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RESEARCH ARTICLE
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OUTPATIENT TEACHER DEMONSTRATION VERSUS PEYTON'S METHOD IN ACQUISITION OF CLINICAL SKILLS IN OTORHINOLARYNGOLOGY BY PHASE III PART II MEDICAL STUDENTS

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ABSTRACT

Background

The acquisition of clinical skills is essential in medical education, particularly in fields like otorhinolaryngology. Various teaching methods have been used to enhance skill acquisition , but the effectiveness of structured methods, such as Peyton's Four-Step Method, compared to traditional outpatient teacher demonstration(OPTD) methods remains unclear. Peyton's teaching approach is a stepwise teaching approach and consists of the following four steps: Demonstration, Deconstruction, Comprehension and Performance. It is more effective when small groups with few students per teacher are used. Peyton's four-step method has several advantages over OPTD including faster learning, increased confidence and higher competency in students. This study aimed to compare the effectiveness of outpatient teacher demonstration method and Peyton's Four-Step Approach in the acquisition of clinical skills in undergraduate otolaryngology students

Methods

Total of 40 undergraduate students were randomly assigned to four groups. GP1, GP2, GP3, GP4. Six clinical skills in otorhinolaryngology were taught over six days, with one skill introduced per day. After each session, students were assessed in their performance in clinical skills,OSCE scores and confidence through Objective Structured Clinical Examinations (OSCE) based on a checklist of key competencies and participants feedback and perceptions were assessed through a Likert-scale.

Results

Results showed that Peyton's four-step approach is definitely suitable for teaching clinical examination skill. Even though retention of clinical skills was found to be equally good ,but it was superior with PFSA than with OPTD.Students who received training with Peyton's Four-Step Method performed significantly better in the OSCE compared to students who got training with traditional out patient teacher demonstration method.Statistically significant difference was obtained proving that Peyton's Four-Step approach as more effective tool in teaching and assessing students.Assessment of all 6 skills found to be significant with P <0.001. Both groups showed an increase in self-reported confidence, but Peyton's group reported a higher mean increase in confidence.

Conclusion
The study demonstrates that Peyton's Four-Step Method is more effective than the traditional OPD method in improving the clinical skill performance and confidence of undergraduate otolaryngology students. The findings suggests that more structured, interactive teaching approaches should be considered in clinical education to enhance skill acquisition

Keywords: GP - Group, OPTD- outpatient teacher demonstration, PFSA- Peyton's four-step approach.

INTRODUCTION

Otorhinolaryngology is a surgical specialty that encompasses a wide range of conditions aided by procedural clinical skills to diagnose and manage patients[1]. Multiple studies have shown that ear, nose and throat (ENT) teaching at undergraduate level is taught poorly, with medical school curricula often being limited to one or two weeks of teaching directed to the specialty[2]. Acquisition of procedural skill is an important element in health professions education Conventional method is poorly structured and often fails to achieve a uniform standard in the achievement of basic clinical examination skills. There has been a global awakening over the last decade in terms of achieving learner-centered constructive education rather than persisting with the conventional teacher-oriented behavioristics approach. Peyton's four-step approach is one of the newer structured instructional approaches for teaching-learning, especially for imparting procedural and complex psychomotor skills. This recent teaching approach for the acquisition of procedural skills was presented by Walker and Peyton. However, one could assume that the step-by-step approach would require considerably more time for teaching.

PFSA is effective even for training large groups.PFSA comprises four steps, namely,' Demonstration' where in trainer perform the skill at a normal speed and without additional comments, while the trainee observes. The second step is 'Deconstruction' in which the trainer repeats the skill step by step, with the necessary explanation. In the next step, trainers explains each step and instructs the trainee, who performs the steps on command which is 'Comprehension'. The last step is' Performance' wherein the trainee performs the entire skill by self [3]. The traditional teaching approach consist typically of two steps (demonstration and practice). The additional two steps might be assumed to be time-consuming. PFSA combines attention, performance observation, feedback, motor imagination, and two way dialogue[4]. Medical school teacher's all over the world are now increasingly using this method to teach procedural and psychomotor skills to undergraduates[5]. It has been seen that the imparting of knowledge does not always and necessarily translate into clinical skill mastery, using the traditional bedside teaching technique[6]. Levin et al. opined that the approach for teaching clinical and procedural skills to medical undergraduates is gradually shifting towards a structured learner-centric approach[7]. Teaching complex motor skills at a high level remains a challenge in medical education[8]. Acquisition of procedures is an important element in health professions[9]. Traditionally, clinical skills training in medicine can be summarized under the adage 'see one, Do One, Teach One', meaning that the trainees, after observing a particular procedure once, are expected to be capable of performing that procedure followed by being able to teach another trainee how to conduct that procedure[10]. Due to the often lack of time resources, the important last step "Teach One' 'is often omitted. Le. Duca et al. explained the gap in the present curriculum in imparting clinical examination skills to medical students[11]. Hence, there is a need to explore and analyze whether structured instructional pedagogies will fare better in teaching the acquisition of clinical examination skills to medical students.

PFSA is a proven and effective tool, consisting of two-way dialogue, active learning and feedback in imparting clinical skills to students. This study aims to analyse whether PFSA is effective in imparting the acquisition and retention of clinical examination skills to medical students. The present study undertaken to compare the effectiveness of Conventional outpatient teacher demonstration with Peyton's method in acquiring clinical skills in otorhinolaryngology among phase III part II medical students.

RESEARCH OBJECTIVES

1. To evaluate the psychomotor skills acquired by two teaching methods using OSCE check list.
2. Comparing OSCE scores between two groups of students.
3. To evaluate students' self-assessment, confidence and perception on Peyton's and outpatient teacherr demonstration method.

MATERIALS AND METHODS

This study is a **comparative randomized controlled trial** designed to assess the efficacy of two teaching methods, Outpatient Teacher Demonstration (OPTD) and Peyton's Four-step Approach (PFSA), in the acquisition of clinical skills in undergraduate students of Otorhinolaryngology. The study will evaluate the effectiveness of these teaching methods on student's performance in clinical skills, OSCE scores and confidence through Objective Structured Clinical Examinations (OSCE) and participants feedback, self-assessment and perceptions will be gathered by feedback forms, which will be in the form of closed ended questions **(LIKERT SCALE)**.

Peyton's Four – step Approach involves:

1) Demonstration of the skill by the instructor (Step1)
2) Instructor performs skill by explaining each step in detail, while students observe(step2)
3) Students perform the skill while instructor explain each step(step3)
4) Students perform the skill independently(step4)

Sample size

The total undergraduate students involved in the study were Forty. So there were a total of 6 exposures. The sampling method adopted was convenience sampling.

Settings and study population

The study was conducted in the ENT OP of MES Medical College hospital from October 2024. Under graduate students of phase III part II, posted in ENT were included in the study after getting informed consent. Data collection was successfully completed by late December 2024.

Data collection

A detailed proforma including basic demographic details of participants, a statistically validated OSCE checklist to assess the acquisition of clinical skills taught using two different teaching learning methods.

Method of study

Students were divided into four groups 1,2,3,4 (ten students in each group). Students are randomly allotted to each of the groups. Six interventions are planned- for these six clinical skills to be demonstrated in simulated patients which includes,

1) Ear speculum examination.
2) Otoscopic examination.
3) Nasal speculum examination
4) Tuning fork test,
5) Indirect laryngeal mirror examination
6) Ear syringing

The study commenced after getting approval from the institutional ethics committee(No.IEC/MES/F12/2024) dated on 30-09-2024.Four teachers/ facilitators were chosen from the department in order to carry on the intervention. The principal investigator acted as preceptor for all the encounters. An introductory class was taken for all the involved undergraduates and Faculties,

where objectives of the study and plan of its conduct were dealt with . So that they taught all the groups in both the method in same manner.

Outpatient rooms (OP) were divided into OP1,2,3,4 and Students were randomly grouped into GP1, GP2, GP3, GP4. 10 students were there in each group and per outpatient department. One clinical skill covered per day over the course of six days. On first day, clinical skill taught was Ear speculum examination. GP1 and GP2 students received a traditional method of teaching and GP3 and GP4 students received Peyton's Four -step method of teaching. On second day, GP3, GP4 students received traditional method of teaching and GP1, GP2 students received Peyton's method of teaching. Clinical skill taught was Otoscopic examination. Third day, Ear syringing was taught for GP1 and GP2 students in Peyton's method and GP3 and G4 students in traditional method. Tuning fork test was taught for GP3 and GP4 students in Peyton's method and GP1 and GP2 students in traditional method on Fourth day. On fifth day GP1 and GP3 received traditional method of teaching and GP2 and GP4 received Peyton's method of teaching in Nasal speculum examination. Sixth day, Indirect laryngeal mirror examination was taught for GP2 and GP4 students in traditional method and GP1 and GP3 students in Peyton's method. So total of 6 exposure.At the end of each teaching day students were assessed using an **Objective Structured Clinical Examination (OSCE).** The OSCE were conducted according to a predefined checklist to ensure standardized assessment of skills. The checklist included specific criteria relevant to each clinical skill being taught. After the OSCE assessment, individual feedback were provided to each student , outlining areas of strength and areas requiring improvement. Participants feedback and perceptions will be gathered by feedback forms, which will be in the form of closed ended questions **(LIKERT SCALE)**.Cross over done post assessment.

Days	**Skills**				
		OPD1	**OPD2**	**OPD3**	**OPD4**
1	Ear speculum	G1(TD)	G2(TD)	G3(P)	G4(P)
2	Otoscopic examination	G3(TD)	G4(TD)	G1(P)	G2(P)
3	Ear syringing	G2(P)	G1(P)	G4(TD)	G3(TD)
4	TFT	G4(P)	G3(P)	G2(TD)	G1(TD)
5	Nasal speculum	G1(TD)	G3(TD)	G2(P)	G4(P)
6	Indirect laryngeal mirror examination	G2(TD)	G4(TD)	G1(P)	G3(P)

Table 1 shows the distribution of groups and teaching learning sessions for six days

GPI-GP4(Groups), TD- Teacher demonstration, P-Peyton's

Statistical Analysis

Data were entered into Microsoft Excel sheet. Analyzed using SPSS software. The mean and standard deviation of OSCE scores were calculated for each group and the mean scores were compared between the outpatient teacher demonstration method and Peyton's method using unpaired t test (student t test).

RESULTS

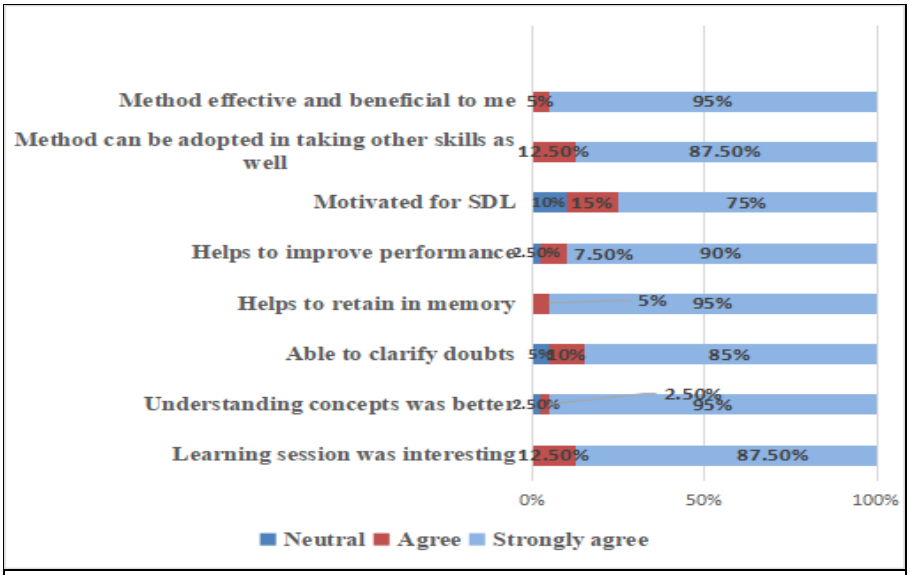
Both OPTD method and PFSA method were found to be effective tool for teaching clinical skills.Mean value of all assessed skills of PFSA method were better than OPTD method . There was a statistically significant higher OSCE scores on all six ENT skills in PFSA compared to OPTD method, proving that PFSA as more effective tool in teaching and assessing students .All 40 students were randomly selected into 4 groups and skills were taught and assessed. For ear speculum examination , mean value of 3.375 for OPTD method and 4.825 for PFSA method, In Otoscopic examination, mean value is 3.175 and 4.900 for OPTD method and PFSA method respectively.In Ear syringing skill, OPTD method has a mean value of 3.225 and mean value of PFSA is 4.850. Tuning fork test assessment shows a mean value of 3.100 for OPTD and 4.900 for PFSA method, In Nasal speculum examination mean value obtained are 3.175 and 4.825 for OPTD and PFSA method respectively. Finally for ILS examination assessment, mean value for OPTD method is 3.975 and 4.900 for PFAS method.So assessment of all 6 clinical skills found to be significant with $P < 0.001$ suggesting that PFSA method is more effective than OPTD

method . Entire results are consolidated in table 2 below.

For analyzing the perception of students towards OPTD and PFSA methods, a Likert scale was given for all the students to fill and return which contain eight questions . The responses are consolidated in Annexure ii below. While assessing answers to first question, it was found that most of the respondents indicated strongly agreement with the idea that PFSA method was easier than OPTD method . For better understanding the observations were plotted with percentage of students opined marked on the graph, as a divergent stack bar and is given in figure 2 below

Skill assessed		Traditional method	Peyton's method
Ear speculum examination	Mean (SD)	3.375 (0.4253)	4.825 (0.2936)
	T Score (P VALUE)	T=12.54 (P =0.000)	
Otoscopic examination	Mean (SD)	3.175 (0.2936)	4.900 (0.2052)
	T Score (P Value)	T =21.53 (P =0.000)	
Ear syringing	MEAN (SD)	3.225 (0.324)	4.850 (0.2351)
	T Score (P Value)	T=18.97 (P = 0.000)	
Tuning fork test	Mean (SD)	3.100 (0.3479)	4.900 (0.2052)
	T Score (P Value)	T=19.92 (P=0.000)	
Nasal speculum examination	Mean (SD)	3.175 (0.2447)	4.825 (0.2447)
	T Score (P Value)	T=21.32 (P=0.000)	
ILS	Mean (SD)	3.975 (0.9525)	4.900 (0.252)
	T Score (P Value)	T=4.24 (P=0.000)	

Table 2: Assessment Score



Graph 1 showing perception of students using Likert scale

DISCUSSION

Results indicate that students taught using Peyton's Four-Step Method performed significantly better in objective structured clinical examinations (OSCE) compared to those taught using the traditional OPD method. Additionally, both groups reported an increase in confidence post- training with the Peyton's Four -Step Method group showing a higher increase in confidence, although there was no significant difference in overall satisfaction between the groups. The superior performance of students in Peyton's Four-Step Method group may be attributed to the structured, step-by-step approach that emphasizes gradual learner involvement, from observation to independent practice. The possible long-term comprehension advantage of Peyton's teaching approach has been discussed in a study conducted by Heermann-Werner et al.in 2013.[12] This method encourages active participation and helps students internalize the skills more effectively. In the Peyton's Method, students were actively engaged in the learning process compared to the OPTD group, where students had limited involvement in the demonstration phase. The opportunity for students to practice under guidance and receive immediate feedback likely contributed to their improved performance and confidence. Previous studies have shown that active learning approaches, such as Peyton's method are effective than traditional method of demonstration of clinical skills in improving clinical skills acquisition. It has found out that structured teaching methods led to better retention of clinical skills and higher performance in OSCEs, which aligns with this findings. Recently, Krautter et al.[3] were able to prove the effectiveness of Peyton's Four Step Approach for the teaching of gastric tube insertion using a mannequin. A broad range of approaches were identified such as : Halsted Teaching, 2-stage teaching approach, Orde's 2-step method. Study conducted by Gradl-Dietsch et al[13.] stated that however, all of the standard teaching approaches have in common that they did not include the third step of Peyton's teaching approach (guiding the teacher through the procedure), which is beneficial for skill acquisition.

On the other hand, OPD based traditional method of teaching is still widely used in clinical education due to its simplicity and ease of implementation. However its effectiveness may be limited when compared to more interactive methods that involve the learner more actively in the skill development process.

Based on the results of this study, teachers should consider adopting more structured , interactive methods like Peyton's Four-Step Method to improve the acquisition of clinical skills in undergraduate students with the necessary guidance to master complex procedures and build confidence in their abilities. Also institutions could benefit from incorporating active learning strategies into their clinical training programs to enhance both technical skills and student engagement. Instructors should also be trained in providing effective feedback during the guidance phases to optimize learning outcomes. One of the strength of this study is the randomized controlled design, which minimizes the bias and increases the reliability of the results. The use of an OSCE to assess clinical skills provided a standardized and objective measure of student performance, further strengthening the validity of the findings. Another strength is the use of two distinct teaching methods, which allowed for a clear comparison of their effectiveness in a real-world clinical training setting.

Future studies could investigate the long-term impact of Peyton's Four Step Method on clinical skills retention and performance in real clinical environments. Follow -up assessments several months after training could provide valuable insights into whether the gains made in the short term are sustained over time. Further research could explore student's perceptions of different teaching methods, particularly focussing on their views on engagement, confidence and the learning process.

LIMITATIONS

While 40 students is a reasonable sample size, the generalizability of the findings may be limited by the relatively small sample size. A larger sample could provide more robust evidence and potentially highlight more subtle differences between the teaching methods

This study was conducted at a single institution, and the results may not be applicable to other settings with different teaching environments or student population.Only simulated cases were used for the study.

The use of the OSCE as the primary outcome measure, while objective, may not capture all aspects of clinical competence, such as communication skills or decision-making under pressure. Including a broader range of assessment tools like video review, peer assessment may provide a more comprehensive evaluation of the teaching methods.

CONCLUSION

This study suggests that Peyton's Four-Step Method is a more effective approach for teaching clinical skills in otorhinolaryngology compared to the traditional OPD method, as it leads to better performance and increased student confidence .This highlights the importance of adopting structured, interactive teaching methods in clinical training to improve learning outcomes. Further research is needed to explore the long-term effectiveness and applicability of these methods across different clinical settings

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REFERENCES

1. Acharya V, Haywood M, Kokkinos N, Raith Atha A, Francis S, Sharma R. Does focused and dedicated teaching improve the confidence of GP trainees to diagnose and manage common acute ENT pathologies in primary care? Adv Med Educ Pract. 2018;9:335. DOI: 10.2147/AMEP.S155424
2. Khan MM, Saeed SR. Provision of undergraduate otorhinolaryngology teaching within General Medical Council approved UK medical schools: what is current practice? J Laryngol Otol. 2012;126(4):340-4. DOI: 10.1017/S0022215111003379
3. Krautter M, Weyrich P, Schultz JH, Buss SJ, Maatouk I, Junger J, et al. Effects of Peyton's four-step approach on objective performance measures in technical skill training: a controlled trial. Teach Learn Med. 2011;23(3):244-50. DOI: 10.1080/10401334.2011.586917
4. Moran A, Guillot A, Macintyre T, Collet C. Re-imagining motor imagery: building bridges between cognitive neuroscience and sport psychology. Br J Psychol. 2012;103(2):224-47. DOI: 10.1111/j.2044-8295.2011.02068.x
5. Patil GL, Pujar TV, Seema BN, Patil SL, Nayak SR, Chigateri S. Clinical skill learning for tomorrow's doctors: a step towards better obstetric care. Int J Reprod Contracept Obstet Gynecol. 2016;5(5):1832-3.
6. Benbassat J, Baumal R, Heyman SN, Brezis M. Viewpoint: suggestions for a shift in teaching clinical skills to medical students: the reflective clinical examination. Acad Med. 2005;80(12):1121-6. DOI: 10.1097/00001888-200512000-00012
7. Levin M, Cennimo D, Chen S, Lamba S. Teaching clinical reasoning to medical students: a case-based illness script worksheet approach. MedEdPORTAL. 2016;12:10445. DOI: 10.15766/mep_2374-8265.10445
8. Seifert LB, Schnurr B, Seu MCS, Sterz J. Comparing video-based versions of Halsted's 'see one, do one' and Peyton's 4-step approach for teaching surgical skills: a randomized controlled trial. BMC Med Educ. 2020;20(1):194. DOI: 10.1186/s12909-020-02105-5
9. Grantcharov TP, Reznick RK. Teaching procedural skills. BMJ. 2008;336(7653):1129-31. DOI: 10.1136/bmj.39517.686956.47
10. Sopka S, Biermann H, Rossi AM, Knott S, Skorning M, Brokmann JC, et al. Evaluation of a newly developed media-supported 4-step approach for basic life support training. Scand J Trauma Resusc Emerg Med. 2012;20(1):37. DOI: 10.1186/1757-7241-20-37
11. Duca NS, Glod S. Bridging the gap between the classroom and the clerkship: a clinical reasoning curriculum for third-year medical students. MedEdPORTAL. 2019;15:10800. DOI:

10.15766/mep_2374-8265.10800
12. Herrmann-Werner A, Nikendei C, Keifenheim K, Bosse HM, Lund F, Wagner R, et al. "Best practice" skills lab training vs. a "see one, do one" approach in undergraduate medical education: a randomized controlled trial. PLOS ONE. 2013
13. Gradl-Dietsch G, Lübke C, Horst K, Simon M, Modabber A, Sönmez TT, et al. Peyton's four-step approach for teaching complex spinal manipulation techniques—a prospective randomized trial. BMC Med Educ. 2016;16(1):284. DOI: 10.1186/s12909-016-0804-0