnaire comprised of questions to evaluate the content and structure of the examination, student's perceptions of OSCE reliability, and rating of individual OSCE stations and also rating OSCEs compared to other assessment methods used during the experiential course. A 4-point Likert-type scale that indicated degrees of agreement consisting of disagree, normal, agrees and no comment was used for 14 items. Rating and compares of specific stations was carried with 7 items with a "none of the stations "option. In addition, an item evaluated the general rating of students of the conducted OSCE followed by an open-ended follow- up request for comments to generate qualitative data.

2.4 Data Analysis

Descriptive statistics, such as frequency and percentage were used to describe characteristics such as level of satisfaction, and students' responses were expressed as proportions. In the last question assessing overall satisfaction, strongly disagree and disagree were combined and considered as "disagreement." Strongly agree and agree were combined and considered as "agreement." Shapiro-Wilk test of normality was applied identifying data not to support parametric assumptions. Thus Kruskal–Wallis test and Mann–Whitney U test were performed where applicable. For evaluating the associations between categorical variables, Pearson Chi-Square test was performed. Spearman Correlation test was applied to assess associations between responses for different items. Level of significance was accepted as $\alpha = 0.05$. All calculations and analysis were carried out with SPSS (Statistical Package of Social Sciences Demo Version 22.0) program.

3. RESULTS

3.1 Response Rate and Students Characteristics

Of 81 students that participated in the final OSCE examination, 74 of them completed self-administered questionnaire representing 92.5% response rate.

The results obtained represent two different shifts, shift-A with 37(49.3%) students and shift-B consisting of 38(50.7%) students. The median (IQ) student's age was 24 (1) years (24-39 years). Of respondents, 36 (48%) were females while 39 (52%) were males (Table 2).

Table 2. Student's characteristics

	N (50)	%
Gender		
Male	39	52
Female	36	48
Age groups		
24	46	61.3
25	18	24
>25	11	14
Shifts		
Shift A	37	49.3
Shift B	38	50.7

3.2 Student's Evaluation and Satisfaction

In total, 58 (77.3%) students felt that time allocated to each station was adequate. A total of 68(90.7%) students agreed that the OSCE accurately measured their knowledge and skill. And 62 (82.7%) reported that OSCE provided opportunity to learn real life scenarios' their communication skill. Of the respondents, 53 (70.7%) felt that OSCEs standardized patients were competent in their role playing. OSCE was perceived to be less stressful test format than other exams by only 26 (34.7%) respondents,

and 51 (68%) also suggested that this year OSCE was better than last year pilot OSCE assessment formats. Majority of students(60%) though they identify that OSCEs highlighted areas of weakness in their skills and knowledge but still disagree with incorporating OSCEs marks into final marks and thus prefer it as an formative assessment. Overall 77.4% of students rated the OSCE exam settings as good or excellent (Table 3). Using Wilcoxon-Mann-Whitney test, was no significant difference between male and female responses as well as in different shifts; A and B ($p>0.05$). No significant difference was also noted in general satisfactions between different demographic groups including age and gender (Chi-Square, $P>0.05$). Kruskal Wallis test shows no significant differences among age groups; except that younger students aged 24 years were less satisfied with information provided before exam ($p= 0.039$) compared to those aged 25 or more. Also the same age group less agreed with the idea that all tested skills were covered in the practice course as compared to those respondents aged 25 or more ($p=0.046$). Spearmen correlation analysis tests showed that "diversity in clinical skills and knowledge assessed" ($r= 0.353$; $p=0.002$), and the "well structure and sequencing" of the exam stations to be positively correlate with overall students satisfaction of the OSCE exam ($r= 0.412$; $p<0.001$). A multiple regression analysis identifies these latent 2 items as predictors of OSCE student satisfaction (beta = 0.294; S.E= 0.142; $p= 0.042$) (beta = 0. 458; S.E= 0. 117; $p< 0.000$).

Table 3. General evaluation of OSCE

	Questions	Level satisfaction			
		Disagree	Neutral	Agree	No comment
Q1	Wide knowledge area and clinical skills were covered in OSCE	4(5.3%)	3(4.0%)	68(90.7)	0(0.0%)
Q2	Exams was well structured &sequenced	4(53%)	24(32.0%)	44(58.7%)	3(4.0%)
Q3	Exam was well administered and run	3(4.0%)	12(16.0%)	59(78.7%)	1(1.3%)
Q4	Time at each station was adequate	10(13.3%)	6(8.0%)	58(77.3%)	1(1.3%)
Q5	Enough information was provided before the exam	9(12.0%)	18(24.0%)	42(56.0%)	6(8.0%)
Q6	All assessed skills were covered in the practice course	25(20.0%)	17(22.7%)	42(56.0%)	1(1.3%)
Q7	OSCE provided opportunity to learn real life scenarios	1(1.3%)	11(14.7%)	62(82.7%)	1(1.3%)
Q8	OSCE was less stressful than other exams	20(26.7%)	22(29.3%)	26(34.7%)	7(9.3%)
Q9	Good direction and feedback were provided.	3(4.0%)	22(29.3%)	44(58.7%)	6(8.0%)
Q10	OSCE highlighted areas of weaknesses in skills and knowledge	4(5.3%)	23(30.7%)	45(60.0%)	3(4.0%)
Q11	This year OSCE was better organized than last year pilot OSCE	7(9.3%)	13(17.3%)	51(68.0%)	4(5.3%)
Q12	The OSCE cases were clear challenging but not too much difficult	19(25.3%)	25(33.3%)	28(37.3%)	3(4.0%)
Q13	Standardized patients seemed competent in their role playing	8(10.7%)	8(10.7%)	53(70.7%)	6(8.0%)
Q14	OSCE would been more beneficial if it was part of final mark	41(54.7%)	15(20.0%)	14(18.7%)	5(6.7%)

3.3 Evaluation of Stations Difficulty and Educational Value

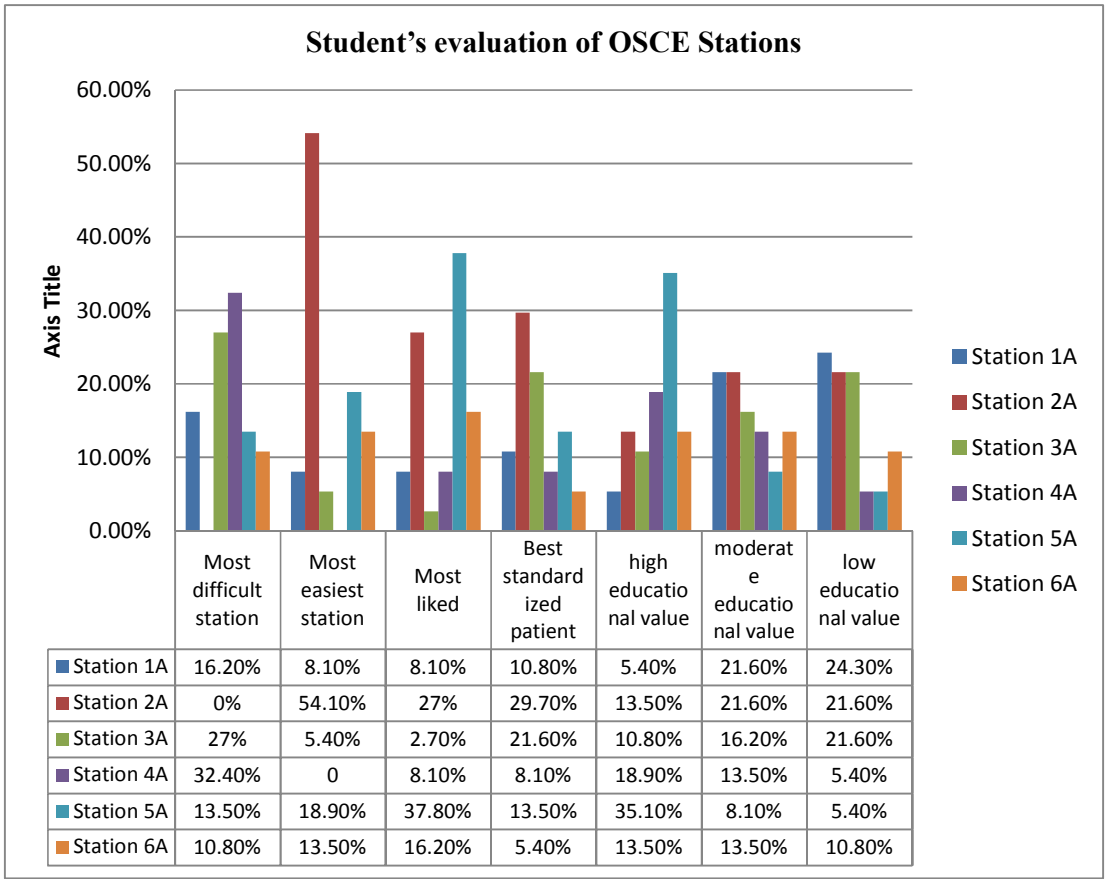
The evaluation of the OSCE stations was different related to shifts as each shift received a different set of cases. Of the respondent; 12(32.4%) students in shift-A and 10 (26.3%) students in shift-B described that station 4A and station 6B were the most difficult stations respectively. A total of 35.1% of respondents in shift-A thought that station-5A which they liked the most had the highest educational value, while 23.7% of students in shift-B assigned station-3B and station-5B equally to be of high educational value (Fig. 1 and Fig. 2).

In contrast a total of 24.3% of respondents in shift-A, and 23.7% of students in shift-B thought that station-1A and station-4B had low educational value respectively. No significant differences were observed (Chi-Square, P>0.05) within gender and age groups in terms of difficulty of cases or educational value of stations.

4. DISCUSSION

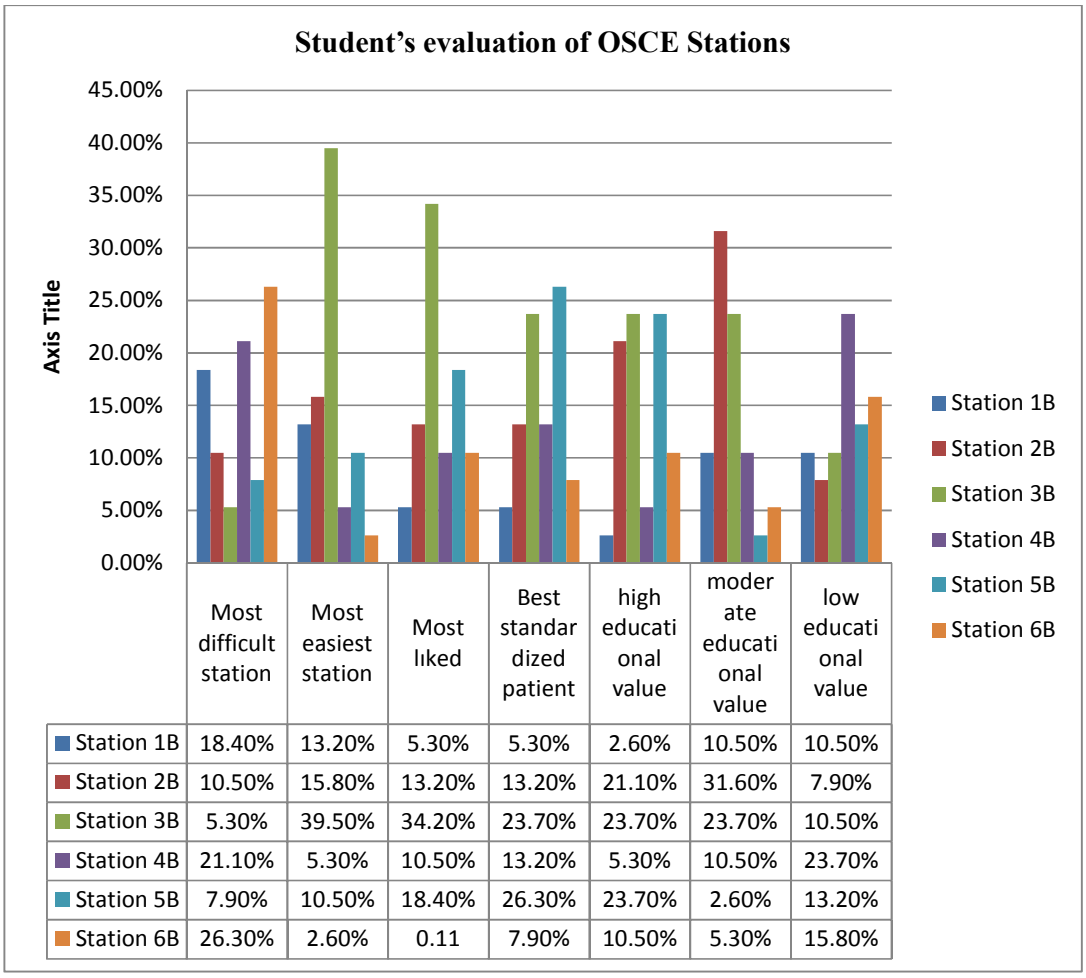
The majority of students saw the OSCE as an unprecedented opportunity to encounter real-life scenarios. The finding that an overwhelming proportion of the students (82.7%) admitted that the OSCE provided a useful and practical learning experience was consistent with similar studies reported elsewhere [16].

OSCE was seen as a useful practical experience by most students; also most of them provided a positive feedback about the quality of OSCE performance in terms of the clarity of the provided information before the exam; the sequence of OSCE stations; the reflection of the tasks taught and the time at each station. These findings are consistent with studies elsewhere [13-15,17-19].



	Most difficult station	Most easiest station	Most liked	Best standardized patient	high educational value	moderate educational value	low educational value
Station 1A	16.20%	8.10%	8.10%	10.80%	5.40%	21.60%	24.30%
Station 2A	0%	54.10%	27%	29.70%	13.50%	21.60%	21.60%
Station 3A	27%	5.40%	2.70%	21.60%	10.80%	16.20%	21.60%
Station 4A	32.40%	0	8.10%	8.10%	18.90%	13.50%	5.40%
Station 5A	13.50%	18.90%	37.80%	13.50%	35.10%	8.10%	5.40%
Station 6A	10.80%	13.50%	16.20%	5.40%	13.50%	13.50%	10.80%

Fig. 1. Shift A student's evaluation of OSCE stations (*n*=37)



	Most difficult station	Most easiest station	Most lıked	Best standardized patient	high educational value	moderate educational value	low educational value
Station 1B	18.40%	13.20%	5.30%	5.30%	2.60%	10.50%	10.50%
Station 2B	10.50%	15.80%	13.20%	13.20%	21.10%	31.60%	7.90%
Station 3B	5.30%	39.50%	34.20%	23.70%	23.70%	23.70%	10.50%
Station 4B	21.10%	5.30%	10.50%	13.20%	5.30%	10.50%	23.70%
Station 5B	7.90%	10.50%	18.40%	26.30%	23.70%	2.60%	13.20%
Station 6B	26.30%	2.60%	0.11	7.90%	10.50%	5.30%	15.80%

Fig. 2. Shift B student's evaluation of OSCE stations (*n*=38)

Although OSCE nowadays has an established place in evaluation and assessment of both undergraduate and postgraduate pharmacy students in many pharmacy schools all over the world, it remains a newly used assessment tool in the context of North Cyprus and Turkey pharmacy schools. OSCE has been used by department of clinical pharmacy consistently since 2015 in the evaluation of fifth year's students upon completion of their training in clinical pharmacy practice courses [19].

The OSCE was one of the useful assessment methods recently added into the students' curriculum as a formative assessment of experiential practices and an objective tool for evaluating clinical skills in pharmacy education. Hence, this survey is important so to assess how the students perceived this evaluation and if the setting and the stations were carried properly and fairly [13].

The concept of standardized patients (SPs) was introduced by Howard Barrows and Abrahamson in 1964s to facilitate the learning of clinical skills under the name of programmed patients and subsequently used for assessment since 1968. Many other descriptive terms were used latter but the most common are simulated patients and standardized patients. The standardization referred to in the term "standardized patient" relates to the consistent content of verbal and behavioral responses by the SP to stimulus provided by a student or examinee [20-24]. SPs have been used in the context of formal examination such as OSCE by Harden and Gleeson in 1979 [4]. The use of standardized patients in our department started with the introduction of OSCE and it is essential to have feedback from the students about such patients to evaluate the role of SPs in the examination and in this study the 70.7% of respondents agreed that standardized patients seemed

competent in their role playing. The finding is in consistent with Austin et al, who reported that students expressed in a survey considerable concern that there was so much variability between cases and patient-actors that it might adversely affect their academic standing and believed that it was problematic within an evaluation perspective [25]. A comparison of traditional testing methods and simulated examination for therapeutics was carried by Gardener et al. who reported a moderate positive correlation between performance on the simulated cases evaluation and the traditional examinations [21].

Monaghan and his colleagues reported that all examinees believed that OSCE compared to other traditional methods of evaluation was a much better indicator of how they would perform in the real world, as well was reported from pharmacy students elsewhere [26-31] and also agreed by vast majority in our assessment (82%).

Further, many students felt that the OSCE was an extremely anxiety-producing examination. Only 34.7% saw that OSCE was less stressful than other exams. Similar results are reported from studies mostly reporting student's first experience of OSCE, or a newly introduced OSCE [26-32]. Hence, it was a new experience for students which made them feel anxious about it. Similarly, students stress and anxiety was more tied to a new experience with OSCEs [33, 34], yet carrying OSCEs as only formative assessment not a final exam may relax students added to the entity of standardized patient which may also contribute to students anxiety [35].

The evaluation of OSCE by pharmacy students highlighted some areas that need to be enhanced in future, such as the inadequate information and guidance before OSCE as many students did not realize the formativeness of the exam.

Most of students indicated that suitable time was allocated to perform tasks in contrast to other observations elsewhere. This maybe contributed to the team setting and reviewing of cases and real pilots before exam which enhance the quality and reliability of the assessment setting. Yet a significant percent of surveyed students did not agree on the exam cases toughness, 35% vs. 25% agreed that the cases were challenging but not difficult.

The evaluation of the OSCE stations differed between the morning and evening shift. The most difficult stations for shift-A students was station 4A "cardiovascular risk assessment and providing education" while for shift-B students a case of decongestants use and management of Rhinitis Medicamentosa. Shift-A students also identified station 1A assessing management of clinical prescriptions in pregnancy as the station with least educational value. In contrast Shift-B students assigned station-4B "Educating a hypertensive patient on misconceptions about his medication" as the station with least educational value.

From this discussion we recommend students' orientation prior to OSCE should be well planned and assured. Written descriptions of expectations and objectives of formative assessments beside exam blueprint maybe more beneficial [13,33].

In conclusion, although the findings in this survey are reassuring regarding students' perception about applicability, preference and acceptance of OSCE, there are several points to be considered to further improvement of the OSCE's use.

Firstly, the majority of students in this survey preferred to keep the traditional examination in addition to the OSCE, which is the current policy of the department. Secondly, it is important to improve training of SPs to gain students acceptance or alternatively to find solution for using real patients. Thirdly, more attention and care should be directed toward organization of station.

At last we will wait and see our students' perception of the OSCE change with increasing use and with introducing more specific testing which need a frequent appraisal and refinement by the department in addition to feedback from the students.

5. CONCLUSION

Students highly perceived the exam feeling that it more resembles actual practice providing them with self-confidence and more clearly their defects and what they need to improve regarding both skills and knowledge. They saw OSCEs as being a beneficial formative assessment that should not be included as marks into finals. Diversity of assessed clinical skills and knowledge and the structure and sequencing of the exam stations were identified as predictors of student's satisfaction. It is extremely important to invest in the Turkish students' positive perception toward advancing pharmacy education in Turkey and Northern Cyprus, in order keep up to date with global practice demands and to shift to a

more patient-centered profession and patient-centered educational system. Such educational interventions could be further implemented in other faculties of pharmacy within the Turkish Higher Ministry of Education.

CONSENT

It is not applicable.

ETHICAL APPROVAL

Ethical clearance was obtained from ethical committee of Health institute, Near East University. Examinees were asked to complete the questionnaire on a voluntary basis immediately after the OSCE. No disclosure of identity was required on the questionnaire, and participants were assured of confidentiality. Inclusion into the survey was entirely on a voluntary basis, and examinees that chose to opt out of the survey were reassured that there would not be any repercussion for declining to respond.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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