Abstract  
Objective: To determine the efficacy of a peer-led tuition model for training healthcare students in basic life support compared to tuition delivered by clinical tutors.

Design and setting: Randomised controlled trial in the Medical School, University of Birmingham, UK. Participants: 122 first-year medical, dental, nursing and physiotherapy students.

Interventions: Students were randomised to receive basic life support tuition from either second-year student instructors or from experienced clinical staff.

Measurements and results: Students’ practical skills, knowledge and satisfaction were tested at the end of the course. Instructor reliability was assessed throughout the course. Students taught by their peers were significantly more likely to be successful in the end-of-course practical CPR test than those taught by clinical staff (56/57 vs. 53/62). The student instructors were also found to be more reliable than clinical staff at attending the training sessions (48/48 vs. 36/48). There was no significant difference in the theoretical test results or the students’ assessment of the quality of teaching.

Conclusions: This model of peer-led undergraduate training in basic life support provides a quality of education which is at least as good as that provided by clinical staff, while offering advantages in terms of reliability. The re-deployment of clinical tutors from basic to more advanced training may allow the overall enhancement of undergraduate resuscitation and critical care training.

Keywords  Cardiopulmonary resuscitation · Clinical competence · Comparative study · Education · Medical undergraduate · Resuscitation

Introduction

Basic life support (BLS) is an important step in the “chain of survival” from cardiac arrest, with early and good-quality BLS being recognised as an important determinant of survival. Although training in resuscitation and critical care medicine is recognised as important [1, 2], it remains a comparatively neglected element in the undergraduate curriculum. Funding constraints, competition within the curriculum, and increasing service demands placed on clinical staff who would generally provide the tuition are all factors delaying the provision of quality undergraduate training in resuscitation and critical care.

The traditional model of undergraduate teaching whereby students receive didactic teaching from senior clinical and scientific academic staff is changing [2]. Faced with the challenge of delivering small-group BLS and emergency care to 350 students, we developed a system of peer-led tuition. The scheme trains second-year healthcare student volunteers to become BLS instructors at the beginning of their second year. These student instructors then deliver a BLS training course to (currently) 540 medical, dental, nursing and physiotherapy-
Students taught by their peers were significantly more likely to be successful in the end-of-course practical BLS examination than those taught by clinical staff (56/57 vs. 53/62, p<0.05). The student instructors were also found to be more reliable than clinical staff at attending the training sessions (48/48 vs. 36/48, p=0.01). There was no significant difference in multiple-choice question results or student satisfaction rates (Table 1).

Discussion

The main finding of this study is that our model of peer tuition is at least as effective in training first-year healthcare students in BLS as the more traditional approach using clinical teachers. It also appears to offer additional advantages in terms of instructor reliability.

It is important that the assessment tools used for evaluating an educational program are valid and reliable. The simulated cardiac arrest scenario was important for assessing the efficacy of the two groups, as it tested the application of the skills that the students need to acquire, and hence the validity of this test may regarded as a high [5]. The reliability of an assessment is dependent on a number of factors, including the reproducibility of the marking by examiners [6, 7]. Different methods for assessing practical competence in BLS have been described [8]. A global assessment of performance was chosen in this study because it is simple and easy to apply to testing a large number of students, and we found reasonable inter-observer agreement between examiners.

Resuscitation training is an important component of the critical care and emergency medicine curriculum [2].

Table 1 Comparison of outcome measures between peer-led tuition group and clinical staff group

<table>
<thead>
<tr>
<th>Measure</th>
<th>Peer group</th>
<th>Clinical staff group</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practical exam pass rate</td>
<td>56/57</td>
<td>53/62</td>
<td>0.018</td>
</tr>
<tr>
<td>Teacher attendance at classes</td>
<td>48/48</td>
<td>36/48</td>
<td>0.01</td>
</tr>
<tr>
<td>MCQ mark (score out of 30)</td>
<td>21</td>
<td>22</td>
<td>NS</td>
</tr>
<tr>
<td>Median (interquartile range)</td>
<td>(20–22)</td>
<td>(20–24)</td>
<td>–</td>
</tr>
<tr>
<td>Quality of teaching</td>
<td>83</td>
<td>86</td>
<td>NS</td>
</tr>
<tr>
<td>Median (interquartile range)</td>
<td>(72–91)</td>
<td>(76–93)</td>
<td>–</td>
</tr>
</tbody>
</table>

Data were tested for normality and found to be not normally distributed. Comparisons between groups used χ² and Fisher’s exact tests and the Mann-Whitney U test. A p value less than 0.05 was regarded as statistically significant.

Materials and methods

One hundred and twenty-two first-year medical, dental, nursing and physiotherapy students who had been allocated to the second of four courses during the 2000/2001 academic year were randomised (simple randomisation) to receive their tuition either from second-year student instructors or from clinical staff. The 8-h course was delivered on four consecutive weeks during the autumn of 2000. The course was conducted according to a common curriculum developed by the Royal Life Saving Society UK, which was based on the European Resuscitation Council guidelines current at that time [4]. Twelve second-year students from the pool of student instructors and 12 clinical staff from a pool of critical care and resuscitation training instructors from local hospitals were selected to take part in this study. Students were taught in groups of 10–12 by two student or clinical instructors (one or both of whom were Resuscitation Council UK qualified instructors). The instructors were unaware that a comparison between the two teaching groups would be undertaken at the time of the course.

Sixty students were randomised to the student instructor group and sixty-two to tuition by clinical staff. Three students, all in the student instructor group, withdrew from the University following randomisation but prior to the commencement of the course and were excluded from analysis. There were no differences between the baseline characteristics (age, sex, ethnicity, recent BLS training and undergraduate course) between the two groups. At the end of the course external examiners from the Royal Life Saving Society UK tested all students for the acquisition of practical cardiopulmonary resuscitation (CPR) skills in a simulated cardiac arrest scenario using a resuscitation manikin (Laerdal, Orpington, Kent, UK). Examiners made a global assessment of performance and assigned a pass or fail mark depending on whether the student’s performance was regarded as competent. Inter-examiner agreement was assessed prior to the students’ formal tests and found to be 77%. To reduce any systematic bias from marking differences between examiners an equal number of students from each tuition group were assigned to each examiner. The examiners were blinded to the students’ tuition groupings. Theoretical knowledge for all students was assessed with a multiple-choice paper comprising 30 true/false questions based on questions drawn from the Resuscitation Council UK Advanced Life Support Course which were relevant to BLS. A mark was awarded for each correct answer, allowing a total possible score of 30 (no negative marking). Students were asked how they rated the quality of teaching (between poor and excellent) using a visual analogue score. Instructor reliability was measured by recording the attendance of instructors at the training sessions.

Data were stored in Excel (Microsoft, N.Y., USA) and analysed using SPSS 10.0 for Windows (SPSS, Chicago, Ill., USA). The advantages of this novel approach are that it reduces reliance on using busy postgraduate clinical staff as instructors, and provides students with an opportunity to acquire teaching and pastoral support skills. However, although regular audit has demonstrated high pass rates (99%), we were uncertain whether it would offer the same quality of teaching as using clinical staff. We therefore conducted a prospective randomised study to test the hypothesis that the quality of BLS teaching provided by healthcare students is no worse than that provided by postgraduate clinical staff.

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py students. The 8-h course, which has been previously described in detail [3], involves practical and theoretical instruction in small groups, followed by a formal examination, and is a mandatory part of the curriculum.

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