Supplemental Digital Content 2.

Data extraction table for variables extracted from the top 100 articles retrieved from Scopus under search terms relating to healthcare simulation education and research, and healthcare professionals and trainees. Articles with the same number of citations were given the exact same rank.

Rank	Author and year	Total numbe r of citations	Type of paper	Type of simulator	Skill	Clinical topic	Participants/ population	Journal	Country of publication
1	Seymour et al., 2002 ²²	1411	Intervention	VR (part-task trainer)	Technical skills	Surgery (laparoscopy); Medical education and training;	Surgical residents (<i>n</i> =16)	Annals of Surgery	USA
2	Issenberg et al., 2005 ²³	1342	Systematic review	Various	Both	Medical education and training;	Medical trainees and professionals	Medical Teacher	USA
3	Epstein & Hundert, 2002 ²⁴	1201	Review (non- systematic)	Various	Both	Assessing clinical/professional competence; medical education and training;	Medical trainees and professionals	Journal of the American Medical Association (JAMA)	USA
4	Martin et al., 1997 ⁹⁰	1084	Tool evaluation	Various	Technical skills	Surgery (generic); medical education and training;	Surgical residents, PGY1, 3, 5 (<i>n</i> =20)	British Journal of Surgery	Canada
5	Ericsson, 2004 ²⁵	1066	Invited address	Various	Both	Medical education and training;	Medical trainees and professionals	Academic Medicine	USA
6	Reznick & McRae, 2006 ⁹¹	740	Review (non- systematic)	Various	Technical skills	Surgery (generic); Medical education and training;	Surgeons and trainees	New England Journal of Medicine	Canada
7	Grantcharov et al., 2004 ¹⁰⁸	711	Intervention	VR (part-task trainer)	Technical skills	Surgery (laparoscopy); medical education and training;	16 surgical trainees	British Journal of Surgery	Denmark
8	Peabody et al., 2000 ²⁶	656	Tool evaluation	SPs	Both	Primary care; assessing	20 primary care physicians	JAMA	USA

9	Epstein, 2007 ²⁷	622	Review (non-systematic)	Various	Both	clinical/professional competence; Assessing clinical/professional competence; medical education and training;	Medical trainees and professionals	New England Journal of Medicine	USA
9	Reznick et al., 1997 ⁹²	622	Tool evaluation	Inanimate part- task trainer	Technical skills	Surgery (generic); medical education and training;	48 general surgery residents	American Journal of Surgery	Canada
11	Gaba, 2004 ¹⁷	562	Review (non- systematic)	Various	Both	Healthcare in general; medical education and training;	Healthcare trainees and professionals	Quality and Safety in Healthcare	USA
12	Issenberg et al., 1999 ²⁸	543	Review (non- systematic)	Various	Both	Medical education and training;	Medical trainees and professionals.	JAMA	USA
13	Fallowfield et al., 2002 ⁶⁷	536	Intervention	SPs	Non- technical skills	Doctor-patient communication; Oncology; medical education and training;	160 oncologists.	The Lancet	UK
14	McGaghie et al 2010 ¹	507	Review (non- systematic)	Various	Both	Medical education and training;	Medical trainees and professionals	Medical Education	USA
15	Roter et al., 1995 ²⁹	505	Intervention	SPs	Non- technical skills	Medical education and training; primary care; Doctor-patient communication;	Primary care physicians	Archives of Internal Medicine	USA
16	Fried et al., 2004 ⁹³	484	Tool evaluation	Inanimate part- task trainer	Technical skill	Surgery (laparoscopy); Medical education and training;	215 surgeons and trainees.	Annals of Surgery	Canada
17	Fletcher et al., 2003 ⁶³	480	Tool evaluation	Manikin; full simulated environment	Non- technical skills	Anesthesiology; CRM; Medical	50 consultant anesthetists	British Journal of Anesthesia	UK

18	Scott et al., 2000 ³⁰	476	Intervention	Inanimate part- task trainer	Technical skills	education and training; Surgery (laparoscopy); medical education and training;	22 second and third year residents.	Journal of the American College of Surgeons	USA
19	Wass et al., 2001 ⁶⁴	475	Review (non- systematic)	SPs	Both	Assessing clinical/professional competence; medical education and training;	Medical trainees/students	The Lancet	UK
20	Cook et al, 2011 ³¹	461	Systematic review and meta-analysis	Various	Both	Health professions education/training;	Health professions trainees	JAMA	USA
21	Gallagher et al., 2005 ³²	456	Review (non- systematic)	VR (part-task trainers)	Technical skills	Surgery (MIS); medical education and training;	Surgical trainees	Annals of Surgery	USA
22	Jeffries, 2005 ³³	445	Review (non- systematic)	Various	Both	Nursing education and training;	Nursing students	Nursing Education Perspectives	USA
23	Derossis et al., 1998 ¹⁰⁵	443	Observational	Inanimate part- task trainers	Technical skills	Surgery (laparoscopy); medical education and training;	N=42; 6 general surgery residents from each of the 5 years (n=30); 6 laparoscopic surgeons; 6, non-laparoscopic, attending surgeons	American Journal of Surgery	Canada
24	Howard et al., 1992 ³⁴	424	Intervention	Manikin; full simulated environment	Non- technical skills	Anesthesiology; CRM; surgery (laparoscopy); medical education and training;	12 anesthesia residents	Aviation, Space and Environmental Science.	USA

25	Maguire & Pitceanthly, 2002 ⁸⁹	423	Review (non- systematic)	SPs	Non- technical skills	Doctor-patient communication; medical education and training;	Medical professionals	British Medical Journal (BMJ)	UK
26	Regehr et al., 1998 ⁹⁵	418	Tool evaluation	Inanimate part- task trainers	Technical skills	Surgery (generic); medical education and training;	53 general surgery residents (PGY1- PGY6)	Academic Medicine	Canada
27	Fanning & Gaba, 2007 ³⁵	411	Review (non- systematic)	General/non specified	Both	Medical education and training;	Medical professionals	Simulation in Healthcare	USA
28	Ziv et al., 2003 ¹⁰⁶	398	Review (non- systematic)	Various	Both	Surgery (generic); medical education and training;		Academic Medicine	Israel
29	Appleyard et al., 2000 ⁶⁵	389	Tool evaluation	Live animals	Technical skills	Surgery (endoscopy);	Surgeons	Gastroenterology	UK
30	Cooke et al., 2006 ³⁶	381	Review (non- systematic)	Various	Both	Medical education and training;	Medical professionals.	New England Journal of Medicine	USA
31	McGaghie et al., 2011 ³⁷	364	Meta-analysis	Various	Both	Medical education and training;	Medical trainees	Academic Medicine	USA
32	Peabody et al., 2004 ³⁸	350	Tool evaluation	SPs; computerized clinical vignettes	Both	Primary care; assessing clinical competence/quality of care;	Primary care physicians (<i>n</i> =116)	Annals of Internal Medicine	USA
33	Moorthy et al., 2003 ⁶⁶	348	Review (non- systematic)	Various	Technical skills	Surgery (generic); medical education and training.	Surgical trainees	ВМЈ	UK
33	Gaba et al., 1998 ²¹	348	Performance assessment	Manikins; full simulated environment	Both	Anesthesiology; CRM;	Anesthetists	Anesthesiology	USA
35	Gaba et al., 2001 ³⁹	345	Review (non- systematic)	Manikins; Full simulated environment	Both	CRM; Anesthesiology; Medical education and training;	Anesthetists and trainees.	Simulation and Gaming	USA
36	Wayne et al., 2008 ²⁰	343	Observational	Manikin	Technical skills	Medical education/training;	Internal medical residents	Chest	USA

37	Anastakis et al., 1999 ⁹⁶	338	Intervention	Various	Technical skills	Surgery(generic); Medical education and training;	PGY1 surgical residents (<i>n</i> =23)	American Journal of Surgery	Canada
38	Bradley, 2006 ⁶⁸	327	Review (non- systematic)	Various	Both	Medical education and training;	Medical trainees	Medical Education	UK
39	Maran & Glavin, 2003 ⁶⁹	326	Review (non- systematic)	Various	Both	Medical education and training;	Medical trainees	Medical Education	UK
40	Back et al., 2007 ⁴⁰	324	Intervention	SPs	Non- technical skills	Oncology; Doctor- patient communication; medical education and training;	115 medical oncology fellows	Archives of Internal Medicine	USA
41	Yule et al., 2006 ⁷⁰	322	Review (non- systematic)	Various	Non- technical skills	Surgery (generic); medical education and training;	Trainees or consultant surgeons	Surgery	UK
42	Taffinder et al., 1998 ⁷¹	313	Performance assessment	VR (Part-task trainer);	Technical skills	Surgery (laparoscopy);	6 trainee surgeons	The Lancet	UK
43	Vassiliou et al., 2006 ⁹⁸	303	Tool evaluation	Inanimate part- task trainers	Technical skills	Surgery (Laparoscopy); medical education and training;	General surgery residents PGY1-5 (<i>n</i> =17); attending surgeons (<i>n</i> =4)	American Journal of Surgery	Canada
44	Reznick, 1993 ⁹⁷	296	Review (non- systematic)	Various	Technical skills	Surgery (generic); medical education and training;	Surgeons	American Journal of Surgery	Canada
45	Baker et al., 2006 ⁴¹	291	Review (non- systematic)	Manikins; full simulated environment	Non- technical skills	Team training; CRM; medical education and training;	Medical professionals	Health Services Research	USA
46	Okuda et al., 2009 ⁴²	288	Review (non- systematic)	Various	Both	Medical education and training;	Undergraduate and graduate medical trainees	Mount Sinai Journal of Medicine	USA
47	Satava, 1993 ⁴³	287	Review (non- systematic)	VR (part-task trainer)	Technical skills	Surgery (generic); medical education and training;	Surgical residents and trainees	Surgical Endoscopy	USA

48	Kneebone et al., 2003 ⁷²	283	Review (non- systematic)	Various	Both	Surgery (generic); medical education and training;	Healthcare trainees and professionals	Medical Education	UK
49	Gaba & De Anda, 1988 ⁴⁴	276	User evaluations	Manikin; Full simulated environment	Technical skills	Anesthesiology; CRM; medical education and training;	First and second year residents; medical students (<i>n</i> =17)	Anesthesiology	USA
50	Ahlberg et al., 2007 ¹⁰⁹	272	Intervention	VR (part-task trainer)	Technical skills	Surgery (laparoscopy); medical education and training;	13 surgical residents	American Journal of Surgery	Sweden
51	Aggarwal et al., 2004 ⁷³	266	Review (non- systematic)	VR (Part-task trainers)	Technical skills	Surgery (laparoscopy); medical education and training;	Surgeons and surgical trainees	British Journal of Surgery	UK
52	Datta et al., 2001 ⁷⁴	265	Tool evaluation	Inanimate part- task trainers	Technical skills	Surgery (generic); medical education;	Basic surgical trainees (<i>n</i> =12); junior specialist registrars (<i>n</i> =13); senior specialist registrars (<i>n</i> =13); consultants (<i>n</i> =13).	Journal of the American College of Surgeons	UK
53	Sutherland et al., 2006 ¹¹⁴	263	Systematic review	Various	Technical skills	Surgery (generic); medical education and training;	Surgeons; surgical trainees/residents; medical students	Annals of Surgery	Australia
53	Korndorffer et al., 2005 ⁴⁵	263	Intervention	Inert animal products; Inanimate part- task trainer;	Technical skills	Surgery (laparoscopy); Medical education and training;	Surgical residents (PGY1-PGY5; n=17)	Journal of the American College of Surgeons	USA

55	Sturm et al., 2008 ¹¹⁵	262	Systematic review	Various	Technical skills	Surgery (generic); Medical education and training;	Surgeons and trainees.	Annals of Surgery	Australia
56	Draycott et al., 2008 ⁷⁵	258	Observational	Manikins	Both	Medical education and training; Obstetrics/midwifery /gynecology;	Midwifery and obstetric staff	Obstetrics and Gynecology	UK
56	Downing, 2004 ⁴⁶	258	Review (non- systematic)	SPs	Both	Medical education and training;	Undergraduate medical trainees	Medical Education	USA
58	Shapiro et al., 2004 ⁴⁷	256	Intervention	Manikins; full simulated environment	Non- technical skills	Emergency medicine; team training; CRM; medical education and training;	Teams of ED physicians and nurses.	Quality and Safety in Healthcare	USA
58	Fallowfield et al., 1998 ⁷⁶	256	Intervention	SPs	Non- technical skills	Doctor-patient communication; medical education and training; oncology;	Senior oncologists (attendings; <i>n</i> =127); senior registrars (<i>n</i> =51	Journal of Clinical Oncolog y	UK
60	Rudolph et al., 2006 ⁴⁸	253	Review (non- systematic)	Non-specified (simulation in general)	Non- Technical skills	Medical education and training;	Medical professionals and trainees.	Simulation in Healthcare	USA
61	Cant & Cooper., 2010 ¹¹⁶	251	Systematic review	Manikins; Full simulated environments.	Both	Nursing education and training;	Nursing students and registered nurses.	Journal of Advanced Nursing	Australia
62	Yedidia et al., 2003 ⁴⁹	250	Intervention	SPs	Non- technical skills	Medical education and training; Doctor- patient communication;	Medical students (n=293)	JAMA	USA
63	Barsuk et al., 2009 ⁵⁰	248	Observational	Manikin	Technical skills	Medical education and training; Critical care;	Postgraduate trainees: 2 nd & 3 rd year internal medicine and emergency medicine (<i>n</i> =103)	Critical Care Medicine	USA

64	Duffy et al., 2004 ⁵²	246	Review (non- systematic)	SPs	Non- technical skills	Doctor-patient communication; medical education and training;	Physicians	Academic Medicine	USA
65	Chopra et al., 1994 ¹¹⁰	240	Intervention	Manikin; full simulated environment	Both	Anesthesiology; CRM; medical education and training;	Anesthetists and anesthesiology trainees (<i>n</i> =28)	British Journal of Anesthesia	The Netherlands
66	Steadman et al., 2006 ⁵³	239	Intervention	Manikin; full simulated environment	Both	Medical education and training; CRM;	4 th year medical students (<i>n</i> =31)	Critical Care Medicine	USA
67	Fletcher et al., 2002 ⁷⁷	238	Review (non- systematic)	Manikins; Full simulated environments.	Non- technical skills	Anesthesiology; medical education and training; CRM;	Anesthetists and anesthetic trainees.	British Journal of Anesthesia	UK
68	Yule et al., 2006 ⁷⁸	235	Qualitative; Tool evaluation/developme nt	Various	Non- technical skills	Surgery (generic);	Trainees or consultant surgeons	Medical Education	UK
69	Grober et al., 2004 ⁹⁹	228	Intervention	Inanimate part- task trainers & live animals	Technical skills	Medical education and training; Surgery (generic); CRM;	Junior Surgical residents (PGY 1 &3; <i>N</i> =50)	Annals of Surgery	Canada
70	Barsuk et al., 2009 ⁵¹	227	Observational	Manikin	Technical skills	Medical education and training;	Internal and emergency medicine residents (<i>n</i> =92)	Archives of Internal Medicine	USA
71	Sroka et al., 2010 ¹⁰⁰	224	Intervention	Inanimate part- task trainer	Technical skills	Surgery (laparoscopy); Medical education and training;	Junior surgical residents (<i>n</i> =16)	American Journal of Surgery	Canada
71	Beaubien & Baker, 2004 ⁵⁴	224	Review (non- systematic)	Various	Non- technical skills	Medical education and training; Team training;	Healthcare professionals	Quality and Safety in Healthcare	USA
71	Munz et al., 2004 ⁷⁹	224	Intervention	VR (part-task trainer); Inanimate part- task trainers	Technical skills	Surgery (Laparoscopy); medical education and training;	Medical students (<i>n</i> =24)	Surgical Endoscopy	UK

74	Tamblyn et al., 2007 ¹⁰¹	220	Observational	SPs	Both	Doctor-patient communication; medical education and training	Medical trainees and professionals.	JAMA	Canada
74	Taffinder et al., 1998 ⁸⁰	220	Tool evaluation; intervention;	VR (part-task trainer); Inanimate part- task trainers;	Technical skills	Surgery (laparoscopy); medical education and training;	Expert (n=10) and novice (n=10) surgeons.	Conference proceedings – Studies in Health Technology and Informatics.	UK
76	Lasater, 2007 ⁵⁵	216	Review (non- systematic)	Manikins; Full simulated environments;	Non- technical skills	Nursing education and training;	Nursing students	Journal of Nursing Education	USA
77	Aggarwal et al., 2007 ⁸¹	215	Intervention	Various	Technical skills	Surgery (laparoscopy); medical education and training;	Experienced LC surgeons (n=10); Novice LC surgeons (n=20)	Annals of Surgery	UK
78	Alinier et al., 2006 ⁸²	214	Intervention	Manikin; Full simulated environment;	Both	Nursing education and training;	Nursing students	Journal of Advanced Nursing	UK
79	Hyltander et al., 2002 ¹¹¹	213	Intervention	VR (part-task trainer); Inert animal products;	Technical skills	Surgery (laparoscopy); medical education and training;	24 medical students (surgical rotation)	Surgical Endoscopy	Sweden
80	Luck et al., 2000 ⁵⁶	211	Tool evaluation	SPs	Both	Primary care; assessing clinical competence;	Faculty physicians, 2 nd & 3 rd year residents (<i>n</i> =20)	The American Journal of Medicine.	USA
81	Faulkner et al., 1996 ¹⁰²	210	Tool evaluation	Inanimate part- task trainers	Technical skills	Surgery (generic); medical education and training;	Surgical residents (3^{rd} & 5^{th} year; $n=12$)	Academic Medicine	Canada
82	Yule et al., 2008 ⁸³	209	Tool evaluation	Manikin; full simulated environment	Non- technical skills	Surgery (generic); medical education and training;	Consultant surgeons (<i>n</i> =44)	World Journal of Surgery	UK

83	Fraser et al., 2003 ¹⁰³	205	Tool evaluation; performance assessment	Inanimate part- task trainer.	Technical skills	Surgery (laparoscopy); Medical education and training;	Medical students and junior surgical residents (<i>n</i> =83); Chief senior surgical residents (<i>n</i> =82)	Surgical Endoscopy	Canada
84	Derossis et al., 1998 ⁹⁴	203	Intervention;	Inanimate part- task trainer.	Technical skills	Surgery (laparoscopy); Medical education and training;	Surgical residents (PGY3; <i>n</i> =12)	Surgical Endoscopy	Canada
85	Flin & Maran, 2004 ⁸⁴	202	Review (non- systematic)	Various	Non- technical skills	Emergency medicine; medical education and training; CRM;	Emergency medical staff; anesthetists; surgeons.	Quality and Safety in Healthcare	UK
85	Hodges et al., 1999 ¹⁰⁴	202	Tool evaluation	SPs	Non- technical skills	Medical education and training;	Clinical clerks (psychiatry; $n=14$); family practice residents ($n=14$); practicing family physicians ($n=14$).	Academic Medicine	Canada
87	Awad et al., 2005 ⁵⁷	200	Intervention	Role-play	Non- technical skills	Team training; medical education and training; surgery (generic); CRM;	Operating room teams	American Journal of Surgery	USA
88	Grantcharov et al., 2003 ¹¹³	199	Performance assessment; tool evaluation.	VR (part-task trainer);	Technical skills	Surgery (laparoscopy); medical education and training;	Surgeons (<i>n</i> =41)	American Journal of Surgery	Denmark
89	Fallowfield et al., 2003 ⁸⁵	198	Intervention follow up	SPs	Non- technical skills	Doctor-patient communication; Oncology; medical	Oncologists (<i>n</i> =74): of whom: consultants	British Journal of Cancer	UK

						education and training;	(<i>n</i> =48); Senior SPRs in training (<i>n</i> =26);		
90	Parle et al., 1997 ⁸⁶	197	Review (non- systematic)	SPs; role-play	Non- technical skills	Doctor-patient communication; oncology; medical education and training;	Healthcare professionals	Social Science & Medicine	UK
90	Holzman et al., 1995 ⁵⁸	197	Intervention	Manikin; full simulated environment	Non- technical skills	Anesthesiology; CRM; medical education and training;	Anesthesiologist s (<i>n</i> =68); anesthesia nurses (<i>n</i> =4)	Journal of Clinical Anesthesia	USA
92	Kneebone et al., 2004 ⁸⁷	196	Review (non- systematic)	Various	Both	Medical education and training;	Medical trainees and professionals.	Medical Education	UK
93	Larsen et al., 2009 ¹¹²	195	Intervention	VR (part-task trainer);	Technical skills	Surgery (laparoscopy); Gynecology and obstetrics; medical education and training;	First and second year registrars specializing in gynecology and obstetrics (<i>n</i> =24)	ВМЈ	Denmark
94	Van Hove et al., 2010 ¹⁰⁷	194	Review (non- systematic)	Various	Technical skills	Surgery (generic); medical education and training;	Surgeons; surgical trainees.	British Journal of Surgery	The Netherlands
94	Brown et al.,1999 ⁵⁹	194	Intervention	Role-play	Non- technical skills	Doctor-patient communication; medical education and training;	Primary care physicians; surgeons; medical subspecialists; nurse practitioners; physician assistants (<i>n</i> =69)	Annals of Internal Medicine	USA
96	Gaba, 1992 ⁶⁰	192	Editorial	Various	Both	Anesthesiology; CRM;	Anesthesiologists	Anesthesiology	USA

97	Feingold et al., 2004 ⁶¹	190	User evaluations	Manikin; Full simulated environment.	Both	Nursing education and training;	Nursing students (<i>n</i> =65); faculty (<i>n</i> =4)	Journal of Nursing Education	USA
98	Aggarwal et al., 2006 ¹¹⁷	189	Curriculum development; performance assessment	VR (part-task trainer)	Technical skills	Surgery (laparoscopy); medical education and training;	Experienced surgeons $(n=20)$; novice surgeons $(n=20)$	Annals of Surgery	Denmark
99	Gurusamy et al., 2008 ⁸⁸	188	Systematic review	VR (part-task trainers)	Technical skills	Surgery (laparoscopy); medical education and training;	Surgical trainees; medical students; surgical residents.	British Journal of Surgery	UK
100	Scott & Dunnington, 2008 ⁶²	186	Review (non- systematic)	Various	Both	Surgery (generic); Medical education and training;	Surgeons/surgic al trainees	Journal of Gastrointestinal Surgery	USA