

Multimedia Appendix 1. E-tables.

E-table 1.search strategy

Search date 2014.9.25

*=wild word Adj=adjacent

Medline:

- 1.“blended learning”[Title/Abstract] OR “hybrid learning”[Title/Abstract] OR “integrated learning”[Title/Abstract] OR “computer-aided learning”[Title/Abstract] OR “computer-assisted learning”[Title/Abstract] OR “distributed learning”[Title/Abstract] OR “hybrid training”[Title/Abstract] OR “integrated training”[Title/Abstract] OR “computer-aided training”[Title/Abstract] OR “integrated education”[Title/Abstract] OR “computer-aided education”[Title/Abstract] OR “computer-assisted education”[Title/Abstract] OR “distributed education”[Title/Abstract] OR “integrated instruction”[Title/Abstract] OR “computer-aided instruction”[Title/Abstract] OR “computer-assisted instruction”[Title/Abstract] OR “blended teaching”[Title/Abstract] OR “integrated teaching”[Title/Abstract] OR “computer-aided teaching”[Title/Abstract] OR “computer-assisted teaching”[Title/Abstract] OR “blended course”[Title/Abstract] OR “hybrid course”[Title/Abstract] OR “integrated course”[Title/Abstract] OR “computer-assisted course”[Title/Abstract]
- 2.physician*[Title/Abstract] OR medic*[Title/Abstract] OR nurs*[Title/Abstract] OR pharmac*[Title/Abstract] OR dental[Title/Abstract] OR health*[Title/Abstract] OR cme[Title/Abstract]
- 3.compar* OR trial* OR evaluat* OR assess* OR effect* OR pretest* OR pre-test OR posttest* OR post-test OR preinterven* OR pre-intervention OR postinterven* OR post-intervention
- 4.1 AND 2 AND 3

Ovid Embase:

- 1.(blended OR hybrid OR integrated OR distributed OR computer-aided OR computer-assited) adj (learing OR training OR educat* OR instruct* OR teach* OR course*).ti,ab.
- 2.(physician*OR medic* OR nurs* OR pharmac* OR dental OR health* OR cme) .ab.
- 3.(compar* OR trial* OR evaluat* OR assess* OR effect* OR pretest* OR pre-test OR posttest* OR post-test OR preintervention OR pre-intervention OR

postintervention OR post-intervention).af.

4. 4.1 AND 2 AND 3

Web of science

1.title: ("blended learning" OR "hybrid learning" OR "integrated learning" OR "computer-aided learning" OR "computer-assisted learning" OR "distributed learning" OR "hybrid training" OR "integrated training" OR "computer-aided training" OR "integrated education" OR "computer-aided education" OR "computer-assisted education" OR "distributed education" OR "integrated instruction" OR "computer-aided instruction" OR "computer-assisted instruction" OR "blended teaching" OR "integrated teaching" OR "computer-aided teaching" OR "computer-assisted teaching" OR "blended course" OR "hybrid course" OR "integrated course" OR "computer-assisted course")

2.subject: (physician*OR medic* OR nurs* OR pharmac* OR dental OR cme OR health*)

3. subject: (compar* OR trial* OR evaluat* OR assess* OR effect* OR pretest* OR pre-test OR posttest* OR post-test OR preintervention OR pre-intervention OR postintervention OR post-intervention)

4. 1 AND 2 AND 3

CINAHL

1.TI"blended learning" OR TI"hybrid learning" OR TI"integrated learning" OR TI"computer-aided learning" OR TI"computer-assisted learning" OR TI"distributed learning" OR TI"hybrid training" OR TI"integrated training" OR TI"computer-aided training" OR TI"integrated education" OR TI"computer-aided education" OR TI"computer-assisted education" OR TI"distributed education" OR TI"integrated instruction" OR TI"computer-aided instruction" OR TI"computer-assisted instruction" OR TI"blended teaching" OR TI"integrated teaching" OR TI"computer-aided teaching" OR TI"computer-assisted teaching" OR TI"blended course" OR TI"hybrid course" OR TI"integrated course" OR TI"computer-assisted course" OR AB"blended learning" OR AB"hybrid learning" OR AB"integrated learning" OR AB"computer-aided learning" OR AB"computer-assisted learning" OR AB"distributed learning" OR AB"hybrid training" OR AB"integrated training" OR AB"computer-aided training" OR AB"integrated education" OR AB"computer-aided education" OR AB"computer-assisted education" OR AB"distributed education" OR AB"integrated instruction" OR AB"computer-aided instruction" OR AB"computer-assisted instruction" OR AB"blended teaching" OR AB"integrated teaching" OR AB"computer-aided teaching" OR AB"computer-assisted teaching" OR AB"blended course" OR AB"hybrid course" OR AB"integrated course" OR AB"computer-assisted course"

2. TI physician*OR TI medic* OR TI nurs* OR TI pharmac* OR TI dental OR TI health* OR TI cme OR AB physician* OR AB medic* OR AB nurs* OR AB pharmac* OR AB dental OR AB health* OR AB cme

3. compar* OR trial* OR evaluat* OR assess* OR effect* OR pretest* OR pre-test OR posttest* OR post-test OR preinterven* OR pre-intervention OR postinterven* OR post-intervention

4.1 AND 2 AND 3

ERIC

1 title:(“blended learning” OR “hybrid learning” OR “integrated learning” OR “computer-aided learning” OR “computer-assisted learning” OR “distributed learning” OR “hybrid training” OR “integrated training” OR “computer-aided training” OR “integrated education” OR “computer-aided education” OR “computer-assisted education” OR “distributed education” OR “integrated instruction” OR “computer-aided instruction” OR “computer-assisted instruction” OR “blended teaching” OR “integrated teaching” OR “computer-aided teaching” OR “computer-assisted teaching” OR “blended course” OR “hybrid course” OR “integrated course” OR “computer-assisted course”) AND abstract:(physician*OR medic* OR nurs* OR pharmac* OR dental OR health* OR cme) AND (compar* OR trial* OR evaluat* OR assess* OR effect* OR pretest* OR pre-test OR posttest* OR post-test OR preintervention OR pre-intervention OR postintervention OR post-intervention)

Sciadirect

1.(ttl(“blended learning”) OR ttl(“hybrid learning”) OR ttl(“integrated learning”) OR ttl(“computer-aided learning”) OR ttl(“computer-assisted learning”) OR ttl(“distributed learning”) OR ttl(“hybrid training”) OR ttl(“integrated training”) OR ttl(“computer-aided training”) OR ttl(“integrated education”) OR ttl(“computer-aided education”) OR ttl(“computer-assisted education”) OR ttl(“distributed education”) OR ttl(“integrated instruction”) OR ttl(“computer-aided instruction”) OR ttl(“computer-assisted instruction”) OR ttl(“blended teaching”) OR ttl(“integrated teaching”) OR ttl(“computer-aided teaching”) OR ttl(“computer-assisted teaching”) OR ttl(“blended course”) OR ttl(“hybrid course”) OR ttl(“integrated course”) OR ttl(“computer-assisted course”))AND (tak(physician*) OR tak(medic*) OR tak(nurs*) OR tak(pharmac*) OR tak(dental) OR tak(health*) OR tak(cme))AND (compar* OR trial* OR evaluat* OR assess* OR effect* OR pretest* OR posttest* OR preintervention OR postintervention)

Cochrane Central

1. Title, Abstract, Keywords:(“blended learning” OR “hybrid learning” OR “integrated learning” OR “computer-aided learning” OR “computer-assisted learning” OR “distributed learning” OR “hybrid training” OR “integrated training” OR “computer-aided training” OR “integrated education” OR “computer-aided education” OR “computer-assisted education” OR “distributed education” OR “integrated instruction” OR “computer-aided instruction” OR “computer-assisted instruction” OR “blended teaching” OR “integrated teaching” OR “computer-aided teaching” OR “computer-assisted teaching” OR “blended course” OR “hybrid course” OR “integrated course” OR “computer-assisted course”)
2. Title, Abstract, Keywords: (physician*OR medic* OR nurs* OR pharmac* OR dental OR health* OR cme)
3. Search all text (compar* OR trial* OR evaluat* OR assess* OR effect* OR pretest* OR pre-test OR posttest* OR post-test OR preintervention OR pre-intervention OR postintervention OR post-intervention)
4. 1 AND 2 AND 3

E-Table 2. Reference

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Section 2: articles excluded due to insufficient data (n=6)

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E-Table 3. Description of included publications

Section 1. Studies comparing blended learning with no intervention

Study	Design RCT/NRS)	Country	Participants no.(B/N)*; type	Topic	Study intervention(component or features)	Modality or technology	Intervention duration	Exercises	Interactivity	Discussion	Delay between posttest and course	Assessment(question type)	Conflict of interest	Funding from company	Quality score
Flys,2012	Pre-posttest 1-group; NRS	Panama, Nicaragua, Dominican Republic, and Guatemala	225; Doctors, nurses, psychologists, health administrators, etc.	Principles of HIV care and health systems	Online+on-site +projects	Moodle; on-site workshops	150 hours (10 weeks)	Present(cases, self-assessment)	High(essays, group work)	Present	No delay	Subjective (MCQ, essays)	No	No	4
Puri,2010	Pre-posttest, 2 groups; NRS	India	350/102; Dietetic students	Communication and counseling skills	CAI+print resources	Internet-based site	1 week	Present(cases)	Low	Absent	No delay	Objective(cannot tell)	No	No	6
Karaksha,2011	Posttest, 2 groups; RCT	Australia	23/17; Pharmacy students	Pharmacology	CAI+lecture	CD, iSpring Pro 4.3.0.	24 hours	Present(quiz, assessment)	Low	Absent	No delay	Objective(MCQ)	No	No	4
Buchowski,2002	Pre-posttest, 1 group; NRS	USA	80/78; Medical students	Nutritional Anemias and the Diabetes and Weight Management	CAI+traditional	Aberrations in Glucose Metabolism modules	1 semester	Present(cases, self-assessment)	High(group work)	Absent	3 months	Objective(cannot tell)	No	Yes	3
Wallen,2010	Pre-posttest 1-group; NRS	USA	127;-nurses	Basic genetics	Web-based+face-toface	self-paced learning modules	<1 semester	Absent	Low	Absent	No delay	Objective(problem-based questions)	No	No	3
Weaver,2014(a)	Pre-posttest	USA	60; Health	Health policy	e-learning+traditional	technology-driven	12 months	Present(cases, self-	High(team-based	Present	No delay	Subjective(analysis, interpretation, inference,	No	No	3

	t 1-group; NRS		students			combined platform, blackboard-uploaded virtual interactive lectures	hs	assessment)	assignment)	t	y	evaluation)			
Weaver,2014(b)	Pre-posttest 1-group; NRS	USA	60; Health students	Health policy	e-learning+traditional	technology-driven combined platform, blackboard-uploaded virtual interactive lectures	12 months	Present	High	Present	No delay	Subjective(analysis, interpretation, inference, evaluation)	No	No	3
Riesen,2012	Pre-posttest 1-group; NRS	Canada	60; Health graduates	Interprofessional competencies	virtual face-to-face +traditional face-to-face+online	real-life simulation, virtual simulation, virtual debriefing and a didactic learning component. Web.Alive	2 days	Absent	High(discussion group)	Present	No delay	Subjective(self-report)	No	Yes	3
Cho,2014(a)	Pre-posttest 1-group; NRS	South Korea	45; Nurses	Research ethic	Web-based online instruction + a off-line instruction(review of the core contents on the online program, case analysis, small group discussion and miscellaneous activities)	developed Analysis, Design, Development, Implementation, and Evaluation (ADDIE) model	30 hours	Present(cases)	High(group discussion)	Present	No delay	Objective(cannot tell)	No	No	3
Cho,2014(b)	Pre-posttest 1-group; NRS	South Korea	69; Nursing students	Research ethic	Web-based online instruction + a off-line instruction(review of the core contents on the online program, case analysis, small group discussion and miscellaneous activities)	Analysis, Design, Development, Implementation, and Evaluation (ADDIE) model	30 hours	Present(cases)	High(group discussion)	Present	No delay	Objective(cannot tell)	No	No	3
Pereira,2008(a)	Pre-posttest 1-group;	Canada	14; Family medicine resident	Palliative care	Web-based learning+face-to-face workshop	asynchronous discussion forums, a	8 weeks	Absent	High(group-based discussion)	Present	No delay	Objective(MCQ)	No	No	4

	NRS		s			live audio and text-based online synchronous session(Centra); online modules (Macromedia Breeze)										
Pereira,2008(b)	Pre-posttest 1-group; NRS	Canada	16;Family medicine residents	Palliative care	Web-based learning+face-to-face workshop	asynchronous discussion forums a live audio-and text-based online synchronous session(Centra); online modules (Macromedia Breeze)	8 weeks	Absent	High(group-based discussion)	Present	No delay	Objective(MCQ)	No	No	4	
Karamizadeh,2011 (a)	Pre-posttest 1-group; NRS	Iran	10;Medical students	Medical training	E-learning+class session	Multimedia compact disk	4 weeks	Absent	High(problem solving session)	Absent	2-4 weeks delay	Objective(cannot tell)	No	No	3	
Karamizadeh,2011 (b)	Pre-posttest 1-group; NRS	Iran	40;Extern	Medical training	E-learning+class session	Multimedia compact disk	4 weeks	Absent	High(problem solving session)	Absent	2-4 weeks delay	Objective(cannot tell)	No	No	3	
Karamizadeh,2011 (c)	Pre-posttest 1-group; NRS	Iran	19;Intern	Medical training	E-learning+class session	Multimedia compact disk	4 weeks	Absent	High(problem solving session)	Absent	2-4 weeks delay	Objective(cannot tell)	No	No	3	
Karamizadeh,2011 (d)	Pre-posttest 1-group; NRS	Iran	38; Resident	Medical training	E-learning+class session	Multimedia compact disk	4 weeks	Absent	High(problem solving session)	Absent	2-4 weeks delay	Objective(cannot tell)	No	No	3	
Karamizadeh,2011	Pre-	Iran	6;Assista	Medical	E-learning+class	Multimedia	4	Absent	High(probl	Abs	2-4	Objective(cannot tell)	No	No	3	

(e)[1][1][21][1]	posttest 1-group; NRS		nt professor	training	session	compact disk	weeks		em solving session)	ent	weeks delay				
Chandler,2008	Pre-posttest 1-group; NRS	USA	817;Public health workers	Emergency preparedness	Web-based+on-the-job+face-to-face; downloadable homework assignment	Website; downloadable template	2 days	Absent	High(required for response)	Present	No delay	Objective(MCQ)	No	No	3
Baumlin 2006	Posttest, 2 group; RCT	USA	40/50; Clinical medical students	Lung cancer	Web tutorial +traditional	Internet tutor, repetition	1-4weeks	Present(case)	Low(case)	Present	No delay	Objective(cannot tell)	No	No	3
Cragun, 2005	Pre-posttest, 1 group; NRS	USA	39/15Nursing students	Genetics	Web tutorial +face-to-face lecture	Web tutorial	1 day	Present(case-based problem)	Low	Absent	No delay	Objective(MCQ, true or false question)	No	No	3

Section 2.Studies comparing blended learning with non-blended learning

Study	Design RCT/NRS)	Country	Comparison intervention	Participants no.(B/N ^a); type	Topic	Study intervention(component or features)	Modality or technology	Duration	Exercises	Interactivity	Discussion	courseDelay between posttest and	Assessment(question type)	Conflict of interest;	Source of support	Quality score
Kulier, 2012	Pre-posttest 2 groups ;RCT	7 LMICs (Argentina, Brazil, Democratic Republic of the	Traditional teaching	123/81; Postgraduate trainees	Reproductive Health	E-learning+F2F	recorded video, specialist database	8 weeks	Present(questions, assignments)	High(Feedback on assignments)	Absent	4 weeks	Objective(MCQ)	No	No	6

		Congo, India, Philipines, South Africa, Thailand).															
Kavadella,2012	Pre-posttest 2 group; RCTs	Greece	Conventional face to face methodology	24/22; Undergraduate	Oral radiology	F2F + online	E-learning platform Web-based tools include self-graded tests and quizzes, online discussion groups	0.5 year	Present(self-graded tests and quizzes)	High(self-graded tests and quizzes, online discussion groups)	Present	No delay	Objective(dichotomous:yes/no)	No	No	4	
Lancaster,2011	Pre-posttest, 1 group; NRS	USA	Traditional	97; Second professional year students	Pharmacy curriculum	online self-directed study +in-class active learning	Blackboard online hosting service	1 semester	Present(quiz)	High(quiz, group discussion)	Present	No delay	Objective(Choice question)	No	No	3	
Sowan,2013	Posttest, 2 groups; RCT	Jordan	Traditional format	105/105; undergraduate nursing students	Scientific research in nursing	Web-based+interactive F2F	Blackboard and Tegrity systems	1 semester	Present(questions, assignments)	High (questions, assignments)	Present	No delay	Objective(open-ended questions)	No	No	5	
Makhdoom,2013	Posttest, 2 groups; RCT	Saudi Arabia	face-to-face	60/61; Medical students	Family medicine course	E-learning+F2F	Electronic course management system	10 weeks	Absent	High(interact with tutors)	Present	No delay	Objective(MCQ)	No	No	5	
Lancaster,2012	Posttest, 2 groups; RCT	USA	Traditional in-class	29/23; Graduate	Pharmacotherapeutics course	Oline+F2F	Griffin Lapel Microphone, Articulate Presenter '09, electronic Blackboardhosting website	1 year	Present(assignment, question and answer sessions)	High (assignment, question and answer session, question and answer sessions)	Present	No delay	Objective(Cannot tell)	No	No	4	
Dankbaar,2014(a)	Posttest, 2 groups; NRS	Netherlands	Traditional course	31/16; Nurse in postgraduate	Acute and intensive care	Online material+F2F lecture	Web lectures	11 days	Present (examples and exercises)	Low(examples and exercises with feedback)	Absent	No delay	Objective(MCQ)	No	No	5	
Dankbaar,2014(b)	Posttest, 2 groups; NRS	Netherlands	Traditional course	31/16; Nurse in postgraduate	Acute and intensive care	Online material+F2F lecture	Web lectures	11 days	Present (examples and exercises)	Low(examples and exercises with feedback)	Absent	No delay	Objective(MCQ)	No	No	5	

Dankbaar,2014(c)	Posttest, 2 groups ;NRS	Netherlands	Traditional course	31/16; Nurse in postgraduate	Acute and intensive care	Online material+F2F lecture	Web lectures	11 days	Present (examples and exercises)	Low(examples and exercises with feedback)	Absent	No delay	Objective(MCQ)	No	No	5
Mangione,1991(a)	Pre-posttest, 2 groups ;RCT	USA	Computer-assisted instruction	13/9; Medical students	Cardiac auscultation	Self-schedule CAI + small-group seminar	HEARTLAB platform,	12 weeks	Absent	Low	Absent	No delay	Objective(choice question)	No	No	4
Mangione,1991(b)	Pre-posttest, 2 groups ;RCT	USA	Tutorial instruction	13/13; Medical students	Cardiac auscultation	Self-schedule CAI + small-group seminar	HEARTLAB platform,	12 weeks	Absent	Low	Absent	No delay	Objective(choice question)	No	No	4
Shomaker, 2002(a)	Pre-posttest, 2 groups ; RCT	USA	traditional	24/24;medical students	parasitology	computer program + lectures	interactive text	2 weeks	Present(questions)	Low(questions)	Absent	No delay	Objective(MCQ or slides)	No	No	5
Shomaker, 2002(b)	Pre-posttest, 2 groups ; RCT	USA	e-learning	24/17; medical students	parasitology		interactive text	2 weeks	Present(questions)	Low(questions)	Absent	No delay	Objective(MCQ or slides)	No	No	5
Stewart,2013	Posttest, 2 groups ; RCT	Australia	standard teaching	34/37; Medical students	Newborn	Online module+standard programme	PENSKE Baby Check Learning module	8 weeks	Absent	Low	Absent	No delay	Objective(Cannot tell)	No	No	4
Mahnken,2011(a)	Pre-posttest, 2 groups ; RCT	Germany	Traditional learning	32/32; Medical students	Radiology	E-learning+internship(F2F)	Electronic cases	1 week	Present (cases and expert feedback, question-and-answer)	High (cases and expert feedback, question-and-answer)	Absent	No delay	Objective(Cannot tell)	No	No	4
Mahnken,2011(b)	Pre-posttest, 2 groups ; RCT	Germany	Traditional learning	32/32; Medical students	Radiology	E-learning+internship(F2F)	Electronic cases	1 week	Present (cases and expert feedback, question-and-answer)	High (cases and expert feedback, question-and-answer)	Absent	No delay	Objective(Cannot tell)	No	No	4
Sung, 2008	Pre-posttest, 2 groups ;NRS	Korea	Face to face instruction	24/26; Nurses	Medical administration	Web-based matirilas +_face-to-face instruction	Web-based e-learning program	10 months	Present(quizzes with feedback, clinical cases)	High (quizzes with feedback, clinical cases, active interaction between tutors and students)	Absent	No delay	Objective(Cannot tell)	No	No	5
Woltering,2009	Posttest	Germa	traditiona	74/71;	Model	Online	multimedia	2	Present(questio	High(online	Pre	No	Objective(MCQ)	No	No	6

	t, 2 groups ;NRS	ny	I PBL	Medical students	Curriculum Medicine	learning+students' Meeting+tutored final session	case vignette, Group-Wiki, The virtual clinical order entry system, bulletin board	weeks	ns, cases)	collaboration including comments of the tutor)	sent	delay				
Karaksha,2011(a)	Posttest, 2 groups ; RCT	Australia	CAI	23/22; Pharmacy students	Pharmacology	Lecture+CAI	iSpring Pro 4.3.0, Blackboard, CD.	24H	Present (quiz, questions,multiple choice)	High(quiz, multiple choice essay questions)	Absent	No delay	Objective(MCQ)	No	No	5
Karaksha,2011(b)	Posttest, 2 groups ; RCT	Australia	Lecture	23/13; Pharmacy students	Pharmacology	Lecture+CAI	iSpring Pro 4.3.0, Blackboard, CD.	24H	Present (quiz, questions,multiple choice)	High(quiz, multiple choice essay questions)	Absent	No delay	Objective(MCQ)	No	No	5
Lowe,2001(a)	Posttest, 2 groups ;NRS	UK	lecture and seminar	39/46; Undergraduate dental students	Index of Orthodontic treatment need	CAL programme+seminar	Internet web-authoring package	1 week	Present(self-assessment)	High(multimedia design with interactive comment)	Present	No delay	Objective(cases)	No	No	5
Lowe,2001(b)	Posttest, 2 groups ;NRS	UK	lecture and seminar	39/46; Undergraduate dental students	Index of Orthodontic treatment need	CAL programme+seminar	Internet web-authoring package	1 week	Present (self-assessment)	High(multimedia design with interactive comment)	Present	No delay	Objective(cases)	No	No	5
Hilger, 1996	Pre-posttest, 2 groups ; RCT	USA	traditional	45/32;medical students	Streptococcal Pharyngitis	CAI program +clerkship	Online tutorial, case simulation	4 weeks	Present (case simulation,self-assessment)	High(discussion with feedback)	Present	No delay	Objective(MCQ. True or false)	No	No	5
Ilic,2013[3][3][23][3]	Posttest, 2 groups ;NRS	Australia	Didactic learning	34/27; Graduate medical students	Evidence based practice (EBP)	Tutorial sessions+website learning	Monash University library website	1 day	Present (patient-basedPresentation)	High(group work, patient-based Presentation)	Present	No delay	Objective(MCQ)	Yes	No	5
Daunt, 2013(a)	posttest, 2 groups ;NRS	UK	traditional	162/168;medical students	geriatric medicine	CAL package + traditional teaching	Xerte open access platform, Storyboards	4 weeks	Present(case,	High(case, interactive session)	Present	No delay	Objective(true or false, choice question, extended matching question)	No	No	3
Daunt, 2013(b)	posttest, 2 groups ;NRS	UK	traditional	92/67;medical students	geriatric medicine	CAL package + traditional teaching	Xerte open access platform, Storyboards	8 weeks	Absent	Low	absent	No delay	Objective(true or false, choice question, extended matching question)	No	No	3
Morales,2012[4][4][24][4]	Posttest, 2 groups	Spain	documents and books	22/22; Physiotherapy second-	Physiotherapy degree course	on-campus training+ website	ECOFISIO website	1 semester	Present(self-assessment)	Low(self-assessment)	Absent	No delay	Objective(MCQ)	No	No	5

	; RCT			year degree students		training										
Raupach,2010	Pre-posttest, 2 groups ; RCT	Germany	Traditional learning	40/34; Medical students	Cardio-respiratory curriculum	Online module+traditional curriculum	web-based learning management system	6 weeks	Present(test with feedback)	High(test with feedback)	Present	No delay	Objective(MCQ)	No	No	5
Carbonaro,2008	Pre-posttest, 2 groups ; RCT	Canada	face to face	22/22; Student	Health science program	E-learning+F2F interprofessional team course		5 weeks	Present(giving/receiving feedback, consensus decision-making)	High(giving/receiving feedback, consensus decision-making, Group discussions, problem solving)	Present	No delay	Subjective(cannot tell)	No	No	5
Pereira,2007	Posttest, 2 groups ;NRS	Spain	Traditional teaching	65/65; Students	Human anatomy	Online learning+seminars	Computerised materials	45 class hours	Present(interactive multiple-choice, short-answer self-assessment test problem solving activities)	High(interactive multiple-choice, short-answer self-assessment test)	Present	No delay	Objective(MCQ, short answer question, practical question)	No	No	4
Devitt,2001	Pre-posttest, 2 group; nrss	Australia	Lecture	85/20; Medical students	Ophthalmology	Lecture+e-learning	Medici software	2 weeks	Present(cases)	Low	Absent	No delay	Objective(MCQ)	No	No	5
Mukti,2005	Posttest, 2 groups ; RCT	Malaysia	Traditional collaborative learning	101/85; Undergraduate students	Animal diversity course	lecture + Online collaborative learning	Online web sites	1 semester	Present(group project)	High(collaborative learning, group working)	Present	No delay	Objective(MCQ)	No	No	5
Kiviniemi,2014	Posttest 2-group; NRS	USA	traditional learning	38/28; Public health graduate student	Public health	Online lecture presentation +didactic lecture	web	3 weeks	Absent	High(active learning activity)	Present	No delay	Objective(MCQ, short answer question)	No	No	3
Hsu,2011(a)	Pre-posttest, 2 groups ;NRS	Taiwan	traditional learning	113/88; Nursing students	Nursing ethics	web-based teaching/learning module+classroom lectures	web-based module(videos, PowerPoint files)	17 weeks	Present(questions and comments)	High(exchange ideas, questions and comments)	Present	No delay	Objective(cannot tell)	No	No	4
Hsu,2011(b)	Pre-posttest, 2 group;	Taiwan	traditional learning	113/88; Nursing students	Nursing ethics	web-based teaching/learning module+classroom	web-based module(videos, PowerPoint files)	17 weeks	Present(questions and comments)	High(exchange ideas, questions and	Present	No delay	Subjective(cannot tell)	No	No	4

	NRSs					lectures				comments)						
Kaveevitthai,2009	Pre-posttest, 2 group; RCTs	Thailand	traditional learning	40/40; Nursing students	Anatomy and physiology	CAL multimedia+traditional lecture	interactive CAL multimedia	2 days	Present(questions, case scenarios)	High(questions, case scenarios)	Present	No delay	Objective(MCQ)	No	No	5
Kumrow,2005	Posttest 2-group; NRS	USA	traditional learning	18/15; Graduate nursing students	Health care economic policy and management	Online instruction(50%)+traditional in-classface-to-face(50%)	Web-based	>1 semester	Absent	Low	Absent	No delay	Subjective(self-report)	No	No	3
Howerton,2004(a)	Pre-posttest, 2 groups; RCT	USA	traditional learning	25/24; Dental students	Dental radiology	Interactive CD +lecture	Director 8 authoring software	2 weeks	Present(exercises)	High(exercises, interactive presentation)	Absent	2 weeks	Objective(cannot tell)	No	No	4
Howerton,2004(b)	Pre-posttest, 2 groups; RCT	USA	e-learning	25/26; Dental students	Dental radiology	Interactive CD +lecture	Director 8 authoring software	2 weeks	Present(exercises)	High(exercises, interactive presentation)	Absent	2 weeks	Objective(cannot tell)	No	No	4
Fleetwood,2009	Posttest 2-group; RCT	USA	traditional learning	89/84; Medical students	Bioethics course	Web-based program+lectures +small-group discussions	MedEthEx Online System	8 weeks	Present case, questions with feedback	High(questions with feedback group discussions)	Present	3 weeks	Objective(MCQ)	No	No	4
Mars,1996	Pre-posttest, 2 groups; NRS	Durban	traditional learning	34/34; Medical students	histology	CAL module+	onscreen "patient"	3 weeks	Present(self-assessment questions)	High (self-assessment questions ,asking and answering questions)	Absent	No delay	Objective(cannot tell)	No	No	4
Gadbury-Amyot,2012	Posttest 2-group; NRS	USA	traditional learning	309/300; Dental and dental hygiene students	Oral Histology	CAL+lecture	Software standard interactions	>1 semester	Present(questions, self-assessment)	High(interactive multimedia)	Absent	No delay	Objective(cannot tell)	No	No	5
Perkins,2010	Pre-posttest, 2 groups; RCT	UK	traditional learning	275/276; Medical students	Life support	Face-to-face course +e-learning	Microsim programme on a CD	4 weeks	Absent	Low(Feedback on experiences)	Absent	No delay	Objective(MCQ)	Yes	No	5
Strickland,2008[6][6][26][6]	Pre-posttest, 2 groups	German	traditional learning	8/6; Health professions student	Respiratory Care	Course materials via Internet +face-to-face	Cannot tell	1 semester	Absent	Low	Absent	No delay	Objective(cannot tell)	No	No	3

	;NRS					interaction										
Rouse,2000(a)	Pre-posttest, 2 groups; RCT	USA	traditional learning	20/26; Nursing Students	Pediatric nursing	computer-assisted instruction +traditional class room lecture	CD-ROM, computer	>1 semester	Absent	Low	Absent	No delay	Objective(MCQ)	No	No	5
Rouse,2000(b)	Pre-posttest, 2 groups; RCT	USA	e-learning	20/26; Nursing Students	Pediatric nursing	computer-assisted instruction +traditional class room lecture	CD-ROM, computer	>1 semester	Absent	Low	Absent	No delay	Objective(MCQ)	No	No	5
Gagnon2013	Posttest 2-group; RCT	Canada	traditional learning	52/50; Nursing undergraduates	Critical reading of scientific articles	Internet-based tutorials +in-class sessions;	interactive, Internet-based modules	1 semester	Present(small-group exercises, quizzes)	High(las discussion, small-group exercises, quizzes.)	Present	No delay	Objective(MCQ, open-ended questions)	No	No	5
Boynton,2007	Posttest 2-group; NRS	USA	traditional learning	98/107; Dental students	Pediatric Behavior Management	Internet-based instructional tool+lectures	web-based instructional tool	6 weeks	Absent	High(essay question)	Present	No delay	Objective(MCQ, short essay)	No	No	3
Lamb,2011	Pre-posttest, 2 groups; NRS	Uruguay	e-learning	36/30; Health professionals	Tobacco Cessation Skills	Face-toface + online activities	EviMed system	3 months	Present(cases)	High(cases, wiki-type collaborative activity group-discussion workshops)	Present	No delay	Objective(cannot tell)	No	No	3
Raupach, 2009	Posttest, 2 groups; RCT	Germany	traditional	72/73; medical students	Clinical reasoning	online module + course	web-based collaborative teaching module	6 weeks	Present(cases)	High(small group discussions)	Present	No delay	Objective(MCQ)	No	No	5
Sherman, 2012	Pre-posttest, 2 groups; RCT	USA	traditional	35/33;nurses	critical care pharmacology	interactive module+discussion session	interactive learning modules delivered via the hospital's learning management system	1 day	Absent	Low	Present	No delay	Objective(MCQ)	No	No	5
Gerdprasert,2010	Pre-posttest, 2 groups; RCT	Thailand	traditional	42/43;nursing students	mechanism of labour	web-based learning +conventional lecture	Web-site	2 weeks	Present(case scenarios, formative questions and exercises)	High(eb-board for posting questions and discussion between students-students	Present	No delay	Objective(MCQ. True or false question, interactive question)	No	No	5

											and students-teacher)					
Wahlgren,2006	Posttest, 2 groups ; RCT	Sweden	traditional	28/85; medical students	dermatology and venereology	conventional teaching +computerised interactsimulation system	computer programming	17 days	Present(cases, questions)	High(cases, question, extensive feedback)	Present	No delay	Objective(diagnosis)	No	No	4
Farrell.2006	Pre-posttest, 2 groups ; RCT	Australia	traditional	35/41; nursing students	pharmacological and clinical contextual knowledge	Mobile Handheld computers+clinical practice	Hewlett Packard PDAs (HP iPAQ Pocket Pch5500)	3 weeks	Absent	Low	Absent	No delay	Objective(MCQ)	No	No	5
Taradi,2004	Posttest, 2 groups ; RCT	Croatia	traditional	37/84; medical students	acid-base physiology	Online+face-to-face	A Webenvironment created by using the commercially available Web Course Tools (WebCT)	5 weeks	Present(self-testing, exercises, quiz)	High(group collaborations)	Present	No delay	Objective(MCQ, true/false, matching, calculated, short answer, and written paragraph questions)	No	No	4
Eskenazi, 2010	Pre-posttest, 2 groups ;NRS	Brasil	traditional	41/37;	oral health	Internet-based training p	Cannot tell	3 months	Present(case)	Low(case)	absent	No delay	Objective(cannot tell)	No	No	4

a. no.(B/N) means number of participants in blended learning versus number of participants in no intervention or non-blended learning.

E-Table 4. Quality of included studies

Section 1. Studies comparing blended learning to no intervention

Author, year	Representative intervention group	Comparison group selected from same community	Comparability of cohorts	Blinded outcome assessment	Follow-up adequate	Score
Flys, 2012	Yes	No	Controlled for baseline	Yes	Yes	4
Purl, 2010	Yes	Yes	Controlled for learning outcome and other	Yes	Yes	6
Karaksha, 2011	Yes	Yes	Randomized	Yes	Yes	4
Buchowski, 2002	Yes	No	Controlled for baseline	No	Yes	3
Wallen,2010	Yes	No	Controlled for baseline	No	Yes	3
Weaver,2014(a)	Yes	No	Controlled for baseline	No	Yes	3

Weaver,2014(b)	Yes	No	Controlled for baseline	No	Yes	3
Riesen,2012	Yes	No	Controlled for baseline	No	Yes	3
Cho,2014(a)	Yes	No	Controlled for age	No	Yes	3
Cho,2014(b)	Yes	No	Controlled for age	No	Yes	3
Pereira,2008(a)	Yes	No	Controlled for baseline	Yes	Yes	4
Pereira,2008(b)	Yes	No	Controlled for baseline	Yes	Yes	4
Karamizadeh,2011(a)	Yes	No	Controlled for baseline	No	Yes	3
Karamizadeh,2011(b)	Yes	No	Controlled for baseline	No	Yes	3
Karamizadeh,2011(c)	Yes	No	Controlled for baseline	No	Yes	3
Karamizadeh,2011(d)	Yes	No	Controlled for baseline	No	Yes	3
Karamizadeh,2011(e)	Yes	No	Controlled for baseline	No	Yes	3
Chandler,2008	Yes	No	Controlled for baseline	No	Yes	3
Baumlin 2006	Yes	No	Randomized	No	Yes	3
Cragun, 2005	Yes	No	No	Yes	Yes	3

Section 2.Studies comparing blended learning to non-blended learning

Author, year	Representative intervention group	Comparison group selected from community same	Comparability of cohorts	Blinded outcome assessment	Follow-up adequate	Score
Kulier, 2012	Yes	Yes	Randomized, allocation concealed	Yes	Yes	6
Kavadella, 2012	Yes	Yes	Randomized	No	Yes	4
Lancaster, 2011	Yes	No	Controlled for other	Yes	No	3
Sowan, 2013	Yes	Yes	Randomized, allocation concealed	No	Yes	5
Makhdoom, 2013	Yes	Yes	Randomized	Yes	Yes	5
Lancaster, 2012	Yes	Yes	Randomized	No	Yes	4
Dankbaar, 2014(a)	Yes	Yes	Controlled for age and other	No	Yes	5
Dankbaar, 2014(b)	Yes	Yes	Controlled for age and other	No	Yes	5
Dankbaar, 2014(c)	Yes	Yes	Controlled for age and other	No	Yes	5
Mangione, 1991(a)	Yes	Yes	Randomized	No	Yes	4
Mangione,1991(b)	Yes	Yes	Randomized	No	Yes	4
Stewart, 2013	Yes	Yes	Randomized	No	Yes	4
Mahnken, 2011(a)	Yes	Yes	Randomized	No	Yes	4
Mahnken, 2011(b)	Yes	Yes	Randomized	No	Yes	4
Sung, 2008	Yes	Yes	Controlled for baseline and other	No	Yes	5
Woltering, 2009	Yes	Yes	Controlled for learning and baseline	Yes	Yes	6
Karaksha, 2011(a)	Yes	Yes	Randomized	Yes	Yes	5
Karaksha, 2011(b)	Yes	Yes	Randomized	Yes	Yes	5
Lowe, 2001(a)	Yes	Yes	Controlled for other	Yes	Yes	5
Lowe, 2001(b)	Yes	Yes	Controlled for other	Yes	Yes	5

Ilic, 2013	Yes	Yes	Controlled for other	Yes	Yes	5
Morales, 2012	Yes	Yes	Randomized	Yes	Yes	5
Raupach, 2010	Yes	Yes	Randomized	Yes	Yes	5
Carbonaro, 2008	Yes	Yes	Randomized, allocation concealed	No	Yes	5
Pereira, 2007	Yes	Yes	Controlled for learning and baseline	No	Yes	4
Devitt, 2001	Yes	Yes	Controlled for other	Yes	Yes	5
Mukti, 2005	Yes	Yes	Randomized	Yes	Yes	5
Kiviniemi,2014	Yes	Yes	Controlled for other	No	No	3
Hsu, 2011(a)	Yes	Yes	Controlled for other	No	Yes	4
Hsu, 2011(b)	Yes	Yes	Controlled for other	No	Yes	4
Kaveevivitchai,2009	Yes	Yes	Randomized	Yes	Yes	5
Kumrow,2005	Yes	Yes	No	No	Yes	3
Howerton,2004(a)	Yes	Yes	Randomized	No	Yes	4
Howerton,2004(b)	Yes	Yes	Randomized	No	Yes	4
Fleetwood,2009	Yes	Yes	Randomized	No	Yes	4
Mars,1996	Yes	Yes	Controlled for other	No	Yes	4
Gadbury-Amyot,2012	Yes	Yes	Controlled for age and other	No	Yes	5
Perkins,2010	Yes	Yes	Randomized	Yes	Yes	5
Strickland,2008	Yes	Yes	No	No	Yes	3
Rouse, 2000(a)	Yes	Yes	Randomized	Yes	Yes	5
Rouse, 2000(b)	Yes	Yes	Randomized	Yes	Yes	5
Gagnon,2013	Yes	Yes	Randomized	Yes	Yes	5
Boynton,2007	Yes	Yes	No	No	Yes	3
Lamb,2011	Yes	Yes	No	No	Yes	3
Raupach, 2009	Yes	Yes	Randomized	Yes	Yes	5
Sherman, 2012	Yes	Yes	Randomized	Yes	Yes	5
Gerdprasert,2010	Yes	Yes	Randomized	Yes	Yes	5
Wahlgren,2006	Yes	Yes	Randomized	No	Yes	4
Farrell.2006	Yes	Yes	Randomized	Yes	Yes	5
Taradi,2004	Yes	Yes	Randomized	No	Yes	4
Shomaker, 2002(a)	Yes	Yes	Randomized	Yes	Yes	5
Shomaker, 2002(b)	Yes	Yes	Randomized	Yes	Yes	5
Hilger, 1996	Yes	Yes	Randomized	Yes	Yes	5
Daunt, 2013(a)	Yes	Yes	No	No	Yes	3
Daunt, 2013(b)	Yes	Yes	No	No	Yes	3
Eskenazi, 2010	Yes	Yes	No	No	Yes	3

E-Table 5: GRADE evidence profile

Section 1: Studies comparing blended learning with no intervention

Quality assessment					No of participants		Effect		Quality
No. and design of study	Risk of bias	Inconsistency	Indirectness	Imprecision	Other consideration	X	Y	Relative	

Flys, 2012	225	90.3	10.71	225	70.9	16.84	Mean,95%CI
Purl, 2010	350	44.33	1.07	102	41.87	1.93	Mean, SD
Karaksha, 2011	23	66.96	23.82	17	45.88	18.39	Mean, SD
Buchowski, 2002	14	73	12	14	31	7	Mean, SD
Wallen,2010	16	56.39	20.02	16	37.09	16	Mean, SD
Weaver,2014(a)	80	76.81	13.43	78	74.13	13.33	Mean, average SD
Weaver,2014(b)	58	74.45	13.43	127	76.03	13.33	Mean, average SD
Riesen,2012	60	84.43	6.54	60	82.1	6.96	Mean, SD
Cho,2014(a)	60	79.2	16.6	60	64.8	13.4	Mean, SD
Cho,2014(b)	60	77.2	12	60	53.4	10	Mean, SD
Pereira,2008(a)	69	78	9.5	69	60.5	13.2	Mean, SD
Pereira,2008(b)	45	80	1.25	45	46.25	15	Mean, SD
Karamizadeh,2011(a)	6	100	11	6	80	11	Mean, SD
Karamizadeh,2011(b)	38	69	24	38	49	19	Mean, SD
Karamizadeh,2011(c)	19	85	22	19	44	15	Mean, SD
Karamizadeh,2011(d)	40	86	16	40	42	19	Mean, SD
Karamizadeh,2011(e)	10	70	31	10	42	14	Mean, SD
Chandler,2008	817	94.25	8.07	817	72.17	16.31	Mean, SD
Baumlin 2006	40	72.8	13.43	50	68.2	13.33	Mean, average SD
Cragun, 2005	39	74	13.5	15	62	13.5	Mean, SD

Section 2. Studies comparing blended learning to non-blended learning

	Intervention			Control			Source
	No.	Standard Mean	Standard SD	No.	Standard Mean	Standard SD	
Kulier, 2012	123	69.52	5.95	81	61.45	6.20	Mean,95%CI
Kavadella, 2012	24	80.88	13.82	22	68.64	13.90	Mean, SD
Lancaster, 2011	97	84.09	8.98	97	65.15	10.14	Mean, average SD
Sowan, 2013	105	78.00	5.50	105	70.00	8.50	Mean, SD
Makhdoom, 2013	60	71.69	12.31	61	66.02	11.82	Mean, SD
Lancaster,2012	29	96.60	1.90	23	92.70	3.80	Mean, SD
Dankbaar, 2014(a)	31	80.00	2.00	16	80.00	3.00	Mean, SD

Dankbaar, 2014(b)	31	76.00	2.00	16	75.00	3.00	Mean, SD
Dankbaar, 2014	31	73.00	2.00	16	68.00	3.00	Mean, SD
Mangione, 1991(a)	13	78.50	18.28	13	70.00	22.28	Mean, SD
Mangione, 1991(b)	13	78.50	18.28	9	62.50	19.85	Mean, SD
Shomaker, 2002(a)	24	44.60	8.98	24	51.00	10.14	Mean, average SD
Shomaker, 2002(b)	24	44.60	8.98	17	51.20	10.14	Mean, average SD
Stewart, 2013	34	75.00	12.25	37	67.50	11.75	Mean, SD
Mahnken, 2011(a)	32	72.90	12.30	32	69.00	12.40	Mean, SD
Mahnken, 2011(b)	32	87.70	12.80	32	69.00	12.40	Mean, SD
Sung, 2008	24	82.21	8.75	26	67.92	7.17	Mean, SD
Woltering, 2009	74	63.20	14.08	71	55.76	12.28	Mean, SD
Karaksha, 2011(a)	23	66.96	23.82	13	54.55	26.32	Mean, SD
Karaksha, 2011(b)	23	66.96	23.82	22	41.54	22.30	Mean, SD
2e, 2001(a)	39	31.80	15.20	46	25.00	16.70	Mean, SD
2e, 2001(b)	39	50.30	14.00	46	50.20	17.40	Mean, SD
Hilger, 1996	45	78.40	8.98	32	73.40	10.14	Mean, average SD
Ilic, 2013	34	40.53	18.00	27	45.13	22.40	Mean, SD
Daunt, 2013(a)	92	92.00	8.98	67	85.10	10.14	Mean, average SD
Daunt, 2013(b)	162	84.20	8.98	168	68.40	10.14	Mean, average SD
Morales, 2012	22	72.30	6.20	22	74.20	8.10	Mean, SD
Raupach, 2010	40	84.80	1.30	34	79.50	1.40	Mean, SD
Carbonaro, 2008	22	32.44	7.33	22	34.00	10.67	Mean, SD
Pereira, 2007	65	63.00	13.00	65	50.00	16.00	Mean, SD
Devitt, 2001	85	61.67	1.11	20	45.00	2.50	Mean, SD
Mukti, 2005	101	61.77	9.98	85	45.38	11.66	Mean, SD
Kiviniemi, 2014	38	93.92	2.45	28	91.76	4.95	Mean, SD
Hsu, 2011(a)	113	80.28	10.84	88	81.96	10.56	Mean, SD
Hsu, 2011(b)	113	66.41	8.46	88	68.11	8.73	Mean, SD
Kaveevivitchai, 2009	40	61.10	6.23	40	59.43	7.83	Mean, SD
Kumrow, 2005	18	97.15	2.56	15	94.78	3.37	Mean, SD
Howerton, 2004(a)	25	84.40	9.28	24	82.50	12.07	Mean, SD

Howerton, 2004(b)	25	84.40	9.28	26	75.00	7.07	Mean, SD
Fleetwood, 2009	89	83.00	5.00	84	83.00	5.00	Mean, SD
Mars, 1996	34	65.60	8.98	34	60.70	10.14	Mean, average SD
Gadbury-Amyot, 2012	309	95.75	10.00	300	92.00	12.75	Mean, SD
Perkins, 2010	275	84.50	11.58	276	84.92	11.50	Mean, SD
Strickland, 2008	8	86.00	8.98	6	85.00	10.14	Mean, average SD
Rouse, 2000(a)	20	77.30	11.50	26	66.20	11.60	Mean, SD
Rouse, 2000(b)	20	77.30	11.50	26	74.00	11.00	Mean, SD
Gagnon, 2013	52	17.20	0.90	50	14.50	0.60	Mean, SD
Boynton, 2007	98	78.22	7.67	107	74.72	12.56	Mean, SD
Lamb, 2011	36	83.10	2.80	30	75.30	17.20	Mean, SD
Raupach, 2009	73	74.00	10.00	72	74.00	9.60	Mean, SD
Sherman, 2012	35	89.7	5.16	33	88.30	6.79	Mean, SD
Gerdprasert, 2010	42	71.90	9.59	43	87.93	5.76	Mean, SD
Wahlgren, 2006	28	88.80	9.38	85	87.50	10.00	Mean, SD
Farrell, 2006	35	50.66	8.98	41	45.34	10.14	Mean, average SD
Taradi, 2004	37	71.69	1.83	84	61.33	1.03	Mean, SD
Eskenazi, 2010	41	33.30	8.98	37	30.30	10.14	Mean, average SD

E-table 7. PRISMA 2009 Checklist

Section/topic	#	Checklist item	Reported on heading
TITLE			
on	1	Antenatal depressive symptoms and the risk of preeclampsia or operative deliveries: A meta-analysis	Title (page 1)
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	Abstract (page 2-3)
INTRODUCTION			

Rationale	3	Describe the rationale for the review in the context of what is already known.	Introduction (page 4)
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	Introduction (page 4-5)
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	N/A
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	Methods: Eligibility criteria (page 5-6)
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	Methods: Data sources (page 6)
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	Methods: e-table 1 (supplemental document)
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	Methods: Study selection (page 6-7)
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	Methods: Data extraction (page 7)

Section/topic	#	Checklist item	Reported on Heading
METHODS (cont.)			
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	Methods: Data extraction (page 7)
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	Methods: Quality Assessment (page 7-8)

Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	Methods: Data Synthesis(page 9)
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I ²) for each meta-analysis.	Methods: Data Synthesis(page 9)
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	Methods: Data Synthesis(page 9)
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.)	Methods: Data Synthesis(page 9)
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	Results: Study selection and Figure 1 (page 9-10)
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	Results: Table 1 (page 11-12) and e-table 3 (supplemental document)
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	Results: Study quality(page 12-13)
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	Results: Figure 2 (page 14) and Figure 4 (page 18),

			and e-table 6 (supplemental document)
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	Results: Figure 2 (page 14) and Figure 4 (page 18)
Section/topic	#	Checklist item	Reported on Heading
RESULTS (cont.)			
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	Results: Figure 3 (page 15) and Figure 5 (page 19)
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	Results: Table 2 (page 16-17) and Table 3 (page 20-21)
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	Discussion (page 22-24)
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	Limitations and strengths (page 24-25)
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	Conclusion (page 26-27)
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	Acknowledgements (page 27)

From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(6): e1000097. doi:10.1371/journal.pmed1000097