Research Article

Ear, Nose, And Throat (ENT) Emergency Training In Undergraduate Medical Education

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ABSTRACT

Background:
Ear, Nose, and Throat (ENT) emergencies are common in clinical practice and require prompt recognition and management. However, undergraduate medical training often provides limited exposure to such conditions. The aim of present study is to assess about Ear, Nose, and Throat (ENT) emergency training in Undergraduate Medical Education.
Materials and Methods: This observational study was conducted among 150 final-year students and interns using a structured questionnaire assessing exposure, comfort level (Likert scale), and knowledge through validated questions. Statistical analysis was performed using SPSS version 25.0, descriptive and inferential methods, including Chi-square test, t-test, and Spearman's correlation.
Results:
A majority (82.7%) of students received formal ENT teaching, with moderate to extensive clinical exposure in 61.3% participants. The mean knowledge score was 6.4 ± 1.5, with interns scoring significantly higher than final-year students ($p = 0.002$). Students reported higher confidence in managing ear infections but lower confidence in airway emergencies. A moderate positive correlation ($r = 0.42$, $p < 0.001$) was observed between knowledge and confidence levels.
Conclusion:
Despite adequate exposure, gaps persist in critical emergency competencies, highlighting the need for enhanced practical training and curriculum strengthening.

Keywords: airway management, clinical exposure, ENT emergencies, knowledge assessment, medical students, undergraduate medical education.

INTRODUCTION

Emergency services are an integral part of clinical medi cine and it is considered as an indicator of providing quality health care. Ear, nose and throat (ENT) emergencies are common in all secondary and tertiary care hospitals. Early diagnosis and management result in reduction in morbidity and mortality [1]. Access to ENT emergency services may vary from country to country and are either an open access ENT emergency clinic where patients do not require a referral to be seen or a referral based ENT emergency clinic where patients are usually seen by general physicians prior to referral. [2]

ENT emergencies require specialized anatomical knowledge, trained personnel and special instruments and equipments to manage the patients [3,4]. They can be of various types and range in severity from trivial complaints of sore throat to severe respiratory distress or brain abscess. The ear and nose are in close proximity to the brain and the nose is also closely related to the orbit. Therefore, delayed treatment of infections of the nose and ear may result in intraorbital or intracranial complications leading to high morbidity or mortality.[5] It is essential for primary care providers, as well as all graduating medical students, to be competent in recognizing and managing basic ENT conditions, knowing when to refer to an otolaryngologist, and to feel comfortable treating patients with otolaryngologic complaints.[6]

For students aiming to pursue a career in primary care, this education is important as they reported the lower levels of confidence when dealing with common ENT complaints.[7,8] Previous literature showed that the prevalence of otolaryngologic presentations in general practice does not match the extent of teaching and exposure in undergraduate medical education. Considering that the course duration does not exceed 3 weeks in many medical schools, the lack of knowledge is reflected by students' diagnostic abilities and management

skills.[9] As stated, all graduating doctors will be dealing with patients with ENT cases regardless of their specialties. Therefore, medical schools' curriculum developers should be obligated to enrich students with basic ENT knowledge, describe the variety and the complexity of the field, and when to refer in case of problems surpassing the knowledge of doctors of different specialties.[10,11]
Hence the present study is conducted to assess about Ear, Nose, and Throat (ENT) emergency training in Undergraduate Medical Education.

MATERIAL AND METHODS

The present observational study was conducted at a medical college among undergraduate medical students for a period of one year. Ethical clearance for conducting the research was taken from institutional ethics committee of college before commencement of study. Written informed consent was taken from participants after explaining them about the study.
Through simple random sampling the students of final year and interns were selected for the study on the basis of inclusion and exclusion criteria.
The sample size was calculated using the standard formula for prevalence studies, assuming a 95% confidence level, 50% expected proportion, and 5% margin of error, yielding a sample size of 384. As the total study population was limited, finite population correction was applied, reducing the sample size to 132. After accounting for a 10–15% non-response rate, the final sample size was rounded to 150 participants.

$$n_{adj} = \frac{384}{1 + \frac{383}{200}} \approx 132$$

Adding Non-Response Rate
Add ~10–15%:
132 + 15% ≈ 150

Inclusion Criteria

- Students who had their completed ENT clinical postings in college
- Students willing to participate in the study.

Exclusion Criteria

- Students who were absent during data collection days.
- Students who does not completed the full questionnaire.

The questionnaire form was distributed manually to students, collecting the following information from respondents: present year in medical college (final/intern) , amount of exposure to ENT, (table 1) and comfort level in managing ENT cases (5 point Likert scale)(table 2), followed by 9 psychometrically validated content knowledge questions (table 3).[4]

Table 1 Exposure to ENT

Question	Response Options
Have you received formal teaching of head and neck examination?	Yes / No
Number of times head & neck examination was taught	1–2 times / 3–5 times / >5 times
Duration of ENT posting	<1 week / 1–2 weeks / >2 weeks
Clinical exposure to ENT cases	None / Limited / Moderate / Extensive

Table 2 Comfort level in managing ENT

Clinical Scenario	1	2	3	4	5
Managing epistaxis	☐	☐	☐	☐	☐
Managing airway obstruction	☐	☐	☐	☐	☐
Removing foreign body (ear/nose)	☐	☐	☐	☐	☐
Managing ear infections	☐	☐	☐	☐	☐
Performing head & neck examination	☐	☐	☐	☐	☐

Table 3 Psychometrically validated content knowledge questions

Question	Option A	Option B	Option C	Option D
A patient with severe epistaxis should first be managed by	Posterior nasal packing	Anterior nasal packing	Immediate surgery	Antibiotics
Sudden unilateral hearing loss should be initially managed by	CT scan	Steroids	Antibiotics	Observation
Peritonsillar abscess presents with	Bilateral tonsillar enlargement	Uvular deviation	Ear discharge	Nasal obstruction
Initial management of auricular hematoma	Ice packs	Incision and drainage	Antibiotics only	Observation
Benign paroxysmal positional vertigo is treated by	Antibiotics	Epley maneuver	Surgery	Sedation
Instrument used in tracheostomy tube insertion	Forceps	Obturator	Speculum	Retractor
First step in airway obstruction	Oxygen + airway assessment	CT scan	Antibiotics	Steroids
Mastoiditis is a complication of	Otitis externa	Otitis media	Sinusitis	Rhinitis
Initial management of allergic rhinitis	Steroids/antihistamines	Surgery	Antibiotics	Observation

IBM SPSS Statistics version 25.0 was used to analyse the data after entered into Microsoft Excel. Confidence levels, knowledge scores, exposure to ENT training, and demographic characteristics were summarised using descriptive statistics. While categorical data were shown as frequencies and percentages, continuous variables were given as mean ± standard deviation (SD). To evaluate relationships between categorical factors like knowledge level and exposure to ENT instruction, the Chi-square test was employed. The mean knowledge scores of two groups (e.g., interns vs. final-year students) were compared using Independent t-test.When comparing more than two groups, the Kruskal-Wallis test was employed (e.g., levels of clinical exposure). The association between confidence levels and knowledge scores was assessed using Spearman's correlation coefficient. The Shapiro-Wilk test was used to determine whether the data distribution was normal. Statistical significance was defined as a p-value of less than 0.05.

RESULTS A total of 150 undergraduate medical students participated in the study, including 54.7% final-year students and 45.3% interns, 41.3% were female while 58.7% were male, with a mean age of 23.8 ± 1.2 years as shown in table 4.

Table 4 Demographic data of participants

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	Mean ± SD	23.8 ± 1.2	—
Gender	Male	88	58.7%
	Female	62	41.3%
Year of Study	Final Year	82	54.7%
	Interns	68	45.3%

Regarding exposure to ENT training, 124 (82.7%) students reported receiving formal teaching of head and neck examination. Nearly half of the participants (48.0%) had been taught 3–5 times, while 21.3% reported more than five teaching sessions. The duration of ENT postings was 1–2 weeks for 42.7% of students, and 38.6% had postings exceeding two weeks. Clinical exposure to ENT cases was moderate to extensive in 61.3% of participants as shown in table 5.

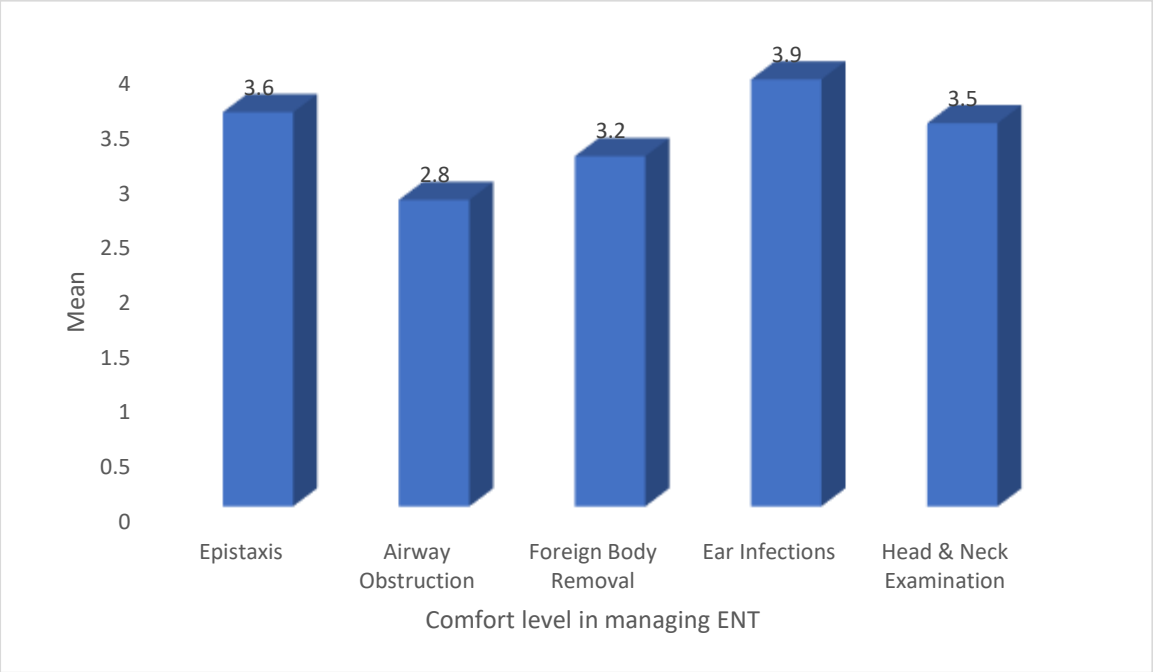
Table 5 Exposure to ENT training

Parameter	Category	Frequency (n)	Percentage (%)

Formal Teaching	Yes	124	82.7%
	No	26	17.3%
Number of Times Taught	1–2 times	46	30.7%
	3–5 times	72	48.0%
	>5 times	32	21.3%
Duration of Posting	<1 week	28	18.7%
	1–2 weeks	64	42.7%
	>2 weeks	58	38.6%
Clinical Exposure	None	12	8.0%
	Limited	46	30.7%
	Moderate	58	38.7%
	Extensive	34	22.6%

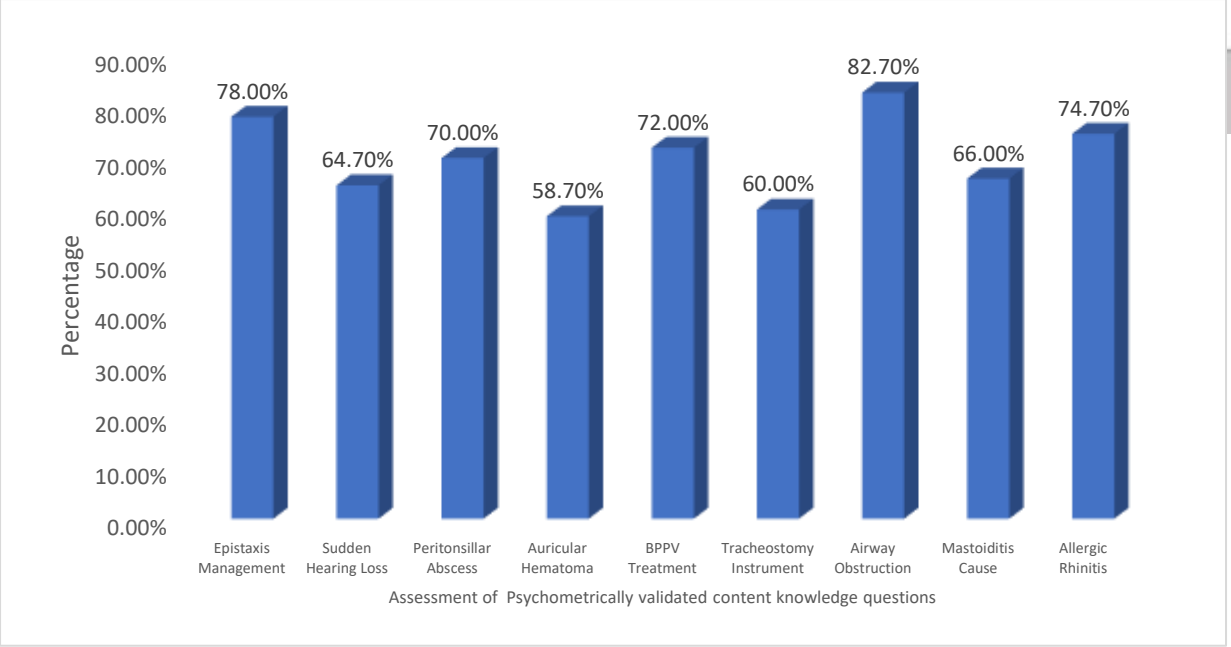
In terms of self-reported comfort level, students demonstrated higher comfort in managing ear infections (mean score: 3.9 ± 0.9) and performing head and neck examination (3.5 ± 1.0), whereas lower confidence levels were reported for managing airway obstruction (2.8 ± 1.1) as shown in figure 1.

Figure 1 Comfort level in managing ENT



The overall mean knowledge score was 6.4 ± 1.5 (range: 2–9). The highest proportion of correct responses was observed for airway obstruction (82.7%) and epistaxis management (78.0%), whereas comparatively lower correct responses were noted for auricular hematoma (58.7%) and tracheostomy instrument identification (60.0%) as shown in figure 2.

Figure 2 Assessment of Psychometrically validated content knowledge questions



Comparison of knowledge score between final year and interns showed that Interns demonstrated significantly higher knowledge scores than final-year students (6.9 ± 1.3 vs 6.0 ± 1.4; p = 0.002) as shown in table 6.

Table 6 Comparison of knowledge score between final year and interns

Group	Mean Score	p-value
Final Year	6.0 ± 1.4	0.002
Interns	6.9 ± 1.3	

A moderate positive correlation was observed between comfort levels and knowledge scores ($r = 0.42$, $p < 0.001$), indicating that increased knowledge was associated with higher self-reported confidence in managing ENT emergencies as shown in table 7.

Table 7 Correlation Between Comfort level and Knowledge

Variable	r-value	p-value
Comfort vs Knowledge	0.42	<0.001

DISCUSSION

The ENT emergency department is responsi ble for a large share of the care given in high complexity hospitals. For a number of years we have been attending to a growing demand, that is represented not only by an increase in the requests for consultations with specialists but also by an increase in the number of patients coming to the emergency ward. This can reach significant magnitude with implications for practitioners, health care managers and patients, and may result in saturation of emergency care, thus affecting the quality of care given [12]. The population increase, and the fact that the population is ageing and life expectancy is higher than before are all factors that clearly point to a need for increased medical resources both in terms of personnel as well as equipment and facilities [13]. The present study is conducted to assess about Ear, Nose, and Throat (ENT) emergency training in Undergraduate Medical Education among 150 medical students studying in a medical college.

In this study, the mean knowledge score observed in this study (6.4 ± 1.5) suggests a moderate level of understanding of ENT emergencies among participants. Students who achieved higher scores are more comfortable in handling Otorhinolaryngology cases, as well as performing head and neck exams. Also, students who had longer courses were more knowledgeable than those who attended shorter ENT courses, which is almost the same when compared to the American medical students.[7]

When surveyed about their comfort levels to manage or treat relatively common and less complex conditions, there was a higher level of comfort in managing ear infections or being able to conduct a head and neck examination than in managing an airway obstruction. This is an important difference clinically because airway

emergencies, or an airway obstruction, are considered to be an emergency and life-threatening. Therefore, it is critical to provide timely and skilled intervention to manage airway emergencies. A low level of confidence in critical clinical situations indicates that there is a lack of practical and simulation-based training experiences in students' current curriculum. A student's basic ENT competency can thus be gauged by comfort or knowledge measures. One study in the United Kingdom reported that there is a need for improvement in student confidence with ENT. The authors described confidence with ENT history-taking, physical examination, and managing basic ENT conditions as signifi cantly lower than with cardiovascular counterparts.[14]

In our study interns had higher average knowledge scores compared to final year students, (p= 0.002). There was also moderate positive correlation between the amount of knowledge obtained and the confidence level; there was a positive correlation ($r = 0.42$, $p < 0.001$) between amount of theoretical knowledge gained and level of confidence reported by the intern experiencing that knowledge gained through theoretical study. Study conducted by Alassaf HI et al [11] found that there was a statistically significant positive association between knowledge score and comfort with diagnosing or recognizing conditions related to ENT. Post hoc pairwise comparisons showed that the average knowledge score was higher with medical interns compared to all other medical students ($P < 0.05$). The average knowledge score was higher in fifth-year medical students compared to third-year medical students ($P < 0.05$) and fourth-year medical students ($P < 0.05$). Also, the knowledge score was higher in fourth-year medical students compared to third-year students.[11]

This national study of undergraduate otolaryngology education indicates that medical students frequently receive minimal targeted clinical training in otolaryngology, revealing significant variability in the experiences provided to them in this field.

The prevalence of ENT cases among patients at primary health care centers suggests a necessity for extended ENT courses in the undergraduate curriculum or postgraduate residency training programs to address the existing deficiency in the undergraduate curriculum.

CONCLUSION

This study indicates that undergraduate medical students had reasonable knowledge and exposure to ENT emergency training; yet, significant deficiencies remain in essential abilities, especially in airway control. Interns exhibited markedly superior knowledge compared to final-year students, underscoring the importance of clinical practice. A positive association between knowledge and confidence indicates that enhanced training can improve clinical readiness. Notwithstanding extensive formal education, disparities in clinical exposure reveal anomalies within existing curricula. Targeted interventions, such as simulation-based and competency-focused training, are crucial to rectify these deficiencies. Enhancing ENT emergency education at the undergraduate level is essential for optimising patient outcomes and guaranteeing proficient primary care management.

REFERENCES

1. Kitcher ED, Jangu A, Baidoo K. Emergency ear, nose and throat admissions at the korle-bu teaching hospital. Ghana Med J.2007; 41(1):9–11.
2. Yojana S, Mehta K, Girish M. Epidemiological profile of otorhinolaryngological emergencies at a medical college, in rural area of Gujarat. Indian J Otolaryngol Head Neck Surg.2012; 64(3):218–224.
3. Raj A, Wadhwa V, Jain A. Epidemiological profile of ENT emergencies: our experience. Indian Journal of Otolaryngology and Head & Neck Surgery. 2019 Oct;71(Suppl 1):301-4.
4. Reis LR, Correia F, Castelhano L, Escada P: Epidemiology of epistaxis in the emergency department of a southern European tertiary care hospital. Acta Otorrinolaringol Esp (Engl Ed). 2018; 69:331-8.
5. Cave J, Goldacre M, Lambert T, Woolf K, Jones A, Dacre J: Newly qualified doctors' views about whether their medical school had trained them well: questionnaire surveys. BMC Med Educ. 2007, 7:1-6.
6. Biswas D, Rafferty A, Jassar P: Night emergency cover for ENT in England: a national survey . J Laryngol Otol. 2009; 123:899-902.
7. Pasick LJ, Benito D, Zapanta P, Sataloff RT. Assessing medical student basic otolaryngology knowledge: a multi-institutional study. Ear, Nose & Throat Journal. 2019 Jan;98(1):44-9.
8. Naples JG, Canfarotta M, Tabtabai R, Sparks D, Parham K, Falcone T. Otolaryngology interest groups: A potential solution to the residency match crisis. Laryngoscope Investig Otolaryngol 2019;4:24-9.
9. Doshi J, Carrie S. A survey of undergraduate otolaryngology experience at Newcastle University Medical School. J Laryngol Otol 2006;120:770-3.
10. Fung K. Otolaryngology – Head and neck surgery in undergraduate medical education: Advances and innovations. Laryngoscope 2015;125 Suppl 2:S1-14.

11. Alassaf HI, ALturki AY, Almansour NM, Albdulsalam AM, Altameem RM, Alqahtani ZA, et al. Basic ear, nose, and throat knowledge among medical students: A multi-institutional study reflecting the current stage of ear, nose, and throat curriculum in undergraduate medical education. J Nat Sci Med. 2023;6:59-65.
12. Hijano R, Herna´ndez A, Marti ´nez-Arias A, Homs I, Navarrete ML. Epidemiological study of emergency services at a tertiary care center. Acta Otorrinolaringol Esp.2009; 60(1):32–37.
13. Rodrı´guez AF, Gonza´lez MJI, Sanz SF, Jaramillo GE, Banegas BJR, Rodrı´guez ML, Carbonell CA. La urgencia geria´trica frente a la urgencia en la edad adulta: Ana´lisis retrospectivo de las urgencias me´dicas de un hospital general. Med Clin (Barc).1989; 93(11):411–414.
14. Powell J, Cooles FAH, Carrie S, Paleri V. Is undergraduate medical education working for ENT surgery? A survey of UK medical school graduates. J Laryngol Otol. 2011;125(9): 896–905.