The effectiveness of cardiology e-training in improving electrocardiogram interpretation skills in junior medical trainees; a pre-post mixed methods study

Authors: Amr Elkammash[A] and Liam Ring[B]

Introduction

The COVID pandemic has seriously compromised cardiology training due to restrictions on face-to-face teaching sessions and the cancellation of learning opportunities.[1] This has compromised junior trainees' electrocardiogram (ECG) reading skills (foundation and core medical trainees). We showed such an effect in an audit we ran before starting the study. In this study, we aimed to study the effectiveness of online e-training in improving ECG interpretation skills in junior trainees.

Methods

Out of 65 trainees who participated in an audit showing a significant gap in their ECG reading skills, we randomly included

Authors: [A]Cambridge University Hospitals, Cambridge, UK; [B]West Suffolk Hospital NHS Foundation Trust, Bury St. Edmunds, UK

10 trainees who worked in a single district general hospital. We studied them in a pre-post mixed methods study pattern before and after their attendance at a 4-month ECG training course of eight online lectures broadcast on Microsoft Teams. We studied the changes in their subjective perception of confidence in interpreting ECGs independently and the difficulty level they face on reading ECGs on a 1 to 10 Likert scale (where 1 is the least confidence and difficulty, and 10 is the highest confidence and most difficulty). By the end of the course, we tested their ECG reading skills in an online exam covering the ECG training requirements of the foundation training programme.[2] We used the independent student t-test to run the statistical analysis.

Results and discussion

In total, 10% of participants were at FY1, 60% at FY2, and 30% in the CT1–2 training year. The participants' confidence in the independent reading of the ECGs significantly increased after the implementation of the e-training model. The perceived difficulty
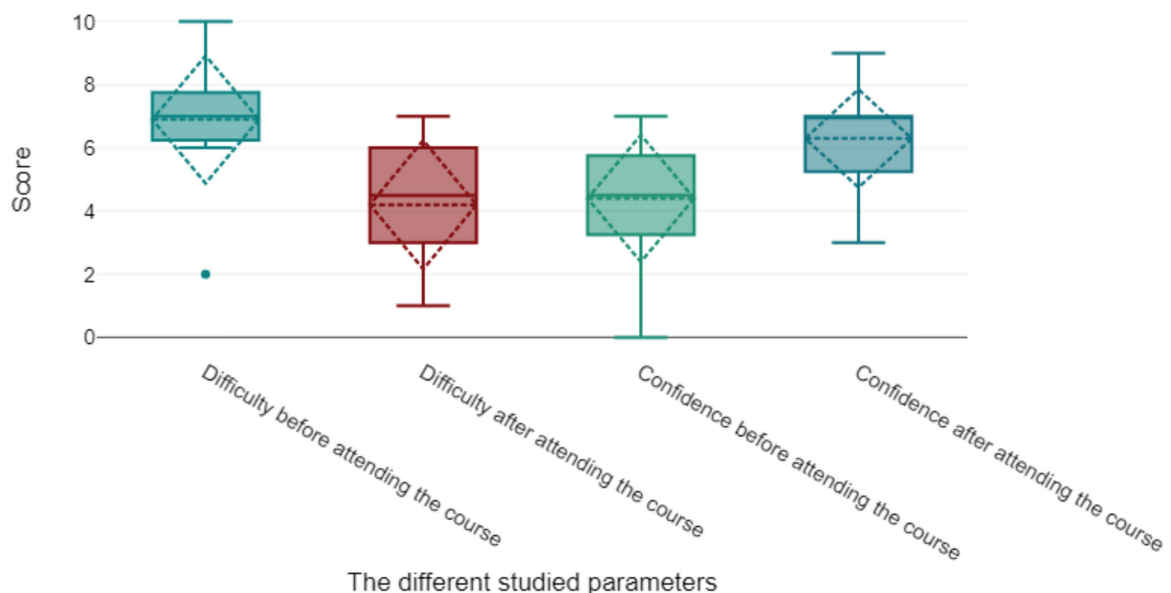

Fig 1. Pre- and post-course difficulty and confidence in reading ECGs.

Table 1. Difference in scores before and after course attendance

Parameter	Before course attendance	After course attendance	p
The score of the self-confidence scale (mean±SD)	4.4 ± 2.12	6.3 ± 1.64	0.038
The score of the perceived difficulty scale (mean±SD)	6.9 ± 2.13	4.2 ± 2.15	0.011

in reading ECGs significantly decreased after attendance at the course (Fig 1) (Table 1). Spearman correlation analysis showed a high negative correlation between the perceived difficulty and the number of lectures attended by the participant (r = -0.63, p = 0.049). The score in the final ECG exam showed a high positive correlation with the number of lectures attended (r = 0.68, p = 0.031) rather than the trainee training stage (r = -0.29, p = 0.418). Our findings confirm the findings of the systematic review by McCutcheon et al,[3] showing the potential of online learning in teaching clinical skills to medical professionals. Our study adds an essential piece of evidence on the effectiveness of online learning in teaching clinical skills. The study was limited by the small number of candidates and the limited selection geography from one medical centre.

Conclusion

Cardiology e-training can improve junior trainees' confidence and the difficulty they face in reading ECGs. The number of lectures attended is more important than the level of training experience in determining the amount of improvement of this skill. ∎

References

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