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ENHANCING CLINICAL PERFORMANCE THROUGH WORKPLACE-BASED ASSESSMENT IN MEDICINE

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ABSTRACT

Background

Clinical skills in medicine grow most effectively when students work directly with patients under supervision. Workplace-based assessment (WPBA) is widely used to help students improve through observation and timely feedback. This study examined the impact of WPBA on clinical and procedural skills among house officers during their medicine rotation.

Methodology

This pre- and post-interventional study was conducted in the Medicine Department at LUMHS and Sir Syed Hospital over nine months in 2022. A total of 100 house officers were enrolled Mini-Clinical Evaluation Exercises (Mini-CEX), Direct Observation of Procedural Skills (DOPS), and case-based discussions were used to assess performance in history taking, physical examination, clinical reasoning, documentation, and prescribing. Pre- and post-WPBA scores were compared, and paired statistical tests were applied with significance set at $p \leq 0.05$.

Results

House officers demonstrated significant improvement across all clinical domains following WPBA implementation. Mean scores increased in history taking, physical examination, clinical reasoning, documentation, and safe prescribing ($p < 0.001$ for all outcomes). Procedural competencies such as ABG sampling, IV cannulation, airway management, ECG interpretation, and blood culture technique also improved markedly after repeated DOPS encounters and guided feedback

Conclusion

WPBA significantly enhanced clinical and procedural competencies among house officers, indicating its value as both an assessment and learning tool in postgraduate clinical training. Integrating structured WPBA with timely feedback throughout the house-job period strengthens clinical readiness and supports safe, independent practice. Wider and earlier implementation may further optimise training outcomes.

Keywords: Workplace-based assessment, Mini-CEX, DOPS, medical education, clinical competence, House officers training, medicine, real-time feedback

INTRODUCTION

Producing clinically competent medical graduates requires more than theoretical knowledge; it depends on meaningful patient interaction, supervised practice, and opportunities for reflection. As health care moves toward outcome-based education, assessment methods must reflect real-world clinical responsibilities. Traditional written or oral examinations evaluate knowledge, yet they may not fully capture a student's ability to apply learning in practical settings. In response, many medical programs have adopted workplace-based assessment (WPBA) to bridge this gap [1-3].

WPBA allows students to be observed during authentic clinical encounters, followed by immediate feedback from faculty. Tools such as the Mini-Clinical Evaluation Exercise (Mini-CEX), Direct Observation of Procedural Skills (DOPS), and case-based discussions allow supervisors to evaluate both technical and professional attributes. These methods not only assess performance but also act as learning opportunities, encouraging students to improve communication, examination habits, clinical decision-making, and procedural skills [4-6].

Medicine rotations are a crucial pillar of an undergraduate program, as they expose MD students to a range of patient presentations and integrated care teams. During this stage, meaningful supervision and timely feedback are essential to refine clinical judgment, procedural confidence, and professional behavior. [7-9].

Despite growing acceptance of WPBA globally, evidence from local postgraduate training environments remains limited, South Asian settings continues to evolve. Limited published evidence exists from local institutions regarding its impact on student performance and clinical growth. In Pakistan, the application of WPBA during the house-job period is increasing, yet systematic evaluation of its educational impact remains scarce.

Therefore, this study aimed to assess the effect of WPBA on clinical and procedural skills among house officers during a nine-month medicine rotation at LUMHS and Sir Syed Hospital. Unlike earlier undergraduate-focused work, this study used a pre- and post-implementation design to measure performance improvement within the same cohort following structured workplace-based assessments and feedback.

METHODOLOGY

This study followed a pre- and post-interventional descriptive design, assessing clinical competencies before and after workplace-based assessment during a nine-month medicine rotation during 2022. This study was carried out in the Medicine Department of Liaquat University of Medical and Health Sciences (LUMHS), Jamshoro, and at Sir Syed Hospital, Hyderabad, and focused on evaluating how WPBA affects the clinical skills of house officers during their medicine ward rotation.

Ethical approval was obtained from the institutional review committee. All participants were informed about the study purpose and written consent was taken. Confidentiality of data was maintained throughout, and participation had no influence on their routine training or evaluation.

A total of 100 house officers were enrolled through convenience sampling, as they were already posted in the medicine wards for their mandatory house job. House officers who failed to complete the rotation or missed assessment sessions were excluded.

This research followed a pre- and post-intervention design. WPBA tools used in the study included:

- Mini-Clinical Evaluation Exercise (Mini-CEX)
- Direct Observation of Procedural Skills (DOPS)
- Case-based Discussion (CbD)

These assessments were performed during routine clinical duties, including ward rounds and emergency postings. Key areas evaluated were history taking, physical examination, diagnostic reasoning, documentation, and prescription safety.

All assessments were directly supervised by trained faculty members. Immediate feedback was provided after each encounter to help participants reflect on their performance and identify areas for improvement. Each house officer completed several WPBA activities across the rotation.

A structured proforma was used to record demographic details, number of assessments performed, and scores before and after training. Data collection was overseen by the principal investigator to ensure accuracy.

Data analysis was performed using standard statistical software. Frequencies and percentages were calculated for demographic variables, while mean and standard deviation were used for performance scores. Paired statistical tests were applied to compare pre- and post-training results, and a p-value ≤ 0.05 was considered statistically significant.

RESULTS

A total of 100 house officers completed a 9-month medicine rotation at LUMHS and Sir Syed Hospital in 2022. Participants were predominantly single, with an almost equal male-to-female ratio. The average age was 24.1 years, indicating uniformity in trainee seniority. These demographics reflect a typical house-officer cohort and provide a stable baseline for performance comparison.

Table 1: Demographic Characteristics of Participants (N = 100)

Variable	Category	Frequency (%)
Age (years), Mean ± SD	—	24.1 ± 1.2
Sex	Male	48 (48%)
	Female	52 (52%)
Marital Status	Single	85 (85%)
	Married	15 (15%)

The cohort represented a balanced gender distribution, mostly single young graduates, typical of first-year house officers. All house officers underwent workplace-based assessment throughout the rotation. Each trainee completed multiple Mini-CEX, DOPS, and case-based discussion encounters. On average, feedback was immediate in most encounters and lasted approximately 12 minutes, supporting real-time learning and guided reflection.

Table 2: WPBA Encounter Frequency

Assessment Activity	Mean ± SD
Mini-CEX completed	6.1 ± 1.9
DOPS completed	5.2 ± 1.5
Case-based discussions	3.9 ± 1.2
Immediate feedback	78%
Feedback duration (minutes)	12.0 ± 3.4

House officers received structured assessments and consistent, timely feedback, reinforcing the value of direct observation and guided clinical improvement.

Significant improvement was noted in all core clinical competencies following WPBA implementation. Post-training scores were substantially higher compared to baseline, showing that supervised case encounters and feedback effectively strengthened history-taking, examination, reasoning, documentation, and prescribing skills.

Table 3: Comparison of Clinical Competency Scores Before and After WPBA

Competency	Pre Mean ± SD	Post Mean ± SD	p-value
History taking (1–9)	5.8 ± 0.9	7.4 ± 0.8	<0.001
Physical examination (1–9)	5.6 ± 0.8	7.2 ± 0.9	<0.001
Clinical reasoning (1–9)	5.5 ± 0.9	7.3 ± 0.8	<0.001

Documentation (%)	70.5 ± 6.9	83.1 ± 6.5	<0.001
Safe prescribing (%)	72.2 ± 7.4	85.4 ± 7.2	<0.001

All domains showed statistically significant improvement, confirming WPBA as an effective tool in enhancing clinical judgment, accuracy, and professional competence among house officers.
Procedural skills demonstrated substantial gains across all measured tasks. Post-rotation competence was markedly higher, particularly in IV cannulation, ABG sampling, and airway management. These results highlight the importance of supervised practice and DOPS evaluations in sharpening procedural proficiency.

Table 4: Procedural Competence Before and After WPBA

Procedure	Pre n (%)	Post n (%)	p-value
ABG sampling	60 (60%)	87 (87%)	<0.001
IV cannulation	65 (65%)	92 (92%)	<0.001
ECG interpretation	58 (58%)	82 (82%)	<0.001
Blood culture technique	55 (55%)	84 (84%)	<0.001
Basic airway management	50 (50%)	80 (80%)	<0.001

There was clear and significant enhancement in procedural skills following structured observation and feedback, confirming the effectiveness of WPBA in promoting safe clinical practice.
Overall, WPBA significantly improved clinical competence, procedural proficiency, and confidence among house officers. Structured supervision, continuous observation, and immediate feedback played a pivotal role in strengthening clinical readiness for independent practice.

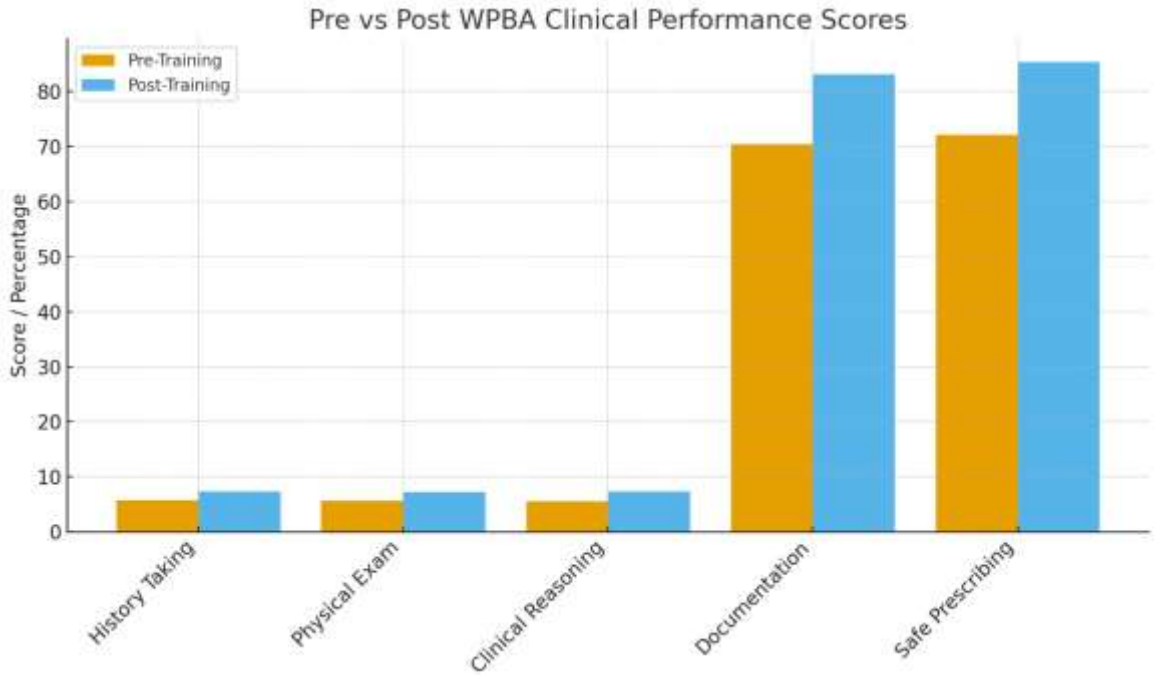

Figure 1 *The graph demonstrates a marked increase in mean scores across all domains following WPBA implementation, indicating substantial improvement in clinical competence and documentation/prescribing accuracy.*

DISCUSSION

The impact of workplace-based assessments (WPBA) on clinical competence was evaluated in the case of house officers completing a nine-month rotation in the department of medicine. Results show significant clinical performance improvement after structured assessment, followed by feedback. Unlike earlier studies which compared different academic years, in this case, the cohort of 100 house

officers was assessed before and after exposure to WPBA. This enabled the researchers to directly assess the improvement of skills during the supervised clinical practice.

Increased competence was noted in the areas of history taking, physical examination, clinical reasoning, documentation, and safe prescribing. Such improvements attest to the benefits of multiple workplace-based evaluations, genuine patient interactions, and prompt feedback, all of which contribute to the development of accurate and confident clinical judgment. This is consistent with the international literature, where the association of formative assessment and real-time feedback with clinical performance and professional behavior improvements is well documented [10-13].

The procedural competencies have shown marked improvements. After WPBA-oriented training, house officers became increasingly proficient in ABG sampling, IV cannulation, airway management, ECG interpretation, Blood Cultures, and other procedures. Such improvements in clinical procedural competencies affirm the benefits of purposively engineered practical sessions, guided supervision, and the repetitive use of DOPS in fostering consolidation and retention of clinical procedural competencies [14-16].

An important aspect of this training model was the provision of immediate constructive feedback a principle upon which WPBA is based. In line with the literature, immediate feedback provided by supervisors facilitated reflection, the opportunity to correct errors at the point of care, consolidation of learning, and enhanced performance. Frequent interactions between trainees and supervisors promoted the development of clinical confidence and the establishment of a supportive learning environment [17, 18].

The results indicate that WPBA integrates assessments and develops learning competencies as an educational tool that fosters rapid learning acquisition. Interwoven assessments integrated into daily practice enhance complex clinical thinking and procedural skills far more effectively than assessments utilized in non-integrated practice frameworks [19, 20].

Incorporation of WPBA early in clinical training and its consistent continuation for the whole house-job period is likely to further the development of competent and safe medical practitioners even more. The participation of faculty members and the consistent use of the same assessment tools are vital for justice, dependability, and educational efficacy.

CONCLUSION

This study demonstrates that workplace-based assessment significantly enhances clinical and procedural skills among house officers during their medicine rotation. Participants showed meaningful improvement across all domains, supported by repeated observation, structured supervision, and immediate feedback. The findings reinforce WPBA as a valuable strategy for developing clinical competence and professional readiness for independent practice. Continued implementation, supported by trained faculty and consistent assessment practices, may further strengthen postgraduate clinical training and patient-care standards.

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