

Educational Effectiveness of E-Learning Interventions for Practicing Surgeons: A Systematic Review

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Introduction

E-learning interventions are cost-effective, convenient, and accessible.

The educational effectiveness of E-learning for continuing professional development is not well known.

Objective



Systematic review to assess the educational effectiveness of E-learning interventions for practicing surgeons.

Methods

- Two independent reviewers screened and assessed studies for relevance, inclusion, and quality of evidence
- **Electronic databases:** Ovid MEDLINE, Ovid MEDLINE Daily, and Epub ahead of print
- **Date:** 1994 – 2020
- **Languages:** English and Spanish
- **Critical Appraisal:** Critical Appraisal Skills Programme (CASP) Checklists

E-Learning interventions can **improve** practicing **surgeons'** declarative knowledge, procedural knowledge, and competence.

These **self-paced** and **convenient** interventions can contribute to surgeons' **continuing professional development.**



Online Poster & References.
Questions?
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Results	n	Population	Type of Educational Intervention	Assessment Tool	Study Quality	Moore's Levels
Mahmud et al. 2013	42	Practicing obstetricians, midwives	E-learning modules based on evidence from cochrane reviews and trauma assessments	Pre- and post-tests	Strong	↑L2, ↑L4
Nakanishi et al. 2017	395	Practicing endoscopists	Online vessel of narrow-band imaging to teach endoscopic diagnosis of gastric lesions, lectures, and repetitive exercises	Pre- and post-tests	Strong	↑L3A&B, ↑L4
Ozturk et al. 2018	206	Surgeons, Residents, Anesthesiologists	6-week E-course of videos, readings, quizzes, forum discussions	Pre- and post-tests	Strong	↑L2, ↑L3A, ↑L3B, ↑L5
Aihara et al. 2018	17	Physicians, GE fellows	Online colorectal lesion identification tutorial	Pre/post dx test	Moderate	↑L4
Bergman et al. 2019	121	General surgeons	web-based training module for detecting Barrett's esophagus	Diagnosis skills test	Moderate	↑L3A
Calderwood et al. 2014	184	GEs, surgeons, family physicians	web-based education for improving the practice of colonoscopy	Post-test questionnaire	Moderate	↑L2, ↑L3B
Comer et al. 2011	177	Physicians, allied health	web-based training course on central line blood infections	Pre- and post-tests	Moderate	↑L3A, ↑L4
Ortega-Moran et al. 2017	21	Surgeons	Self-paced platform of videos, adaptive content, tests, social network	Validation trials	Moderate	↑L2
Rosser et al. 2000	201	Surgeons, residents	Instruction delivered by CD-ROM videos or live instruction	Knowledge test	Moderate	↑L3A
Zavell et al. 2017	654	Faculty	Webinar-based online monthly journal club	Feedback Survey	Moderate	↑L2
Goldstein et al. 2014	58	Physicians, consultants, trainees	Self-directed online curriculum and web portal	Survey	Weak	↑L2
Turina et al. 2008	82	Practicing surgeons, trainees	Internet-based repository of current surgical techniques, including graphic descriptions, videos, and schematics with sound	Usability survey and electronic tracking	Weak	↑L2

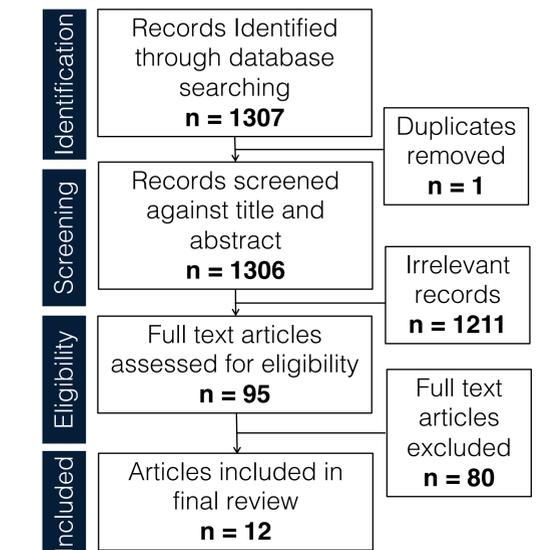
Figures

Inclusion and Exclusion Criteria

Inclusion Criteria	Exclusion Criteria
Studies using an intervention involving social media	Any interventions involving in-person classes or hybrid virtual & in-person
Studies the practicing surgeon population	Studies with surgical trainees (residents, medical students only)
Evaluates educational effectiveness (Moore's Framework of 2+)	Studies only evaluating participation (Moore's Framework of 1)



F1. Outcomes organized using Moore's Framework.



F2. Flow diagram for included articles.