**Table 1: Data extraction table**

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| **Study, year** | **Study Design** | **Subjects and Setting** | **Number of participants** | **Content** | **Outcome measures** | **Results** |
| Aquel, 20145 | RCT | Nursing students, Jordan | 90 (45 per group) | BLS | K (pre-post test); S (CPR post test); both outcomes at completion and 3 months | Course conclusion CPR skills: CG 11.58 (1.63) vs IG 13.13 (1.01) (p<0.001) Knowledge: CG 11.22 (0.90) vs IG 12.67 (1.07) p<0.001).  3 months: CPR Skills: CG 10.31(1.88) vs IG 12.80 (1.44) (p<0.001); Knowledge: CG 10.07(1.44) vs IG 12.27 (1.14)p<0.001) |
| Campbell, 20096 | RCT | 1st year residents, Canada | 15 (IG 8, CG 7) | NRP, 2 scenarios | S (number of redirections from facilitator; time to task completion; time to intubation) | Fewer redirections from facilitator in IG; no difference in time to intubate or other tasks |
| Cheng, 20131 | RCT (factorial design) | Resident teams, USA | IG 45 teams; CG 45 teams | Single PALS scenario | S (clinical performance (CPT); teamwork (BAT)); K (MCQ test) | No significant differences |
| Conlon, 20147 | RCT | EM residents, USA | 54 (IG 18; CG 36 (18 in lo-fi, 18 in mid-fi)) | ACLS | S (clinical performance); K (written exam) | No significant differences |
| Curran, 20158 | RCT | Medical students, Canada | IG 31; CG 35 | NRP | S (clinical, teamwork) | No significant differences |
| Donoghue, 20092 | RCT | Residents, USA | IG 25; CG 26 | PALS scenarios | S (clinical performance) | Greater skill improvement in IG (p=0.007) |
| Finan, 20129 | RCT | Neonatal fellows, Canada | 16 (crossover) | NRP scenarios | S (Megacode performance; ANTS score) | No significant differences |
| Hoadley, 200910 | RCT | Allied heath professionals, USA | IG 29; CG 24 | ACLS | S (clinical sceanrios); K (Written test) | No significant differences |
| King, 201111 | RCT | Nursing students, USA | 49 (IG 24, CG 25) | ACLS | K (written test); S scenario checklists at 2 wk and 2 mons | No significant differences |
| Lo, 201112 | RCT | Medical students, USA | 86 (IG 45, CG 41) | ACLS | S (megacode performance at completion and at 1 year) | At completion: IG > CG (83% vs 70%, p<0.001); at one year NSD |
| Massoth, 201913 | RCT | Medical students, Germany | 135 (IG 67, CG 68) | ALS | K: written test; S: practical performance assessed by video analysis; A: self-assessment, confidence | Knowledge: No significant difference (p>0.05). Skill: CG superior in breathing control (p=0.012), continous chest compression while charging the defibrillator (p=0.017), electrocardiogram analysis (p=0.021), time interval between electric shocks (p=0.016). |
| McCoy, 201823 | RCT | Medical students, USA | 70 (IG 35, CG 35) | BLS | S: compression rate, depth, recoil, compression fraction; time to EMS activation | Skill: mean compression depth IG 4.57 cm vs CG 3.89 cm (p=0.02) Compression fraction IG 72% vs CG 70% (p=0.01)  Mean compression rate IG 123.3 cpm vs CG 116 cpm (p=0.06)  Full recoil: NSD  Time to activation of EMS: IG 24.7 sec vas CG 79.5 seconds (p=0.007) |
| Nimbalkar, 201514 | RCT | Medical students, India | 101 (IG 51, CG 53) | NRP | S: NRP Megacode scenario; K: NRP written test (both at course completion and 3 mos) | No significant differences |
| Owen, 200615 | RCT | Residents, Australia | 41 (IG 20, CG 21) | Adult cardiac arrest scenario | S: clinical performance score; K: written test | K: IG>CG (p=0.026); S: NSD |
| Rishipathak, 202016 | RCT | EMS students, India | 100 (unsure of group size) | ACLS | A (learner satisfaction and confidence) | Higher confidence in IG; higher preference (2 out of 5 items) in IG |
| Roh, 201418 | Observational study | nursing students, South Korea | 163 (IG 28, CG 135) | Adult cardiac arrest scenario | A: self-efficacy scale | Greater improvement in self-efficacy scores in IG (p<0.001) |
| Rogers, 200917 | Observational study | Nursing students, USA | 34 (IG 16; CG 18) | ACLS | S: scenario performance; K: written test | S: higher scenario score in IG (p=0.01); K: greater pre- to post- test improvement (p=0.002) |
| Settles, 201119 | RCT | Allied health professionals, USA | 146 (IG 73, CG 73) | ACLS | S: scenario performance () mos, 3-6 mos, 6-9 mos); K: written test | No significant differences |
| Stellflug, 201820 | RCT | Healthcare providers, USA | 94 (IG 28; CG 66) | PALS | S: time to task performance; Knowledge: PALS written exam | Skill: NSD; Knowledge : NSD btw groups at course completion; improved knowledge retention at 6 months post course in IG group (exam score 27.7 vs. 26.2, p = 0.042) |
| Thomas, 201021 | RCT | Residents, USA | 62 (IG 31, CG 31) | NRP | S: NRP megacode score | No significant differences |
| Tufts, 202122 | RCT | Medical students, USA | 50 (IG 27, CG 23) | PALS scenario | S: resuscitation task completion; A: self-reported confidence | Skill: IG>CG in 4 of 11 specific tasks (p<0.001 for all); self confidence IG>CG in 3 of 14 domains |

Abbreviations: RCT: randomized controlled trial; S: skill; K: knowledge; A: attitude; IG: intervention group (higher fidelity); CG: control group (lower fidelity); BLS: Basic life support; CPR: cardiopulmonary resuscitation; NRP: Neonatal Resuscitation Program; PALS: Pediatric advanced life support; ACLS: Advanced cardiac life support; EM: emergency medicine; NSD: no significant difference PPV: positive pressure ventilation; MCQ: multiple choice questions

**Table b: Assessment of bias tables for studies from 2015 to present**

**RCTs (RoB 2)**

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **1st Author** | **Year** | **Randomization** | **Deviations from interventions** | **Missing data** | **Outcome measurement** | **Outcome reporting** | **Overall** |
| Aqel5 | 2014 | Some concerns | Some concerns | Some concerns | Some concerns | Some concerns | ***Some concerns*** |
| Massoth13 | 2019 | Low | Low | Low | Some concerns | Some concerns | ***Some concerns*** |
| McCoy23 | 2018 | Low | Low | Low | Some concerns | Some concerns | ***Some concerns*** |
| Nimbalkar14 | 2015 | Low | Low | Low | Some concerns | Low | ***Some concerns*** |
| Rishipithak16 | 2020 | Some concerns | Some concerns | High | High | Some concerns | ***High*** |
| Stellflug20 | 2018 | Some concerns | Low | Low | Some concerns | Low | ***Some concerns*** |
| Tufts22 | 2021 | Some concerns | Low | Low | Some concerns | Some concerns | ***Some concerns*** |

**Observational studies (ROBINS-I)**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1st Author** | **Year** | **Confounding** | **Participant selection** | **Intervention classification** | **Deviations from interventions** | **Missing data** | **Outcome measurement** | **Outcome reporting** | **Overall** |
| Roh18 | 2022 | Serious | Low | Low | Low | Serious | Serious | Low | ***Serious*** |