Is there a difference between self-perceived performance and observed performance in an Objective Structured Clinical Examination (OSCE)? An exploratory study among medical students in the United Arab Emirates

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6.1 Abstract

Competency-based education and training has become a key component of healthcare systems across the globe. Ensuring that healthcare professionals are able to assess their own competencies is critical for continued professional development and the delivery of high-quality care.

The aim of this study was to assess how medical students perceive their performance on an objective structured clinical examination. Using a cross-sectional study design, a sample of Emirati third and fourth year (preclinical) medical students (N=106; 56.4% response rate) was recruited from the United Arab Emirates University in Al Ain, United Arab Emirates. Medical students completed a short non-invasive clinical task (i.e. measuring and recording blood pressure and performing hand hygiene) followed by a structured survey to self-assess their performance and skills. Trained assessors used a clinical skills observation checklist tool to score each student's performance.

According to the observed performance, 27.36% of medical students performed the objective structured clinical task adequately. In contrast, 69.52% rated their own performance as adequate. Furthermore, only 8.43% of medical students rated their own clinical skills as below average. This study did not find evidence that medical students can accurately assess their own clinical skills and performance.

In order to support the delivery of high-quality healthcare, it is important that medical students develop their ability to accurately assess their own clinical skills and performance early in their medical careers. Teaching and appraising self-reflection is an important component of any undergraduate or postgraduate medical degree program.

6.2 Introduction

Medical education plays an important role in maintaining and improving the quality of a country's healthcare system[1]. Many competencies are defined for medical students that must be acquired before graduation, such as clinical knowledge and expertise, professional integrity, empathy, communicative skills, and conceptual thinking[2,3]. To achieve these desired competencies, future doctors need to be able to accurately self-assess and appraise their multiple skills, also in addition to recognizing their limitations[3].

In this paper, we assumed that a competency involves multiple skills. Healthcare providers and educators are moving towards competency-based education and assessment skills, and the lack of self-assessment skills from healthcare professionals can act as a barrier for self-paced learning[4]. Self-assessment has multiple definitions in the literature and the term has also been used to describe self-reflection or self-evaluation. Andrade and Du (page 160) define each of these concepts independently, and in this paper we used their self-assessment definition as the "process of formative assessment during which students reflect on and evaluate the quality of their work and their learning, judge the degree to which they reflect explicitly stated goals or criteria, identify strengths and weaknesses in their work and revise accordingly"[5]. Studies have found that physicians often assess themselves as being more competent than they actually are[6]. Therefore, introducing self-assessment for medical students may assist them to accurately assess their own skills and competencies in the future. Accurate self-assessment of personal and professional capabilities are now seen as essential for success[7] as healthcare professionals and essential for delivery of high quality care.

The Objective Structured Clinical Examination (OSCE) is a comprehensive evaluation tool that has been used to assess the competencies of medical students in the majority of medical schools worldwide[8]. The OSCE assesses clinical skills, counselling, and communication-based competencies through direct observation[8]. The OSCE has been widely used over the past two decades and can be defined as a "timed examination in which medical students interact with a series of simulated patients in stations"[8]. The OSCE comprises several clinical stations, usually 10-12, where the student performs tasks including history-taking, physical examinations, counselling or patient management, and clinical procedures. The student is required to complete the task within a set time limit and according to well-defined criteria for each specific clinical skill. These clinical tasks are normally assessed by trained assessors from the medical faculty[8,9].

This study took place in the United Arab Emirates (UAE), an independent federation, consisting of seven Emirates with a total population of approximately 9.1 million people, in 2016[10]. It is a relatively young, high-income country, established in 1971[11] with a strong government-led

desire to build a world-class healthcare system to improve the health of its population[12]. The World Health Organization described the Eastern Mediterranean Region, where the UAE is located, as a region facing major challenges regarding the healthcare workforce. Specifically, the UAE faces major challenges related to the shortage of UAE national healthcare workers, a high reliance on expatriate staff, limited health professionals' production capacity, and a high turnover of expatriate healthcare workers[13]. In this context, the present study focuses on one of these challenges: the capacity deficit to educate and train an adequate number of appropriately educated and trained UAE nationals' healthcare professionals.

The main objective of the study was to explore the differences between self-assessment and trained-assessors OSCE score. Our hypothesis was that a medical student who rates their clinical skills and competencies as adequate would also achieve a higher observed OSCE overall score.

6.3 Methods

Study design

A cross-sectional study was used to investigate the relationship between self-perceived performance from medical students and trained-assessor rated OSCE performance. The STrengthening the Reporting of OBservational studies in Epidemiology (STROBE) Statement was used to structure this paper[14].

Setting

The study was conducted at the clinical skills simulation centre of the College of Medicine and Health Sciences of the United Arab Emirates University, the largest public university in the UAE. Data collection occurred over two consecutive days in April 2016. This study was approved by the institution's Social Sciences Research Ethics Committee (ERS_2015_3212).

Participants

Medical students from the Doctor of Medicine (M.D.) six-year program at the College of Medicine and Health Sciences were the study population. Pre-clinical students (third and fourth year) were invited to participate in the survey and to perform a specific non-invasive clinical task (measure blood pressure).

Variables

The study variables were overall OSCE score, student self-assessed performance, and self-reported clinical skills. These two last variables were measured by statements in the survey, ranked by a Likert scale ranging from one to five. The variable self-assessed performance was

defined through the survey sentence "Overall, I think that I performed the OSCE to the best of my abilities" measured by the Likert scale as strongly disagree (1), disagree (2), neither (3), agree (4) and strongly agree (5). The variable self-reported clinical skills was defined through the sentence "I would rate my own clinical skills and competence as" categorized into (1) poor, (2) fair, (3) average, (4) good and (5) very good.

The dependent variable overall OSCE score was created by summing the scores of the clinical skills observation tool that was completed by the observers. The trained observers were faculty and staff from the College of Medicine. They were considered eligible to assess the clinical task of collecting blood pressure by their qualifications, and they were professionally trained on how to evaluate the quality of hand hygiene practice, having successfully completed a two hour long online hand hygiene course from Hand Hygiene Australia and through a bespoke two-hour face-to-face practical course prepared by the authors.

Data sources/measurements

To accomplish our research objective, we used a cross-sectional survey and a clinical observation tool to collect the data. The survey was designed specifically for this study and the designing process took into consideration a review of other papers and surveys[15–18]. The survey formed part of a larger study exploring medical student's perceptions of healthcare regulation[19] and included questions regarding the two above mentioned variables (self-perceived performance and self-reported clinical skills).

The clinical skills observation tool was designed in consideration of other observation tools used to assess OSCE, for example, the OSCEstop[20]. This observation tool included data collection on four major parts: preparation, including introducing self to the patient, hand hygiene including the WHO hand hygiene standards (before and after the clinical task), and blood pressure measurement (clinical task performed at OSCE). These four parts were assessed by observers using a Likert scale ranging from one to three (one – performed adequately, two – attempted, but performed inadequately and three – not attempted).

Eligible medical students received an email invitation to participate in the research study one week before the study took place. Students were informed and asked to perform a clinical task and to complete the survey. Students who were willing to participate booked a slot or '*walked in*' at the clinical skills simulation centre during the two days of the data collection. Upon arrival, the students received a brief description of the study and consent process, and they were requested to read and sign a consent form. A research assistant explained the study as follows: the participant was asked to perform a short non-invasive clinical task – measuring and recording a person's blood pressure – and complete the survey afterwards. Students were randomly assigned to one of the four available clinical skills simulation rooms.

One of the observers played the role of the "standardized patient", and the other one pretended to be completing a Sudoku book, but observed the student performing the OSCE and completed the clinical skills observation tool. Usually the OSCE is a circuit of stations, but as this OSCE was designed specifically for this study, it comprised only one station with one clinical task. At the end of the task, the participant was asked to complete the survey and earned a Certificate of Attendance. All students had received the same training on performing the clinical task and were aware of the key steps involved in completing the task correctly and in accordance with the UAE health regulations.

Bias

To minimize potential bias in our study, the observers were not known to the students, they were always of the same gender as the participants and they were trained and experienced in observing students' OSCE performance. In addition, each participant was randomly assigned to the clinical room where the OSCE was carried out. The layout of the clinical observation rooms was identical. Students were unaware (blinded) to the covert assessor role of the research assistant who pretended to complete the Sudoku book whilst they performed their clinical task. This method of blinding was used to minimize any possible Hawthorne effect (i.e. observer effect that causes reactivity in which an individual modifies their behaviour in response to awareness of being observed).

Study sample size

All undergraduate medical students from the third and fourth year (N=188) were invited to participate in the study. From the 188 students, 106 participated in our study (56.38% response rate).

Quantitative variables/Statistical methods

Descriptive statistical techniques were used to describe the dependent variable (trained assessor rated overall OSCE score) and the two independent ones under analysis: self-perceived performance and self-reported clinical skills. A t-test was used to test the difference between genders and the dependent variable. An ANOVA was used to determine the difference between the categories of the independent variables and the OSCE overall score. All the tests were performed using α=5%.

6.4 Results

Participants

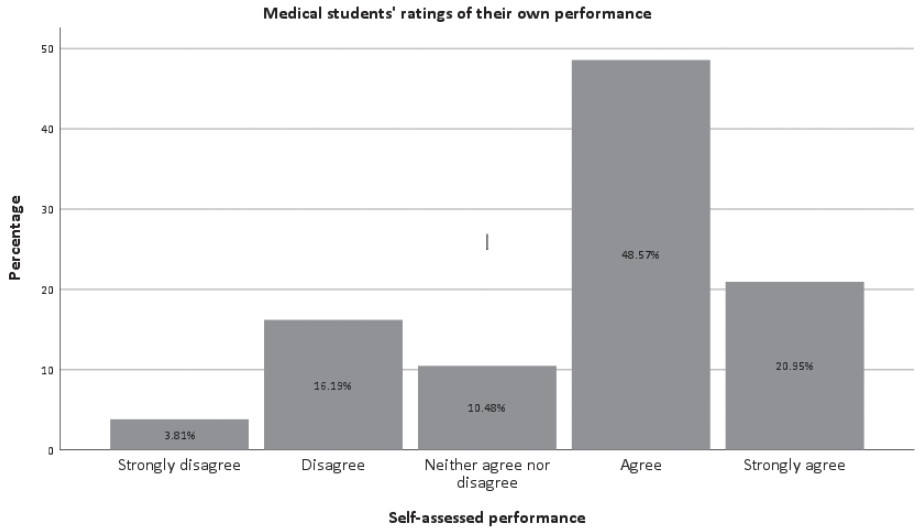
A total of 106 medical students participated in our study representing 31.80% of all undergraduate medical students in the university. All university students from the College of

Medicine and Health Sciences at the United Arab Emirates University are UAE nationals, and 77.40% were female. The proportion of male/female in the study sample is similar to the gender distribution of the medical student population in the college.

Main results

When asked if they performed the OSCE to the best of their abilities, the majority (69.52%) of students answered agree or strongly agree, while nearly a third (30.48%) of students self-assessed their performance as neutral (neither) or negative (disagree or strongly disagree) (Figure 1).

Figure 1 Medical students self-perceived performance after OSCE.



Half of the students (55.66%) self-reported their clinical skills as 'good' and only 8.49% considered their clinical skills below average (Figure 2). None of the students rated their clinical skills and competencies as 'poor'.

The observed score shows that the OSCE overall score was performed 'adequately' by 27.36% of students, while 72.64% were rated as 'attempted, but performed inadequately'. None of the students did not attempted. The mean (±SD) of the trained-assessor observed OSCE overall score was 1.7±0.0, minimum of 1.0 and maximum of 2.6. The mean (±SD) of the trained-assessor observed OSCE score for females was 1.7±0.0 and for males was 1.6±0.0 (Figure 3). This difference was not statistically significant (p=0.794).

Figure 2 Medical students self-reported clinical skills

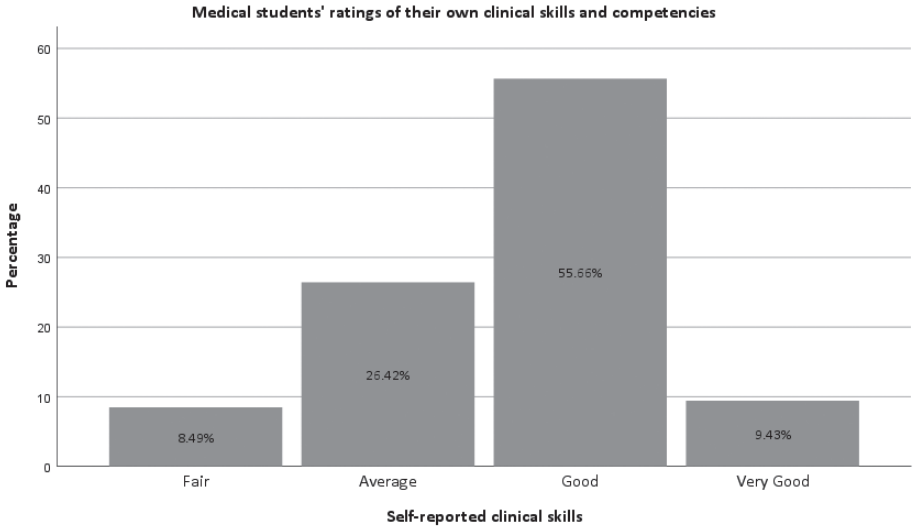
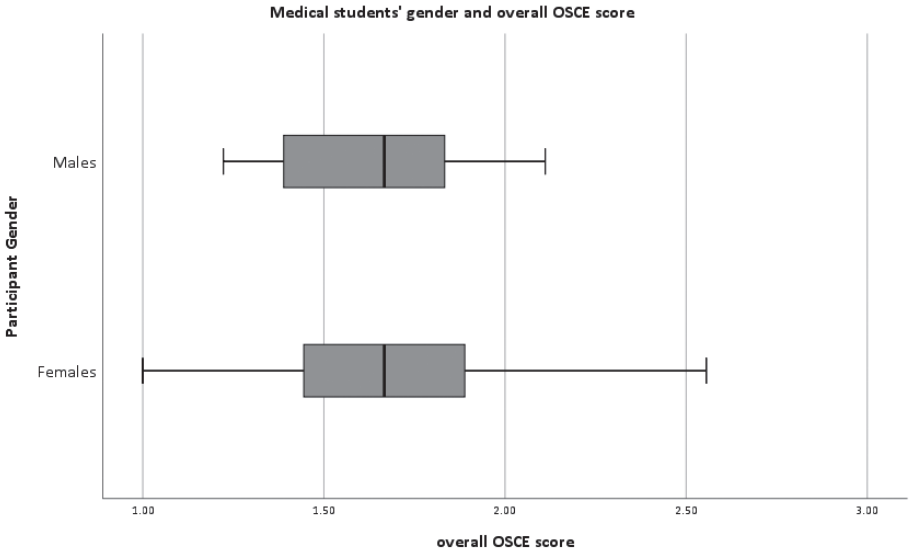
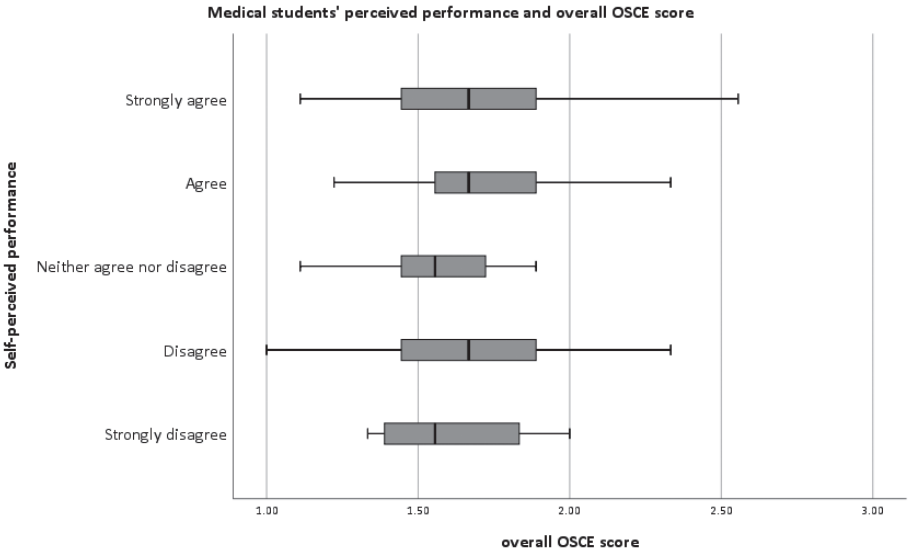


Figure 3 OSCE overall score per gender



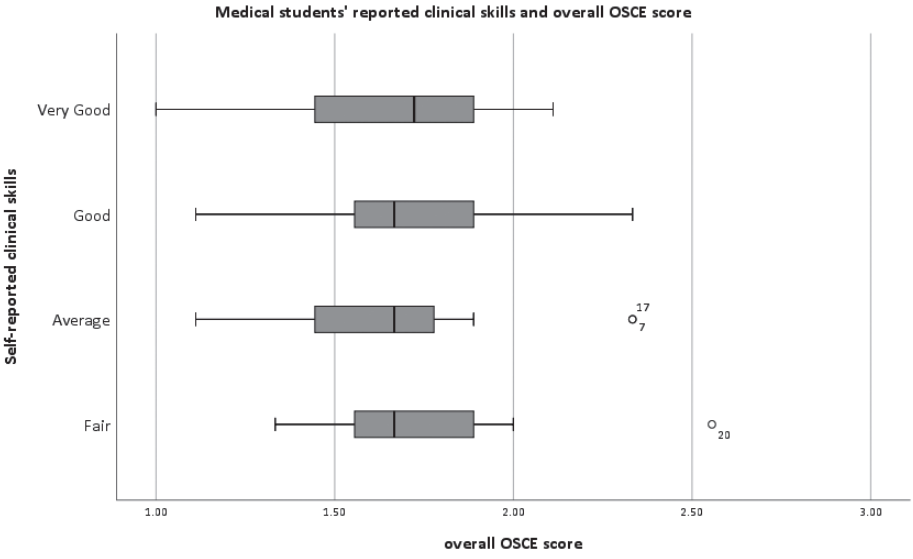
The students that 'strongly disagreed' and the students that 'neither agreed nor disagreed' to performing the OSCE at their best had a mean OSCE overall score of 1.6±0.1 and 1.6±0.0, respectively (Figure 4). The students that 'strongly agreed', 'agreed' and 'disagreed' revealed same mean OSCE overall score with a decimal difference amongst them. ANOVA was calculated to assess the difference between the students' perceived performance categories and there were no statistically significant differences (p=0.763).

Figure 4 OSCE overall score and medical students self-perceived performance.



The students that reported their clinical skills as 'fair' showed the highest mean (±SD) OSCE overall score (1.8±0.1). While the students who reported their clinical skills to be 'good' or 'very good' presented mean (±SD) overall OSCE score of 1.7±0.0 and 1.7±0.1, respectively. There was no statistical significance between how students reported their clinical skills and OSCE overall score (p=0.6). The intragroup variance between gender, self-perceived performance and self-reported clinical skills is not statistically significant (p=0.492).

Figure 5 OSCE overall score and medical students self-reported clinical skills



The intragroup variance between gender, self-perceived performance and self-reported clinical skills is not statistically significant (p=0.492).

6.5 Discussion

Key results

The key result is that this study did not find evidence to support the hypothesis that medical students in the pre-clinical phase can accurately self-assess their own skills, competencies and performance. In other words, the lack of a statistically significance between the mean of overall OSCE score the two self-rated variables may indicate that medical students in the pre-clinical phase have not yet developed the necessary self-reflection skills to accurately appraise their own performance compared to their assessed performance. There was no difference between the gender of the medical students regarding self-assessment and trained-assessor observed overall OSCE score. These findings were similar to Andrade and Du's study that explored the attitudes toward and beliefs about self-assessment in undergraduate teacher education students in the United States and did not find differences in the responses of male and female students[5].

Limitations

The undergraduate preclinical medical students that participated in the present study represented nearly a third (31.80%) of the total medical students at the United Arab Emirates University. One of the limitations of this study is that it represents a convenient sample from one of six medical universities in the UAE, and includes only third and fourth-year preclinical medical students.

Interpretation

Only one-quarter of preclinical medical students performed the OSCE adequately. However, the majority of the students reported a positive self-assessment when asked if they performed the OSCE to their best ability. In Oman, a similar study compared the difference between the student's self-assessment and the trained-assessor OSCE score in 60 medical students and the results show that the students consistently overestimated their performance in four of the 12 items while underestimating their performance in the remaining eight items[21].

Almost 70% of participants self-reported their clinical skills as good or very good and that they had completed the OSCE to the best of their ability. This is in stark contrast with the actual trained-assessed OSCE appraisal which found that only 27% of students performed the OSCE task adequately. Other studies have found similar discrepancies. In a systematic review including 20 studies on the accuracy of physician self-assessment compared with observed

assessments, the results showed that physicians did not accurately self-assess themselves in the majority of the studies[6]. In addition, the systematic review reported only weak or no associations were found between self-rated assessment and external observed assessments[6]. The inaccuracy of self-assessment is also reported in medical students as being frequent and across several specialities or levels in the graduating program[3,4,22].

The timing of assessment has been shown to play a role in student self-reflection. A study examining the self-rated competencies of 168 medical students pre- and post-OSCE showed that students decreased their self-rating after the family medicine objective examination, but not significantly for family medicine specific skills[4]. A study of 244 medical students for the specialization in general practice revealed that the method of self-assessment was experienced and perceived as useful, but only 57% of the sample opted for self-assessment combined with individual feedback on their strengths and weaknesses[3]. Self-assessment is a complex process of internalization and self-regulation[5], and many medical students may not have developed the necessary cognitive skills and reflective practices during their medical undergraduate degrees to provide a realistic self-appraisal. Therefore, providing sufficient time for students to develop their self-reflection skills is an important component of any undergraduate or postgraduate medical degree programme.

Some authors have questioned the reliability of self-assessment[4,6,23]. It has been reported by medical students that if the subjective self-rating is to be used as a formal aspect of the medical education program, then it should be complemented with formative feedback from the supervisors[3]. As such, several researchers advise the development of all-inclusive continuing professional education programs including portfolios, documenting practice-based learning and improvement activities, and creating less general and more detailed learning objectives[3,6]. In this case, it is important to include direct observation in clinical training which has also been a standard in medical education as it is linked to students self-confidence in their final year[23]. For future studies including medical students, we would suggest including a third way of measuring clinical competencies: peer review, this would ensure a triangulated measurement: self, peer and external assessments[24].

6.6 Conclusion

The self-assessment of medical students is not related to trained-assessed OSCE score in this study. To achieve good practices in future healthcare professionals, specifically physicians, it is important to understand the discrepancies between the medical student's self-perception and their actual observed performance. Further research is required to provide a deeper understanding of the factors related to the discrepancy between student self-assessment

and trained-assessed performance. Such detailed information would allow educators to create better learning environments with more effective self-assessment strategies. This paper contributes to the understanding of the current production of Emirati medical students in the UAE, to achieve the UAE Vision 2021 and to the 2030 agenda of the Sustainable Development Goals and Universal Health Coverage.

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