



## An action research to introduce direct observation of procedural skills (DOPS) as clinical skill performance assessment tool during medical internship in the department of surgery, Debre Tabor University, Debre Tabor, Ethiopia, 2023

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### Abstract

Direct observation of procedural skill (DOPS) is a work-based assessment method consisting of a supervisor observing a trainee conducting a procedural skill using structured procedural checklist and providing feedback to the trainee about their performance within an authentic workplace context. The general aim of this study was to introduce DOPS as a clinical skills performance assessment for medical interns and to explore the perceptions and the levels of satisfaction among medical interns and their assessors in their surgery clinical attachments, at Debre Tabor University, Department of Surgery, Debre Tabor, Ethiopia, 2023. The study was an action research that was conducted during surgery rotation for medical interns. Each student performed at least two procedures. Under the observation of two assessors using direct observation of procedural skills checklists designed for each procedure. Twelve medical interns were completed two procedures in one or each of the four checklists/procedures. Irrespective of the type of procedure, the DOPS performance improved significantly between the first and second assessments in all four procedures. The most common reasons why DOPS is not routinely undertaken were work overload/time constraints for assessors 8 (40%), lack of training about DOPS 5 (25%) and a combination of the two 4 (20%).

**Keywords:** Direct observation of procedural skills (DOPS), Performance assessment, Medical internship, Skill assessment, Work-place based assessment

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## 1. Introduction

According to Ethiopian medical education institutions intern doctor refers to “pre-physician” Ethiopian ministry of Health, is the author institution (Organization as an Author). In widely used sense, it is the name assigned to students who serve in a hospital for a year to acquire basic knowledge and skills before graduating from a medical school. The internship year is a key part of the transition from medical school to independent practice as a general practitioner and specialty training, and focuses on practical training under supervision from senior colleagues, who also provide the trainees with support, feedback, teaching, and assessment (Australian Medical Council, 2013).

The quality of medical students’ academic performance is an essential part of the success of the educational process (Ibrahim et al., 2018). The assessment of medical students is a complicated process with medical schools making regular changes in the assessment methodology (Hashim et al., 2012). Assessment of clinical skills is far more important and complex as it directly link with patients care (Hashim et al., 2012). Direct observation of procedural skills (DOPS), mini-clinical evaluation exercise (mini-CEX) and Case-based discussion (CBD) are some of the most commonly used methods of workplace-based assessments (Bangal, 2018). Workplace-based assessments are assessments of trainees’ performance in the workplace. Thus, in contrast to many other assessments in medical education, these assessments do not occur in artificial settings, but take place as part of the daily work. DOPS are not designed to test the person but rather provide the opportunity for that to ensure that a particular skill is performed correctly according to agreed guidelines using an agreed checklist in the workplace setting (Duffy et al., 2004). In DOPS, the trainee is evaluated regarding his or her demonstrated understanding of indications, relevant anatomy, technique of procedure, obtaining informed consent, demonstrating appropriate preparation pre-procedure, technical ability, aseptic technique, seeking help where appropriate, post-procedure management, communication skills, consideration of patient/professionalism, and overall ability to perform the procedure involving real patient encounter (Lörwald et al., 2018; Jui and Shilpa, 2021). Here is a concern that undergraduate medical students are seldom observed, assessed and given feedback during their workplace clinical attachments and their procedural skill performance. Traditionally, log books with a list of procedures performed have been used as an indicator of procedural competence. But, merely carrying out various procedures a prescribed number of times cannot ensure that the intern is adequately skilled. Moreover, this is self-reported and may be inaccurate. Usually, informal feedback is given by the supervising consultant which mainly focuses on technical skill.

The DOPS assessment tool was originally introduced and evaluated by the Royal College of Physicians in 2003 as one means of workplace based assessment (Wragg et al., 2003). Workplace-based assessment involves ongoing formative assessment of knowledge, clinical decision-making and procedural skills (Wragg et al., 2003). DOPS helps to identify gaps in performance and provides structured feedback (Jui and Shilpa, 2021).

DOPS, formative in nature, has been widely employed in western countries (Khanghahi and Azar, 2018). It also targets the highest level of Miller’s triangular framework for clinical assessment (Figure 1) (Khanghahi and Azar, 2018; Norcini and Mackinley, 2007; Miller, 1990). It is widely accepted that DOPS have high reliability, good validity and objectivity. It is easy to use with good feasibility but requires training for optimal reliability (Norcini and Mackinley, 2007).

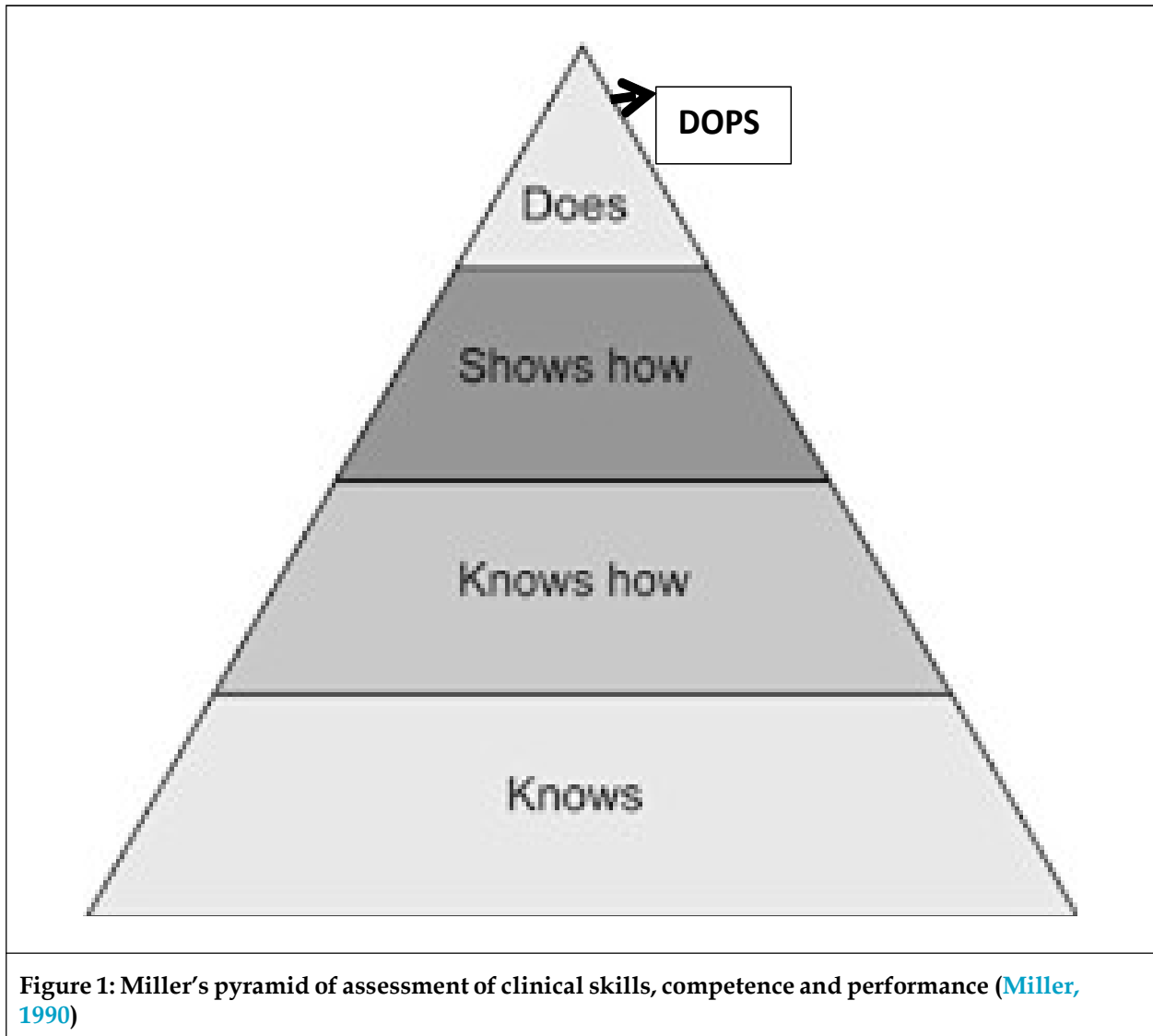
### 1.1. Basic action research questions

In order to achieve the intended objectives of action research project, the following basic research questions will be raised:

- What is the applicability of DOPS as basic procedural skills assessment in the department of surgery?
- What are the perceptions and level of satisfactions of interns and their assessors after introduction of DOPS?
- How DOPS affect the level of performance of medical intern?

### 1.2. Definition of term

- Direct observation of procedural skills (DOPS) is a work based assessment method consisting of a



supervisor observing a trainee conducting a procedural skill using structured procedural checklist, on real patients and providing formatted feedback to the trainee about their performance within authentic workplace context.

## 2. Objectives of the study

### 2.1. General objectives

The aim of this study was to introduce DOPS as clinical skills performance assessment for medical interns and to explore the perceptions and the levels of satisfaction among medical interns and their assessors in their surgery clinical attachments, in Debre Tabor University, department of surgery, Debre Tabor, Ethiopia, 2023.

### 2.2. Specific objectives

To achieve the above general objective, the study was attempted to achieve the following specific objectives:

- To introduce DOPS as clinical skills performance assessment for medical interns.
- To analyze the change in the level of performance after introduction of DOPS.
- To determine Interns' and assessors' perceptions about DOPS.
- To analyze the level of satisfaction after introduction of DOPS as assessment procedural skill assessment tool.

### **3. Research design and methodology**

In this section, design of the study, participants of the study, instruments used, and procedures of the study and methods of data analysis will be presented.

#### **3.1. Study design, data collection tools and processes**

The study was based on principles of action research project. The assessment includes basic surgical procedural skills such as securing peripheral IV line and taking blood for sample, suturing and knot tying, inserting Nasogastric Tube (NGT), inserting trans-urethral urinary catheter. The procedures was selected based on a consensus in the department of surgery and other medical education experts. Most procedures take no longer than 20 min. The assessment was performed using a standardized structured checklist prepared for each procedure to give guidance for the assessors. To determine the validity of the checklist, the content of the checklist was checked and approved by department of surgery. The assessment was not limited to the technique but included various aspects namely knowledge, consent, preparation, vigilance, infection control, technical ability, patient interaction, insight, documentation and team interaction. Assessment was performed by both general practitioners and consultants in the department of surgery. The assessors was trained in assessment of medical interns using direct observation of procedural skills (DOPS). The training was undertaken to ensure that assessors applied the same standards for every student (study participants).

All medical interns and assessors were oriented about the commonly performed procedures. The orientation and assessment was take place during the normal course of an intern's work. Each student was performed atleast two procedure (before and after DOPS feedback) under the observation of two assessors using direct observation of procedural skills (DOPS) designed for each procedures. The assessment was done in three grades (0 = Not performed at all, 1 = Performed partially (unsatisfactory), 2 = Well performed (satisfactory). Specific Verbal and written feedback about the performance using the checklist as the basis was given to the medical interns after completion of the assessment, so that the students can identify their strength, weaknesses and areas for improvement. Minimum of 60% was considered passing marks for the last procedure. If the performance is below the accepted range (below 60%) during the second assessment (after feedback was given), the intern will be asked to perform the procedure again. The result included in their portfolio as evidence of the student's performance in the department of surgery. Pre and post intervention scores were compared to find out the difference in the score. Perceptions from the interns and assessors were rated on Likert scale of 5 (strongly agree, agree, neither, disagree and strongly disagree).

#### **3.2. Questionnaire**

Data collection instruments was self administered semi-structured questionnaires for interns and their assessors. Once the DOPS interventions were completed, the questionnaire was given to students and teachers. The questionnaire had a number of statements regarding its application, perceptions, experiences, levels of satisfaction, and perceived limitations about DOPS as teaching-learning tool and feasibility of inclusion into routine work.

An informed consent was obtained and the study protocol will be explained to each participant and fully justified for them.

#### **3.3. Procedures**

An educational action research project was carried out for a period of around 10 weeks in the department of surgery. This research project was include three stages, which followed the action research spiral of planning, acting and/or observing, reflecting.

#### **3.4. Participants of the study**

The subject of the study were final year medical students (medical interns) in the academic year 2023 attaching in the department of Surgery, 4<sup>th</sup> rotation and their teachers during their fifth to tenth weeks of attachment (from April 10, 2023 to May 19, 2023).

According to the registrar office of Debre Tabor university, the number of final year medical students who are registered are 44. From them 12 students were attaching at department of surgery during fourth rotation. Therefore, the study participants were 12 medical interns and 8 of their assessors (both GPs and consultants).

### 3.5. Methods of data analysis

Analysis of the qualitative data was carried out for the purpose of meeting the objectives of the study and to compared and contrast with the finding obtained from the quantitative data. Collected data was analyzed and represented with SPSSv26.0 software including frequency, percentage values to obtain information as comparison.

## 4. Results

### 4.1. Socio-demographic characteristics of study participants

The participants included 8 assessors (3 consultants and 5 general practitioners) and 12 medical interns. The mean age of participants was 28 years with standard deviation of 3.7 with the minimum and maximum ages of 22 and 35 years respectively. Male participants were nearly twice that of female participants with males to females ratio of 1.9:1.

Variable	Group	Frequency (n), Percentage (%)	
Age	20-25	7 (35)	
	26-30	9 (45)	
	31-35	4 (20)	
	<b>Total</b>	<b>20 (100)</b>	
Sex	Male	13 (65.0)	
	Female	7 (35.0)	
	<b>Total</b>	<b>20 (100)</b>	
Role in DTU/DTC SH	Students (Medical Interns)	12 (60.0)	
	Assessors	General practitioner	5 (25.0)
		consultants	3 (15.0)

### 4.2. Study participants perceptions about DOPS

According to this study, the most common reasons why DOPS is not routinely undertaken as a work place assessment as reported from study participants were work overload/time constraints for assessors 8(40%), lack of awareness/lack of training 5(25%) and combination of the two 4(20%). 90% of interns and their teachers assumes that DOPS can increase objectivity of students skill assessment.

More than half 11(55%) and 12(60%) of participants strongly agreed that DOPS create an opportunity for pertinent feedback to a medical intern, DOPS improves student teacher relationship, DOPS should be continued in the future in other departments and DOPS is an effective teaching learning tool respectively (see Table 2).

In addition, Most of the respondents were either satisfied 12(60%) or Highly satisfied 4(20%) with DOPS assessment. staff members' satisfaction was consistent with interns' satisfaction level. Most of the respondents perceived that DOPS is simple to use and it is easy to use for assessors and interns to administer.

Variables	Response					
	Strongly disagree = n (%)	Disagree = n (%)	Neither = n (%)	Agree = n (%)	Strongly agree = n (%)	Mean (SD)
DOPS is simple to use	0(0.0)	3(15.0)	5(25.0)	5(25.0)	7(35.0)	<b>3.80*(1.1)</b>
DOPS is easy to use for assessors and interns to administer	0(0.0)	2(10)	3(15.0)	5(25.0)	10(50)	<b>4.15(1.0)</b>
DOPS assessment can be incorporated into the fabric of regular and routine interns procedural skill assessment	1(5)	1 (5)	4(20)	10(50)	4(20)	<b>3.75(1.0)</b>
There is sufficient time for assessors to observe medical interns performing skill using DOPS Methods	2(10)	2(10)	4(20)	6 (30)	6(30)	<b>3.60 (1.3)</b>
Time given for feedback was adequate	2(10)	2(10)	5(25.0)	7(35)	4(20)	<b>3.45(1.2)</b>
DOPS create an opportunity for pertinent feedback to a medical intern	0(0.0)	1(5)	1(5)	7(35)	11(55)	<b>4.40(0.8)</b>
DOPS improves student-teacher relationship	0(0.0)	1(5)	1(5)	7(35)	11(55)	<b>4.40(0.8)</b>
DOPS is an effective teaching learning tool	0(0.0)	3(15.0)	0(0.0)	5(25.0)	12(60)	<b>4.30(1.1)</b>
DOPS should be continued in the future in other departments	1(5)	0(0.0)	2(10)	6(30)	11(55)	<b>4.30(1.0)</b>

### 4.3. Comparison of pre-DOPS and post-DOPS performance of interns

#### 4.3.1. DOPS ratings for procedural skills

Among basic procedures during surgery rotation, a total of four checklists were prepared and thus, the interns were evaluated on four procedures – Securing IV line and taking blood for sample, suturing and knot tying, NG tube Insertion and transurethral catheterization. Immediately after completion last DOPS performance, interns and teachers feedback were obtained. DOPS-1 performances were considered as formative assessment. Thus, DOPS-1 assessment results were given to students. The students were allowed to practice and correct their procedure for a week and then DOPS -2 assessment was carried out. But DOPS-2 results will be included in their portfolio as evidence of the student's performance in the department of surgery (as pass or fail summative assessment. Interns scoring below 60% should repeat the procedure until they get passing marks).

#### 4.3.2. Post DOPS intervention assessment

Twelve medical interns were complete two procedures in one or each of the four checklists/procedures. Results were reported from 100%. The minimum and maximum mean score during pre DOPS assessment was observed in suturing and knot tying (49.0%) and transurethral catheterization (81.0%) Whereas during Post-DOPS performance, it was during NG tube Insertion (76.0%) and suturing and knot tying 94.50% respectively. Irrespective of the type of the procedure, the DOPS performance improved significantly between the first and second assessment in all four procedures. Thus, the overall mean DOPS score increased from DOPS-1 to 2 as shown in Table 3.

<b>Table 3: Shows pre-DOPS and post-DOPS performance of medical interns at Debre Tabor university, surgery department, 2023 (n = 12)</b>				
<b>S. No.</b>	<b>Basic procedure</b>		<b>Pre-DOPS performance (%)</b>	<b>Post-DOPS performance (%)</b>
1	Securing IV line and taking blood for sample	Maximum	85.00	96.00
		Minimum	65.00	80.00
		Mean	<b>73.5</b>	<b>87.33</b>
		Total no of interns assessed	6	6
2	Suturing and knot tying	Maximum	59.00	97.00
		Minimum	44.00	85.00
		Mean	<b>49.00</b>	<b>94.50</b>
		Total no interns assessed	6	6
3	NG tube insertion	Maximum	69.00	78.00
		Minimum	61.00	72.00
		Mean	<b>66.33</b>	<b>76.00</b>
		Total no interns assessed	3	3
4	Transurethral catheterization	Maximum	82.00	94.00
		Minimum	80.00	90.00
		Mean	<b>81.00</b>	<b>92.00</b>
		Total no interns assessed	2	2

## 5. Discussion

Directly observed procedural skills (DOPS), as a workplace-based assessment, was specifically designed to evaluate clinical skills and provide feedback. Since the method requires direct observation of trainees while doing a procedure in real life situations, it is particularly useful in evaluating the practical skills of the trainee and also gives opportunity to receive constructive feedback to improve the performance.

There is no research on the applicability of DOPS in Ethiopian medical education. Thus, the aim of this study was to introduce DOPS as clinical skills performance assessment for medical interns and to explore the perceptions and the levels of satisfaction among medical interns and their assessors.

In this study medical interns and department staffs gave positive feedbacks about Direct Observation of Procedural Skills. Likewise, a study from University of Dundee (UK), The report showed that 88.7% thought that DOPS was easy to use and administer. Students were also very positive about the opportunity that DOPS creates for feedback to a medical student (76.1%) (McLeod et al., 2011). This study also showed that 90% of interns and their teachers assumes that DOPS can increase objectivity of students skill assessment. This finding was similar to studies conducted by the Royal Australian and new Zealand Collage of psychiatrist (RANZCP, 2023).

This study also found an association between progressive DOPS practices and improved trainees' performance as many comparable finding showed similar results (Lörwald et al., 2018; Jui and Shilpa, 2021).

Furthermore, major challenges to implement this method of assessment met by participants of this study included lack of awareness and work overload. This is consistent with the other studies that showed similar feedbacks (Zainab Shafiq et al., 2019). As most of other studies also, DOPS satisfaction and practicality in this study were reported as favorable (Banal, 2018; Jui and Shilpa, 2021; McLeod et al., 2011; Wilkinson et al., 2008).

## 6. Conclusion and recommendations

As the art of medicine is a combination of knowledge, procedural skills, communication skills, clinical decision making, etc., therefore, to ensure that good and qualified doctors have been trained, the need for the application of appropriate assessment methods will be inevitable. We found significant improvement in interns' clinical skills through introduction and repeated DOPS for common surgical procedures after the exercise of DOPS at department of surgery and the method was well accepted by both the students and teachers. Another finding of this study is that medical interns and their trainers felt the DOPS assessment was objective and useful assessment tool within department of surgery. Results also showed that medical interns and department staffs gave positive feedbacks about DOPS.

Thus, DOPS can be used as a routine work based assessment method for basic practical skills in the department of surgery. Since action research is a Paradigm shift and requires continuous reflection and improvement. It is recommended that further studies will be required which would assess intern's performance in all other departments for reaching a conclusion.

## 7. Limitation of the study

In this study assessment was done in a single center with small sample size and undertaken only in a single department. Hence, further studies are required with more number of students involved.

## Conflicts of interest

The authors declare that they have no conflicts of interest.

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