

## Blended learning is most effective in increasing evidence-based health care competencies of health workers



*E-learning is a useful strategy to increase EBHC knowledge and skills, and when combined with face-to-face learning, to increase EBHC attitude and behaviour.*

### What is the aim of this review?

This Campbell systematic review examines the effectiveness of e-learning in improving evidence-based health care knowledge and practice.

Evidence-based health care (EBHC) is decision-making for health care, informed by the best research evidence. Doctors, nurses and allied health professionals need to have the necessary knowledge and skills to apply EBHC. The use of electronic learning (e-learning) for EBHC training is increasing.

E-learning, compared to no learning, improves EBHC knowledge and skills but not attitudes and behaviour. There is no difference in outcomes when comparing e-learning to face-to-face learning. Combining e-learning with face-to-face learning (blended learning) has a positive impact on EBHC knowledge, skills, attitude and behaviour.

### What did the review study?

Evidence-based health care (EBHC) involves phrasing questions based on a knowledge gap, searching for research that can answer the question, critically appraising and interpreting the research, applying the results and auditing the process. Electronic learning (e-learning) has become an increasingly popular method of teaching EBHC.

This review assesses the effectiveness of e-learning of EBHC for increasing EBHC competencies in healthcare professionals. The primary outcomes are EBHC knowledge, skills, attitude and behaviour.

### What studies were included?

Eligible studies were randomised controlled trials (RCTs), cluster RCTs, non-RCTs, controlled before-after studies and interrupted time series of any healthcare professional evaluating any educational intervention on EBHC, and that was delivered fully (pure e-learning) or in part (blended learning) via an electronic platform compared to no learning, face-to-face learning or other forms of e-learning of EBHC.



### How up-to-date is this review?

The review authors searched for studies published until May 2016. This Campbell Systematic Review was published in March 2017.

### What is the Campbell Collaboration?

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### About this summary

This summary was prepared by Howard White (Campbell Collaboration) based on the Campbell Systematic Review 2017:4 *E-learning of evidence-based health care (EBHC) to increase EBHC competencies in healthcare professionals: A Systematic Review* by Anke Rohwer, Nkengafac Villyen Motaze, Eva Rehfuess, and Taryn Young (DOI 10.4073/csr.2017.4). Copy-editing and layout was done by Tanya Kristiansen (Campbell Collaboration). Financial support from the American Institutes for Research for the production of this summary is gratefully acknowledged.



The review included 24 trials, comprising 20 RCTs and four non-RCTs, with a total of 3,825 participants. Participants were medical doctors, nurses, physiotherapists, physician assistants, athletic trainers and a combination of professionals at all levels of education. The studies included a variety of interventions.

### What are the main results in this review?

Compared to no learning, pure e-learning improves EBHC knowledge and skills but not attitudes and behaviour. Pure e-learning is no better than face-to-face learning in improving any of the primary outcomes.

Blended learning is better than no learning for improving EBHC knowledge, skills, attitude and behaviour; and is better than face-to-face learning in improving attitudes and behaviour. Compared to pure e-learning, blended learning improves EBHC knowledge. It is not clear which e-learning components are most effective in improving outcomes.

However, the included studies were of moderate to low quality, with a small number of studies included in each analysis, and imprecision and inconsistency of results in all comparisons. These shortcomings need to be taken into consideration when interpreting the results.

### What do the findings in this review mean?

E-learning of EBHC, whether pure or blended, compared to no learning, improves EBHC knowledge and skills. There is no difference in these outcomes when comparing e-learning to face-to-face learning. Blended learning, which typically comprises multiple interventions, appears more effective than other types of learning in improving EBHC knowledge, skills, attitude and behaviour.

Future research should focus on the different components of e-learning and should adequately report on all the intervention components, the educational context and implementation strategies.