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Electronic learning in advanced resuscitation training: The perspective of the candidate☆

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ABSTRACT

Background: Studies have shown that blended approaches combining e-learning with face-to-face training reduces costs whilst maintaining similar learning outcomes. The preferences in learning approach for healthcare providers to this new style of learning have not been comprehensively studied. The aim of this study is to evaluate the acceptability of blended learning to advanced resuscitation training.
Methods: Participants taking part in the traditional and blended electronic advanced life support (e-ALS) courses were invited to complete a written evaluation of the course. Participants' views were captured on a 6-point Likert scale and in free text written comments covering the content, delivery and organisation of the course. Proportional-odds cumulative logit models were used to compare quantitative responses. Thematic analysis was used to synthesise qualitative feedback.
Results: 2848 participants from 31 course centres took part in the study (2008–2010). Candidates consistently scored content delivered face-to-face over the same content delivered over the e-learning platform. Candidates valued practical hands on training which included simulation highly. Within the e-ALS group, a common theme was a feeling of "time pressure" and they "preferred the face-to-face teaching". However, others felt that e-ALS "suited their learning style", was "good for those recertifying", and allowed candidates to "use the learning materials at their own pace".
Conclusions: The e-ALS course was well received by most, but not all participants. The majority felt the e-learning module was beneficial. There was universal agreement that the face-to-face training was invaluable. Individual learning styles of the candidates affected their reaction to the course materials.

Introduction

Electronic learning heralds a new approach for the provision of clinical learning in healthcare, including advanced resuscitation training.[1,2] With financial pressures facing health care, there is a demand to provide equivalent standards of education at lower costs. With regard to the Resuscitation Council (UK) Advanced Life Support (ALS) course, a multi-centre, randomised controlled, non-inferiority trial compared a blended approach of electronic learning resources (e-ALS) coupled with traditional face-to-face teaching.[3] The study found that although knowledge and skill based assessments were similar between the two groups, performance in the cardiac arrest simulation test (CASTest) was lower in the e-ALS group. After remedial teaching the final pass rates were similar. The blended approach (with e-learning and reduced face to face contact) was approximately half the cost of the traditional approach, which has the potential to lead to significant cost savings to the health system.

A subsequent study, analysing 27,170 candidates,[4] demonstrated slightly higher scores for e-ALS in all assessment modalities including first attempt CAS-test pass rate (84.6% vs 83.6%, $p = 0.035$). The overall pass rate was equivalent between both courses (96.6%, $p = 0.776$).

A key additional determinant of the success of an e-learning programme is the acceptability and reaction amongst the candidates attending the course. The opinion of healthcare providers regarding electronic learning in life support training has not been

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comprehensively studied. This study aims to evaluate the reactions of candidates attending the traditional two-day face-to-face (c-ALS) or the blended approach of electronic learning and a one-day face-to-face course (e-ALS).

Methods

Course description

The c-ALS is a 2-day, 20-h course. It consists of four face-to-face lectures, six interactive workshops (rhythm recognition, blood gases, tachycardia, bradycardia, special circumstances and ethics), two skill stations including airway management, initial assessment, CPR and defibrillation and 12 simulated cardiac arrest scenarios.

The e-ALS is a 1-day, 10-h, face-to-face course accompanied by 158 min of electronic learning material. The e-learning material includes e-lectures (with the same slides but accompanying commentary) and interactive learning material (with the same material as the face-to-face workshops but combined with interactive activities and formative tests). The face-to-face element delivers identical skill stations and cardiac arrest scenarios to the conventional course.

Study design

The primary study[3] was an open-label, non-inferiority, randomised controlled trial enrolling participants between December 2008 and October 2010. Participants were randomised between c-ALS and e-ALS with 1:1 randomisation. Data were collected for 31 study centres with 25 centres in England, two in Scotland, one in Wales and Northern Ireland and two participating in Australia. All candidates were healthcare providers or trainees.

We developed and pilot tested an evaluation form to capture candidate experience of learning in evaluating the c-ALS and e-ALS courses. The questionnaire captured professional background, course centre and course type. No personal identifiable data were collected. Respondents were invited to rate content and presentation of learning material using a 6 point Likert scale (1 = very poor, 6 = very good). The reported impact of the course content on personal development were also captured using a 6 point Likert scale (1 = strongly disagree, 6 = strongly agree). Binary (yes/no) preferences were sought on preferred learning style.

Free text feedback to the following open questions was also recorded.

a. What aspects of learning did you find most helpful in the course?
b. Please comment on how the course learning methods matched your preferred learning approaches.
c. Any other comments.

Ethical approval

The National Research Ethics Committee for the West Midlands granted ethical approval for UK courses. The University of Western Australia Human Research Ethics committee provided ethical approval for Australian courses. The Heart of England Foundation trust, UK (HEFT) provided sponsorship and acted as the coordinating centre. Participants gave informed consent via a central online consent service, run by the Resuscitation Council (UK).

Statistical analysis

The ratings, impacts and preferences for e-ALS and c-ALS were compared using odds ratios. The ratings and impacts responses are on 6 point Likert scales but because very few participants chose scores of 1, 2 or 3, in the analysis, we combined responses with scores 1, 2 and 3 into a single category. To account for the ordinal nature of the responses, the odds ratios were obtained by fitting proportional-odds cumulative logit models. We parameterised the models so that the odds ratios compare the odds of higher scores. Hence, for example, an odds ratio of 0.5 means that the odds for higher scores for e-ALS is half the odds for higher scores for c-ALS, and an odds ratio of 1.15 means that the odds for higher scores for e-ALS is 15% more than the odds for higher scores for c-ALS. We report the odds ratios (95% confidence intervals) and the *p*-values.

Thematic analysis

An inductive approach to the qualitative data was undertaken with thematic content analysis.[5] The free text comments covered a number of different themes. As more evaluation forms were analysed, a list of common themes developed. These themes were given a numerical label and were linked to original comments. All comments and thematic labels were recorded in an excel spreadsheet

Results

2733 candidates attended the courses between December 2008 and October 2010 and were issued evaluation forms. 2596 evaluation forms were received (95% response rate), with 137 forms lost to follow up. The remaining 2596 comprised 1294 in the c-ALS group and 1302 in the e-ALS group (Fig. 1).

The professional background of candidates included 1835 doctors, 431 nurses, 23 operating department practitioners, 19 paramedics, 6 resuscitation officers, 188 'other', and 94 unknown/not specified on evaluation form. The level of experience, seniority and speciality was not recorded for this evaluation, although in the main trial the groups were well matched with respect to age, profession, specialty and grade.

Reactions to lectures and workshops

The candidates' reactions to different styles of course content are summarised in Table 1. Candidates consistently preferred

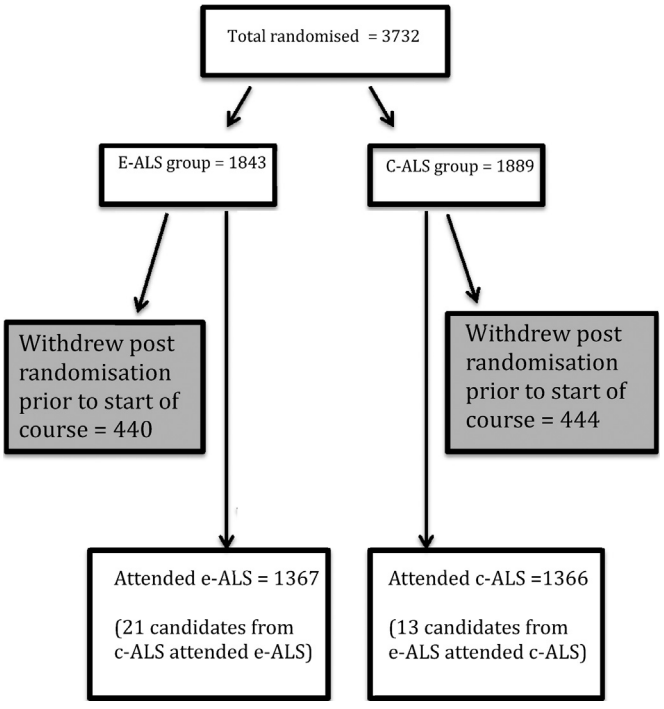

Fig. 1. Numbers involved in e-ALS and c-ALS groups.