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ORIGINAL RESEARCH

The Implementation of Virtual Clinical Skills Teaching in Improving Procedural Confidence in ENT Trainees

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Purpose: Medical education has faced new challenges with the recent coronavirus pandemic. Traditional teaching methods for face-to-face learning have shifted towards the delivery of digital teaching. The difficulty arises in specialties, such as otorhinolaryngology, where clinical procedural skills are necessary for diagnosis and management. This article aims to determine the impact of a clinical skills video on the confidence of postgraduate ENT trainees when managing nasal fractures.

Patients and Methods: Postgraduate ENT trainees completed a baseline questionnaire, declaring their subjective confidence across 5 domains relating to nasal fractures using a 10-point Likert scale. They were then given a lecture, and this questionnaire was repeated. Lastly, trainees were shown a clinical skills video, and the questionnaire was repeated once more. The qualitative data was analysed using Kruskal–Wallis testing.

Results: There was poor overall confidence in the management of nasal fractures prior to focused teaching. There was a marked statistically significant ($P < 0.01$) improvement in subjective confidence following the lecture intervention. There was further statistically significant improvement across all domains following the introduction of the clinical skills video.

Conclusion: This study confirms that clinical skills videos are a useful accessible learning tool in medical education. We advocate their use in the postgraduate setting, to mirror their current use in undergraduate medical education.

Keywords: confidence, ENT, clinical skills, video, postgraduate

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] This has been a common occurrence in the United Kingdom with no marked improvement over the years.[3] Furthermore, this results in the majority of ENT trainees lacking formal teaching on the management of common Accident and Emergency presentations, such as epistaxis, nasal fractures, and upper aerodigestive tract obstruction from foreign body.

Medical education has faced a new challenge and has required adaptation in light of the recent coronavirus pandemic. Traditionally, clinical skills have been taught face-

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to-face both at an undergraduate, and postgraduate level. Internationally, this has changed with university institutions and postgraduate education moving towards digital delivery of education in order to reduce in-person contact. Teaching via video conferencing has largely been well received by students and has been shown to be effective in terms of achieving learning outcomes.[4] Many medical schools may produce clinical skills videos to aid teaching for medical students. These useful resources allow students to learn the theory and practical delivery of a procedure in their own time. Digital teaching methods, such as those described above, have been reported to be beneficial in preparing students for their clinical skills examinations.[5] In times when face-to-face teaching is being limited, clinical skills videos may have an important role to play in both undergraduate and postgraduate teaching.

After leaving medical school, clinicians must often learn several new practical skills as they rotate through various specialties that are not taught routinely at an undergraduate level. There are several clinical skills videos available on the internet through sites, such as YouTube that detail how to perform specialist procedures. However, it is important to note that the quality of these videos is highly variable.[6] A review of the literature has showed no studies have been conducted to see whether clinical skills videos are an effective method in the postgraduate setting. This study assessed the effectiveness of using a clinical skills video to teach postgraduate ENT trainees how to manage nasal fractures.

Materials and Methods

A baseline questionnaire (Appendix A) was completed by all ENT trainees within the department below registrar grade (n=12). The questionnaire was designed based upon necessary knowledge and skills required to safely manage nasal fractures. It assessed their subjective confidence in 5 domains regarding nasal bone fractures. Domains were scored on a 10-point Likert scale ranging from 0 (no confidence) to 10 (completely confident). The domains were as follows:

- Anatomy
- Focused history taking
- Examination
- Assessing and recognizing complications
- Performing a manipulation of a nasal bone fracture under local anaesthetic (LA) on their own

A face-to-face lecture was delivered on the subject and the same questionnaire was repeated. Subsequently, a clinical skills video was shown to the trainees 3 months later, and the questionnaire was repeated for a third time (Figure 1). All 3 questionnaires had a 100% response rate. The video not only included a demonstration of a manipulation under local anaesthetic on a real patient but also discussed relevant anatomy, history taking, examination and complications. In total, the video lasted 9 minutes 14 seconds.

The baseline questionnaire assesses skill and confidence acquisition after the delivery of a lecture and clinical skills video. The questions aim to determine an unbiased level of confidence in the domains mentioned above, and purely assess the confidence before and after teaching. However, it is important to note that both the questionnaire and the clinical skills video are not a validated measure of confidence and learning tool, respectively. To determine the validity of these, a formal validation study by potentially comparing to a known gold-standard method of both would be required.

Statistical analysis was performed using Kruskal–Wallis testing as data were not normally distributed. The test was used to compare scores from baseline to after the lecture and again from after the lecture to after the clinical skills video. We evaluated whether there was a statistically

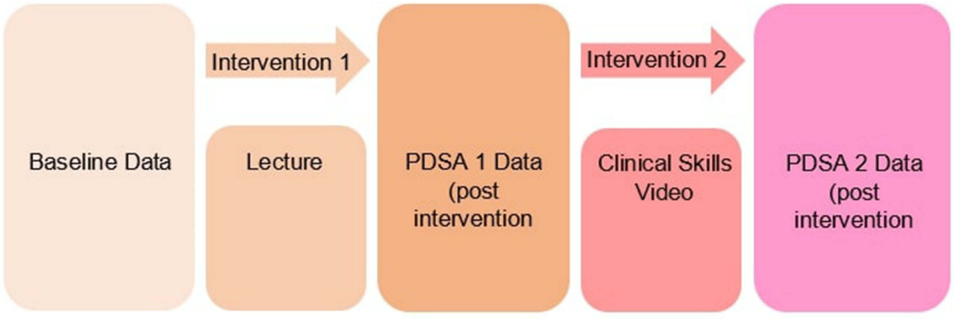

Figure 1 Data collection cycles.

significant change between the teaching interventions, which was defined as P-value ≤0.05. Effect size was calculated for baseline vs post-video data using Cohen's d, with a large effect defined as a value greater than 0.8.

Ethical approval was not required in line with NHS Health Research Authority guidelines; however, the principles of the Declaration of Helsinki were followed. Participants provided informed consent for their anonymous data to be used in any presentations and/or publications that may follow.

Results

The results report the confidence at baseline, post-lecture and post-clinical skills video, as determined by the questionnaires from the 12 trainees (Table 1). In general, there was an overall poor confidence surrounding the topic of nasal bone fractures. Trainees demonstrated almost no confidence in having the ability to perform a manipulation of a nasal fracture under local anaesthetic on their own. We performed a statistical analysis of the data using Kruskal–Wallis testing data. The results demonstrate that following the lecture, there was a statistically significant (P ≤0.01) improvement in their self-rated confidence across all domains. The average confidence in the "performing a nasal fracture manipulation under LA on your own" domain increased from 1.25 at baseline, to 6.83 post-lecture. Although these improvements were present across all domains, there was still room to increase scores further, which we can demonstrate with the post-video results. A further increase in perceived confidence occurred in all domains following the instructional video. All results were statistically significant with the greatest improvement in the "performing a nasal fracture manipulation under LA on your own" domain, with the average confidence value increasing from 6.83 post-lecture to 8.58 post-video. The effect size for this study was calculated for baseline vs post-video data and results showed a large effect across all domains.

Discussion

The General Medical Council (GMC) as part of their "promoting excellence: standards for medical education and training" programme, advocate "Learners must have access to technology enhanced and simulation based learning opportunities within their training programme as required by their curriculum".[7] Technology has certainly become an integral part of medical education, even more so during the pandemic as teaching has largely had to be given remotely.

A key aspect of medicine is the ability to perform clinical skills confidently and competently. Traditionally, this has been delivered in person as part of a small group teaching at both undergraduate and postgraduate level.[8] However, for some time, clinical skills videos have been available to medical students to help aid them in their learning. They have been well received and have been shown to be beneficial to their learning.[5] Documented advantages include maintaining greater attention and the ability to satisfy individual learning needs by pausing and rewinding.[9]

Our study aimed to determine whether clinical skills videos are an effective tool in postgraduate education. We have demonstrated that they are an asset and help the learner feel more confident which is mirrored in results from studies involving medical students. Furthermore, this method allows training to be delivered remotely, which is particularly useful during a global pandemic.[10] As we exit the coronavirus

Table 1 Summary of Trainee Domain Responses

Domain	Average Baseline Confidence Plus SD	Average Post Lecture Confidence Plus SD	Average Post Video Confidence Plus SD	Baseline vs Lecture p value	Baseline vs Video p value	Lecture vs Video p value	Baseline vs Video Effect Size
Anatomy	4.00 ± 1.81	7.25 ± 1.36	8.75 ± 0.62	P<0.01	P<0.01	P<0.01	2.60
Focused history taking	4.50 ± 2.11	7.58 ± 1.24	8.92 ± 0.79	P<0.01	P<0.01	P<0.01	2.82
Examination	4.00 ± 2.09	7.33 ± 1.44	9.17 ± 1.03	P<0.01	P<0.01	P<0.01	2.46
Assessing and recognizing complications	3.83 ± 2.29	7.33 ± 1.37	9.00 ± 0.74	P<0.01	P<0.01	P<0.01	5.09
Performing nasal fracture manipulation under LA on your own	1.25 ± 1.96	6.83 ± 1.33	8.58 ± 0.79	P<0.01	P<0.01	P<0.01	1.41

pandemic, we also anticipate clinical skills videos to be useful in countries whereby in-person practical sessions are limited either due to lack of equipment and/or availability of teachers.[11] However, we do advocate the use of blended learning where possible, using the clinical skills videos in conjunction with practical sessions as evidenced in the literature.[12]

Our study is limited by the small sample size, and further studies involving a greater number of participants would be advisable to confirm our results. Our results demonstrate that confidence values increase significantly from baseline to post-video across all domains. The greatest improvement is seen in the "performing a nasal fracture manipulation under LA on your own" domain where the confidence value increases from 1.25, to 8.58 respectively. When comparing confidence values between post-lecture, and post-video, we can see the largest increase in the "Examination" domain, where the confidence value increases from 7.33 post-lecture, to 9.17 post-video. This data suggests that certain domains benefit from a clinical skills video, specifically when considering examination, and practical procedures are better understood when the procedure can be visualised. Furthermore, upon analysis of our results overall, we can note the effect of an overall confidence increase in all domains after the delivery of a lecture and educational video. This suggests that such educational interventions are beneficial in post-graduate teaching both in increasing procedural confidence, and overall clinical knowledge. We also collected qualitative data from individuals as they ranked their confidence; however, confidence scales are not an accurate representation of objective performance. Future studies may wish to objectively assess if clinical skills videos produce objectively superior outcomes either on their own or as part of blended learning. Furthermore, we believe the possibility of creating an open-source library of high-quality skills videos accessible to all to internationally improve surgical learning should be explored.

Conclusion

Clinical skills videos are a useful tool for medical educators to employ in the postgraduate setting. They increase confidence in all areas of performing the skill in question and help to promote values deemed important within the GMC medical education and training guidelines.

Disclosure

The authors report no conflicts of interest in this work.

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