



Simulation and education paper

The significance of clinical experience on learning outcome from resuscitation training—A randomised controlled study[☆]Morten Lind Jensen^{a,*}, Freddy Lippert^b, Rasmus Hesselfeldt^a, Maria Birkvad Rasmussen^a, Simon Skibsted Mogensen^a, Michael Kammer Jensen^c, Torben Frost^d, Charlotte Ringsted^a^a Centre for Clinical Education, Copenhagen University Hospital, Rigshospitalet, Denmark^b Head Office, The Capital Region of Denmark, Denmark^c Danish Institute of Medical Simulation, Copenhagen University Hospital, Herlev, Denmark^d Department of Anaesthesia, Centre of Head and Orthopaedics, Copenhagen University Hospital, Rigshospitalet, Denmark

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ABSTRACT

Context: The impact of clinical experience on learning outcome from a resuscitation course has not been systematically investigated.**Aim:** To determine whether half a year of clinical experience before participation in an Advanced Life Support (ALS) course increases the immediate learning outcome and retention of learning.**Materials and methods:** This was a prospective single blinded randomised controlled study of the learning outcome from a standard ALS course on a volunteer sample of the entire cohort of newly graduated doctors from Copenhagen University. The outcome measurement was ALS-competence assessed using a validated composite test including assessment of skills and knowledge.**Intervention:** The intervention was half a year of clinical work before an ALS course. The intervention group received the course after a half-year of clinical experience. The control group participated in an ALS course immediately following graduation.**Results:** Invitation to participate was accepted by 154/240 (64%) graduates and 117/154 (76%) completed the study. There was no difference between the intervention and control groups with regard to the immediate learning outcome. The intervention group had significantly higher retention of learning compared to the control group, intervention group mean 82% (CI 80–83), control group mean 78% (CI 76–80), $P=0.002$. The magnitude of this difference was medium (effect size = 0.57).**Conclusions:** Half a year of clinical experience, before participation in an ALS course had a small but statistically significant impact on the retention of learning, but not on the immediate learning outcome.

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Introduction

Resuscitation training is an increasingly popular component of undergraduate and postgraduate medical education curricula. As simulation-based courses represent a substantial cost¹ the educational effectiveness should be determined as a part of the implementation in curricula.^{2,3} Learning theories indicate that learning from simulation-based training may rapidly decay over time^{4–6} and that is generally supported by experimental studies on cardiopulmonary resuscitation training of health professionals.^{7–11}

It is therefore important to identify strategies that maximize the retention of learning from resuscitation courses.

One area of concern is the timing of resuscitation training in relation to clinical experience.¹² The maximum learning outcome from a training programme is obtained when content, methods and strategies fit participants' characteristics such as prior knowledge and skills.¹³ In theory, clinical experience prior to a resuscitation course might influence the participants' understanding of the subject⁵ and perceived need for training and intention to learn, which might increase the learning outcome.¹⁴ Supporting this is a study by Semeraro et al., who found that senior anesthesiologists retain knowledge gained in a resuscitation course better than junior anesthesiologists.¹⁵ In addition a study by Wayne et al¹⁶ on residents in internal medicine found a 14 months retention of learned resuscitation skills. However, a consistent finding in other studies is that the acquired competence declines to a significantly lower level within a year after the course^{8,10,11}, and a previous study by

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Wayne et al. demonstrated no advantage of 3 months prior clinical experience on learning from a resuscitation course.¹⁷ Despite these indications^{15,16} the impact of clinical experience on learning outcome from resuscitation training has not to our knowledge been systematically investigated. Hence, the aim of this study was to examine the significance of clinical experience on the learning outcome from a resuscitation course.

The context was the European Resuscitation Council (ERC)'s Advanced Life Support (ALS) course, which is one example of an internationally recognized highly standardized cardiopulmonary resuscitation course¹⁸ and newly graduated doctors about to enter clinical practice as interns.

The specific research question was: does half a year of clinical experience before participation in an ALS course increase immediate learning outcome and the 6-month retention of the learned compared to participation in the course immediately following graduation from medical school?

Methods

Design

This project was a prospective single blinded randomised controlled study of the learning outcome from a standard ALS course

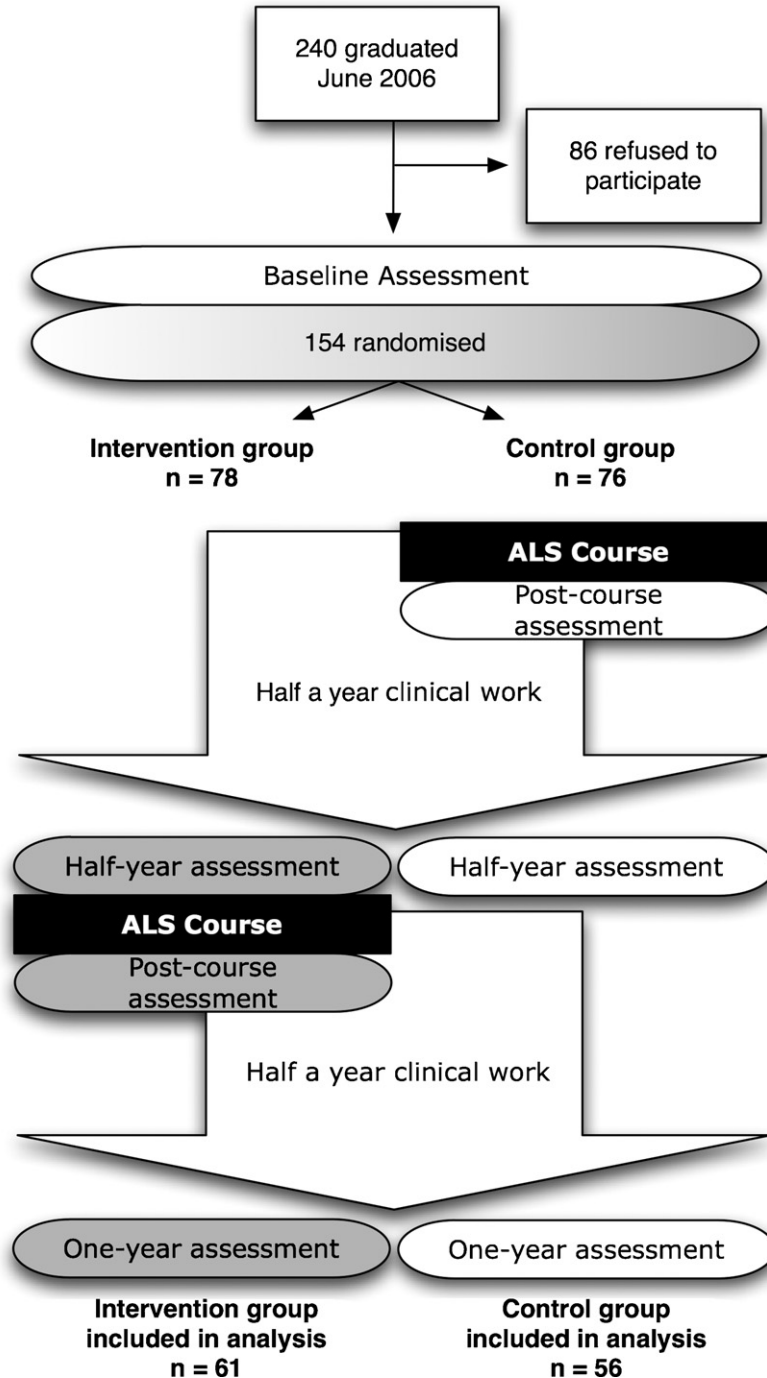


Figure 1. Overview of the study design and flow of participants through the study.

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