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PROCEDURAL SKILLS;

LEARNING OF PROCEDURAL SKILLS IN OPHTHALMOLOGY THROUGH DIRECTLY OBSERVED PROCEDURAL SKILLS (DOPS) OR TRADITIONAL METHODS; A RANDOMIZED CONTROLLED TRIAL

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ABSTRACT... Objective: To compare the effectiveness of Directly Observed Procedural Skills (DOPS) and Traditional Method of Learning of Procedural Skills in Ophthalmology at undergraduate Level. **Setting:** Armed Forces Institute of Ophthalmology Rawalpindi. **Period:** Nov 2015 to June 2016. **Study Design:** It is an interventional study and is based on randomized pre and post-test comparison of DOPS with Traditional method of teaching & learning procedural skills. **Methods:** After obtaining informed consent; a batch of 40 students were equally assigned to interventional and non interventional study groups through stratified randomization. The Objective Structured Clinical Examination (OSCEs) was used as data collection instrument after validation. Pre and post test were taken from both groups before and after intervention. The data were analyzed using SPSS version 20. **Results:** By comparison of means of post test of two groups it was found that Post test torch examination traditional group had a mean of 5.35 and post test mean of DOPS group was 6.80 with a p value <0.05 which was significant. Post test Fundoscopy had a mean of 4.70 in traditional group and post test mean DOPS group was 6.50 with p value < 0.05. **Conclusion:** There is significant difference between the two groups and the students in DOPS group performed better than their counterparts in traditional group.

Key words: Directly Observed Procedural Skill (DOPS), Effectiveness, Learning, Traditional Method, Medical Education, Undergraduate Students.

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INTRODUCTION

Workplace based assessment has always been considered as an effective method to enhance educational impact and improve learning in medical education.[1] Teaching and learning of Medical education is different from other types of education as in medicine interaction with patient is involved.[2] Therefore not only knowledge is mandatory, but also human interaction is of foremost importance. Henceforth the concept of workplace based teaching and assessment evolved.[3] For carrying out a successful DOPS session faculty development[4] is the key to success. Despite this assumption as its effectiveness as an assessment method of formative performance, there are few published articles exploring its impact on doctors education and performance[5] and no article on its use at undergraduate level in Ophthalmology. Directly Observed Procedural Skills (DOPS) is one type of workplace based assessment tool. DOPS is not widely used in undergraduate medical education in Pakistan and around the world except by the Royal Australasian College of Physicians as part of its maintenance of professional standards program since 1994.[1] Students learn the procedure from various sources including their associates and a class senior.[5] Due to this variability in learning, they comprehend the technique in their own way and at the time of examination they perform differently.[1] They invariably consider, only the psychomotor part, neglecting the attitude part. This lack of comprehension of importance of communication skills and patient handling reflects even later on in their life. It is even more stressed due to the fact that in our undergraduate curricula, communication skills and patient handling is not being taught formally.

It is considered that out of the total procedural

skills mandatory at undergraduate level in ophthalmology if few of the skills are practiced through DOPS, it will have many advantages.[6] This training will help them comprehend the essentials of learning a procedure[7] and can serve as a scaffold for further learning of procedures.

Up to my literature search, DOPS as a tool for teaching procedural skills in Ophthalmology at under graduate level has not been studied so far. Miller[5] carried out literature search on "Impact of workplace based assessment on doctors' education and performance: a systematic review". That literature search had yielded one relevant search result as far as DOPS was concerned. It is considered that out of the total procedural skills mandatory at undergraduate level in ophthalmology if few of the skills are practiced through DOPS, it will have many advantages.[6] The students will learn the skills from a senior person in a structured manner and their communication skills will also be polished. They will also learn patient handling and gain confidence. This training will help them comprehend the essentials of learning a procedure[7] and can serve as a scaffold for further learning of procedures.

Armed Forces Institute of Ophthalmology is a premier institute for training of undergraduate and postgraduate doctors. Medical students of Army medical college Rawalpindi come for their Ophthalmology rotation to AFIO. Considering the resource constraints in terms of logistics and trained staff for teaching at undergraduate level in Armed Forces institute of Ophthalmology and the variable competency of undergraduate students who appear in their final Ophthalmology examination, it is considered necessary to modify the teaching methodology for essential clinical skills. The modification in teaching methodology cannot be carried out abruptly. Therefore this interventional study was planned to see whether the students who pass through this process attain the basic competency in that particular skill.

MATERIAL AND METHODS

This study is interventional, randomized pre and post-test and conducted for comparing DOPS with Traditional method of teaching. The study was carried out at Armed Forces Institute of Ophthalmology (AFIO) Rawalpindi. The ethical approval for this study was taken from Khyber Medical University, Peshawar and Armed Forces Institute of Ophthalmology (AFIO) Rawalpindi. Fourth year MBBS students of Army Medical College have eight weeks Ophthalmological Rotation. A batch of 40 students on Ophthalmology rotation at AFIO Rawalpindi was divided into two groups on the basis of their marks in their 2nd professional examination. 2nd Professional MBBS examination Marks of the whole batch were graded from highest to lowest and a comprehensive list was made. To distribute students of similar capabilities equally in two groups all even serial numbers were placed in group 1, and all odd serial numbers were placed in group II.

Composition of these two groups was similar statistically in all aspects as there was equal number of boys and girls, the group aggregate of marks in 2nd professional examination were almost equal. Therefore whatever was the difference between two groups after the intervention was brought by the intervention itself. Ophthalmic Torch Examination (OTE) and Fundoscopy were the skills selected for the study. These two procedures were selected because, while performing these two skills different observable steps were taken and the examiner could mark the student on the basis of performance of those steps. Another reason for selection of these two procedures was the importance of these two skills in practical life. Twelve items were developed for OTE and Fundoscopy separately, and the experts grade them on the basis of their importance and relevancy for teaching the skill. By using universal agreement calculation method[8], Item-level content validity Index (I-CVI) and scale-level content validity index ((S-CVI/UA) were determined for both.

Based on the opinion of experts as mentioned earlier, DOPS structured teaching scheme was devised. A form for each procedure is created.[8,9,10] Each student was allowed to perform the procedure on a patient; 5 minutes were given to complete the procedure and once he/she finishes, a feedback was given to the student.

On an average it took 7 minutes to complete the procedure on each student. A group of seven students were engaged, one performing and others observing. With this modification time spent by each student was shortened and students observing the procedure were able to comment on the performance of their colleagues. Structured OSCE marking scheme was employed for both pre test and post test. All students were judged on the basis of these parameters and scores were awarded accordingly.

Both batches were assessed on the format of OSCE for two selected procedures. To minimize bias, a cross over technique was used. The students of Traditional group were taught the procedure by DOPS method and students of DOPS group were taught the procedure by traditional method.[15] Performance of each group was compared. Means of pre test and post test were taken for Ophthalmic Torch examination and Fundoscopy along with Standard deviation. Minimum and maximum marks in each group were also determined. Through SPSS version 20, paired sample T test was applied on each of the eight groups and results were tabulated.

RESULTS

This study was conducted on Forty students (n=40) of 4th years MBBS at Rawalpindi Medical College. There were 14 male students and 6 female students in each group. These 40 students were randomly divided into two groups. Both groups had equal number of students (20 in each group). Considering these parameters, the groups were similar. Two procedures (Torch examination and fundoscopy) were selected as per its importance in the field of Ophthalmology. Group I were taught the procedures through DOPS and Group II were taught through traditional method. They were assessed through OSCEs. Mean scores of two groups were recorded. Difference among interventional (DOPS) and non-interventional group (Traditional) was insignificant (p=0.6, p=0.7) at pre test. However, both groups showed statistically significant difference among mean scores of post –test for both procedures (p= .001) as shown in Table-I.

	Groups	Mean	N	Std. Deviation	Std. Error Mean	Sig. (2-tailed)	P value
Pair 1	Pretest Torch exam Traditional group	2.50	20	.607	.136		
	Pretest Torch exam DOPS group	2.60	20	.503	.112	.606	>.05
Pair 2	Pretest Fundoscopy Traditional group	2.55	20	1.146	.256		
	Pretest Fundoscopy DOPS group	2.65	20	.813	.182	.725	>.05
Pair 3	Pretest Torch exam Traditional group	2.50	20	.607	.136		
	Post test Torch exam Traditional group	5.35	20	.745	.167	.001	<.05
Pair 4	Pretest Torch exam DOPS group	2.60	20	.503	.112		
	Post test Torch exam DOPS group	6.80	20	.894	.200	.001	<.05
Pair 5	Pretest Fundoscopy Traditional group	2.55	20	1.146	.256		
	Post Test Fundoscopy Traditional group	4.70	20	.864	.193	.001	<.05
Pair 6	Pretest Fundoscopy DOPS group	2.65	20	.813	.182		
	Post test Fundoscopy DOPS group	6.50	20	.827	.185	.001	<.05
Pair 7	Post test Torch exam Traditional group	5.35	20	.745	.167		
	Post test Torch exam DOPS group	6.80	20	.894	.200	.001	<.05
Pair 8	Post Test Fundoscopy Traditional group	4.70	20	.864	.193		
	Post test Fundoscopy DOPS group	6.50	20	.827	.185	.001	<.05

Table-I. Comparison of mean scores between and with in subjects

DISCUSSION

DOPS as a teaching and learning tool is very useful for teaching of selected essential procedural skills at undergraduate level in Ophthalmology. It creates a supervised direct learning environment that is essential for continuing professional development.[11] Essential and selected clinical encounters, that are relevant to students overall curriculum can be taught at workplace and the interaction between students and their teachers provides an invaluable learning experience.

This study was carried out to compare the effects of DOPS and traditional methods of learning procedural skills in Ophthalmology at under graduate level. The results indicate that the DOPS is more effective in learning the selected procedural skills than traditional methods of teaching. These findings were confirmed by the Shahgheibi et al[12] study carried out to assess the DOPS effect on the evaluation of clinical skills of internship course students in maternity units. In their study students' mean scores which were evaluated through DOPS had significant difference in comparison with the control group. In our study a slight modification was made in the DOPS method. We made groups of seven and in that group each student was told to perform the procedure in front of other colleagues. This resulted in even more consolidated learning as shown in results. Naghma N[1] in her narrative review of 30 articles concluded that DOPS is a useful tool for assessment of procedural skills. Here DOPS had been used for assessment while in my study I have used DOPS as learning tool to teach procedural skills. That also concluded that the use of DOPS is most prevalent amongst surgical residents due to the higher frequency of procedures and DOPS is not widely used in undergraduate medical education. In contrast my study is done on undergraduate medical students. Bazrafkan[77] study published in 2009 showed that the students' scores in DOPS test had normal distribution and 87.6% of students earned acceptable scores. Contrary to my study, it was not compared with traditional method and only highlighted the usefulness of DOPS. In this study there was an ascending trend in two procedures' scores in intervention group.

Wang et al[13] evaluated the clinical skills development of nurses through DOPS and mini-CEX. It showed that these methods enhance development of skills, learning strategies, and attitude toward hospital functioning. And this resulted in improvement of the quality of interventions performed by nurses in their practices. This study did not compared DOPS with other teaching and learning tools as I have done but It indicated that student passing through this intervention had better skill development to deal with their patients. Wang and Lin[14] in their study found no significant correlation between students' demographic variables and clinical skills scores but total average of scores as compare to their last performance had significant correlation with IV catheterization procedure score. It indicates the improvement in procedural skills in this group of students. In this study comparisons in control manner was not done as I did in my study.

Salimi et al[15] in their study found no difference between male and female students' performance of clinical skill but there was a significant difference between average of last semester and clinical skills mean scores in intensive units amongst the same group of students when taught through DOPS. It also shows that better theoretical background and higher average scores have direct effect on skill learning. They compared the scores with last semester results. Since it was not a control trial, there could be other reasons for improvement of grades of students.

Liu C[16] in his publication concluded that if DOPS is incorporated in a structured program of teaching of doctors, can promote active, learner-centered learning. Aim of this publication was to highlight the importance of DOPS. It was a scholarly article and comparisons were not done to prove a hypothesis in contrast to my work.

Imanpur M. Jalili M[17] work showed that DOPS is a suitable evaluation method to assess the students' procedural skills objectively. It has high validity, reliability and acceptability. In the study it was recommended that to evaluate all aspects of the students' performance the DOPS test should be combined with other clinical performance tests.

In it different students groups were assessed and their perception about DOPS was sought and conclusions were drawn. As compared to this study my work is more specific, controlled and group selection is randomized to minimize the bias.

The finding of our study strongly supports that procedural skills can be learned better through DOPS. Learning of procedure occurs as a natural part of the training environment[18], which minimizes the artificiality of the task. In our hospitals, there is plenty of opportunity to select cases for this purpose. The evaluation is recorded on a structured checklist[19,20] that enables provision of developmental verbal feedback to the students immediately afterwards. Students and trainers can identify and agree strengths, areas for development and an action plan for each encounter can be formulated. The modified strategy of DOPS, in which group of 6-7 students are called to perform the procedure has extra advantage of repetition for each student and performance in front of other students helps them to gain confidence. Overall time taken for each student is also reduced once the procedure is performed five times in a single session.

CONCLUSION

This study showed that using DOPS improved the students' scores in clinical procedural skills. In our setup we teach the procedures as a theory. Students make an imaginary picture of the procedure. Some of the students perform themselves on patients, while other memorizes it for examination. There is a theory-practice gap. Resultantly during examination we find students who are not able to even turn on the Ophthalmoscope, what to talk about using it. On the other hand there are students who perform the examination properly. There is a wide gap in between these two groups. Our attempt is to narrow down this gap so that an average student is able to perform the procedural skills adequately and become a safe doctor.

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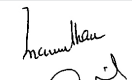
AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Inam ul Haq	HIU designed study, collected and analyzed the idea, Edited all drafts of paper.	
2	Brekhna Jamil	BJ helped in generation of idea, edited all drafted of paper.	
3	Misbah Durrani	DM helped in collection of data, edited all draft papers including final draft.