

Multimedia Appendix 3: Research designs used in included studies and objectives investigated

Study	Research design	Objectives Investigated			
		Effectiveness ^a	Engagement	Acceptability	Usability
<i>Protocols</i>					
Walters et al 2010 [41]	2-group RCT	✓			
Kharrazi et al 2011 [42]	Nonrandomized group design	✓		✓	
Pellegrini et al 2012 [43]	3-group RCT	✓	✓		
Jimenez Garcia et al 2013 [44]	Repeated measures; randomized crossover design	✓		✓	
Geraedts et al 2014 [45]	Repeated measures; pre-post design	✓	✓		
Recio-Rodriguez et al 2014 [46]	2-group RCT	✓	✓		
Clayton et al 2015 [47]	2-group RCT	✓	✓		
Cooper et al 2015 [48]	4-group RCT	✓	✓	✓	
Granado-Font et al 2015 [49]	2-group RCT	✓	✓	✓	✓
Hurley et al 2015 [50]	4-group RCT	✓			
Pellegrini et al 2015 [51]	3-group RCT	✓			
Agboola et al 2016 [52]	2-group RCT	✓	✓	✓	
Amorim et al 2016 [53]	2-group RCT	✓		✓	
Duncan et al 2016 [54]	2-group RCT	✓	✓	✓	✓
Jones et al 2016 [55]	2-group RCT	✓	✓	✓	
Ortiz et al 2016 [56]	Observational		✓		

Shin et al 2016 [57]	3-group RCT	✓	✓	✓	
Taylor et al 2016[58]	Observational		✓	✓	
van Nassau et al 2016 [59]	2-group RCT	✓	✓	✓	
Brickwood et al 2017 [60]	2-group RCT	✓	✓		
Ridgers et al 2017 [61]	2-group RCT	✓	✓	✓	
Wolk et al 2017 [62]	2-group RCT	✓	✓		
Completed Trials					
Slootmaker et al 2005 [63,64]	2-group RCT	✓	✓		
Fujiki et al 2007 [65]	Case study with baseline phase	✓ (D)		✓	✓
Hurling et al 2007 [66]	2-group RCT	✓	✓		
Polzien et al 2007 [67]	2-group RCT	✓	✓		
Consolvo et al 2008 [68]	3-group RCT	✓		✓	
Faridi et al 2008 [69]	2-group RCT	✓	✓	✓	✓
Fujiki et al 2008 [70]	Nonrandomized group design	✓ (D)		✓	✓
Lacroix et al 2008 [71,72]	Repeated measures; pre-post design	✓			
Albaina et al 2009 [39]	Case study with baseline phase	✓ (D)		✓	✓
Bickmore et al 2009 [73]	Repeated measures; randomized crossover design	✓		✓	
Fialho et al 2009 [74]	Nonrandomized group design	✓		✓	

Arsand et al 2010 [75]	Case study	✓	✓		
Mattila et al 2010 [76,77]	Repeated measures; pre-post design	✓	✓	✓	
Penados et al 2010 [78]	Case study	✓ (D)		✓	
Lim et al 2011 [79]	4-group RCT	✓		✓	✓
Shuger et al 2011 [80]	4-group RCT	✓			
Burns et al 2012 [81]	Case study with baseline phase	✓ (D)	✓	✓	✓
Gomes et al 2012 [40]	Repeated measures; pre-post design	✓			
Pellegrini et al 2012 [82]	2-group RCT	✓	✓		
Reijonsaari et al 2012 [83]	2-group RCT	✓	✓		
Van Hoye et al 2012 [84]	4-group RCT	✓			
Xu, Poole, et al 2012 [85,86]	Repeated measures; longitudinal design	✓	✓	✓	
Barwais et al 2013 [87]	2-group RCT	✓			
Bentley et al 2013 [88]	Nonrandomized group design	✓	✓	✓	
Chatterjee et al 2013 [89,90]	Case study with baseline phase	✓ (D)		✓	
Fitzsimmons et al 2013 [91]	Repeated measures; pre-post design	✓			
Harries et al 2013 [92, 93]	2-group RCT	✓	✓	✓	
Hirano et al 2013 [94]	2-group RCT	✓		✓	
Khalil & Abdallah 2013 [95]	Nonrandomized group design	✓		✓	
Khan & Lee 2013 [96]	Case study with	✓ (D)		✓	

	baseline phase				
King et al 2013 [97,98]	4-group RCT	✓	✓	✓	
Nakajima et al 2013 [99]	Nonrandomized group design	✓		✓	
Tabak et al 2013 [101]	2-group RCT	✓	✓		
Valentin & Howard 2013 [102]	Repeated measures; cross-over design	✓ (D)			
Bond et al 2014 [103] [104]	Repeated measures; randomized crossover design	✓	✓	✓	
Caulfield et al 2014 [105]	Repeated measures; pre-post design	✓			
Chen & Pu 2014 [106]	3-group RCT	✓	✓	✓	
Glynn et al 2014 [107,108] [109]	2-group RCT	✓		✓	
Miller et al 2014 [110]	Repeated measures; longitudinal design	✓	✓	✓	
Thompson et al 2014 [111]	2-group RCT	✓			
Thorndike et al 2014 [112]	2-group RCT	✓			
Verwey et al 2014 [113]	Repeated measures; pre-post design	✓	✓	✓	✓
Walsh et al 2014 [114]	Repeated measures; randomized crossover design	✓			
Zuckerman et al 2014 [115]	3-group RCT	✓	✓		
Cadmus-Bertram et al 2015 [116, 117]	2-group RCT	✓	✓	✓	✓
Direito et al 2015 [118]	3-group RCT	✓	✓	✓	

Finkelstein et al 2015 [119,120]	4-group RCT	✓	✓		
Frederix et al 2015 [121]	2-group RCT	✓			
Frederix et al 2015 [122]	2-group RCT	✓		✓	✓
Garde et al 2015 [123]	Repeated measures; randomized crossover design	✓	✓	✓	
Gouveia et al 2015 [124]	Observational	✓	✓		
Guthrie et al 2015 [125]	3-group RCT	✓	✓		
Komninos et al 2015 [126]	Repeated measures; randomized crossover design	✓		✓	
Lee et al 2015 [127]	4-group RCT	✓		✓	
Lee et al 2015 [128]	Case study; with baseline phase	✓ (D)		✓	
Martin et al 2015 [129]	2-group RCT	✓		✓	
Munson et al 2015 [130]	3-group RCT	✓		✓	
Rabbi et al 2015 [131]	Single -case Design	✓			
Verwey et al 2015 [132-134]	2-group RCT	✓	✓	✓	
Wadwha et al 2015 [135]	Observational	✓ (D)	✓	✓	
Wang et al 2015 [136]	2-group RCT	✓	✓	✓	
Watson et al 2015 [137]	2-group RCT	✓	✓	✓	
Broekhuizen 2016 [138]	2-group RCT	✓			
Butryn et al 2016 [139]	Repeated measures; longitudinal design	✓	✓	✓	
Choi et al 2016 [140]	2-group RCT	✓	✓		

Ciman et al 2016 [141]	Repeated measures; randomized crossover design	✓ (D)	✓	✓	
Darvall et al 2016 [142]	Case study		✓	✓	✓
Ding et al 2016 [143]	2-group RCT	✓ (D)		✓	✓
Fennell et al 2016 [144]	Repeated measures; crossover design	✓			
Garde et al 2016 [145]	Nonrandomized group design	✓	✓	✓	✓
Gilson et al 2016 [146]	Repeated measures; longitudinal design		✓		
Glance et al 2016 [147]	Nonrandomized group design	✓			
H-Jennings et al 2016 [148]	3-group RCT	✓			
Hartman et al 2016 [149]	2-group RCT	✓			
Herrmany et al 2016 [150]	3-group RCT	✓		✓	
Melton et al 2016 [151]	2-group RCT	✓			
Patel et al 2016 [152- 154]	4-group RCT	✓			
Paul et al 2016 [155]	Nonrandomized group design	✓			
Quintiliani et al 2016 [156]	Repeated measures; pre-post design	✓ (D)	✓	✓	
Vorrink et al 2016 [157]	2-group RCT	✓	✓		
Walsh et al 2016 [158]	Repeated measures; randomized crossover design	✓			
Yingling et al 2016 [159]	Case study		✓	✓	✓

Ashton et al 2017 [160]	2-group RCT	✓	✓	✓	✓
Chen et al 2017 [161]	Nonrandomized group design	✓		✓	
Chung et al 2017 [162]	Nonrandomized group design	✓ (D)	✓	✓	
Gell et al 2017 [163]	Repeated measures; pre-post design	✓		✓	
McMahon et al 2017 [164]	MOST	✓			
Neil-Sztramko et al 2017 [165]	Repeated measures; pre-post design	✓	✓	✓	
Valle et al 2017 [166]	3-group RCT	✓	✓	✓	
Total		107	58	64	16

^aD: The study described (as opposed to statistically analyzed) effectiveness/impact, using descriptive statistics or visual analysis.

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