### Supplementary table

**Table S1.** Overview of the educational interventional studies included in a systematic review on training and education of healthcare workers during viral epidemics including general descriptive information

<table>
<thead>
<tr>
<th>First author, year of publication</th>
<th>Country of first author</th>
<th>Viral illness</th>
<th>Participants</th>
<th>Competency category and overall educational content</th>
<th>Delivery</th>
<th>Main educational modality</th>
<th>Duration of training</th>
<th>Preparation (items 1–2), mean</th>
<th>Interventio n (items 3–15), mean</th>
<th>Evaluation (items 16–17), mean</th>
<th>Kirkpatrick’s Levels</th>
<th>Main findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abrahamson, 2006</td>
<td>Canada</td>
<td>SARS</td>
<td>Doctors, nurses</td>
<td>Knowledge and technical skills on advanced cardiac life support protocol for SARS patients</td>
<td>Simulation-based training (scenario-based)</td>
<td>2-hour session</td>
<td>2.0</td>
<td>1.3</td>
<td>1.5</td>
<td>1</td>
<td>1</td>
<td>Participants rated the comprehensiveness, duration, and effectiveness of teaching methods favorably.</td>
</tr>
<tr>
<td>Abualenain, 2018</td>
<td>Saudi Arabia</td>
<td>EVD</td>
<td>Doctors, nurses, paramedics, anesthesia technicians, others</td>
<td>Technical skills: donning and doffing of PPE</td>
<td>Simulation-based training</td>
<td>Not specified</td>
<td>1.5</td>
<td>1.3</td>
<td>0.5</td>
<td>2b</td>
<td></td>
<td>Pre- and post-training test written scores for the participants improved significantly (p &lt; 0.01) from 67% (range 57–75%) to 85% (range 81–91%), respectively. All 179 HCW completed the Ebola PPE checklist, about half compromised (different levels of compromising) the PPE protocol at some point.</td>
</tr>
<tr>
<td>Adini, 2012</td>
<td>Israel</td>
<td>H1N1</td>
<td>Doctors, nurses</td>
<td>Knowledge and technical skills related to avian flu (management of patient; donning and doffing of PPE)</td>
<td>Lectures; small group discussions and tabletop exercises</td>
<td>Not specified</td>
<td>1.5</td>
<td>0.5</td>
<td>0.5</td>
<td>2b</td>
<td></td>
<td>The overall mean score for the 14-item multiple choice questions for emergency department medical personnel was 75.6. The correlation between the level of knowledge related to pandemic flu and the performance in the avian flu exercise was not significant (Spearman’s rho &lt; 0.25).</td>
</tr>
<tr>
<td>Aiello, 2011</td>
<td>Canada</td>
<td>SARS, H1N1</td>
<td>Doctors, nurses, other hospital staff</td>
<td>“Non-technical” skill: resilience</td>
<td>Lectures</td>
<td>Multiple 1-hour sessions over a 5-month period</td>
<td>1.5</td>
<td>1.1</td>
<td>2.0</td>
<td>1</td>
<td></td>
<td>A high proportion of participants found the session relevant to work life and personal life, useful, helpful, and informative. Ten themes emerged from the comments: family-work balance, antiviral prophylaxis, need for information, education and preparedness, ethical concerns, visibility of leadership, valuing frontline staff, mistrust/fears, information relating to redeployment, need for ongoing resilience training.</td>
</tr>
<tr>
<td>Andonian, 2019</td>
<td>USA</td>
<td>EVD</td>
<td>HCW (not specified)</td>
<td>Technical skill: donning and doffing of PPE; “Non-technical” skills: teamwork, cognitive load</td>
<td>Lectures; video demonstrations, simulation-based training</td>
<td>2-hour session</td>
<td>1.5</td>
<td>1.0</td>
<td>0.5</td>
<td>2b</td>
<td></td>
<td>Any type of self-contamination was high in both groups (84.6–100%) during doffing, but the intervention group contaminated fewer sites (p = 0.002). Intervention group demonstrated more teamwork behaviors (median 27.1) compared to controls (median 9.1). Participants in the intervention group perceived marginally higher mental demand than the controls (p = 0.055).</td>
</tr>
<tr>
<td>Study, Year</td>
<td>Country</td>
<td>Region</td>
<td>HCW/HCW role</td>
<td>Knowledge and skill(s)</td>
<td>Duration</td>
<td>Participants</td>
<td>Knowledge Increase</td>
<td>Notes/Comments</td>
<td></td>
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<tr>
<td>Bazeyo, 2015</td>
<td>Uganda</td>
<td>EVD</td>
<td>Doctors, nurses and other district HCW including lab technicians, immigration officers and security officers, media persons</td>
<td>Knowledge related to EVD</td>
<td>5-day course</td>
<td>1.0</td>
<td>0.6</td>
<td>0.5</td>
<td>2b</td>
<td>Knowledge increased from ~56–78 % pre-intervention to ~68–88 % post-intervention on a knowledge test.</td>
<td></td>
<td></td>
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<tr>
<td>Benah, 2019</td>
<td>Liberia</td>
<td>EVD</td>
<td>HCW (not specified)</td>
<td>Knowledge related to PPC, EVD and IPC</td>
<td>8-day course</td>
<td>1.0</td>
<td>1.1</td>
<td>0.5</td>
<td>4b</td>
<td>Both clinicians (n = 188) and non-clinicians (n = 149) showed statistically significant improvements in knowledge on clinical care and IPC concepts as measured by the 9-item pre-and post-training questionnaires (both p &lt; 0.001). HCW infection rate was 9% by October 2014 (pre-course) and had dropped to 1% by January 2015 (post-course). Furthermore, after the conclusion of training in March 2015, no infections reported among HCW exposed to the confirmed cases despite the resurgence of Ebola cases in June and November 2015, and April 2016.</td>
<td></td>
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</tr>
<tr>
<td>Brazzi, 2012</td>
<td>Italy</td>
<td>HI11</td>
<td>Anesthesiologists</td>
<td>Knowledge: gas exchange during extracorporeal bypass; Technical skill: ECMO</td>
<td>3-day course</td>
<td>1.0</td>
<td>1.6</td>
<td>2.0</td>
<td>1</td>
<td>Participants rated the relevance, quality and efficacy of the training favorably.</td>
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</tr>
<tr>
<td>Bredmose, 2014</td>
<td>Norway</td>
<td>EVD</td>
<td>Helicopter Emergency Medical Service (HEMS) crew</td>
<td>Technical skill: Helicopter Emergency Medical Service in relation to EVD patients</td>
<td>Simulation-based training</td>
<td>Not specified</td>
<td>0.5</td>
<td>0.7</td>
<td>1.0</td>
<td>1</td>
<td>All participants reported high degrees of satisfaction and realism.</td>
<td></td>
</tr>
<tr>
<td>Bustamente, 2015</td>
<td>USA</td>
<td>EVD</td>
<td>Doctors, respiratory therapists</td>
<td>Technical skill: PPE</td>
<td>Simulation-based training</td>
<td>4 hours</td>
<td>0.5</td>
<td>0.8</td>
<td>1.0</td>
<td>2a</td>
<td>The intervention increased the confidence of participants. 95% and 87% of participants, respectively, rated the program and faculty as good or outstanding on a five-point Likert scale.</td>
<td></td>
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<tr>
<td>Carlos, 2015</td>
<td>Philippines</td>
<td>EVD</td>
<td>Doctors, medical technologists</td>
<td>Knowledge related to EVD</td>
<td>Lecture and practical hands-on workshop</td>
<td>3-day workshop</td>
<td>1.0</td>
<td>1.5</td>
<td>2.0</td>
<td>2b</td>
<td>The percentage of participants who correctly answered all 10 questions was 2.8% (8 of 285) and 22.5% (82 to 364) pre- and post the workshop, respectively. The number of questions correctly answered by participants increased from a pre-workshop median of 7 (IQR 6–8; range 3–10) to a post-workshop median of 9 (IQR 8–9; range 4–10) (p &lt; 0.009).</td>
<td></td>
</tr>
<tr>
<td>Carrico, 2007</td>
<td>USA</td>
<td>SARS</td>
<td>Nurses</td>
<td>Knowledge of respiratory pathogen transmission as well as standard precautions; Technical skill: donning and doffing of PPE</td>
<td>Classroom training and simulation-based training</td>
<td>Not specified, but &lt;1 day</td>
<td>1.0</td>
<td>1.6</td>
<td>1.0</td>
<td>3</td>
<td>Pre- and post-training test scores were similar for the two groups and increased from 0.64 to 0.76. Participants who received the visual training demonstrated use of PPE more often (74% vs 53%, respectively).</td>
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<tr>
<td>Carvalho, 2019</td>
<td>Spain</td>
<td>EVD</td>
<td>Doctors, nurses, cleaning personnel, nursing assistants, security personnel, stretcher bearers</td>
<td>Knowledge: principles of care and management of infected patient. Technical skill: donning and doffing of PPE, other procedures such as blood extraction, catheter placement, endotracheal intubation, hygiene, stool and vomit, cleaning, emergency situations, patient transfer</td>
<td>Classes and seminars; simulation-based training</td>
<td>80-h course over 10 days</td>
<td>1.0</td>
<td>1.4</td>
<td>1.5</td>
<td>2a</td>
<td>Participants felt that the course increased their sense of security, predisposition to take care of these patients and confidence in management.</td>
<td></td>
</tr>
<tr>
<td>Casalino, 2015</td>
<td>France</td>
<td>EVD</td>
<td>Medical and nursing students</td>
<td>Knowledge related to EVD; Technical skill: donning and doffing of PPE</td>
<td>Classroom lecture; specific skills training</td>
<td>1-hour theoretical session; and a practical session repeated every 72 hours for each group</td>
<td>1.0</td>
<td>1.3</td>
<td>1.0</td>
<td>2b</td>
<td>In all 4 groups, the frequency and number of total errors and critical errors decreased significantly over the course of the training sessions (p &lt; .01). The intervention was associated with a greater reduction in the number of total errors and critical errors (p &lt; .0001). The B-PPE intervention groups had the fewest errors and critical errors (p &lt; .0001).</td>
<td></td>
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<tr>
<td>Chen, 2009</td>
<td>Taiwan</td>
<td>SARS</td>
<td>Doctors</td>
<td>Technical skills: Advanced Airway Life Support</td>
<td>Lecture; simulation-based training</td>
<td>2-hour lecture, 4-hour hands-on workshop</td>
<td>1.5</td>
<td>1.8</td>
<td>1.5</td>
<td>2b</td>
<td>Residents received higher scores during re-simulation regardless of scoring methods.</td>
<td></td>
</tr>
<tr>
<td>Choi, 2020</td>
<td>Hongkong</td>
<td>COVI D-19</td>
<td>Doctors and nurses</td>
<td>Technical skills: donning and doffing of PPE, intubation, central venous catheter</td>
<td>Simulation-based training</td>
<td>20-30 min simulation and 30-mins debriefing</td>
<td>1.0</td>
<td>1.08</td>
<td>1.0</td>
<td>2a</td>
<td>The domains for feedback and discussion included the following key events in chronological order: donning PPE, pre-intubation check, intubation procedure, and doffing PPE. Local guideline changes.</td>
<td></td>
</tr>
<tr>
<td>Author, Year</td>
<td>Country</td>
<td>Disease</td>
<td>Participants</td>
<td>Training Details</td>
<td>Control Group</td>
<td>Intervention Group</td>
<td>Comparison</td>
<td>Observations</td>
<td></td>
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<tr>
<td>Christensen, 2020</td>
<td>Denmark</td>
<td>COVID-19</td>
<td>Medical students</td>
<td>Technical skills; donning and doffing of PPE</td>
<td>Demonstration/return demonstration; video-based</td>
<td>2- to 3-hour training session for control group; intervention group watched videos as many times as they wished at home</td>
<td>1.0</td>
<td>1.25</td>
<td>0.5</td>
<td>2b</td>
<td>19 of 21 participants returned for 1-month post-instruction evaluation. In donning, the scores in the instructor group ranged from 67% to 100%, and the scores in the video group ranged from 62% to 100%. The overall mean donning score was 86.5/100; the mean score was 84.8 for the instructor group and 88.0 for the video group. In doffing, the scores in the instructor group ranged from 59% to 96%, and the scores in the video group ranged from 51% to 93%. The overall mean doffing score was 76.4/100; the mean score for the instructor group was 79.1, and it was 73.9 for the video group.</td>
<td></td>
</tr>
<tr>
<td>Diaz, 2013</td>
<td>USA</td>
<td>H1N1</td>
<td>Doctors</td>
<td>Knowledge related to H1N1</td>
<td>Lecture, interactive group sessions, role play</td>
<td>3-day course</td>
<td>1.0</td>
<td>1.3</td>
<td>2.0</td>
<td>2b</td>
<td>Critical care knowledge improved significantly from before the training to immediately after (Caribbean site: 58–80%; Indonesia site: 56–75%; ( p &lt; 0.001 ) for both).</td>
<td></td>
</tr>
<tr>
<td>Diaz, 2018</td>
<td>Switzerland</td>
<td>H1N1</td>
<td>Undergraduate students in nursing and health sciences</td>
<td>Knowledge: Critical care management/best ICU practices, ARDS, and pregnancy influenza</td>
<td>Lectures; case-based learning</td>
<td>3-day course</td>
<td>2.0</td>
<td>1.7</td>
<td>2.0</td>
<td>2b</td>
<td>Test scores improved significantly after training ( (p &lt; .001) ) both in pilot and implementation phases; participants rated the learning units as good to very good ( (\text{mean, 5-point Likert scale: } 4.6–4.8) ).</td>
<td></td>
</tr>
<tr>
<td>Dube, 2018</td>
<td>USA</td>
<td>EVD</td>
<td>Natural and health science major undergraduate students</td>
<td>Knowledge related to EVD</td>
<td>Case-based learning</td>
<td>Integrated in undergraduate curriculum</td>
<td>2.0</td>
<td>1.3</td>
<td>2.0</td>
<td>2b</td>
<td>Students improved in relation to theoretical knowledge on all 10 questions ( (\text{a mix of multiple choice questions, true/false statements and free text responses}) ). Overall score ( (\text{normalized}) ) improved from ~47%–80%.</td>
<td></td>
</tr>
<tr>
<td>Eardley, 2015</td>
<td>UK</td>
<td>EVD</td>
<td>HCW, university and military staff</td>
<td>Knowledge related to EVD</td>
<td>Lectures; drills</td>
<td>4-day course</td>
<td>1.5</td>
<td>1.5</td>
<td>2.0</td>
<td>2b</td>
<td>Factual knowledge increased ( (\text{a median change on the VAS of 4.0 by all delegates, } p&lt;0.001) ). Change in confidence in teaching increased ( (\text{median change on the VAS of 5.0 for all delegates, } p&lt;0.001) ).</td>
<td></td>
</tr>
<tr>
<td>Eckes, 2016</td>
<td>USA</td>
<td>EVD</td>
<td>Nurses</td>
<td>Knowledge: Principles of EVD care and PPE; Technical skill: donning and doffing of PPE</td>
<td>Lectures; simulation-based training</td>
<td>Quarterly course ( (\text{hours not mentioned}) )</td>
<td>1.5</td>
<td>1.3</td>
<td>1.0</td>
<td>1</td>
<td>Participants completed a return demonstration and written assessment. Further details not provided.</td>
<td></td>
</tr>
<tr>
<td>Elcin, 2016</td>
<td>Turkey</td>
<td>MERS</td>
<td>Paramedics</td>
<td>Knowledge related to MERS and PPE for healthcare providers</td>
<td>Simulation-based training</td>
<td>1-day course with 3 sessions</td>
<td>1.5</td>
<td>1.6</td>
<td>2.0</td>
<td>2b</td>
<td>16 of 19 ( (84%) ) teams recognized the possibility of MERS as a measure of their awareness in the baseline evaluation. The participating sites lacked PPE, which revealed their baseline level of preparedness for MERS. Certain improvements in donning and doffing PPE were observed in the post-training evaluation.</td>
<td></td>
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</tbody>
</table>

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<table>
<thead>
<tr>
<th>Author, Year</th>
<th>Country</th>
<th>Event</th>
<th>Target Audience</th>
<th>Methodology</th>
<th>Duration</th>
<th>Score Pre</th>
<th>Score Post</th>
<th>Score Ret</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ferranti, 2016</td>
<td>USA</td>
<td>EVD</td>
<td>Nurses</td>
<td>Knowledge related to EVD</td>
<td>E-learning: online PowerPoint slides</td>
<td>3-day course</td>
<td>1.5</td>
<td>1.7</td>
<td>0.5</td>
</tr>
<tr>
<td>Hanley, 2008</td>
<td>USA</td>
<td>SARS, H1N1</td>
<td>Nurses, respiratory therapy students, general internists, physician assistants, nurse practitioners, non-critical-care nurses, veterinarians, and physical therapists</td>
<td>Knowledge and technical skills: Infection control, manual ventilation, mechanical ventilation, airway maintenance, and airway suctioning</td>
<td>E-learning: video (DVD); simulation-based training</td>
<td>Just-in-time training (90 mins)</td>
<td>2.0</td>
<td>1.1</td>
<td>1.0</td>
</tr>
<tr>
<td>Jones-Konneh, 2017</td>
<td>Japan</td>
<td>EVD</td>
<td>Nurses, other HCW (not specified)</td>
<td>Knowledge related to EVD; Technical skills on PPE and other IPC skills such as hand hygiene, mixing of chlorine solutions, etc.</td>
<td>Simulation-based training</td>
<td>3 phases of training: A. 3 days theory, 2 days for SBT; B. 1-day theory and 2 days SBT; C. 3 days for basic IPC/PPE</td>
<td>2.0</td>
<td>1.3</td>
<td>1.0</td>
</tr>
<tr>
<td>Kim, 2018</td>
<td>Korea</td>
<td>H1N1</td>
<td>Doctors, nurses</td>
<td>Knowledge: basic hemodynamics, ECMO physiology, circuit anatomy, and hemostasis of patients on ECMO; Technical and behavioral skills to manage ECMO scenarios; “Nontechnical” skills: team communication</td>
<td>Lectures; simulation-based training</td>
<td>Every month (duration not mentioned)</td>
<td>1.5</td>
<td>1.2</td>
<td>0.5</td>
</tr>
<tr>
<td>Klomp, 2020</td>
<td>USA</td>
<td>EVD</td>
<td>CDC staff (non-clinical deployers)</td>
<td>&quot;Non-technical skills&quot;: resilience</td>
<td>Traditional didactics</td>
<td>3-day training</td>
<td>1.5</td>
<td>1.3</td>
<td>0.5</td>
</tr>
<tr>
<td>Lin, 2008</td>
<td>Taiwan</td>
<td>SARS</td>
<td>Patient-hired attendants and outsourced workers</td>
<td>Knowledge: control of nosocomial infections</td>
<td>Lecture; video-based demonstration (CD)</td>
<td>2-hour session</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Marshall, 2008</td>
<td>USA</td>
<td>SARS</td>
<td>Nurses, social workers and student, public health student</td>
<td>Knowledge: Bioterrorism preparedness</td>
<td>Problem-based learning</td>
<td>3-hour session; follow-up session 1 week later</td>
<td>1.5</td>
<td>1.6</td>
<td>2.0</td>
</tr>
<tr>
<td>Mathias, 2015</td>
<td>USA</td>
<td>SARS, EVD, H1N1</td>
<td>Pharmacists</td>
<td>Knowledge related to EVD; roles pharmacists play as health care professionals; “Non-technical” skill: critical thinking skills</td>
<td>Learner-led discussions and presentations</td>
<td>3-hour/week, offered over two consecutive years</td>
<td>2.0</td>
<td>1.8</td>
<td>2.0</td>
</tr>
<tr>
<td>Maunder, 2010</td>
<td>Canada</td>
<td>H1N1</td>
<td>Nurses, other HCW (not specified)</td>
<td>&quot;Non-technical&quot; skill: Resilience</td>
<td>E-learning: Course materials on a flash drive for self-learning and audio and video mini lectures</td>
<td>3 course lengths (short/medium/long): 7/12/17 sessions</td>
<td>2.0</td>
<td>1.9</td>
<td>1.5</td>
</tr>
<tr>
<td>Author, Year</td>
<td>Country</td>
<td>Disease</td>
<td>HCW</td>
<td>Knowledge related to EVD</td>
<td>E-learning:</td>
<td>Multiple modules, each approx. 5 minutes</td>
<td>Education day (number of hours not detailed)</td>
<td>Data</td>
<td>Comments</td>
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<td>Mc Kenna, 2019</td>
<td>Belgium</td>
<td>EVD</td>
<td>Community HCW</td>
<td>Knowledge related to EVD</td>
<td>E-learning: mobile training platform</td>
<td>1.5</td>
<td>1.5</td>
<td>2.0</td>
<td>2b</td>
</tr>
<tr>
<td>McInnes, 2005</td>
<td>Canada</td>
<td>SARS</td>
<td>Security guards, volunteer students</td>
<td>Knowledge related to SARS</td>
<td>Lectures; demonstrations and role playing</td>
<td>1.5</td>
<td>1.2</td>
<td>0.5</td>
<td>1</td>
</tr>
<tr>
<td>Menkinsmit h, 2018</td>
<td>USA</td>
<td>EVD</td>
<td>Medical fellows and residents, nursing specialty training, others (students)</td>
<td>Knowledge safety measures in Ebola patient care; Technical skills in donning and doffing of PPE, infection control practices</td>
<td>E-learning: information via online software; Simulation-based training (team training scenarios)</td>
<td>3-day course</td>
<td>1.5</td>
<td>1.8</td>
<td>2.0</td>
</tr>
<tr>
<td>Narra, 2016</td>
<td>USA</td>
<td>EVD</td>
<td>HCW</td>
<td>Knowledge related to EVD, infection prevention and control; Technical skill: donning and doffing of PPE</td>
<td>Lectures; small-group discussions, and practical exercises</td>
<td>3-day course</td>
<td>2.0</td>
<td>1.8</td>
<td>2.0</td>
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<tr>
<td>O’Keeffe, 2016</td>
<td>Ireland</td>
<td>EVD</td>
<td>Nurses, respiratory therapists, laboratory technicians, and ancillary staff</td>
<td>Knowledge related to EVD and safety management; Technical skills: donning and doffing of PPE, airway management, dressing care and IV infusion, urinary catheter care</td>
<td>Simulation-based training (interprofessional)</td>
<td>4-hour program</td>
<td>2.0</td>
<td>1.7</td>
<td>2.0</td>
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<tr>
<td>Otu, 2016</td>
<td>Nigeria</td>
<td>EVD</td>
<td>Nurses, community HCW, midwives, laboratory scientists, auxiliary nurses, pharmacy technicians and health record staff.</td>
<td>Knowledge on EVD disease specific information; &quot;Non-technical&quot; skill: attitude</td>
<td>E-learning: tablet computers with Ebola awareness tutorial (EAT)</td>
<td>2 weeks allowed to review training materials</td>
<td>1.5</td>
<td>1.5</td>
<td>1.0</td>
</tr>
<tr>
<td>Authors</td>
<td>Year</td>
<td>Country</td>
<td>Disease</td>
<td>Target Audience</td>
<td>Knowledge and Skills</td>
<td>Training Details</td>
<td>Evaluation Method</td>
<td>Findings</td>
<td></td>
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<tr>
<td>Phranumpus, 2016</td>
<td>USA</td>
<td>EVD</td>
<td>Doctors, nurses, other response team members</td>
<td>Knowledge on EbolA, principles of PPE, response, equipment, personal safety, policies; Technical skills: donning and doffing of PPE;</td>
<td>Onsite and online pre-course modules; simulation-based training</td>
<td>4-hour sessions 4 days/week for 3 weeks</td>
<td>Post-course evaluation using an 18-item tool= Median score for each item ranged from 8 to 9 (on a 9-point Likert scale), with interquartile range of 7-9 in all items</td>
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<td>Rehman, 2020</td>
<td>Pakistan</td>
<td>EVD</td>
<td>Nurses</td>
<td>Knowledge: EVD awareness</td>
<td>Lectures; video demonstration and discussion</td>
<td>3-hour session</td>
<td>Pre- and post-training test scores demonstrated improvement in knowledge. The mean baseline knowledge score was 3.93±2.519 while the intervention mean score was 13.18±1.192; difference was significant (p&lt;0.05)</td>
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<tr>
<td>Rogers, 2019</td>
<td>USA</td>
<td>SARS</td>
<td>Nurses, respiratory therapists, certified nursing assistants, industrial hygienists, safety and occupational health professionals, infection preventionists, and others identified with respiratory protection practice</td>
<td>Knowledge: Respiratory protection practice such as infectious agent transmission routes, hand hygiene, hazard assessment, respirator selection and care, medical evaluation and monitoring, fit-testing and training, respirator donning/doffing and seal checks.</td>
<td>Educational program (lecture) Clinical observations, focus group interviews</td>
<td>Educational program: 1-day training</td>
<td>In the educational program, 17 (68%) participants received either a higher or perfect score on the post-training test. Observations of HCW: 216 documented incident observations of individuals and worker groups that resulted in 253 actions or resolutions by the practice champions.</td>
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<tr>
<td>Sijbrandij, 2020</td>
<td>Netherlands</td>
<td>EVD</td>
<td>Nurses, community HCW, midwives, maternal health assistant, vaccinators, lab assistant, etc</td>
<td>Knowledge: psychological first aid (PFA)</td>
<td>Traditional didactics</td>
<td>one day (no. of hours not mentioned)</td>
<td>Overall knowledge of appropriate psychosocial responses we found a significant effect of time, which was moderated by condition (X2(2) = 28.63; p &lt; 0.0001). In the PFA group, knowledge about appropriate psychosocial responses increased relative to the control group. Post-hoc contrasts showed a medium to large effect size at the post-PFA assessment (mean estimated difference 1.73; d = 0.50; t(486.01) = 4.54; p &lt; 0.001) and a medium effect size at the follow-up (mean estimated difference 1.54; d = 0.43; t(329.28) = 3.87; p = 0.001.</td>
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<tr>
<td>Soeters, 2018</td>
<td>USA</td>
<td>EVD</td>
<td>Doctors, nurses, pharmacists, laboratoryan, health tech, midwife, admin, students,</td>
<td>Knowledge on IPC; Technical skills: donning and doffing of PPE, triage, waste management</td>
<td>Traditional didactics; hands-on training</td>
<td>First course: 3 days Second course: condensed 2 days</td>
<td>Median test scores increased from 40% among HCW, 15% among IPC trainers, and 21% (among IPC supervisors to post-training test scores of 83%, 93%, and 93%, respectively (all p&lt;0.0001).</td>
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<table>
<thead>
<tr>
<th>Year</th>
<th>Country</th>
<th>Pathogen</th>
<th>Type</th>
<th>Training Method</th>
<th>Duration</th>
<th>Results</th>
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</thead>
<tbody>
<tr>
<td>Watson, 2011</td>
<td>USA</td>
<td>H1N1</td>
<td>Doctors, nurses, respiratory therapist, support technicians, pharmacists, physician extenders and students</td>
<td>Technical skill: PPE adherence</td>
<td>Simulation-based training (in-situ)</td>
<td>8-week observation period</td>
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<tr>
<td>Wu, 2009</td>
<td>Taiwan</td>
<td>SARS</td>
<td>Nurses</td>
<td>Knowledge on IPC</td>
<td>Formal lectures, hands-on demonstrations, simulation scenarios, role play, brainstorming and group discussion</td>
<td>1-hour/week (total 16 hours).</td>
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<tr>
<td>Zhou, 2020</td>
<td>China</td>
<td>COVI D-19</td>
<td>Nurses and nursing students</td>
<td>Knowledge: emergency and critical care nursing; Technical skills: CPR, use of defibrillator, use of ECG, collection of various specimens, artificial airway techniques, usage of oropharyngeal ventilation tube and mask; gastric lavage technology of gastric lavage machine; Hemostasis, bandaging, and fixation technology</td>
<td>Traditional didactics and simulation-based training; micro-video (webcasts)</td>
<td>10-hr class sessions</td>
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</tbody>
</table>
Quality Appraisal using the Educational intervention checklist\(^\ddagger\). Each item is assigned a score of 0/1/2 (higher is better) based on descriptive anchors.

Kirkpatrick levels\(^*\): Level 1=learner’s view regarding the educational experience; level 2a=modification of behaviour or attitude; level 2b=acquisition or modification of knowledge/skills; level 3=actual behavioural change documented by transfer of learning to the workplace; level 4a=changes in organisational practice that are attributable to the intervention; and level 4b= outcomes at the level of patient health and well-being

Abbreviations: SARS- severe acute respiratory syndrome; H1N1- H1N1 influenza virus infection; MERS- Middle East respiratory syndrome; EVD- Ebola virus disease; COVID-19- corona virus disease 2019; HCW – healthcare workers; PPE – personal protective equipment; IPC – infection prevention and control; ECMO – extracorporeal membrane oxygenation; SBT – simulation-based training; CPR- Cardiopulmonary resuscitation; ECG- electrocardiogram