

Effectiveness of Capsulated Training during Internship in Otolaryngology: A Pilot Study

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Conflict of interest: Nil

Abstract

Background: This educational research project evaluated the impact of a focused, three-day “capsulated” training module on medical interns in the Otolaryngology department at Burdwan Medical College, Burdwan. The study aimed to assess whether such structured, competency-based training improves interns’ knowledge and skills more effectively than conventional methods.

Materials and Methods: Over a 2-months period, 32 interns were divided into two groups:

Group A (control): received standard internship training.

Group B (intervention): underwent the capsulated training covering core ENT competencies such as history taking, informed consent, and managing emergencies.

Both groups were assessed through pre- and post-tests (written questionnaire and OSCE). Then we took feedback from all of them after their completion of internship.

Result: While Group A had no significant improvement, Group B demonstrated statistically significant gains in both theoretical knowledge and clinical skills ($p < 0.001$). Participant feedback from 32 interns indicated positive reception of the training, with average ratings between 3.4 and 3.5 out of 5 for various aspects of the program.

Conclusion: The study concludes that capsulated training effectively enhances learning outcomes in ENT internships. It recommends broader integration of such structured, simulation-based modules into internship programs to bridge the gap between academic learning and clinical practice. However, limitations such as small sample size and limited OSCE stations suggest a need for further studies on a larger scale.

Keywords: Capsulated training; Internship; Otolaryngology.

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Introduction

Medical education is evolving rapidly to meet the increasing demands of competency, patient safety, and effective clinical performance in healthcare systems worldwide. The transition from classroom learning to clinical practice remains a critical challenge in undergraduate medical education, particularly during internship periods where students are expected to integrate theoretical knowledge into clinical settings.

Interns often experience an abrupt shift from passive learning to active patient care responsibilities, which can result in variability in their practical competence and confidence. This gap is particularly evident in specialized fields such as Otolaryngology, where interns need to master specific clinical skills related to diagnosis and management of ear, nose, and throat (ENT) disorders. Otolaryngology demands a precise combination of cognitive knowledge, psychomotor skills, and communication abilities due to the

complex nature of ENT conditions and procedures. Traditional internship models typically rely on passive observation and ad-hoc clinical exposure, which may not consistently develop core competencies in a structured manner. Competency-Based Medical Education (CBME) emphasizes outcome-driven education with clear objectives, providing a solution to this gap by focusing on mastery of key competencies before progression [1] (Frank et al., 2010).

Simulation-based training and Objective Structured Clinical Examinations (OSCEs) have emerged as valuable tools in medical education, offering low-risk environments for skill acquisition and performance assessment [2] (Issenberg et al., 2005). A capsulated training program, defined as a short, intensive, and focused training module, represents a pragmatic intervention that addresses time constraints during internships while enhancing structured learning opportunities. Prior research

indicates that such targeted training can significantly improve knowledge retention, clinical skills, and learner confidence [3] (Zendejas et al., 2013).

This study aims to evaluate the effectiveness of a capsulated ENT training program in improving both the theoretical knowledge and clinical competencies of medical interns during their ENT rotation. The program specifically focuses on three core competencies: patient history elicitation, informed consent, and management of ENT emergencies, using a combination of didactic sessions, simulated environments, and OSCE-based assessment.

Methodology

Study setting: This prospective study was conducted in the Otolaryngology department of Burdwan Medical College & Hospital, Burdwan for from February, 2025 to May, 2025. The interns who undergone internship programme in Otolaryngology during the month of March, 2025 and April, 2025 were included in this study.

Inclusion and Exclusion criteria (if any): All the interns working in the department of Otolaryngology during the month of March, 2025 and April, 2025 were included in our study.

Sampling Method

Sample Size: In each batch usually 8 interns are posted in our department for 15 days. So, in two months we will get total of 32 interns with 8 interns in each batch.

Data Collection Tool (if any) & Validation: Pre-test and post-test questionnaire and OSCE, Student's Feedback form. The abovementioned tools were validated by the coordinator and members of MEU of our college.

Data collection procedure/methodology: We started our study after getting Institutional Ethics Committee approval. By this time, we came across three MBBS Batches who have undergone new CBME curriculum. Usually, the internship posting of one group of students in Otolaryngology is for 15 days only. Interns coming to our department in 2 months were included in our study. We will divide the interns in two groups:

Group A: Consists of first two batches posted in the Otolaryngology department in the first month of the study period.

Group B: Consists of 3rd and 4th batches of interns who will work in otolaryngology in 2nd month of our study period. Before starting internship all the interns of both Group A and Group B were assessed with a pre-test questionnaire and OSCE.

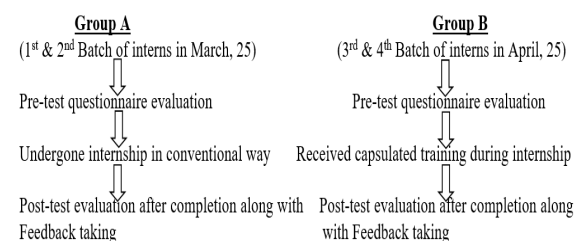
Group A interns were not undergone capsulated

training during their internship and they undergone internship in the conventional way in otolaryngology. This group was taken as control group. Their competency level was re-assessed by post-test questionnaire and OSCE on 15th day of their internship. We don't train the first two batches as there may be mixing of knowledge when they will mix up with their peers.

3rd and 4th batch of interns who were posted in Otolaryngology department in the second month during our study period, undergone capsulated training during first three days of their internship. This group was the study group.

In the capsule training course, we trained them on three specific basic core competencies in ENT listed below as there was a scope of teaching and assessing all three domains of learning from these competencies:

1. Elicit document and present an appropriate history in a patient presenting with an ENT complaint (EN 2.1)
2. Counsel and administer informed consent to patients and their families in a simulated environment for Ear: Tympanoplasty, mastoidectomy, Myringotomy Nose: FESS, Septoplasty, Nasal Bone Reduction Throat: Adenotonsillectomy, Foreign Body Removal from Airway and Food passage, Tracheostomy. (EN 2.9)
3. Identify, resuscitate and manage ENT emergencies in a simulated environment (including tracheostomy, anterior nasal packing, removal of foreign bodies in ear, nose, throat, and upper respiratory tract and food passages). (EN 2.10).



Then they were re-assessed by post-test questionnaire and OSCE on day 15th of their internship to evaluate their level of competencies. Because of time constrain, we assessed only anterior nasal packing by OSCE from 3rd competency.

Now we assessed the Pre and post-test improvement of each group separately to assess improvement of each group. Along with that we compared the post-test assessment of two groups (Group A & B) of interns in terms of improvement in the level of competencies.

At the end, we took feedback from every interns. After the study period was over, we arranged extra

time for Group A interns in 1st and 2nd batch to train them in the same way as the 3rd and 4th batch of interns.

Ethical Aspects /IEC: After getting Institutional Ethics Committee approval (vide Memo no.: BMC/IEC/472 dated 25/02/2025) from our Institute, we started our study.

Data Analysis: First, we assessed the pre-test to post-test improvement of each group separately and the data were compared and analyzed by Wilcoxon signed-rank test. Then, the post test result of both the groups were compared and analyzed by Mann-Whitney U test to measure whether there was any statistically significant change in the level of knowledge, skill and attitude at the end of otolaryngology internship if they receive capsulated training or not. Feedback was also analyzed by Likert's scale.

Observation &Results: The study compared two groups of MBBS interns – Group A (G-A, control) and Group B (G-B, intervention) – to evaluate the effect of a capsulated ENT training program during internship. Each group included 16 interns. Pre- and post-test scores were measured using questionnaires and OSCEs.

Within-Group Comparisons:

Group 1 (Control)

- Questionnaire Scores: No statistically significant improvement (Wilcoxon W = 22.5, p = 0.530). Mean score change was negligible.
- OSCE Scores: No statistically significant improvement (Wilcoxon W = 20.0, p = 0.821).

Group 2 (Capsulated Training):

- Questionnaire Scores: Significant improvement from a mean of 2.375 to 8.875 (Wilcoxon W = 0.000, p < 0.001).
- OSCE Scores: Significant improvement from a mean of 3.250 to 8.688 (Wilcoxon W = 0.000, p < 0.001).

Between-Group Comparisons:

Post-Test Questionnaire

- Group B significantly outperformed Group A (Mann-Whitney U = 0.000, p < 0.001).

Post-Test OSCE

- Again, Group B showed superior performance (Mann-Whitney U = 0.000, p < 0.001).

The boxplot visualizes the stark contrast between the two groups' pre- and post-test questionnaire scores, clearly showing marked improvement in Group B due to the capsulated training.

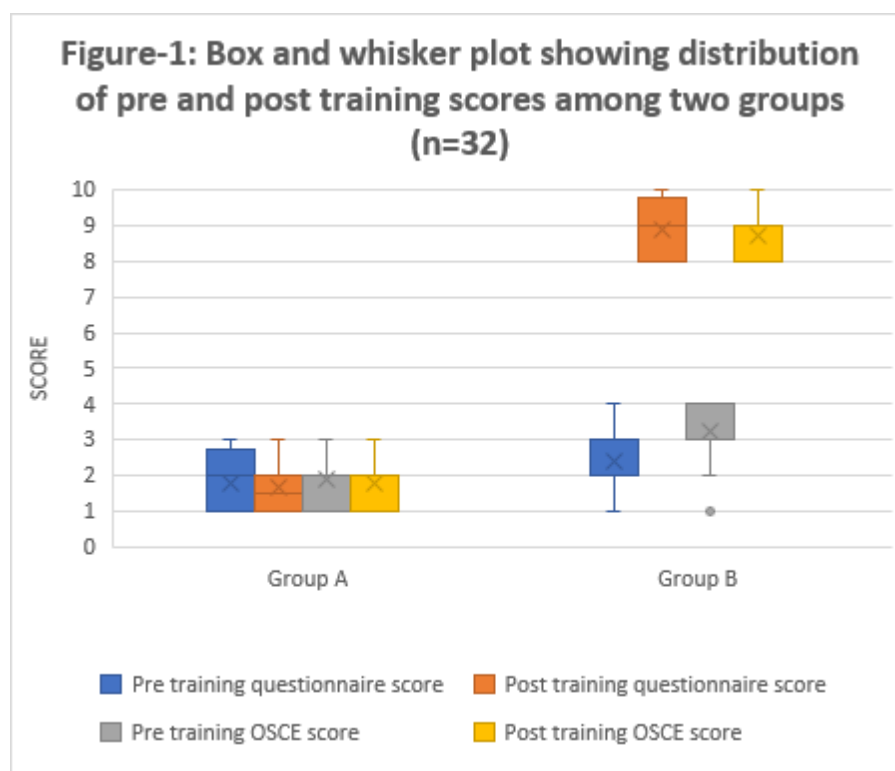


Figure 1: Box and whisker plot showing distribution of pre and post training scores among two groups

The error bar plots above demonstrate the contrast between groups in terms of learning gains, both in knowledge (questionnaire) and practical skills (OSCE).

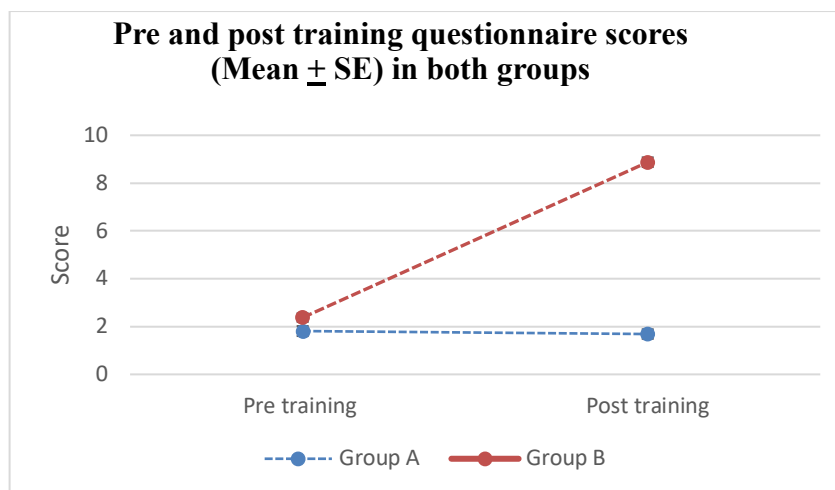


Figure 2: Pre and post training questionnaire scores (Mean + SE) in both groups

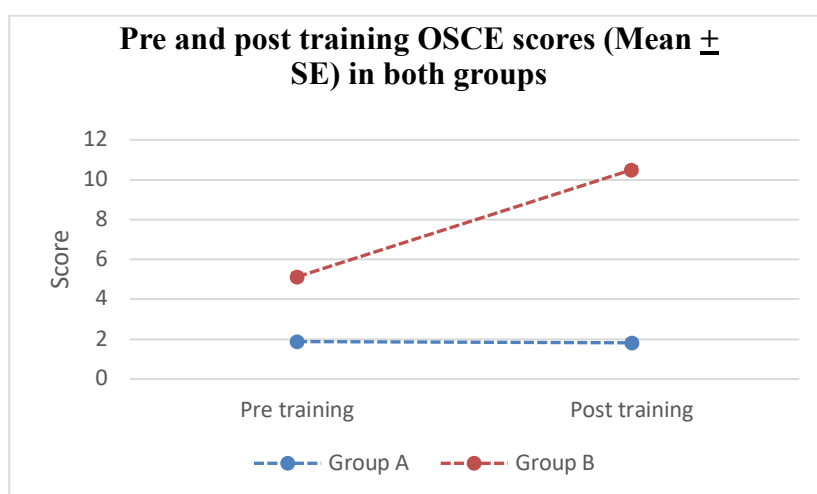


Figure 3: Pre and post training OSCE scores (Mean + SE) in both groups

The feedback form received 32 responses. Overall, participants rated the training positively, with average scores ranging from 3.4 to 3.5 out of 5 across various aspects:

- Overall quality: 3.44
- Content relevance: 3.47
- Effectiveness in improving knowledge/skills: 3.44
- Quality of materials: 3.41

Discussion

The findings of this study reveal a significant improvement in knowledge and practical skill among interns exposed to capsulated ENT training, compared to those undergoing conventional internship training. Statistically significant improvements were observed in both pre- and post-test questionnaire scores as well as OSCE performance, highlighting the effectiveness of structured, competency-based training over passive clinical exposure. The superior performance of the intervention group supports the growing body of evidence endorsing CBME in medical education [1] (Frank et al., 2010). The deliberate alignment of

learning objectives with measurable outcomes, as per the National Medical Commission (NMC) guidelines in India (Medical Council of India, 2019) [4], underpins the effectiveness of such capsulated training approaches. This aligns well with the competence model by Epstein and Hundert (2002) [5], which emphasizes cognitive, technical, and integrative abilities as central to professional competence.

Simulation-based learning plays a pivotal role in bridging the gap between theory and practice [2] (Issenberg et al., 2005). By simulating clinical scenarios such as anterior nasal packing or informed consent procedures, interns were able to gain hands-on experience in a risk-free environment. Studies by McGaghie et al. (2010) [6] and Okuda et al. (2009) [7] similarly confirmed that simulation enhances clinical performance and learner confidence, reinforcing the approach used in our capsulated program. Effective direct observation tools are critical for valid assessment of clinical skills. Kogan et al. (2009) [8] underscored the need for validated tools to objectively assess medical trainees during clinical

encounters. Although this study used OSCE stations to measure skill acquisition, adding workplace-based assessments would have improved the overall reliability of competence evaluation, as workplace assessments are more reflective of real-world performance [9] (Norcini & Burch, 2007).

G. Norman (2005) [10] in Medical Education discusses advancements in understanding clinical expertise, highlighting that it relies on both formal/experiential knowledge and pattern recognition rather than generic problem-solving skills. The paper reviews progress in areas like the role of illness scripts and exemplars in expert reasoning, the impact of problem-based learning, and improvements in performance assessment through simulations and objective structured clinical examinations (OSCEs).

Moreover, integrating principles of deliberate practice [11] (Ericsson et al., 1993) and using validated frameworks like the Kalamazoo consensus for communication skills [12] (Duffy et al., 2004) may strengthen training design.

The use of validated assessment tools plays a critical role in the objective evaluation of clinical competence in medical education. Kogan et al. (2009) [8] emphasize the importance of implementing direct observation tools that are validated and structured to improve the accuracy and reliability of clinical skills assessment. In our study, although we employed OSCE stations to assess psychomotor and cognitive domains, the incorporation of validated workplace-based assessment tools would have provided a more comprehensive evaluation of interns' performance in real clinical settings. This would have further strengthened the assessment of competencies beyond simulated scenarios, allowing for a more authentic reflection of clinical practice performance.

Additionally, Harden and Laidlaw (2017) [13] advocate for essential skills in medical teaching that promote structured learning, active engagement, and continuous assessment in clinical education. Our capsulated training approach incorporated structured teaching modules, deliberate practice sessions, and hands-on simulated practice, reflecting these educational principles. This method not only aligns with Harden and Laidlaw's recommendation of structured and systematic educational interventions but also ensures that interns actively participate in skill acquisition and knowledge consolidation, which is more effective than passive observational learning.

Moreover, the concept of simulation in medical education, as highlighted by Khan, Pattison, and

Sherwood (2011) [14], supports the view that simulation-based strategies enhance experiential learning and offer safe environments for practice without risk to patients. In our study, simulation was a cornerstone of the capsulated training design, particularly for managing ENT emergencies and practicing informed consent in a controlled environment. This aligns well with Khan et al.'s assertion that simulation provides opportunities for repetitive practice, immediate feedback, and focused skill development, which contribute to improved learner confidence and competence.

Collectively, these references underscore the need for validated assessment frameworks, structured teaching methodologies, and simulation-based strategies to effectively bridge the theory-practice gap in medical education. Future iterations of the capsulated training program should integrate these validated tools and educational frameworks to enhance its effectiveness and ensure that assessment of competence is both reliable and reflective of clinical reality. Participant feedback further strengthens the positive perception of capsulated training. Ratings of 3.4 to 3.5 out of 5 suggest general satisfaction with the program's content and delivery. Previous research by Bhatnagar et al. (2020) [15] and Swamy & Sumanth (2015) [16] similarly highlighted the positive reception of structured, skill-based training among medical interns.

The role of feedback in clinical education is well documented. Cantillon & Sargeant (2008) [17] and Hattie & Timperley (2007) [18] emphasize that structured feedback is essential for learning and skill development. Although feedback was gathered via Likert scales in this study, more in-depth qualitative feedback and direct observation could have further enriched the data.

Moreover, the importance of structured and effective feedback in clinical training cannot be overstated. As discussed by Watling et al. (2017) [19], a strong professional culture influences the effectiveness of feedback in learning environments, highlighting that not only the provision of feedback but also the context and manner in which it is delivered affect trainee development. In this study, the feedback collected via structured Likert-scale questionnaires offered a useful, albeit limited, assessment of interns' perceptions of the capsulated training program. Nevertheless, the study is subject to certain limitations. The small sample size (n=32) and inclusion of only one OSCE station limit the generalizability and scope of clinical competencies assessed. Van Der Vleuten et al. (2012) [20] argued that programmatic assessment using multiple tools and stations provides a more comprehensive evaluation of clinical competence, which was not fully achievable in this study due to time constraints. Moreover, the absence of long-term

follow-up to assess knowledge retention and real-world application further restricts our ability to assess sustained impact.

Conclusion

Capsulated training in otolaryngology significantly enhances learning outcomes in terms of both theoretical knowledge and practical skills among medical interns. Interns exposed to structured, competency-aligned training showed marked improvement in both cognitive and psychomotor domains, supporting the integration of such modules into the routine internship structure. Expanding such interventions across specialties could elevate the overall quality of undergraduate medical education in India. Integrating such modules into routine internship programs could bridge the gap between undergraduate learning and real-world clinical competency. Future studies with larger cohorts and multiple OSCE domains are recommended for broader validation.

Limitation of the study

Sample size was very small. Duration of study was also very limited. Longterm follow up is required to evaluate the effectiveness of the intervention.

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