Lecture-based versus case-based e-learning in the improvement of ECG interpretation skills in junior medical trainees; a prospective cohort study

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Introduction

E-learning showed a noticeable improvement in the clinical skills of medical professionals and was non-inferior to conventional lectures;[1] however, the evidence on the effectiveness of the case-based (CB) approach versus the lecture-based (LB) e-learning in the improvement of electrocardiogram (ECG) interpretation skills of junior medical trainees (foundation and core medical trainees) is lacking.

Methods

We studied two groups of junior medical trainees working in a single district general hospital in a prospective cohort study

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design. The first group attended online lectures explaining the ECG interpretation requirements of the foundation training program.[2] The second group attended a series of online interactive webinars explaining the same topics using the Slido online interaction application in a case-based discussion style. We assessed the confidence of the trainees in reading ECGs independently and the difficulty they find reading ECGs on one to ten Likert scales. The primary outcome was the change in the composite scores on the ECG reading confidence scale and the subjective difficulty in reading ECGs before and after the intervention.

Results and discussion

The characteristics of the LB and CB groups are summarised in Table 1. The mean of the improvement in the composite primary endpoint of self-confidence and perceived difficulty in reading ECGs was significantly higher in the CB group than in the LB group (4 points vs -0.8 points respectively, $p = 0.014$) (Fig 1). Our findings suggest the CB learning approach's higher effectiveness
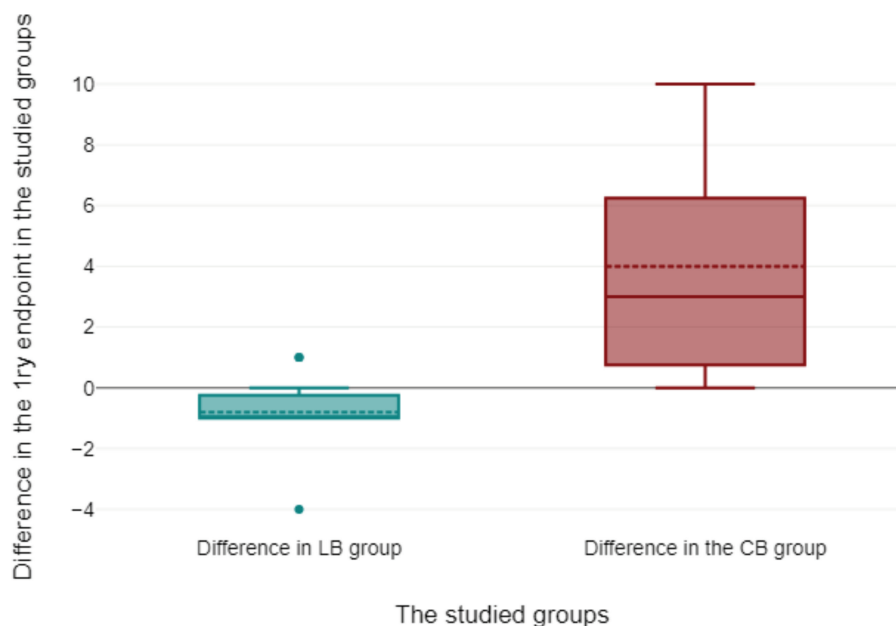

Fig 1. The change in the composite 1ry outcome in the studied groups before and after the intervention.

Parameter	Lecture-based group (n = 10)	Case-based group (n = 8)
Table 1. The baseline characteristics of the studied groups		
1. Training grade (n;%)		
FY1	1 (10%)	2 (25%)
FY2	6 (60%)	2 (25%)
CT1-2	3 (30%)	4 (50%)
2. Composite 1^{ry} endpoint before the intervention (mean±SD)	11.3±1.34	7.75±1.91
3- Composite 1^{ry} endpoint after the intervention (mean±SD)	10.5±1.35	11.75±2.76

than the LB one. Such a result matches the findings of Horne and colleagues[3] showing the superiority of the CB model. To our knowledge, our study is the first to compare LB and CB learning strategies in improving the cardiology training of junior medical trainees. Our study was limited by the small number of studied participants and their selection from a single district general hospital, limiting the generalisability of the results. The baseline ECG knowledge of the participants was not established before the intervention; hence, prior ECG knowledge might have confounded the results.

Conclusion

Our study proposes that CB e-learning is superior to the LB approach in improving the composite of self-confidence and perceived difficulty in reading ECGs in junior medical trainees. ■

References

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