Original Article

OSAT (Objective Structured Assessment of Technical Skill) as a Formative Assessment Tool in Gynecology

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Abstract

Objective: To determine the impact of using Objective Structured Assessment of Technical Skill (OSAT) as a formative assessment tool on the learning curve of postgraduate trainees performing surgery in live setting.

Material and Method: It is a quantitative, quasi-experimental study conducted at Gynecology department of Services Institute of Medical Sciences from January 10, 2023 to September 30, 2023. Trainees were assessed in five OSAT encounters by faculty using standardized structured scoring sheet using global rating scale on a 5-point Likert scale. The data was analyzed using S.P.S.S version 22.0.

Results: Mean scores of trainees significantly improved with each OSAT encounter.

Conclusion: In conclusion, OSAT using the global rating scale in live setting, is validated by the fact that the scores improved with successive OSAT encounters

Keywords: OSAT (Objective Structured assessment of Technical Skills), WPBA, Formative assessment

How to cite: *Yunus S, Naqi A. OSAT (Objective Structured Assessment of Technical Skill) as a Formative Assessment Tool in Gynecology. Esculapio - JSIMS 2023;19(04):430-434.*

DOI: https://doi.org/10.51273/esc23.251319411

Introduction

Historically, postgraduate training in the surgical specialties is centered universally on apprenticeship model where the trainee acquires skills by working with experienced surgeons. Transformation of novice to expert is dependent on closely observing and imitating the seniors. The model although mainly reliant on the accessibility of mentors, however the patients seen and the procedures performed during training are also important.[1] Reduction in working hours of trainees further makes the traditional apprenticeship less efficient. The resulting decline in clinical skills require renewal of minimum standards and performance competencies. Furthermore, public awareness and use of social media require doctors to displays an ongoing commitment to learning and self-improvement.[2]

Competency based curricula, a model requiring trainees to acquire the desired competencies to fulfil the needs of society and patients was implemented by various accreditation authorities. Surgical competence involves amalgamation of knowledge, procedural skills, communication skills and decision making. Of these, dexterity or technical proficiency is considered to be of paramount importance among surgical trainees.[3] Although these core competences are well defined, no uniform assessment method exist to determine whether learner have achieved all core competencies prior to completion of residency. With rapidly evolving newer surgical techniques, skills acquirement and its assessment has become even more challenging.[4]

Objective assessment is fundamental because only direct observation and focused feedback can identify deficiencies in training and performance. Validity, acceptability and reliability of assessment methods is imperative. Different WPBA tools used in clinical settings are valued as they not only facilitate one to one training but also provide timely and targeted feedback. However, the most common difficulties associated with these WPBA are that they comprise of 'tick-box exercise' leading to impractical expectations and a lack of well-defined purpose.[5] Acceptable educational tools that aim

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Submission Date: 16-10-2023
1st Revision Date: 06-11-2023
Acceptance Date: 16-12-2023

at all levels of the Miller's pyramid is necessary to guarantee that trainees are assessed in settings as close to real clinical practice as possible. A valid test should foresee the learner's performance and assess technical skill in addition to knowledge. It should have construct validity or able to separate groups and it must have face validity or be as close to the real world as possible.[6]

An objective assessment tool like OSAT can fulfil this requirement. OSAT was first used as an assessment tool in Toronto in 1997 for assessing surgery residents which was later adopted by other specialties. Assessment using OSAT may be done using a specific checklist designed for a procedure or by using global rating scale. OSAT assessing residents on global rating scale was found to be more reliable in both the live and bench models, compared to checklist (Cronbach's alpha 0.33 and 0.61, respectively).[7] Comparing checklist with global rating scale, Regehr et al showed that using checklist as a marking tool has lower reliability and objectivity than the global rating scale.[8] Barbara Goff used OSATS using animal models to assess Obstetrics & Gynecology at the University of Washington in Seattle.[9] Its use is still in preliminary phases in different training programs in Europe and North America. OSAT was formally introduced by RCOG at all levels of training specialty training for Obstetrics and Gynecology in 2007.[10]

OSAT as an assessment tool have been studied on simulators or animals' models. Although using OSATS in simulator settings has the advantage of repetitive exercise without any risk to patients, however simulators can never imitate operative conditions. Due to lack of enough studies on the use of OSATS in real situation, the study is planned to determine the impact of using OSAT as a formative assessment tool on the learning curve of postgraduate trainees while performing abdominal hysterectomy in theatre (what they actually do).

Different WPBA tools such as DOPS and CBD has been introduced recently by college of Physicians & Surgeons Pakistan (CPSP) for formative assessment of trainees. Previously CPSP was assessing surgical competencies by using Logbook and TOACS.

The use of some objective tool for evaluation of surgical skills in the specialty of obstetrics and gynecology is urgently required. Such tool will not only facilitate the learning process through constructive feedback on performance but it can also be used to determine competency levels and to progress in learning curve. Finally, it can provide standard criteria to be used for formative and summative assessment.

This study was designed to determine the impact of using OSAT as a formative assessment tool on the learning curve of postgraduate trainees performing Abdominal Hysterectomy in live setting.

Material and Method

Study was conducted in Gynecology department of Services Institute of Medical Sciences. After approval of Institutional ethics board approval (Ref no.IRB/2023/1049/SIMS), this quantitative study (quasi-experimental) was conducted from January 10, 2023 to September 30, 2023. Obstetrics and gynecology training program is of four years. In first two years of training residents usually perform obstetrics procedures and in third and fourth year of training they perform under direct supervision different gynecological procedures including abdominal hysterectomy. Surgery is done under supervision of consultants (SRs & faculty).

An orientation session was conducted to explain and familiarize the supervisors and trainees to OSAT. Consultants supervising surgeries were trained in conducting OSAT as assessment tool using global rating scale. The assessment tool is adapted from Martin and colleagues.[7] Residents willing to participate were selected after obtaining informed consent on predesigned proforma. OSAT will be conducted using global rating scale on a 5-point Likert scale. Residents are assessed on their tissue and instrument handling, knowledge of instruments, use of assistants, flow and knowledge of procedure being performed. It was a quantitative, quasi-experimental. The paradigm used was post-positivism and non-probability convenient sampling was done. Gynecology residents usually perform around 8 to 10 abdominal hysterectomies by the end of their four-year training. Ten fourth year residents willing to participate in study were included. The residents were assessed in five OSAT encounters by faculty using standardized structured scoring sheet using global rating scale on a 5-point Likert scale. At the end of each encounter, Constructive feedback was given on each component. Trainees were encouraged to discuss in detail especially trainee's reflection of procedure, what went well, what could have gone better and agreeing on future learning plan using RCOG formative OSAT form. The data was analyzed using S.P.S.S version 22.0. OSAT scores of each trainee in each encounter were noted on standard checklist and mean value and standard deviation was calculated. The scores were compared using paired t-test. P-value of <0.05 was considered as statistically significant.

Results

Ten fourth year residents were included in the study. Each of the residents were observed in five OSAT encounters. After each encounter scoring was done on global rating scale and detailed feedback was given to each resident. Faculty members noticed that these OSAT resulted in improved performance of trainees because of discussion of strengths and weakness in formative feedback sessions. Feedback taken from faculty and trainees showed OSAT to be acceptable and feasible to both. Table-1 shows the mean OSAT score during follow-up. At baseline the mean score was 11.20± 2.28, which was improved to 15.40±4.28 on 2nd visit, 21.80 ±2.59 on 3rd visit, 24.20±3.03 on 4th visit and 27.80±1.79 on final visit. Table 2 showed that there was significant improvement observed in OSAT score at end of study period as compared to OSAT score at baseline ($p<0.05$).

Table 1: *Performance of Gynecology trainees at 5 OSAT encounters*

	OSAT 1	OSAT 2	OSAT 3	OSAT 4	OSAT 5
n	10	10	10	10	10
Mean	11.20	15.40	21.80	24.20	27.80
SD	2.15	4.03	2.44	2.86	1.69
Minimum	9	11	19	20	25
Maximum	15	22	25	28	29

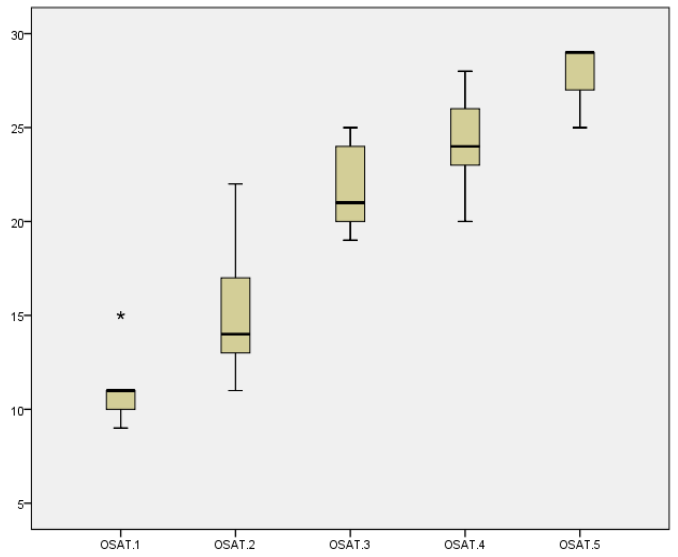

Fig 1: *Comparison graph of improvement in scores with each successive encounter (Repeated measures ANOVA: 660.080, p-value = 0.000)*

Table 2: *Comparison of Pre-OSAT and Post-OSAT performance of Gynecology trainees*

	Pre	After
n	10	10
OSAT	11.20±2.15	27.80±1.69
Mean difference	16.60	
Paired sample t-test value	28.562	
P-value	0.000	

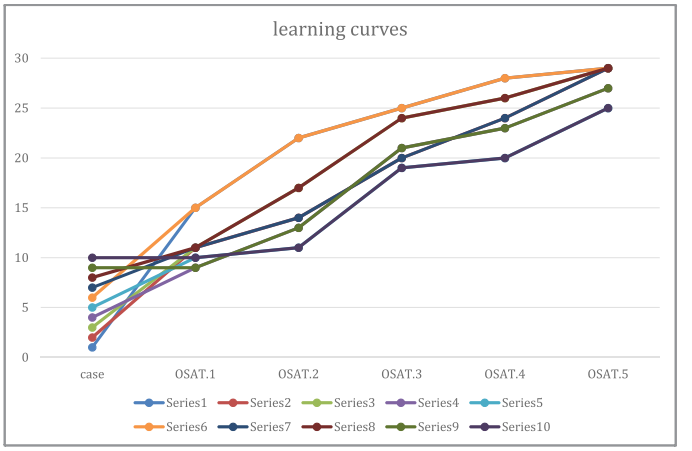

Fig-2: *Individual learning curve of PGRs*

Discussion

Competency Based Medical Education (CBME) has replaced the traditional medical education models both in undergraduate and postgraduate medical education. In conventional residency programs were designed on model which was time based, in which at the end of program trainees were expected to have attained desired competencies. However, in comparison, trainees are expected to achieve proficiency in a variety of perspectives and activities throughout the CBME.[11] Different studies have shown distinctive disadvantages of outcomes-focused approach to determine surgical competence. Moreover, if we want to produce self-motivated and lifelong learners, subjective and global assessment of competence is desired.[12]

The apprenticeship model however cannot be totally detached from surgical education, to improve outcome from this model effective methods of teaching and objective tools of assessment are required in addition to skilled mentors.[13]

Both global rating scores and procedure-based checklist has been used in different settings to determine effectiveness of OSAT. In this study the performance of residents was measured using global rating scores on a 5-point Likert scale. Scores showed significant improvement

with successive OSAT encounters (fig .1-p value=o.ooo). However, Reznick et al. used OSAT to assess surgical skills of residents comparing global rating scale and checklist. Analysis of variance revealed a significant effect of training for both the checklist score, $P < 0.001$, and the global score, $P < 0.001$.[8] A similar study conducted in University of Iowa to assess surgical skills of Orthopedic residents using global rating scale showed that global rating scale do not effectively assess the quality of surgical result. The study suggested a need to develop some new objective, reliable, and clinically relevant measures of the quality of the surgical result.[14]

In this study OSATS was found to be feasible and acceptable to both residents and supervisors. Most of the residents showed satisfaction and found it useful. Supervisors found it fundamental for our postgraduate trainees as it actually assess their surgical skills in real setting, however they found it time consuming and additional burden. H. Niitsu et al used the OSATS global rating scale at Hiroshima City Hospital in Japan to assess the surgical skills of trainees in the operation room. The study concluded that global rating scale of OSAT was feasible and effective as it can be easily done in real situation without any special preparations.[8]

The learning curves of residents can be used more effectively as an objective assessment tool to monitor their progress during training (Fig.2). Learning curves based on OSATS have the potential to recognize residents in need of more guidance so personalized guidance can be provided. Prior parameters used to assess surgical competency were the duration of surgery, the complication rate. However, duration of surgery and complication rate have shown to be crude and in- direct, as these indicators largely depend on the difficulty of the individual surgical case (e.g., the comorbidity of a patient) and the supervising surgeon.[15,16] The study shows the effectiveness of the new OSATS method and if used as a method of assessment it may overcome the barriers associated with other methods used. OSATS score increased significantly with each successive encounter. Feedback questionnaires from trainers and trainees used by Bodle and colleagues in UK proved that OSATS is valid and valuable.[17] Time specific feedback is essential to learn and improve surgical skills, emphasizing the need for technical skills curricula that give trainees the chance to work in a safe environment.

However, there are some limitations of this study as there are different assessors and the trainees are known to them so the scores could be biased. The assessors showed interest and satisfaction however they found it time consuming and additional burden to there already busy clinical routine. Implementation of CBME is associated with a number of challenges, including increased assessment burden and evaluator fatigue resulting from more frequent assessments of surgical trainees.

Conclusion

In conclusion, OSAT using the global rating scale in live setting, is validated by the fact that the scores improved with successive OSAT encounters. The study indicates it can be used as an effective formative assessment tool however further time and validation is required for broader acceptance as summative assessment tool. It will not only standardize assessments, however timely feedback after performance in real setting will encourage reflective practice.

Conflict of Interest *None*

Funding source *None*

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Authors Contribution

S, AN: Conceptualization of Project
S: Data Collection
S: Literature Search
S: Statistical Analysis
S, An: Drafting, Revision
S: Writing of Manuscript