

## A Study of Role of Does Miller Pyramid Simulation of Diagnostic Nasal Endoscopy Increase the Chance of Better Diagnosis of Nasal Pathology: A Performance Based Assessment

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### Abstract:

**Introduction:** The medical students are poor in psychomotor skills at the level of phase II. They are not exposing to any surgical skills given in the books. They are having knowledge by cognition. They are up to the second level of millers pyramid. Our aim is use does performance shows how is based the medical students perform skill based procedure in simulation skill lab. Diagnostic nasal endoscopy is easily to be performed with zero degree endoscope at three levels. First, second, third, passes to be trained and assessed for do gives their clinical internals during their end postings.

**Objective:** (1) Skill based assessment of medical students at the phase of 2 during ENT postings, to improve their internal assessments. (2) Technology enhanced assessment in medical education.

**Materials and Methods:** Phase 2 Medical students allowed to simulation lab for 1 hour per day, with 10 students. Diagnostic nasal endoscopy, first pass, second pass, third pass are trained. Then demonstration, observation, procedural skills assessed before objective structured practical examinations (OSPE) and after OSPE with checklist and scoring done with rating scale 1. Excellent: 8-10; Competent: 5-8; Incompetent 0-5. The students were separated with six groups and each group with 25 students.

**Results:** Before direct observation of procedural skills (DOPS) pre-test score percentage was < 5 =71.7%; 5-8 =28.3%. But the post test score percentage was improved < 5 = 28.6%, 5-8 = 39.85% and 8-10 = 31.88%. Also the mean simulation scores of post test scores were significantly increased comparatively than pre-test in all the groups.

**Conclusion:** Medical student's allowed early clinical exposure to hands on training by DOPS method. The simulation based training influences on student's technical skills in otolaryngology.

**Keywords:** Simulation, Clinical Skills, Cognitive, Medical Education, Mannequin.

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### Introduction

In medical education profession numerous availability of technology like simulation and simulators, information technology and mobile computing devices has given way for more exciting prospect to strengthen and broaden the range of competencies. [1] The use of mannequin training and simulated patients has resulted in an increase of students perception of knowledge and confidence with clinical skills in medical patients. Recent changes to the training schemes in many surgical specialties mean that the work hours spent between senior house officer and consultant has been reduced. [2] Medical education considers multiple phase of learning, such as knowledge, attitude, and skill. Medical education brings knowledge about numerous diseases through by traditional teaching tools including small group discussions (SGD) and

lectures. Traditionally, study was earned by observing through the faculty clinical sessions, ward, outpatient department (OPD) and operation theatres. Also the evaluation was done by case presentations, written tests and viva voce examinations. The initiations of student's curriculum through competency-based medical education (CBME), should express practically, and certified by the faculty after the session.

ENT (Ear, Nose and Throat) emergencies can often be life-threatening without emergency management. In hospital emergency department, junior resident doctors are attending immediately than senior consultants. [3] The patient safety issues are primary fact comes to emergency. Use of simulation based teaching tools in laparoscopic

surgery, emergency resuscitation, essential clinical skill and endoscopy. Simulation helps in improving the function of cognitive, psychomotor and confidence levels. [4] Otoscopy included as a core competency in the CBME curriculum and through simulation each student can perform otoscopy before completing their medical course. [5,6] Modern learning theory characterizes self-directed learning methods was more efficient. Students are studying about the efficacy of endoscopic sinus surgery simulator (ES3) as a training tool and its successful integration. [7] Students are taught ENT anatomy using physical models, ENT diseases examination by watching video recordings, and are taught the principles of common ENT surgery using a computerized mannequin. [8] The aim of our study was to a performance based assessment of does simulation of diagnostic nasal endoscopy increase the chance of better diagnosis of nasal pathology in medical students.

### Materials and Methods

**Study design:** The prospective study was conducted during August 2023 - January 2024. Phase II medical students (150) were separated and allowed that A, B C, D, E and F group. Each group consists of 25 students. Per day 10 students one hour during clinical posting allowed for simulation lab and trained diagnostic nasal endoscope. All students each group was trained with zero degree endoscope in Mannequin. At the end of the posting dates are framed for objective structural practical examination with a check list. The absent students were excluded from the study. The final study students were 138. The study was approved by Institutional Ethical Committee (IEC-SVMCHRI.)

**Inclusion Criteria:** Phase II medicals student are allowed during their clinical posting.

**Exclusion Criteria:** Phase I medical students and phase III part 2 medical students.

Then students were assessed before objective structured practical examination (OSPE) and after

OSPE with rating scale. Details of the intervention of direct observation of procedural skills (DOPS) demonstration 1) Check list framed. (A) Holding of 0 degree endoscope (B) Gloves wearing technique (C) Sterilization of endoscope (D) Direction of first pass (E) Identification sphenoidal recess (F) Identification osteomeatal complex (G) Identification septal deformities (H) Reposition of endoscope (I) Interpretation of varies video clippings (J) Charts identification 2) Time framed ; 4 minutes per student allowed for OSPE by DOPS method.

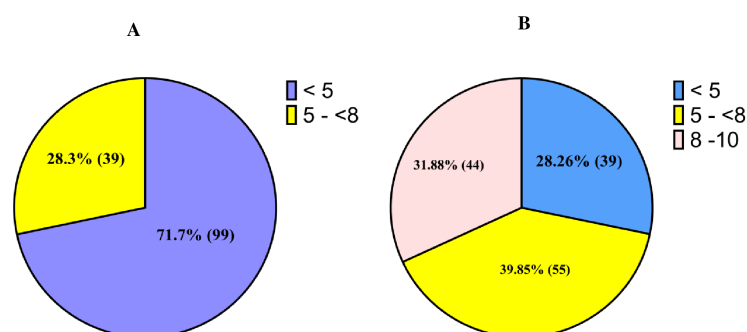
**Outcome Assessment:** A) The students are assessed before OSPE and after OSPE and scored based on score rating scale framed. 1. Excellent 8-10, 2. Competent 5-8, 3. Incompetent 0-5. B) Medical student's phase II are allowed early clinical exposure to hands on training by DOPS method C) Medical students acquiring confidence and interest in surgical procedure.

### Data Analysis

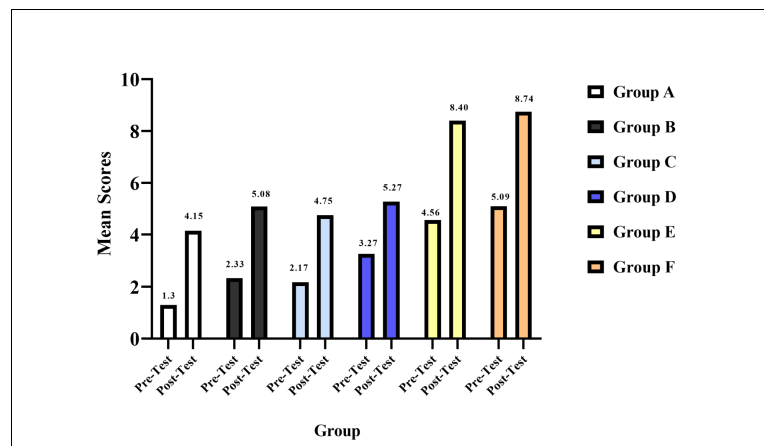
The scores were analyzed using Microsoft Excel and SPSS15 software. Pre and post scores were analyzed using Pearson Chi square test.  $p < 0.05$  was considered as significant between the group.

### Results

The OSPE was performed before DOPS demonstration. Then DOPS was introduced with endoscopy and all other parameters demonstration then OSPE was performed. Before DOPS pre test score was  $< 5 = 71.7\%$ ;  $5-8 = 28.3\%$  (Figure 1A) and the post test score was significantly improved. The post test score was  $< 5 = 28.6\%$ ,  $5-8 = 39.85\%$  and  $8-10 = 31.88\%$  (Figure 1B). The post test score was significantly ( $p < 0.000$ ) observed than pre test score (Figure 2). Also the mean simulation scores of post test scores were increased comparatively than pre test in all the groups.



**Figure 1: Direct observation of procedural skills (DOPS) percentage scores for the students before and after pretest. A) Pre test (before DOPS) B) Post test (After DOPS)**



**Figure 2: Simulation scores of OSPE comparing the mean of pre and post test. The post test score was significantly ( $p < 0.000$ ) observed than pre test score.  $p < 0.05$  was significant by Pearson Chi square test**

## Discussion

Otolaryngology is an area involved technical characteristics, required to develop with a wide variety of skill sets in high standard. The endoscopic sinus surgery becomes a proficient in performing. The surgeons can apply visuospatial anatomical information, pathological properties, and developed endoscopic and surgical ability within a high structured environment in the operating theatre [9] and it requires more hours of conscious practice, enhancement in knowledge and exposure. Surgical training is fast and competency-based, objective and effect based curriculum plan and assessments to give training body with reproducible evidence of surgical competence. So, interest in simulation method to enhance training to allow experience, standardization of skill and influentially increase safety of the patient. Simulation-based medical education (SBME) depicts trainees to clinical setting in the teaching environment to allow purposeful practice with no risk to patients. It can vary in their scope and commitment, from setting of polytrauma disaster response that involving large numbers of simulated patients and learners. To inexpensive, low-fidelity tonsil tie simulators operate by one learner and trainer. [10-11]

Simulation-based method is a self-learning, evaluation of practical tool for teaching clinical protocol and is accepted by many institutes. [12] The simulators augment experience in learning and enhance confidence. Also simulation offers relaxed, realistic and controlled environment that will gives opportunity for learner in multiple attempts without compromising patient safety. [13] In our study, the students were underwent pre test OSPE and then the intervention of DOPS simulation for nasal endoscopy and post test OSPE was given to the students with rating scale. All the students experienced DOPS simulation and convinced as a better tool for teaching practical skills. A study related the practice of learning

otoscopy by traditional and simulation method. About 71% responded well and improved in confidence of diagnosing pathology of the ear. After this session, 70% respondents developed interest in Otorhinolaryngology specialty. [12] Various ear diseases was shown to the students and assessed in a simulated environment, the student have a chance to pause, restart and repeat the skill. [14] A simulation type study included 60 third-year undergraduate medical students in the department of ENT for clinical posting with 32 (53%) girls and 28 (47%) boys. In each step of otoscopy procedure, post scores was significant improvement than pre test scores in five parameters from seven.<sup>[5]</sup> Therefore using simulations as a tool for procedural skills and can use as a suitable method to teach skills with objective learning in ENT that are achievable and assessed.

## Conclusion

Medical student's phase 2 is allowed early clinical exposure to hands on training by DOPS method. Medical student's training through simulation has acquiring confidence and interest in surgical endoscopy procedures can increase the chance of better diagnosis of nasal pathology in ENT department.

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#### **Author's contributions**

SA: Conception and design, data collection and analysis, interpretation of data, drafting and final approval.

SK: Data analysis, interpretation of data, drafting and final approval.

#### **Abbreviations**

OSPE - Objective structured practical examinations; DOPS - Observation of procedural skills; CBME - Competency-based medical education; SPSS - Statistical Package for the Social Sciences

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