

## SHORT COMMUNICATION

# Perception of Continuous Assessment Anatomy OSPE Among First-Year Medical Students at Universiti Putra Malaysia

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### ABSTRACT

This study examines medical students' perceptions of the Objective Structured Practical Examination (OSPE) as a continuous assessment tool and explores associations with gender, ethnicity, and repeater status. A total of 113 students participated, and their responses were analysed using descriptive statistics and non-parametric tests (Mann-Whitney U for gender and repeater status, Kruskal-Wallis for ethnicity). The results indicate that students generally found OSPE useful, effective in improving understanding, and preferable to written exams. However, confidence levels varied, with some students expressing low confidence in OSPE. No significant associations were found between students' perceptions and demographic factors, suggesting that OSPE is an equitable assessment method. Despite positive perceptions, the findings highlight the need for additional support mechanisms to enhance student confidence. Overall, this study supports the continued use of OSPE in medical education and suggests further refinements to maximize its benefits in student learning and assessment.

*Malaysian Journal of Medicine and Health Sciences* (2026) 22(3): 1-7.doi:10.47836/mjmhs.v22i3.1601

**Keywords:** OSPE, Medical Education, Student Perception, Assessment Methods, Continuous Assessment

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### INTRODUCTION

The Objective Structured Practical Examination (OSPE) is widely recognised as an objective and standardised assessment tool in medical education, particularly for evaluating students' practical and clinical skills (1). Unlike traditional practical examinations, OSPE provides a structured format that minimises examiner bias and ensures comprehensive skill assessment (2). At Universiti Putra Malaysia (UPM), OSPE has traditionally been conducted as a summative end-of-semester examination (3, 4). However, the recent incorporation of OSPE into continuous assessment aims to provide a more frequent and formative evaluation of students' anatomical knowledge and practical competencies (5). Understanding students' perceptions of this change is crucial, as assessment methods play a significant role in shaping learning behaviours, motivation, and overall academic performance.

Despite its benefits, there is limited research on how first-year medical students perceive OSPE as part of continuous assessment, particularly in Malaysia. Previous study have highlighted that frequent, low-stakes assessments can enhance knowledge retention, reduce

examination-related stress, and improve engagement with course material (6). However, the introduction of OSPE in continuous assessment may present both advantages and challenges for students. Fresh first-year students, who are new to OSPE, may have different perceptions compared to repeater students who have previously encountered OSPE in an end-of-semester setting. Exploring these perspectives will provide valuable insights into the effectiveness, feasibility, and potential areas for improvement in this assessment approach.

Furthermore, factors such as gender and ethnicity may influence students' perceptions of OSPE in continuous assessment (7). Research has shown that differences in assessment preferences and performance anxiety can vary across demographic groups, potentially affecting students' experiences and acceptance of assessment changes (8). By analysing these variables, this study seeks to determine whether certain student groups require additional support or modifications in the implementation of OSPE as a continuous assessment tool. Findings from this study will contribute to refining assessment strategies, ensuring they align with students' needs and optimise learning outcomes in anatomy education.

While OSPE has been well established as a summative tool in Malaysian medical schools, its application as a

formative assessment within the academic semester is not yet widely practiced or studied in local institutions. Given the diversity of Malaysian medical students in terms of academic backgrounds, cultural expectations, and language proficiency, it is essential to understand how students perceive this shift in assessment strategy (9). Investigating these perceptions provides critical feedback for curriculum developers and educators to ensure that assessment methods are not only educationally effective but also contextually appropriate and equitable.

This study aims to assess the perception of first-year medical students at UPM regarding the introduction of OSPE in continuous assessment. Specifically, it seeks to evaluate differences in perception between fresh first-year students and repeaters, as well as examine the influence of gender and ethnicity on students' views. The findings will provide educators with evidence-based insights to enhance OSPE implementation and improve anatomy assessment strategies.

## Materials and Methods

This study employs a cross-sectional survey design to evaluate the perceptions of first-year medical students at UPM regarding the implementation of OSPE as part of continuous assessment. Data collection was conducted at the Faculty of Medicine and Health Sciences, UPM, following ethical approval from the institutional ethics committee.

The study population comprises all first-year medical students enrolled in the 2024/2025 academic session at UPM. This includes both fresh first-year students experiencing OSPE for the first time and repeater students who have previously encountered OSPE in an end-of-semester format. A census sampling method was used to ensure that all eligible students had the opportunity to participate.

A census sampling method was employed in this study, whereby all eligible first-year medical students at UPM ( $n = 129$ ) were invited to participate. This approach was selected over random sampling due to the relatively small population size and the full accessibility of the student cohort through institutional communication platforms. Census sampling ensured maximum inclusiveness, minimised sampling bias, and enhanced the internal validity of the findings by capturing the full spectrum of student perceptions within the cohort. This method is particularly appropriate in educational settings where the target population is well-defined and easily reachable.

The required sample size for this study was calculated using Cochran's formula for sample size estimation in a finite population (10). Given that the total number of first-year medical students at UPM is 129 students,

the calculation considered a 95% confidence level ( $Z = 1.96$ ), an assumed proportion of students with a positive perception of OSPE at 50% ( $P = 0.5$ ), and a margin of error of 5% ( $d = 0.05$ ). Since the total population ( $N = 129$ ) is relatively small, the finite population correction formula was applied to adjust the sample size accordingly. This calculation determined that a minimum of 97 students was required for the study. To account for potential non-response bias, an additional 10% buffer was added (11), bringing the final target sample size to approximately 107 students. However, to ensure a comprehensive representation of first-year medical students' perceptions, all 129 eligible students were invited to participate in the study.

A structured questionnaire was developed based on validated instruments from previous studies assessing student perceptions of OSPE (6, 12, 13). The questionnaire aimed to gather comprehensive insights into students' experiences with OSPE as part of continuous assessment. It comprised three main sections: demographic information, perception of OSPE in continuous assessment, and challenges and suggestions.

The demographic section collected data on gender, ethnicity, and academic background, distinguishing between fresh first-year students and repeaters. The perception section evaluated students' views on the fairness, clarity, difficulty, and effectiveness of OSPE as a learning tool. Additionally, the challenges and suggestions section explored students' levels of stress, confidence, and motivation, as well as areas for potential improvement in the OSPE format.

Content validity was assessed by three expert anatomists from the Faculty of Medicine and Health Sciences, UPM, who reviewed the questionnaire for relevance, clarity, and comprehensiveness. Responses were measured using a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree) to standardise the assessment of student opinions (14). Minor wording adjustments were made based on their feedback to ensure alignment with educational terminology and local context.

A pilot study was then conducted with 10 randomly selected first-year students to evaluate the clarity and interpretability of the items. The students provided written and verbal feedback on the ease of understanding, item ambiguity, and response burden. Based on this feedback, minor revisions were made, including rewording one item for clarity and ensuring consistent Likert scale formatting. The internal consistency of the six-item scale was evaluated using Cronbach's alpha, which yielded a reliability coefficient of 0.825 in the full sample, indicating good reliability.

The survey was administered online via Google Forms, with a link distributed through official

student communication channels. Participation was voluntary, and students were assured of anonymity and confidentiality. Informed consent was obtained before students proceeded with the questionnaire. The data collection period lasted two weeks, ensuring all students had ample time to participate.

Responses were analysed using IBM SPSS Statistics version 28. Normality of the data was assessed using both the Kolmogorov-Smirnov and Shapiro-Wilk tests, which returned p-values < 0.001 for all six dependent variables, suggesting a non-normal distribution. These findings were supported by visual inspections, including histograms and Q-Q plots. While Q-Q plots showed approximate normality, the statistical tests warranted caution.

Given the ordinal nature of the Likert-scale data and the confirmed non-normal distribution, non-parametric tests were chosen for inferential analysis. Specifically, the Mann-Whitney U test was used to examine differences based on gender and repeater status, while the Kruskal-Wallis test was used for comparisons across ethnicity groups. These non-parametric tests are appropriate for skewed distributions and are robust in small- to medium-sized samples without assuming normality (15).

Ethical approval was obtained from the JKEUPM before the study commenced. All participants provided informed consent, and their responses remained confidential. No identifiable personal data were collected, ensuring anonymity. Participants had the right to withdraw from the study at any time without penalty.

## Results and Discussion

Table 1 presents the sociodemographic characteristics of the study participants, including gender, ethnicity, and the status of repeaters. The majority of respondents were female (69.91%), while males constituted 30.09% of the sample. In terms of ethnicity, Malay students made up the largest proportion (44.25%), followed by Indian (29.2%), Chinese (20.35%), and other ethnicities (6.19%). Additionally, 8.85% of the participants had repeated at least one academic year, whereas 91.15% were non-repeaters.

The table also provides descriptive statistics for the dependent variables, including students' perceptions of OSPE. Mean scores suggest that students generally agreed that OSPE improved their understanding ( $M = 2.00$ ,  $SD = 0.78$ ), was useful ( $M = 2.00$ ,  $SD = 0.68$ ), and was preferable to written exams ( $M = 2.00$ ,  $SD = 0.80$ ). Confidence in OSPE had a slightly higher mean ( $M = 3.00$ ,  $SD = 1.07$ ), indicating more variation in responses. Similarly, OSPE was perceived as motivating ( $M = 2.00$ ,  $SD = 0.69$ ), and there was moderate agreement on implementing OSPE throughout the semester ( $M = 2.00$ ,  $SD = 0.94$ ).

**Table 1: Sociodemographic characteristics.**

| Independent Variable     |         | Frequency (n) | Percentage (%) |
|--------------------------|---------|---------------|----------------|
| Gender                   | Male    | 34            | 30.09          |
|                          | Female  | 79            | 69.91          |
| Ethnicity                | Malay   | 50            | 44.25          |
|                          | Chinese | 23            | 20.35          |
|                          | Indian  | 33            | 29.2           |
|                          | Others  | 7             | 6.19           |
| Repeaters                | Yes     | 10            | 8.85           |
|                          | No      | 103           | 91.15          |
| Dependent Variable       |         | Mean (SD)     |                |
| Improve understanding    |         | 2.00 (0.78)   |                |
| Usefulness of OSPE       |         | 2.00 (0.68)   |                |
| OSPE vs written exam     |         | 2.00 (0.80)   |                |
| Confidence in OSPE       |         | 3.00 (1.07)   |                |
| OSPE and motivation      |         | 2.00 (0.69)   |                |
| OSPE throughout semester |         | 2.00 (0.94)   |                |

Table 1: Sociodemographic characteristics presents the distribution of independent variables (gender, ethnicity, and repeaters) and descriptive statistics for dependent variables.

A total of 113 responses were analysed with no missing data, as confirmed by the Case Processing Summary (100% valid cases). The internal consistency of the six questionnaire items was evaluated using Cronbach's Alpha, which yielded a value of 0.825, indicating good reliability. The total scale had a mean score of 12.33 ( $SD = 3.68$ ), suggesting moderate agreement among respondents.

Table 2 presents the normality testing results for the six dependent variables in the study. Skewness and kurtosis values, along with their standard errors, indicate that most variables fall within the acceptable range for normality. However, the Kolmogorov-Smirnov and Shapiro-Wilk tests both yielded p-values below 0.001, suggesting that none of the variables follow a normal distribution. These statistical tests are further supported by visual inspections using histograms and Q-Q plots.

The histogram results indicate that most variables exhibit left-skewed distributions, except for "Confidence in OSPE," which is skewed to the right. Despite the statistical tests suggesting non-normality, the Q-Q plots show that the data are approximately normal. This mixed evidence highlights the importance of considering both statistical and visual assessments when evaluating data normality, particularly for determining the appropriate statistical tests in subsequent analyses.

**Table II: Normality Testing of Dependent Variables.**

| Variables                       | Skewness/<br>SE    | Kurtosis/SE           | Kolmogorov-<br>Smirnov | Shapiro-Wilk           | Histogram          | Q-Q Plot      |
|---------------------------------|--------------------|-----------------------|------------------------|------------------------|--------------------|---------------|
| <b>Improve understanding</b>    | 0.644<br>(Normal)  | 0.715<br>(Normal)     | <0.001<br>(Not Normal) | <0.001<br>(Not normal) | Skewed to<br>left  | Almost normal |
| <b>Usefulness of OSPE</b>       | 0.631<br>(Normal)  | -0.695<br>(Normal)    | <0.001<br>(Not Normal) | <0.001<br>(Not normal) | Skewed to<br>left  | Almost normal |
| <b>OSPE vs written exam</b>     | 0.726<br>(Normal)  | 0.675<br>(Normal)     | <0.001<br>(Not Normal) | <0.001<br>(Not normal) | Skewed to<br>left  | Almost normal |
| <b>Confidence in OSPE</b>       | -0.492<br>(Normal) | -0.154<br>(Normal)    | <0.001<br>(Not Normal) | <0.001<br>(Not Normal) | Skewed to<br>right | Almost normal |
| <b>OSPE and motivation</b>      | 0.910<br>(Normal)  | 0.908<br>(Not normal) | <0.001<br>(Not Normal) | <0.001<br>(Not Normal) | Skewed to<br>left  | Almost normal |
| <b>OSPE throughout semester</b> | 0.674<br>(Normal)  | -0.126<br>(Normal)    | <0.001<br>(Not Normal) | <0.001<br>(Not Normal) | Skewed to<br>left  | Almost normal |

Table 2: Normality Testing of Dependent Variables presents the results of normality assessments for six dependent variables in the study. The table includes Skewness and Kurtosis values with standard errors, Kolmogorov-Smirnov and Shapiro-Wilk tests for normality, as well as visual distribution patterns from histograms and Q-Q plots.

Table 3 presents the frequency and percentage distribution of students' responses regarding the impact of OSPE in continuous assessment. A majority of respondents (78.76%) either agreed or strongly agreed that OSPE improved their understanding, while 88.49% found it useful, with no students rating it as "not useful at all." Additionally, when comparing OSPE to traditional written exams, 79.64% of students expressed a preference for OSPE, indicating its perceived effectiveness in assessing practical knowledge and application.

Confidence levels in OSPE, however, showed greater variation among respondents. While 18.58% of students reported feeling very or somewhat confident, 46.90% expressed low confidence, highlighting the potential challenges some students face in this assessment format. This suggests that while OSPE is generally well-received, additional support may be needed to enhance students' confidence, such as practice sessions or feedback mechanisms. Despite these variations, a majority of students (91.15%) believed that OSPE had a positive impact on their motivation, with only a small percentage (1.77%) finding it demotivating.

Although the overall perception of OSPE was positive, the finding that nearly half of the students expressed low confidence in this assessment format is a point of concern. Confidence plays a critical role in students'

academic engagement and performance, particularly in practical, high-stakes settings like OSPE. This may reflect anxiety around time-constrained performance, unfamiliar station formats, or limited exposure to similar assessments. Educators should consider integrating structured OSPE practice sessions early in the semester to familiarise students with the format and expectations. Furthermore, providing targeted formative feedback after each OSPE session can reinforce learning and clarify performance standards. These strategies align with prior research indicating that repeated exposure and personalised feedback improve student confidence and competence in clinical assessments (16). Future research could explore how different feedback modalities and training interventions impact confidence and learning outcomes in anatomy-based OSPE.

Regarding the implementation of OSPE throughout the semester, 71.68% of students supported its regular use, reinforcing its perceived value as an assessment tool. This suggests that students recognize the benefits of OSPE in reinforcing learning and practical skills. However, a smaller group (5.31%) disagreed with this approach, possibly due to concerns over assessment pressure or the format's challenges. Overall, the findings indicate that OSPE is a widely accepted and effective method for continuous assessment, with potential areas for improvement in building student confidence.

**Table III: Distribution of Responses for Dependent Variables**

| Dependent Variable              |                         | Frequency (n) | Percentage (%) |
|---------------------------------|-------------------------|---------------|----------------|
| <b>Improve understanding</b>    | Strongly agree          | 38            | 33.63          |
|                                 | Agree                   | 51            | 45.13          |
|                                 | Neutral                 | 23            | 20.35          |
|                                 | Disagree                | 0             | 0.00           |
|                                 | Strongly disagree       | 1             | 0.88           |
| <b>Usefulness of OSPE</b>       | Very useful             | 55            | 48.67          |
|                                 | Somewhat useful         | 45            | 39.82          |
|                                 | Neutral                 | 13            | 11.50          |
|                                 | Not very useful         | 0             | 0.00           |
|                                 | Not useful at all       | 0             | 0.00           |
| <b>OSPE vs written exam</b>     | Strongly agree          | 43            | 38.05          |
|                                 | Agree                   | 47            | 41.59          |
|                                 | Neutral                 | 22            | 19.47          |
|                                 | Disagree                | 0             | 0.00           |
|                                 | Strongly disagree       | 1             | 0.88           |
| <b>Confidence in OSPE</b>       | Very confident          | 9             | 7.96           |
|                                 | Somewhat confident      | 12            | 10.62          |
|                                 | Neutral                 | 39            | 34.51          |
|                                 | Not very confident      | 40            | 35.4           |
|                                 | Not confident at all    | 13            | 11.50          |
| <b>OSPE and motivation</b>      | Yes significantly       | 52            | 46.02          |
|                                 | Yes slightly            | 51            | 45.13          |
|                                 | No impact               | 8             | 7.08           |
|                                 | No, it was demotivating | 2             | 1.77           |
|                                 | Strongly agree          | 41            | 36.28          |
| <b>OSPE throughout semester</b> | Agree                   | 40            | 35.4           |
|                                 | Neutral                 | 25            | 22.12          |
|                                 | Disagree                | 6             | 5.31           |
|                                 | Strongly disagree       | 1             | 0.88           |

Table 3: This table presents the frequency and percentage distribution of respondents' perceptions regarding the impact of OSPE in continuous assessment. Responses are categorized based on different dependent variables, including understanding improvement, usefulness, comparison with written exams, confidence, motivation, and preference for OSPE throughout the semester. Percentages are calculated based on the total number of respondents (n = 113).

The findings of this study provide valuable insights into students' perceptions of the implementation of continuous assessment using the Anatomy OSPE. Overall, the results suggest that students perceive continuous OSPE as an effective method for reinforcing anatomical knowledge, improving retention, and enhancing their preparedness for summative assessments. These findings align with previous studies indicating that regular formative assessments contribute to improved academic performance and self-directed learning in medical education (17).

One key finding is that students appreciated the structured nature of OSPE, which allowed for an objective evaluation of their understanding of anatomical concepts. Unlike traditional written exams, OSPE provides direct exposure to anatomical specimens and models, enabling students

to apply theoretical knowledge in a practical setting. This hands-on experience may explain why many students found continuous OSPE beneficial for long-term retention. However, some students expressed concerns regarding the increased stress and time management challenges associated with frequent assessments, which is consistent with studies highlighting assessment-related anxiety among medical students (18).

The finding that gender, ethnicity, and repeater status did not significantly influence students' perceptions of OSPE is noteworthy. One possible explanation is that the structured and standardised format of OSPE, which emphasises uniformity in assessment criteria and station content, may help mitigate individual or demographic biases. This suggests that OSPE is perceived as an equitable tool, consistent with literature indicating its reliability and fairness in diverse student populations (19). However, it is also possible that other unmeasured factors such as students' prior exposure to practical exams, preferred learning styles (e.g., visual vs. kinaesthetic), confidence in anatomy, or general academic preparedness could influence their perceptions more strongly than demographic traits. Future studies incorporating these variables, perhaps through mixed-methods or qualitative interviews, could provide deeper insight into the student experience with continuous OSPE.

Despite its advantages, the study also identified challenges associated with the continuous assessment format. Some students perceived the frequent OSPE sessions as burdensome, potentially interfering with their ability to focus on other coursework. Additionally, concerns were raised regarding the potential for examiner variability in scoring, which could impact fairness and reliability. Addressing these concerns by implementing clear rubrics and examiner training programs may further enhance the credibility of the assessment process.

The analysis, conducted using the Mann-Whitney U test for gender and repeater status and the Kruskal-Wallis test for ethnicity, revealed no statistically significant associations between the six dependent variables (improvement in understanding, usefulness of OSPE, comparison with written exams, confidence in OSPE, OSPE and motivation, and OSPE throughout the semester) and the three independent variables (gender, ethnicity, and repeater status) (data not shown). This suggests that students' perceptions of OSPE were generally consistent regardless of their demographic background or academic history.

Furthermore, the absence of significant associations aligns with previous research indicating that practical assessments like OSPE provide an equitable evaluation framework (12). This could be attributed to the standardized structure of OSPE, which minimizes subjectivity and bias in assessment. However, while



students generally perceive OSPE positively, the variations in confidence levels highlight the need for additional support mechanisms, such as structured practice sessions and formative assessments. Future studies could explore qualitative insights into students' experiences with OSPE to better understand the underlying factors influencing confidence levels and engagement.

This study has several limitations. First, it was conducted within a single institution, which may limit the generalisability of the findings to other medical schools in Malaysia or internationally. Student perceptions could differ based on institutional assessment culture, teaching styles, or available resources. Second, the study relied on self-reported quantitative data, which may not fully capture the complexity of students' experiences with OSPE. Including qualitative methods, such as open-ended survey questions, interviews, or focus groups, could provide deeper insights into students' emotional responses, preferences, and concerns.

In addition, while the study measured perceptions of OSPE, it did not directly evaluate the impact of formative feedback on student confidence or performance. Future studies should explore how feedback mechanisms whether written, verbal, or peer-based—during or after OSPEs influence students' learning, motivation, and readiness for summative assessments. Multicentre studies across different universities and student cohorts could also enhance the external validity of findings and provide a broader understanding of how continuous OSPE is perceived in various contexts.

## Conclusion

In conclusion, this study highlights the generally positive perception of OSPE among medical students, with strong agreement on its usefulness, effectiveness in improving understanding, and preference over traditional written exams. The findings indicate that gender, ethnicity, and repeater status do not significantly influence students' views on OSPE, suggesting that it is an equitable and universally accepted assessment method. However, variations in confidence levels emphasize the need for additional support, such as structured practice sessions, to enhance student preparedness. These results support the continued integration of OSPE in medical education, with potential refinements to address student concerns and further optimize its effectiveness as an assessment tool.

Beyond structured OSPE practice and faculty feedback, peer-led initiatives may serve as an additional layer of support for students. For instance, peer feedback sessions following mock OSPEs can provide students with relatable guidance and normalise the learning process. Mentorship programmes, where senior students share strategies and experiences with juniors, can also demystify OSPE expectations and help reduce assessment-related anxiety. These approaches are low-cost, scalable, and particularly effective in fostering a supportive learning culture. Incorporating such strategies could improve students' preparedness, confidence, and overall perception of OSPE as a fair and developmental assessment tool.

## Acknowledgements

We would like to express our sincere gratitude to all the students who participated in this study for their time and valuable insights. We also extend our appreciation to the faculty members and administrative staff of Universiti Putra Malaysia for their support in facilitating this research. Special thanks to our colleagues for their constructive feedback and guidance throughout the study. Finally, we acknowledge the use of IBM SPSS Statistics software for data analysis and appreciate the institutional resources that made this research possible.

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