Editorial

Use of Objective Structured Clinical Examinations (OSCE) as a Valid and Reliable Assessment Tool in Medical Education

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Introduction

Medical curricula are designed with specific content to meet demand for quality medical care by the society through producing competent medical doctors to their communities and clients worldwide[1]. Assessment is a vital element in teaching and learning to examine the students' learning. It denotes the procedures involved in judging the students' achievements after the completion of a course[2]. Assessment validates the objectives of teaching. It aims to optimize the capabilities of all learners and practitioners by providing motivation and direction for future learning, to protect the public by identifying incompetent physicians, and to provide a reliable tool for selecting candidates for advanced training[2,3].

In general, assessments are mainly of two categories: formative and summative assessment. Formative assessment is process focused while summative assessment is outcome focused. The prime purpose of formative assessment is to provide feedback to student throughout the ongoing course of the academic year that helps students to advance their learning and monitor their improvement. It also guides the teachers to adopt suitable learning activities in areas of weakness recognised through providing feedback[4]. On the other hand, summative assessment aims to determine the achievement of the student by certifying the student has achieved the requirement for advancement to the next level[5].

A combination of assessment tools is used to assess the knowledge, attitude and skills of medical students. Knowledge can be assessed through written test using multiple-choice questions (MCQ), essay questions such as: modified essay questions (MEQ), short essay questions (SEQ), short answers questions (SAQ) and oral tests, testing clinical competence or skills are through Objective Structured Clinical Examinations (OSCE)/ Objective Structured Practical Examinations (OSPE), simulations, workplace based assessments including the oldest method

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of clinical assessment, still in practice such as short case and long case examinations, viva voce examination[6]. Attitude of students can be tested by observation through check-list, and OSCE. Assessment using the conventional methods has limits due to low reliability and validity. Use of OSCE in such clinical examinations is now more widely acknowledged because of its high reliability and validity[7]. The objective of this paper is to deliver a practical guide on OSCE as a valid and reliable assessment tool.

OSCE was foremost described by Harden in 1975, introduced in 1972 at Dundee Medical School, Scotland and since then it has been used in medical education worldwide[8]. It was introduced to avoid the drawbacks of conventional examination methods using long case, short cases, viva voce etc. The conventional methods possess interference from examiners experience and bias, patient's presentations, conventional marking system and moreover examinee's performances based on various factors such as physical and mental state, personality, environment, knowledge, skills, attitude etc.[8,9]. The OSCE aims to measure the competence at the performance level of "show how" based on Miller's competency pyramid[8,10]. Since its inception, it has been used widely in both undergraduate and postgraduate examination globally as well in the licensure examinations held in UK, Canada, USA and also as a feedback tool in formative settings[7,8]. The definition of OSCE as described in the AMEE guide is ''An assessment tool based on the principles of objectivity and standardisation, in which the candidates move through a series of time-limited stations in a circuit for the purposes of assessment of professional performance in a simulated environment. At each station candidates are assessed and marked against standardised scoring rubrics by trained assessors"[8].

The design of OSCE is based on the principle of 'objectivity' and 'structure'. Objectivity includes the use of standardised scoring/marking rubrics by the same examiner who evaluates all examinees performing the same task at the same station and through asking the same pre-set standard questions. A well-structured OSCE station assesses knowledge and understanding, various clinical skills such as interviewing, clinical reasoning, data interpretation, problem solving, management strategies and attitudes which is designed using the blueprint of the curriculum[8,11]. As validity is the measure of what is supposed to be measured, thus 'test blueprint' ensures the content validity of OSCE[8]. Reliability addresses reproducibility and accuracy of a test, that is the degree to which a test consistently measures what it is intended to measure[12]. Reliability of OSCE can be maintained by including a good number of stations, assessors, sufficient time and good standardization of patients[13]. Use of standard marking scheme can improve the assessor consistency and bias from single assessor by including multiple assessor[12]. For scoring, some institutions use standard checklists with marking scheme in established OSCE, however, global rating scales are found to be superior that show higher inter-station reliability, better construct validity, and better concurrent validity than the checklists[13].

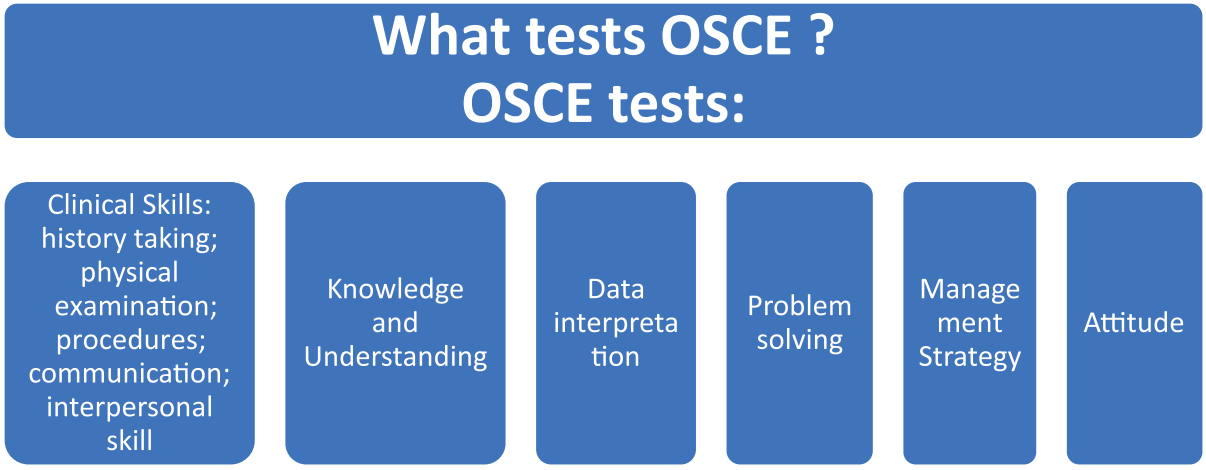

Figure 1: Use of OSCE in testing what?

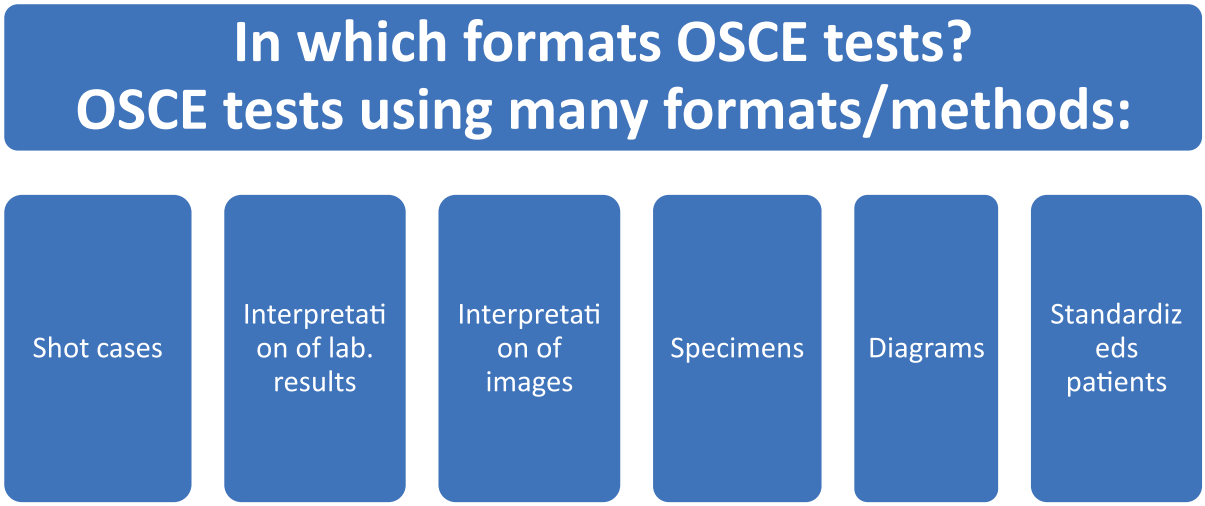

Figure 2: Use of OSCE in testing which format?

To develop an OSCE, the departmental and institutional support is very much essential. Assessor training is very much essential for them to be able to carry out their role. The blueprint is a prerequisite containing the essential clinical competencies to be assessed and adequate inclusion of these competencies are required for content validity of OSCE[14]. The various forms of OSCE tests can be performed by using short cases, interpretation of laboratory results, interpretation of images, specimens, diagrams and standardized or simulated patients[11]. The use of simulated patients instead of actual patients prevents any discomfort or harm to the actual patient and standardizes or keeps similar clinical findings for the examinees[12].

Number of stations in OSCE are designed based on the blueprint and also balancing logistic constraints. The higher number of stations reflects better reliability[14]. Usually it comprises multiple stations, 15-20 in number where each candidate is expected to perform a defined task within a time frame and at the same time the examiner assesses the examinee. A standardized marking scheme specific for each station is used for scoring[5,15]. The OSCE allows to measure the clinical competencies of the examinees at each station in communication skill, professionalism skills, history taking skills, physical examination skills, clinical-reasoning skills and practical /technical skills[8,12,16,17]. Each station has a predefined structured marking scheme or checklist. An assessor at each station observes the candidate and scores their performance according to the checklist. After a set time period, a bell will signal for candidates to move on to the next station. Thus, students rotate around the stations, spending usually 5 minutes in each[12]. If the same OSCE continues between different cohort of students, then quarantine of the cohort who has finished the examination is done until the next batch have finished the OSCE[12].

The OSCE allows to examine a wide range of clinical skills and knowledge in a standardized way among a greater number of students in one session. Here, having the checklist and rating scale prepared in advance increases interrater agreement and makes the method more reliable. Moreover, usage of standardized patients (SPs) offers a flexible assessment method where any harm to the actual patient can be avoided[7,14,18]. This method also allows the testing of attitudes[19]. It is a feasible approach of assessment of clinical competence, to be used for both formative and summative examinations in undergraduate and postgraduate students in different disciplines and different cultural contexts[20]. It is widely accepted among the undergraduate students compared to the conventional methods of examination[5,12,,21]. The method is reliable and valid using the checklist and rating scale with sufficient blue printing by including enough stations, assessors, sufficient time and good SPs[13].

Although having a number of advantages, the shortcomings of OSCE may make the method difficult. A higher expense is a prerequisite for the logistics and infrastructure, the training of

teachers and SPs besides the time, physical space and efforts required to plan, organize and conduct the examination for a large group of students[7,14, 22]. Use of SP may not reflect the real clinical situation and they may not respond adequately to the examinees as they repeat the same task and become exhausted. Furthermore, test being involved in short stations and trainees perform just a fragment of a patient-physician clinical encounter based on the competency tested, holistic approach of a patient care cannot be applied[14,23, 24].

Medical education is constantly changing to adapt to the changing pattern of new technologies and advances in the educational development. Therefore, medical teachers also need appropriate training in order to improve their skills in teaching and assessment related matters[25,26]. Teaching and assessment are the two sides of a same coin[27]; however, students' assessment is a matter of continuing concern in medical education[28]. Hence educators have to pay appropriate attention to diagnose their students' learning problems or capabilities[29] in order to take appropriate remedial measures[30]. Teachers need to be fully aware about the learners' need, learning styles and approaches[31,32]. OSCE is a valid and reliable tool to ensure that students are assessed in relation to their engagement with patients, covering communication, empathy and sensitivity. There are two types of OSCE stations: (i) Procedure or performance stations: -where students have to perform some tasks e.g. taking history, examine neck, chest, abdomen, legs etc. observed and scored by examiner with check list (ii) Question or interpretation stations: -where students have to answer some questions on answer sheet which may or may not relate to findings at previous stations. All students in OSCE, are given the same task and judged by same judges using the same preset standards. Use of OSCE is a comprehensive as clinical skills and knowledge can be tested over a wide range of objectives in short time. Since no examination can cover all the specific objectives of a course, we need to depend on a sample of items drawn from the curriculum. The larger the sample size, the greater its validity as it represents the course content more accurately. OSCE uses a variety of test methods in one session and allows testing of clinical skills such as history taking, physical examination, procedures, communications skills, and attitudes in addition to cognitive skills. OSCE is an objective and reliable method of examination -as check list and rating scale are prepared in advance so that patient and examiner's variability are avoided.

This paper emphasises on the use of more OSCE stations especially of procedures or performance stations instead of questions through examination blueprinting, in order to assess the performance or capabilities of students so that the assessment becomes more valid and reliable.

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Authors' Contribution

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