

Comparing the Procedural Skills of University Residents During 1st & 2nd Cycle of Evaluation


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Received:  November 03, 2023

Published:  November 21, 2023

Abstract

Background: Getting abridged with procedural skills is of utmost importance to our postgraduate trainees to ensure patients' safety and efficient delivery of healthcare services. Such skills are essential for diagnosing as well managing the patients.

Objectives: To compare the procedural skills of university residents during 1st and 2nd cycle of evaluation in tertiary healthcare facilities of Rawalpindi.

Subjects & Methods: A cross-sectional comparative study was done to compare the DOPS score of university residents during 1st cycle (January-June 2018) and 2nd cycle (July-December 2018) of evaluation. Postgraduate trainees enrolled in 16 MS & MD programs at 3 teaching hospitals namely Holy Family Hospital (HFH), Benazir Bhutto Hospital (BBH) and DHQ Hospital Rawalpindi were assessed for procedural skills by supervisors, senior registrars and consultants. 85 and 105 trainees were assessed during 1st and 2nd cycle respectively. DOPS tool was highly reliable with Cronbach alpha of 0.90. Data was analyzed by SPSS software version 25.0. Mean \pm SD were calculated for time spent in DOPS assessment and scores achieved. Discipline-wise difference in assessment score of trainees and difference in mean time of assessment were measured by independent sample t-test. $P < 0.05$ was considered significant.

Results: Mean time spent in DOPS assessment during 1st and 2nd cycle were 25.8 ± 7.3 min and 22.61 ± 12.35 min respectively; this difference was statistically significant ($P = 0.04$). However, difference in mean assessment score of the residents during 1st cycle (46.2 ± 6.8) and 2nd cycle (46.4 ± 9.8) was statistically insignificant ($P=0.52$). Statistically significant improvement ($P=0.004$) was determined in DOPS 2nd cycle score of trainees enrolled in Gynecology & Obstetrics training program. On the other hand, statistically significant decrease in 2nd cycle was among residents of Pediatrics ($P=0.008$), Plastic Surgery ($P = 0.02$) and Urology ($P=0.02$). Holistically, 39 and 27 out of 105 and 85 residents assessed during 2nd and 1st cycle of DOPS performed above expectations.

Conclusion: Trainees of Anesthesia, Internal Medicine and Gynecology & Obstetrics had profoundly improved DOPS score during 2nd cycle of evaluation. Most of them had good communication skills and performed procedure aseptically.

Keywords: procedural skills, tertiary care hospitals, Gynecology, Obstetrics, Pediatrics, university residents.

Introduction

Various assessment modalities are confined in Workplace Based Assessment (WPBA) for apt evaluation of trainees in clinical environment while interacting and managing the patients and

endowing them with prompt feedback [1]. Being a formative assessment, Work Place Based Assessment (WPBA) is of paramount significance in bestowing the postgraduate medical trainees with an opportunity to improve their competencies deemed necessary

for dealing with patients safely [2]. Of the diverse formative assessments carried out at workplace, Mini-Clinical Evaluation Exercise (mini-CEX), Direct Observation of Procedural Skills (DOPS), Case-based Discussion (CbD), Multi-Source Feedback (MSF) and Blinded Patient Encounters (BPE) have frequently been included over a decade for measuring clinical performance and hence the competencies of the trainees pertaining to communication, knowledge, skills, professionalism and ethics [3]. These assessments not only ensure trainees' participation in their assessments but also deliver a comprehensive action plan for improvement [4,5]. Renowned accrediting bodies has familiarized the globe with need of WPBA [6,7]. This initiative sparked the implementation of this innovative assessment in teaching hospitals of Pakistan as well for acquisition of our postgraduate medical trainees with essential competencies [8,9].

DOPS assessment of trainees enrolled in teaching hospitals affiliated with Rawalpindi Medical University is routinely carried out every 6 months to review their academic progress [10]. This tool was practically utilized in 2018 among university residents who were enrolled in MS & MD training programs at public sector tertiary healthcare facilities of RMU through Central Induction Policy (CIP) [11]. The present study is deliberated to compare the acquisition of procedural skills by postgraduate residents enrolled in MS / MD training programs at 3 teaching hospitals of Rawalpindi. The findings of this study would enable us to perceive discipline-wise discrepancies in procedural skills of residents apart from overall difference in 1st and 2nd cycle score of DOPS. Training programs necessitating enhancement will definitely be brought to the attention of stakeholders and strategic planners for betterment in terms of revising the selection criteria for postgraduation and reviewing their training curricula if required.

Subjects & Methods

A cross-sectional comparative study was done to compare the DOPS score of university residents during 1st cycle (January-June 2018) and 2nd cycle (July-December 2018) of evaluation. These residents were enrolled in MS & MD training programs at 3 teaching hospitals namely Holy Family Hospital (HFH), Benazir Bhutto Hospital (BBH) and DHQ Hospital Rawalpindi that are affiliated with Rawalpindi Medical University. This study was done in accordance with STROBE checklist [12]. Expert validation of DOPS tool was established in the light of viewpoints of 5 medical educationists. Trainees were given orientation about DOPS before getting assessed. 85 and 105 trainees were assessed during 1st and 2nd cycle respectively as they had completed at least 6 months of their training. The residents were assessed during 1st year of their training. This tool (Annexure) was adapted following establishment of its

content validity. Data was gathered from trainees and supervisors of Medicine & Allied (Internal Medicine, Nephrology, Dermatology, Gastroenterology), Surgery & Allied (General Surgery, Plastic Surgery, Pediatric Surgery, Urology, Orthopedics), Gynecology & Obstetrics, Paediatrics, Diagnostic Radiology and Anesthesiology by Quality Enhancement Cell (QEC) of RMU which was later analyzed to compare DOPS assessment scores of trainees. Assessment of procedural skills was done by supervisors, senior registrars and consultants of respective specialties. Data was analyzed by using SPSS software version 25.0. For time spent in DOPS assessment and score mean \pm SD were calculated. Descriptive statistics were computed for number of residents in each program from each hospital. To compare the discipline-wise difference in assessment score of trainees, independent sample t-test was applied. $P < 0.05$ was taken as significant. Frequencies of all variables were computed.

Results

Total 85 and 105 trainees were assessed during 1st and 2nd cycle of DOPS. These trainees were undergoing training three in teaching hospitals of Rawalpindi. Mean time spent in assessment and mean score obtained during each cycle are illustrated below in Table 1. Mean time spent in DOPS assessment was greater during 1st cycle of evaluation; however, insignificant difference was observed during DOPS scores of both cycles.

Number of trainees assessed during 1st and 2nd cycle of DOPS with respect to their training programs is depicted below in Table 2. Maximum number of trainees assessed were from Holy Family Hospital as depicted below in Figure 1. Although procedural skills of trainees were measured by multiple assessors but approximately 65% of them were assessed by their own supervisor as illustrated below in Table 3. Almost 81% of our trainees were subjected to DOPS assessment for clinical procedures with medium difficulty level as shown below in Figure 2. Experience of assessors in current study regarding No. of DOPS assessments done by them previously is shown below in Table 4. Trainees of Gynecology & Obstetrics, Internal Medicine and Anesthesia, Internal Medicine had significantly improved DOPS score during 2nd cycle as illustrated below in Table 5. Holistically more trainees during 2nd cycle of evaluation performed above expectations as shown below in Figure 3. Plus point of most (14.6%) of the residents undergoing DOPS was their good communication skills and observance of thorough aseptic techniques (13.7%) as depicted below figure 4. Almost 72.6% of trainees were suggested by their assessors to improve their theoretical knowledge while 14.1% and 13.3% were recommended to enhance their clinical competencies and patient's safety approach respectively.

Table 1: Mean time spent and scores during 1st and 2nd cycle of DOPS assessment.

Variables	(mean \pm SD)		P-value
	1 st cycle (n=85)	2 nd cycle (n=105)	
Time taken in assessing the trainees during DOPS (minutes)	25.8 \pm 7.3 min	22.61 \pm 12.35 min	0.04
DOPS score (total = 66)	46.2 \pm 6.8	46.4 \pm 9.8	0.52

Table 2: Program-wise No. of trainees undergoing DOPS assessment in each cycle.

Sr. #	Training Programs	Trainees Assessed in DOPS		Total
		1 st cycle	2 nd cycle	
1.	MS General Surgery	20	18	38
2.	MS Neurosurgery	12	11	23
3.	MS Obstetrics & Gynecology	12	17	29
4.	MD Paediatrics	6	9	15
5.	MS Otorhinolaryngology	7	7	14
6.	MD Internal Medicine	5	12	17
7.	MS Orthopedics	5	7	12
8.	MD Gastroenterology	2	5	7
9.	MD Nephrology	1	2	3
10.	MD Diagnostic Radiology	2	3	5
11.	MS Urology	5	5	10
12.	MS Plastic Surgery	2	2	4
13.	MS Pediatric Surgery	0	3	3
14.	MS Ophthalmology	2	1	3
15.	MD Dermatology	2	0	2
16.	MS Anesthesiology	2	3	5
17.	Total	85	105	190

Table 3: Assessors from each hospital.

Hospitals	Assessors		
	Supervisor	Specialty Senior Registrar	Consultants other than Supervisor
HFH	47	29	14
BBH	41	13	2
DHQ Hospital	35	3	6
Total	123	45	22

HFH- Holy Family Hospital, BBH – Benazir Bhutto Hospital, DHQ – District Head Quarters

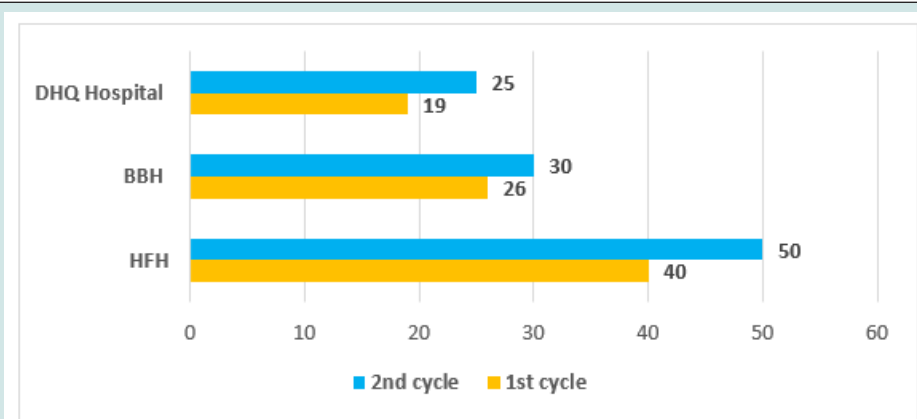
Table 4: Experience of DOPS assessment by Assessors.

No. of DOPS Previously Assessed by Various Assessors					
Evaluation Cycles	0	2-Jan	4-Mar	9-May	>9
1 st cycle	10	22	15	4	34
2 nd cycle	1	18	30	24	32
No. of Times Procedures Performed by Trainees					
Evaluation Cycles	0	4-Jan	9-May	≥10	
1 st cycle	2	25	26	32	
2 nd cycle	2	31	33	38	
Demonstrated Indications, Relevant Anatomy & Technique of Procedure					
Evaluation Cycles	Below expectations	Meet expectations	Borderline	Above expectations	
1 st cycle	4	12	55	14	
2 nd cycle	3	17	53	32	
Obtained Informed Consent From the Patient before Procedure					

Evaluation Cycles	Below expectations	Meet expectations	Borderline	Above expectations	
1 st cycle	1	8	44	32	
2 nd cycle	3	17	41	44	
Demonstrated Pre-operative Preparation Appropriately					
Evaluation Cycles	Below expectations	Meet expectations	Borderline	Above expectations	
1 st cycle	2	9	50	24	
2 nd cycle	6	16	49	34	
Knew Technicality of Safe Sedation Where Necessary					
Evaluation Cycles	Below expectations	Meet expectations	Borderline	Above expectations	
1 st cycle	2	12	47	24	
2 nd cycle	5	18	49	33	
Performed Procedure With Aseptic Measures					
Evaluation Cycles	Below expectations	Meet expectations	Borderline	Above expectations	
1 st cycle	0	6	50	29	
2 nd cycle	5	13	48	39	
Seeks help during Procedure Appropriately					
Evaluation Cycles	Evaluation Cycles	Evaluation Cycles	Evaluation Cycles	Evaluation Cycles	
1 st cycle	1 st cycle	1 st cycle	1 st cycle	1 st cycle	
2 nd cycle	2 nd cycle	2 nd cycle	2 nd cycle	2 nd cycle	

Table 5: Program-wise difference in mean score of DOPS attained during 1st and 2nd cycle of evaluation.

Training Programs	Mean Scores in DOPS Evaluation Cycle (mean ± SD)		P-value
	1 st cycle	2 nd cycle	
MS Anesthesiology	41 ± 4.24	49.3 ± 2.1	0.06
MS Otorhinolaryngology (ENT)	48.43 ± 7.11	39.14 ± 9.72	0.063
MS Ophthalmology	39.5 ± 0.71	44 ± 0	*-----
MS General Surgery	48.95 ± 5.5	50.9 ± 9.5	0.44
MD Gastroenterology	46 ± 14.14	47.2 ± 3.63	0.85
MS Gynecology & Obstetrics	40.5 ± 5.98	49.82 ± 9.1	0.004
MD Internal Medicine	42.4 ± 7.73	49.25 ± 6.3	0.074
MD Nephrology	47 ± 0	46 ± 5.65	*-----
MS Neurosurgery	42 ± 5.65	47.1 ± 4.50	0.17
MS Orthopedics	43.2 ± 6.42	48 ± 3.4	0.21
MD Paediatrics	42 ± 2.53	26.3 ± 8.45	0.0008
MS Plastic Surgery	48 ± 1.41	39.5 ± 0.71	0.02
MS Urology	56.8 ± 4.1	49.4 ± 4.3	0.02
MD Diagnostic Radiology	53 ± 0	48.3 ± 5.7	*-----



Note*: HFH- Holy Family Hospital, BBH-Benazir Bhutto Hospital, DHQ-District Head Quarters
Figure 1: No. of residents undergoing DOPS assessment from each Teaching hospital.

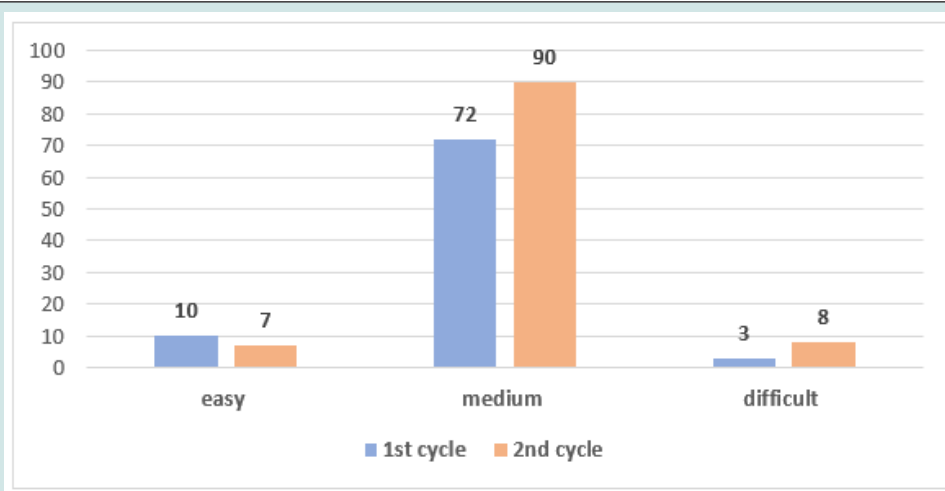


Figure 2: Comparison of Difficulty level of DOPS assessment during 1st and 2nd cycle.

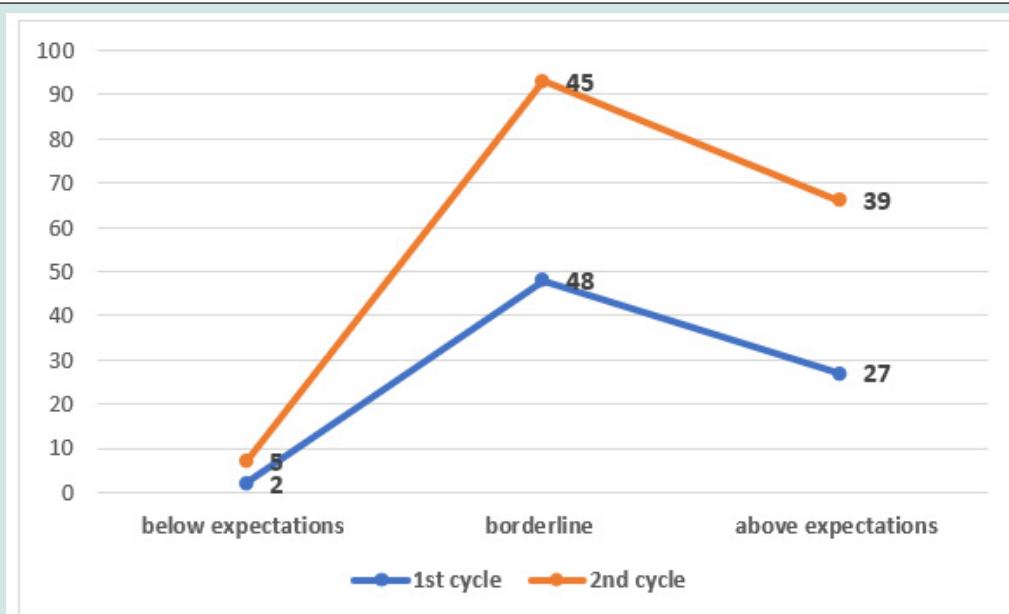
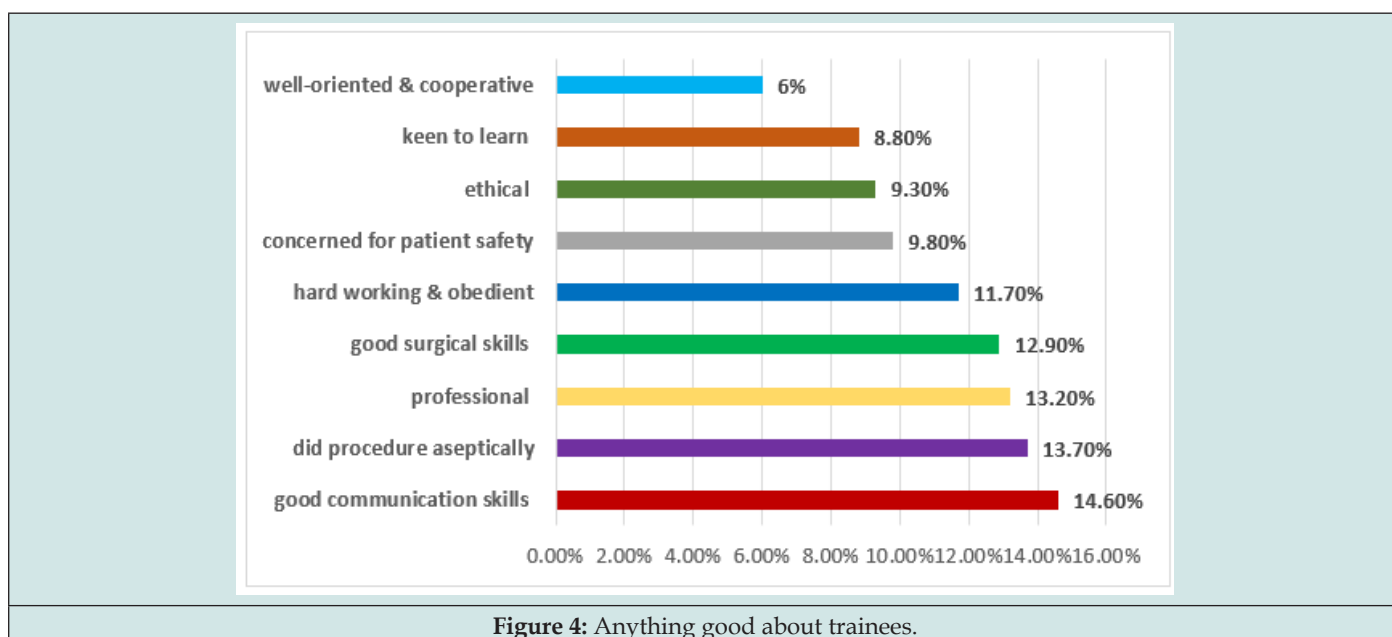


Figure 3: Comparison of residents' performance during 1st and 2nd cycle of DOPS.



Discussion

In current study, mean time spent in practicing DOPS among university postgraduate trainees during 1st and 2nd cycle was about 25.8 ± 7.3 and 22.61 ± 12.35 respectively (Table 1). A similar study by Bindal et al among postgraduate trainees of a UK hospital revealed minimal time (≤ 15 minutes) spent in assessment during performance of a procedure; even assessors did not provide assesses with recommendations for improvement of procedural skills [6]. As competency-based curriculum based on ACGME guidelines is implemented for trainees enrolled in MS and MD training programs, utilizing DOPS tool in gauging the competencies of trainees while performing major and minor clinical procedure is imperative. Apart from direct observation of trainees in clinical settings during DOPS, structured assessment with comprehensive feedback is another aspect that emphasize the value of this instrument [13], as it facilitates the trainees in identification of their shortcomings [14]. However, such assessments, if planned repeatedly can truly prove beneficial in producing competent healthcare professionals. About 81% of our university residents were subjected to medium difficulty level of DOPS assessment. Relative improvement in procedural competencies during 2nd cycle was observed among residents enrolled in MS Anesthesiology, MS Gynecology & Obstetrics, MS General Surgery, MS Neurosurgery, MS Orthopedics, MD internal Medicine and MD Gastroenterology (Table 5).

However, this improvement was determined to be statistically significant in case of MS Gynecology & Obstetrics and MD Internal Medicine trainees. Likewise, a study by Wanjari S et al pertinent to DOPS assessment among postgraduate trainees of Gynecology & Obstetrics revealed comparatively greater DOPS score during 3rd cycle as compared to that recorded during 1st encounter. Even the improvement in 3rd assessment in comparison with that of 1st and 2nd encounter was determined to be highly significant [15].

DOPS has also been suggested for incorporation in undergraduate medical education for enhancement of clinical competencies deemed necessary for providing safe healthcare to the patients [16]. Despite the benefits, implementation of DOPS needs attention of all stakeholders for its sound execution and enhancement of its educational impact [17]. The educational impact can best be measured by correlating the scores achieved in professional assessments with frequency of DOPS assessments done. This practice would definitely prove advantageous in capacity building of our trainees.

Residents undergoing training in MS Otorhinolaryngology (ENT), Pediatrics, Plastic Surgery and Urology reflected poor score during 2nd cycle of training and their score during 2nd cycle was comparatively less than those secured during 1st cycle of evaluation. Likewise, ENT postgraduate residents of an Indian teaching hospital were also subjected to DOPS assessment following sufficient orientation and enlisting the procedures for this purpose. Similar to current study, trainees were assessed during procedure by their trainers. As this is an era of introducing innovative assessment techniques in medical education, the prime objective of practicing DOPS was to get doctors aware of it and its implications in postgraduate medical training [18]. Contrary to poor scoring of our Urology residents during 2nd cycle, Urology trainees of a teaching hospital Peshawar had significantly improved DOPS score during third phase [19]. Although feedback given during DOPS assessment considerably facilitates learners in recognition of their weak areas; however, underlying reasons for this poor score should definitely be inquired by the individual residents during one-to-one counseling session.

Although number of trainees in our study assessed by DOPS during 2nd cycle of evaluation was comparatively more, however; identifying 5 trainees as performing below expectations during 2nd cycle than only 2 categorized likewise did not make a huge differ-

ence and hence assessments done in 2nd cycle cannot be labelled as poor (Figure 3). Holistically viewing the procedural assessments on an average again revealed more trainees on borderline during 1st cycle; however, residents performing above expectations were comparatively more during 2nd cycle (Figure 3). Anyhow the difference between mean score of DOPS assessment during 1st and 2nd cycle as evident from Table 1 was statistically insignificant. Formative assessments should repeatedly be carried out to gauge learners' caliber and to motivate them for learning [20]. Just relying one-time assessment leave many lacunae unaddressed [13]. Integrating DOPS in assessment is an absolute necessity to produce competent doctors.

Conclusion & Recommendations

Significantly improved DOPS score during 2nd cycle of evaluation were revealed among trainees of Internal Medicine, Anesthesia and Gynecology & Obstetrics. Although communication skills and adherence to infection control practices of trainees were remarkable; However, DOPS assessments should periodically be carried out for enhancement of trainees' clinical competencies. The trainees should be subjected to the different procedures so that both trainers and trainees collectively can recognize residency related weaknesses and do focused training for mastering the competencies.

Limitations

The reasons for comparatively poor DOPS scores of trainees during 2nd cycle of evaluation should be sought out for strategic planning and rectification.

Conflict of Interest:

The authors declare no conflict of interest.

Source of Funding:

The author(s) received no financial support for this research.

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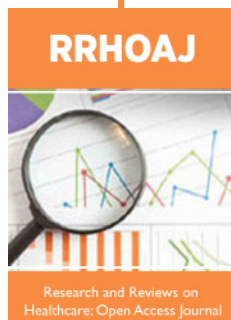
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DOI: [10.32474/RRHOAJ.2023.08.000297](https://doi.org/10.32474/RRHOAJ.2023.08.000297)



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