SUPLEMENTARY MATERIAL C: RESULTS

In this supplementary material C are

- characteristics of the individual RCTs included in the review (Table C1)
- reported exergaming protocols and technologies used in the studies included in the review (Table C2).
- risk of bias in studies included in the review (Figure C1).
- summary of risk of bias across RCTs included in the meta-analysis (Figure C2).
- "summary of findings" table (Table C3).

Table C1. Characteristics of the individual RCTs included in the review.

	Participants				Interventions						
Study and Country of Origin	Group	N	Age (years)	Female %	Setting(s)	Duration (weeks)	Experimental	Comparison(s)	Sessions (x/week) / Session time (min)	Follow-up: Duration (weeks) / Procedure	Outcomes measuring walking
Bacha et al. 2018 [1] Brazil	Community-dwelling	EG: 23 CG: 23	EG: 71.0 (66.0; 74.5) CG: 66.5 (65.0; 71.75)	EG: 65 CG: 83	Hospital clinic	7	Exercising with Xbox Kinect Adventures games	Conventional physical therapy exercises in a group-training program of six participants	2 / 60	4 / NR***)	FGA
Bieryla & Dold 2013 [2] USA	Independently living	EG: 6 CG: 6	EG: 82.5 (1.6) CG: 80.5 (7.8)	NR	EG: Laboratory CG: Home	3	Exercising with Wii fit games	Normal daily activities	EG: 3 / 30	3 / Normal daily activities***)	TUG
Bieryla 2016 [3] USA	Independently living	EG: 6 CG: 7	EG: 82 (2.4) CG: 82.6 (6.9)	NR	EG: Laboratory CG: Home	3	Exercising with Kinect-designed specific games	Normal daily activities	EG: 3 / 30	3 / Normal daily activities***)	TUG
Chow & Mann 2015 [4] China	Community-dwelling	EG: 10 CG: 10	EG: 70.4 (5.4) CG: 68.0 (3.0)	EG: 70 CG: 60	Elderly day activity centre	2	Cyber-golfing training	Regular table games	7 / 30-45	NA	TUG
Christiansen et al. 2015 [5] USA	TKR patients	EG: 13 CG: 13	EG: 68.2 (8.6) CG: 66.6 (8.1)	EG: 46 CG: 54	Acute care, outpatient clinic, home	6	Acute care: postoperative physical therapy protocol Home: standard of care home exercise program and Wii games	Acute care and outpatient: postoperative physical therapy protocol Home: standard of care home exercise program	Acute care: 14 Home: 7 / EG: 30 CG: NR	20 / NR***)	WS
Daniel 2012 [6] USA	Pre-frail	EG: 8 CG1: 8 CG2: 7	EG: 80 (3.37) CG1: 78.13 (5.5) CG2: 72.6 (4.6)	EG: 63 CG1: 63 CG2: 57	EG, CG1: Laboratory	15	Exercising with Wii Fit games with added weight vest	CG1: Community-based seated group exercise classes CG2: Normal daily activities	EG, CG1: 3 / 45	NA	TUG, 6MWT
Delbroek et al. 2017 [7] Belgium	Institutionalized with MCI	EG: 10 CG: 10	EG: 86.9 (5.6) CG: 87.5 (6.6)	EG: 80 CG: 50	Residential care centre	6	Virtual reality cognitive-motor dual-task training**)	Standard of usual care	EG: 2 / 18-30	NA	TUG, TUG Dual-task
Eggenberger et al. 2015 [8] Switzerland	Independently living or community-dwelling	EG: 24 CG1: 22 CG2: 25	EG: 77.3 (6.3) CG1: 78.5 (5.1) CG2: 80.8 (4.7)	EG: 58 CG1: 73 CG2: 64	EG, CG1: Outpatient clinic + home CG:2	26	Video game dancing in groups	CG1: Treadmill walking with simultaneous verbal memory training in groups CG2: Treadmill walking in groups	2 / 60	24 / Falls calendar***)	WS (habitual, fast), WS dual-task (habitual, fast), Gait variables

					Outpatient clinic						(habitual fast), 6MWT
Fung et al. 2012 [9] Canada	TKR patients	EG: 27 CG: 23	EG: 67.9 (9.5) CG: 68.2 (12.8)	EG: 58 CG: 42	Outpatient department of a rehabilitation hospital	5	Wii Fit gaming after physiotherapy session	lower extremity strengthening and balance exercises after physiotherapy session	2 / 15	NA	2MWT
Gomes et al. 2018 [10] Brazil	Frail	EG: 15 CG: 15	EG: 83 (5.87) CG: 85 (6.19)	NR	EG: Outpatient clinic	7	Exercising with Wii Fit Plus games	General advice of physical activity (WHO booklet)	EG: 2 / 50	4 / NR***)	FGA
Gschwind et al. 2015 [11] Germany, Spain and Australia	Community-dwelling	EG: 78 CG: 75	EG: 74.7 (6.7) CG: 74.7 (6.0)	EG: 56 CG: 67	Home*)	16	Exercising with individually tailored iStoppFalls game**)	Normal daily activities	EG: 3 + 3 / 45-120	8 / Falls calendar	TUG, WS, WS dual task
Htut et al. 2018 [12] Thailand	Community-dwelling	EG: 21 CG1: 21 CG2: 21 CG3: 21	EG: 75.8 (4.89) CG1: 75.9 (5.65) CG2: 75.6 (5.33) CG3: 76.0 (5.22)	EG: 52 CG1: 38 CG2: 43 CG3: 43	Homes for the aged	8	Exercising with Xbox 360 games	CG1: Strength and balance exercising CG2: Board and card games CG3: Normal daily activities	EG, CG1, CG2: 3 / 30	NA	TUG, TUG Dual-task
Hughes et al. 2014 [13] USA	MCI	EG: 10 CG: 10	EG: 78.5 (7.1) CG: 76.2 (4.3)	EG: 80 CG: 60	Centrally located church	24	Exercising with Nintendo Wii games in groups	Healthy aging education in groups	1 / 90	28 / NR***)	WS
Imam et al. 2017 [14] Canada	Community living individuals using the prosthesis after amputation of the lower limb	EG: 14 CG: 14	EG: 61.5 (50-78) CG: 62.5 (50-78)	EG: 14 CG: 43	Outpatient clinic, home*)	4	Exercising with Nintendo Wii Fit games	Training with Wii Big Brain games	3 / 40	3 / NR***)	2MWT
Jorgensen et al. 2013 [15] Denmark	Community-dwelling	EG: 28 CG: 30	EG: 75.9 (5.7) CG: 73.7 (6.1)	EG: 68 CG: 70	EG: Outpatient clinic CG: Home	10	Exercising with Nintendo Wii games in pairs	Daily use of EVA shoe insole	EG: 2 /30-40	NA	TUG
Jung et al. 2015 [16] Republic of Korea	At the risk for falls	EG: 8 CG1: 8 CG2: 8	EG: 74.3 (2.1) CG1: 74.3 (3.5) CG2: 73.6 (2.4)	100	Senior citizen centre	8	Exercising with Nintendo Wii Sport games	CG1: Lumbar stabilization exercises CG2: Normal daily activities	EG, CG1: 2 / 30	NA	TUG, Crossing velocity (CV), Maximum vertical heel clearance (MVHC)

Study / Country	Population	N	Age mean (SD)	% female	Setting	Weeks	Intervention	Control	Sessions/week / min	Home exercises / falls	Outcomes
Karahan et al. 2015 [17] Turkey	Rehabilitation clinic patients	EG: 48 CG: 42	EG: 71.3 (6.1) CG: 71.5 (4.7)	EG: 44 CG: 43	EG: Outpatient clinic CG: Home	6	Exercising with Xbox 360 games	Balance, stretching and strengthening exercises	5 / 30	NA	TUG
Ku et al. 2019 [18] Republic of Korea	Community-dwelling, ambulatory	EG: 18 CG: 16	EG: 64.7 (7.27) CG: 65.0 (4.77)	50	EG: Laboratory CG: Home	4	Exercising with the Kinect-designed specific games**)	lower-extremity strengthening and endurance training	3 / 30	NA	TUG
Kwok & Pua 2016 [19] Singapore	Moderately frail	EG: 40 CG: 40	EG: 70.5 (6.7) CG: 69.8 (7.5)	EG: 90 CG: 80	Laboratory and home	12	Exercising with Nintendo Wii Active games, additional home exercises	Gym exercises in groups, additional home exercises	1 / 60	12 + 28 / Home exercises and falls calendar***)	TUG, WS, 6MWT
Lauzé et al. 2017 [20] Canada	Aassisted living, moves independently within the residence	EG: 21 CG: 11	EG: 80.1 (7.5) CG:83.2 (6.7)	EG: 71 CG: 91	Assisted living residence*)	12	Exercising with Jintronix gaming system**)	Normal daily activities	EG: 2 / 45	12 / NR***)	TUG, WS
Lauzé et al. 2018 [21] Canada	Community living following a minor injury	EG: 6 CG: 6	EG: 73.17 (2.93) CG: 76 (6.51)	EG: 83 CG: 100	Home*)	12	Exercising with Jintronix gaming system**)	Normal daily activities	EG: 2 / 50-55	12 / NR***)	TUG, WS
Laver et al. 2012 [22] Australia	Hospitalised	EG: 22 CG: 22	EG: 85.2 (4.7) CG: 84.6 (4.4)	EG: 86 CG: 73	Rehabilitation unit at hospital	2	Exercising with Wii Fit games	Conventional physiotherapy	5 / 25	NA	TUG
Lee & Shin 2013 [23] Republic of Korea	Diabetics	EG: 27 CG: 28	EG: 73.78 (4.77) CG: 74.29 (5.20)	EG: 74 CG: 68	Welfare centre	10	Exercising with PS2 games in pairs + Health education (2 times)	Health education (2 times)	EG: 2 /50	NA	TUG, WS, Gait cadence
Lee et al. 2015 [24] Republic of Korea	Women	EG: 26 CG: 28	EG: 68.77 (4.62) CG: 67.71 (4.31)	100	Laboratory	8	Exercising with Xbox 360 games	Balance, coordination and strength exercises in group	3 / 60	NA	TUG
Lee et al. 2017 [25] Republic of Korea	Community-dwelling	EG: 21 CG: 19	EG: 76.15 (4.55) CG: 75.71 (4.91)	EG: 57 CG: 58	Senior welfare centre	6	Exercising with Wii Fit games in pairs + fall prevention education (3 times)	Fall prevention education (3 times)	EG: 2 / 60	NA	TUG

Liao et al. [26] 2019 Taiwan	MCI	EG: 18 CG: 16	EG: 75.5 (5.2) CG: 73.1 (6.8)	EG: 61 CG: 75	Laboratory	12	Exercising with Kinect-designed specific games in groups**)	Combined physical and cognitive training in groups	3 / 60	NA	WS, WS Dual-task, WS Motor-task, Gait variables (Single-, Dual-, Motor-task)
Liao, Chen & Wang [27] 2019 Taiwan	Pre-frail, frail	EG: 27 CG: 25	EG: 79.6 (8.5) CG: 84.1 (5.5)	EG: 70 CG: 68	Laboratory	12	Exercising with Kinect-designed specific games in groups**)	Combined physical training in groups	3 / 60	NA	TUG, WS
Lim et al. 2017 [28] Republic of Korea	Independent community living	EG: 10 CG: 10	EG: 77.30 (5.62) CG: 80.8 (5.14)	EG: 60 CG: 70	Laboratory	5	Combined exercises with Wii Fit Plus games	Balance exercise with Wii Fit Plus games	2 / 60	NA	TUG
Lin et al. [29] 2007 Taiwan	Patients with knee OA	EG: 29 CG1: 26 CG2: 26	EG: 61.6 (8.1) CG1: 61.0 (7.7) CG2: 62.8 (6.3)	EG: 69 CG1: 81 CG2: 81	EG, CG1: Laboratory	8	Gamified proprioception exercises**)	CG1: Closed kinect chain exercises CG2: Health education (OA)	EG,CG1: 3 / 50	NA	WS (Ground level, Stairs, Spongy Surface, Figure 8)
Maillot et al. 2012 [30] France	Sedentary lifestyle	EG: 15 CG: 15	EG: 73.47 (4.10) CG: 73.47 (3.00)	NR	EG: Laboratory	12	Exercising with Wii Fit games in pairs	Normal daily activities	EG: 2 / 60	NA	TUG, 6MWT
Maillot et al. 2014 [31] France	Sedentary lifestyle	EG: 8 CG: 8	EG: 74.13 (4.73) CG: 74.00 (2.14)	NR	EG: Outpatient	12	Exercising with Wii Fit games in pairs	Normal daily activities	EG: 2 / 60	NA	TUG, 6MWT
Martel et al. 2018 [32] Canada	Community living following a minor injury	EG: 16 CG1: 16 CG2: 12	EG: 74.9 (7.1) CG1: 72.9 (6.7) CG2: 72.7 (6.5)	EG: 75 CG1: 63 CG2: 75	EG: Home*) CG1: Community centre	12	Exercising with Jintronix gaming system**)	CG1: Combined physical training in groups CG2: Normal daily activities	EG, CG1: 2 / 55	NA	TUG, WS, SPPB walking
Micarelli et al. 2019 [33] Italy	UVH / UVH + MCI	EG: 12 / 12 CG: 11 / 12	EG: 74.3 (4.7) / 72.5 (3.6) CG: 76.9 (4.7) / 76.3 (5.5)	EG: 50 / 58 CG: 55 / 58	Home*) and policlinic	4	Vestibular rehabilitation and exercising with HMD games	Vestibular rehabilitation	4 / 30-45	NA	DGI
Mirelman et al. 2016 [34] Belgium, Israel, Italy, the Netherlands, and the UK	Fallers / MCI	Fallers: 109 MCI: 43	EG: 75.4 (6.2) / 80.3 (5.2) CG: 75.6 (6.2) / 74.5 (5.4)	NR	Clinical centre	6	Combined treadmill training with VR component**)	Treadmill training	3 / 45	26 / Falls calendar***)	WS during obstacle negotiation, 2MWT

Study	Population	N	Age mean (SD)	%	Setting	Weeks	Intervention (EG)	Control (CG)	Sessions / min	Follow-up / Falls	Outcomes
Monteiro-Junior et al. 2017 [35] **Brazil**	Living at long term care institution	EG: 9 CG: 9	EG: 85 (8) CG: 86 (5)	67	Long term-care institution	8	Exercising with Wii Fit games	Physical exercise	2 / 30-45	NA	TUG, WS, Gait variables
Montero-Alía et al. 2019 [36] **Spain**	Primary care centre visitors	EG:508 CG: 469	EG: 75.1 (72.6–78.7) CG: 75.4 (72.7–78.6)	EG: 62 CG: 53	Nursing home	12	Exercising with Wii Fit games	Normal daily activities	EG: 2 / 30	36 / Falls calendar***)	Tinetti's gait
Morat et al. 2019 [37] **Germany**	Community-dwelling	EG1: 15 CG1: 15 CG2: 15	EG1: 67.5 (5.1) CG1: 69.7 (6.2) CG2: 71.1 (5.2)	EG1: 67 CG1: 60 CG2: 60	EG1, CG1: Laboratory	8	Group exercising with Dividat Senso games under unstable conditions**)	CG1: Group exercising with Dividat Senso games under stable conditions CG2: Normal daily activities	EG1, CG1: 3 / 10-12	NA	TUG, TUG Dual-task
Padala et al. 2012 [38] **USA**	Mild AD	EG: 11 CG: 11	EG: 79.3 (9.8) CG: 81.6 (5.2)	73	Assisted living facility	8	Exercising with Wii Fit games	Indoor walking in groups	5 / 30	NA	TUG
Park et al. 2015 [39] **Republic of Korea**	Community-dwelling	EG: 12 CG: 12	EG: 66.5 (8.1) CG: 65.2 (7.9)	EG: 25 CG: 17	NR	8	Exercising with Wii Fit games	Ball exercises	3 / 30	NA	TUG
Pichierri et al. 2012 [40] **Switzerland**	Residents of hostels for the aged	EG: 11 CG: 11	EG: 86.9 (5.1) CG: 85.6 (4.2)	EG: 73 CG: 91	Senior citizens hostels	12	Resistance and balance training in groups and additional exercising with dancing game	Resistance and balance training in groups	2 / EG: 50-55 CG: 40	NA	WS (habitual, fast, cognitive, cognitive-fast) , Gait variables (habitual, fast, cognitive, cognitive-fast)
Pitta et al. 2020 [41] / **Santos et al. 2019** [42] **Brazil**	Community-dwelling, pre-frail	EG: 11 CG: 9	EG: 69.7 (5.6) CG: 69.1 (5.0)	100	Laboratory	12	Vigorous exercising with Xbox 360 games	Moderate exercising with Xbox 360 games	3 / 40	NA	TUG, WS, WS fast, Gait variables (habitual, fast)
Pluchino et al. 2012 [43] **USA**	Independent community living	EG: 12 CG1: 14 CG2: 14	EG: 70.72 (8.46) CG1: 69.28 (6.03) CG2: 76.00 (7.74)	EG: 67 CG1: 57 CG2: 64	Laboratory*)	8	Exercising with Wii Fit games	CG1: Tai Chi CG2: Standard balance exercises	2 / 60	NA	TUG, Tinetti's gait

Study	Population	Sample size	Age		Setting	Duration (weeks)	Intervention (EG)	Control (CG)	Frequency / session (min)	Follow-up	Outcomes
Ray et al. 2012 [44] USA	Moves independent, no falls	EG: 29 CG1: 40 CG2: 18	75	67	Community-dwelling	15	Exercising with Wii Fit games	CG1: Traditional senior fitness exercising CG2: Normal daily activities	EG, CG1: 3 / 45	NA	TUG, 6MWT
Rendon et al. 2012 [45] USA	Community-dwelling, at the risk for falls	EG: 20 CG: 20	EG: 85.7 (4.3) CG: 83.3 (6.2)	NR	EG: Outpatient clinic	6	Exercising with Wii Fit games	Normal daily activities	EG: 3 / 35-45	NA	TUG
Rutkowski et al. 2019 [46] Poland	Patients with COPD	EG: 34 CG: 34	EG: 60.5 (4.3) CG: 62.1 (2.9)	EG: 50 CG: 47	Hospital	2	Standard pulmonary rehabilitation in groups and additional exercising with Xbox 360 games	Standard pulmonary rehabilitation in groups	5 / EG: 75 CG: 60	NA	TUG, 6MWT
Sajid et al. 2016 [47] USA	Prostate cancer patients with hormone therapy	EG: 8 CG1: 6 CG2: 5	EG: 77.5 (6.7) CG1: 75.7 (9.5) CG2: 71.8 (5)	0	Home*)	6	Exercising with Wii Fit games	CG1: Aerobic and resistance exercising CG2: Normal daily activities	EG, CG1: 5 / NR	6 / EG, CG1: Continued exercising***)	6MWT
Santamaria et al. 2018 [48] Costa Rica	Senior citizens	EG: 14 CG: 13	EG: 63.21 (6.05) CG: 63.08 (5.74)	EG: 79 CG: 77	EG: Laboratory	5	Video game dancing in groups	Normal daily activities	EG: 3 / NR	NA	TUG
Sato et al. 2015 [49] Japan	Locally residing	EG: 28 CG: 26	EG: 70.07 (5.35) CG: 68.5 (5.47)	EG: 79 CG: 81	EG: Laboratory	7	Exercising with Kinect-designed specific games**)	Normal daily activities	EG: 2-3 / 40-60	NA	WS, Gait variables
Schoene et al. 2013 [50] Australia	Residents of independent-living units of a retirement village	EG: 15 CG: 17	EG: 77.5 (4.5) CG: 78.4 (4.5)	NR	EG: Home*)	8	Exercising with stepping game	Normal daily activities	EG: 2-3 / 15-20 (minim.)	NA	TUG, TUG dual-task
Schwenk et al. 2014 [51] USA	Residents in senior living community	EG: 17 CG: 16	EG: 84.3 (7.3) CG: 84.9 (6.6)	EG: 59 CG: 69	EG: Room in senior living community	4	Exercising with specific balance games**)	Normal daily activities	EG: 2 / 45	NA	TUG, WS (habitual, fast), Gait variability (habitual, fast)
Schättin et al. 2016 [52] Switzerland	Independently living or senior residency dwelling	EG: 13 CG: 14	EG: 80 (73 ; 83) CG: 80 (72.25 ; 81.75)	EG: 38 CG: 50	Senior residence dwelling	8	Exercising with specific Dividat games in groups**)	Conventional balance training in groups	3 / 30	NA	WS, Cadence and Stride length in four conditions (habitual, fast, dual-task, dual-task fast)

Segura-Orti et al. 2019 [53] Spain	HD patients	EG: 9 CG: 9	EG: 68.3 (15.6) CG: 61.8 (13.0)	EG: 33 CG: 44	Hospital	4	Exercising with Kinect-designed specific games	Aerobic and strengthening exercise	3 / 40	NA	WS, 6MWT
Singh et al. 2013 [54] Malaysia	Community-dwelling	EG: 18 CG: 18	EG: 61.12 (3.72) CG: 64.00 (5.88)	NR	Senior citizens´ club	6	Exercising with Wii Fit games	Balance exercises in group	2 / 40	NA	TUG
Smaerup et al. 2015 [55] Denmark	Patients with vestibular dysfunction	EG:30 CG: 30	EG: 76.65 (7.56) CG: 78.68 (6.56)	EG: 58 CG: 65	Hospital and home*)	16	Hospital: Rehabilitation training Home: Exercising with specific Mitii games**)	Hospital: Rehabilitation training Home: Exercising following printed instructions	Hospital: 2 Home: 7 / 20-30	NA	DGI
Smaerup et al. 2016 [56] Denmark	Patients with vestibular dysfunction	EG: 28 CG: 29	EG: 76.39 (7.63) CG: 78.93 (6.58)	EG: 57 CG: 63	Home*)	12	Exercising with specific Mitii games**)	Exercising following printed instructions	7 / 20-30	NA	DGI
Stanmore et al. 2019 [57] UK	Dwelling in assisted living facilities	EG: 56 CG: 50	EG: 77.9 (8.9) CG: 77.8 (10.2)	EG: 80 CG: 76	Sheltered housing	12	Exercising with Kinect-designed specific games**) and falls prevention exercising following program leaflet	Falls prevention exercising following program leaflet	EG: 3 / 15 (exergaming)	NA	TUG
Sutanto et al. 2019 [58] Indonesia	COPD patients	EG: 10 CG: 10	EG: 65.1 (7.5) CG: 65.6 (4.7)	EG: 10 CG: 0	Outpatient clinic	6	Outpatient exercising program and exercising with Wii Fit program	Outpatient exercising program	3 / EG: 60 CG: 30	NA	6MWT
Szturm et al. 2011 [59] Canada	Community-dwelling individuals with balance and mobility difficulties	EG: 15 CG: 15	EG: 80.5 (6) CG: 81 (7)	EG: 67 CG: 60	Geriatric day hospital	8	Exercising with specific video games**)	Strengthening and balance exercises	2 / 45	NA	TUG, WS, Gait variables
Tollar et al. 2019 [60] Hungary	Mobility-limited	EG: 28 CG1: 27 CG2: 28	EG: 69.2 (2.80) CG1: 70.2 (4.08) CG2: 69.5 (3.67)	EG: 50 CG1: 56 CG2: 54	EG: CG1: Hospital's PT gym	5	Exercising with Xbox 360 games	CG1: Cycling CG2: Normal daily activities	EG, CG1: 5 / 60	NA	6MWT, DGI
Toulotte et al. 2012 [61] France	Independently living	EG: 9 CG1: 9 CG2: 9 CG3: 9	EG: 72.2 (8.6) CG1: 76.4 (4.7) CG2: 84.2 (8.1) CG3: 71.8 (8.0)	EG: 56 CG1: 67 CG2: 67 CG3: 56	EG, CG1, CG2: Gymnasium	20	Exercising with Wii fit games	CG1: Exercising with Wii fit games + Adapted Physical activities training CG:2 Adapted physical activities training, CG3: Normal daily activities	EG, CG1, CG2: 1 / 60	NA	Tinetti's gait

Tsang & Fu 2016 [62] **China**	Nursing home residents with poor walking ability	EG: 39 CG: 40	EG: 82.3 (3.8) CG: 82.0 (4.3)	EG: 59 CG: 63	Nursing home	6	Exercising with the Wii balance games	Conventional balance training	3 / 60	NA	TUG
Uzor & Baillie 2019 [63] **England**	History of falls	EG: 16 CG: 22	EG: 76.4 (6.41) CG: 75.4 (6.04)	EG: 63 CG: 64	Home*)	8	Exercising with tailored exergame system**) in addition to standard care	Standard care (booklet, exercise video)	3 / 30 (minim.)	NA	WS
Villumsen et al. 2019 [64] **Denmark**	Patients with prostate cancer	EG: 23 CG: 23	EG: 67.6 (4.6) CG: 69.8 (4.4)	0	Home*)	12	Aerobic and strength exercises with Xbox360 games	Normal daily activities	EG: 3 / 60	12 / Physical activity diary	6MWT
Yeşilyaprak et al. 2016 [65] **Turkey**	History of falls	EG: 7 CG: 11	EG: 70.1 (4.0) CG: 73.1 (4.5)	EG: 43 CG: 82	Nursing home	6	Balance training with the VR rehabilitation system**)	Conventional balance training	3 / 45-55	NA	TUG
Yuen et al. 2019 [66] **USA**	Idiopathic Pulmonary Fibrosis patients	EG: 10 CG: 10	EG: 67.4 (7.4) CG: 72.2 (8.4)	EG: 50 CG: 20	Home*)	12	Exercising with Wii fit games	Cognitive video game training	3 / 30	NA	6MWT

EG = Experimental Group, CG = Comparison Group, NR = Not reported, NA = Not Applicable

Participants: Group; MCI = Mild Cognitive Impairment, TKR = Total Knee Replacement, OA = Osteoarthritis, UVH = Unilateral Vestibular Hypofunction, AD = Alzheimer's Disease, COPD = Chronic Obstructive Pulmonary Disease, HD = Hemodialysis, Age (years); Mean (SD), Medium/Median (Q1; Q3), Median (range), Female %; Rounded to even

Interventions: HMD = Head-Mounted Displays, Setting*) = unsuperviced exergaming, Experimental, **) = Game technology used developed for physical rehabilitation, Follow-up***) = Outcomes reassessed

Outcomes measuring walking: 2MWT = Two Minute Walking Test, 6MWT = Six Minute Walking Test, FGA = Functional Gait Assessment, TUG = Timed Up & Go, WS = Walking speed

Table C2. Reported exergaming protocols and used technologies in studies (n=66) included in the review.

Study and Country of Origin	Type of training	In addition to other exercising	Guidance	Super-viced	Session description	Progression	Hardware	Games made for rehabili-tation purposes
			Exergaming protocol				**Technology**	
Bacha et al. 2018 [1] Brazil	Exercising with Xbox Kinect Adventures games	N	Sessions guided by a physical therapist	Y	Participants trained with four games and were allowed five attempts at each game	Players engaged in games with the goal of obtaining the highest number of adventure points that affect game progression.	360 Xbox Kinect videogame console, Kinect sensor, TV	N
Bieryla & Dold 2013 [2] USA	Exercising with Wii fit games	N	Session were supervised, no physical assistance	Y	Participants trained yoga (half moon, chair, warrior), aerobic (torso twists), and balance games (soccer heading, ski jump). Exercising order was: yoga, aerobic, balance x2, yoga, aerobic	Participants were challenged consistently.	Nintendo Wii, Nintendo Wii Balance Board	N
Bieryla 2016 [3] USA	Exercising with the Kinect-designed specific games	N	Verbal instructions for the games were provided before starting the training. No physical assistance. When necessary, participants were reminded of the goal of the game during training.	Y	Participants trained with two Kinect games (Your Shape: Fitness Evolved and Kinect adventures)	NR	Kinect for Xbox 360	N
Chow & Mann 2015 [4] China	Cyber-golfing training	N	Golf swing demonstration sessions (2x30 min) given by trained research assistant before experimental procedures.	Y	Participants trained with "Tiger Woods PGA Tour 13 / The 10-hole gaming mode" games and were required to finish the whole game in every session	NR	Xbox 360 Kinect	N
Christiansen et al. 2015 [5] USA	Weight-bearing biofeedback exercise with Wii games	N	Physical therapist gave feedback on proper performance while participant was exergaming	Y	Participants trained with Wii Fit Plus games	Depending on participant's ability level, speed was increase and dynamic, unilateral and lunging activities were added	Nintendo Wii, Nintendo Wii Balance Board	N
Daniel 2012 [6] USA	Exercising with Wii fit games with added weight vest	N	Sessions were directed by staff	Y	Participants wore weight vest and trained with basic games such as bowling, tennis, and boxing	Core and quadriceps muscle groups were progressively overloaded with 2% of their body weight added to the weight vest every 2 weeks	Nintendo Wii	N

Study	Intervention		Guidance		Session description	Difficulty adjustment	Technology	
Delbroek et al. 2017 [7] Belgium	Virtual reality cognitive-motor dual-task training	N	Sessions were guided by a physical therapist, exergaming system gave real-time feedback on the movement of the centre of pressure	Y	While standing on platform, participants trained with nine games to train balance, weight bearing, memory, attention and dual tasking. Two 90-second break per session were allowed.	Difficulty levels were adjusted by participants' skill levels, duration of session was gradually increased from 18 to 30 minutes	BioRescue (RM Ingenierie, France; includes a platform (610 × 580 × 10 mm3)	Y
Eggenberger et al. 2015 [8] Switzerland	Video game dancing in groups	Y	Sessions were guided by two trained postgraduate students	Y	Participants did aerobic endurance training with video game dancing in addition to strength and balance exercises (20 minutes each)	To achieve moderate-to-vigorous exercise intensity, treadmill speed and inclination, step frequency in DANCE, or number of sets and repetitions were adapted	Impact Dance Platforms (Positive Gaming BV, Haarlem, the Netherlands), StepMania software	N
Fung et al. 2012 [9] Canada	Wii Fit gaming after physiotherapy session	Y	Sessions were guided by a physical therapist	Y	15 min Wii Fit games engaging in postural control and balance in addition to 60 min physiotherapy session	Protocol started with the 'Deep Breathing' and 'Ski Slalom' games and progressed to other games after top-level scoring	Nintendo Wii, Nintendo Wii Balance Board	N
Gomes et al. 2018 [10] Brazil	Exercising with Wii Fit Plus games	N	Sessions were guided by a physical therapist	Y	Participants played block A and B games (five 2-3 min games in each block) on alternate days. Each game was played twice in each session: first attempt with the manual guidance and verbal feedback, second attempt independently	NR	Nintendo Wii	N
Gschwind et al. 2015 [11] Germany, Spain and Australia	Exercising with individually tailored iStoppFalls game	N	Participants received safety guidance by an experienced researcher and they were instructed with games two times by a trained research staff: at the beginning of the training and after two weeks of training. Phone support, additional home visits, and guidance through the tablet computer were offered if required.	N	Per week, participants performed at least 3 balance gaming sessions (40 min each) and 3 muscle strength gaming sessions (15-20 min each)	Task challenges, such as narrowing base of support, adjusting speed of movement, increasing the number of repetitions, were increased	ICT-based iStoppFalls system; television, personal computer (Shuttle Barebone Slim-PC), Google TV set top box (STB) by Sony, a Microsoft Kinect (3D Depth sensor), a Senior Mobility Monitor (SMM) by Philips (3D accelerometer, barometer), Nexus 7 Android tablet	Y

Htut et al. 2018 [12] **Thailand**	Exercising with Xbox 360 games	N	Sessions were conducted by a physical therapist	Y	In 30 min session, participants played 6 games out of ten (Light Raise, Virtual Smash, Stack'em Up, One Ball Roll, Pin Push, Super Saver, Target Kick, Play Paddle Panic, Body Bally, Bamp Bash), games involved upper and lower limb and balance training	Participants progressed to advanced levels of each game when they obtained the highest score in a previous level	Xbox 360	N
Hughes et al. 2014 [13] **USA**	Exercising with Nintendo Wii in groups	N	Sessions were guided by interventionists	Y	After 10-15 min discussion of healthy aging topics, participants trained 60 min with "core" games (bowling, golf, tennis, baseball).	New games (e.g., Boom Blox, Wii Play, and Sports Resort) were added to the end of the session (final 15-30 min). "Wii tournaments" were held in weeks 10 and 20.	Nintendo Wii	N
Imam et al. 2017 [14] **Canada**	Exercising with Nintendo Wii Fit games in clinic and at home	N	In clinic, a trainer conducted sessions. During home sessions, participants' were contacted once a week by a trainer to monitor safety and equipment function.	N	During sessions, participants played yoga, balance, strength training and aerobic games.	Participants progressed to advanced levels of each game when they performed well in a previous level	Nintendo Wii, Nintendo Wii Balance Board	N
Jorgensen et al. 2013 [15] **Denmark**	Exercising with Nintendo Wii in pairs	N	Sessions were supervised by a trained physical therapist	Y	Participants played five balance games (table tilt, slalom ski, perfect 10, tight rope tension, penguin slide) for 2/3 of session's duration and muscle strengthening game (standing rowing squat) for 1/3 of the session's duration. Participants rotated between games and had 10 minute pauses.	NR	Nintendo Wii	N
Jung et al. 2015 [16] **Republic of Korea**	Exercising with Nintendo Wii Sport games	N	Participants got various visual and audio feedback and guidance from gaming system	Y	Participants played 3 games out of 4 (Wakeboard, Frisbee dog, Jet ski, Canoe game) on a unstable floor, a 2-minute break followed every 10 minutes	NR	Nintendo Wii	N
Karahan et al. 2015 [17] **Turkey**	Exercising with Xbox 360 Kinect Adventures, Sports and Sports Season 2 games	N	Games were instructed to participants by physicians, sessions were companied by an experienced nurse	Y	Participants played football, tennis, table tennis, skiing, golf, volleyball, and bowling games	NR	Xbox 360 Kinect, 46-inch LCD TV	N
Ku et al. 2019 [18] **Republic of Korea**	Exercising with the Kinect-designed specific games	N	Sessions were monitored by the research assistant	Y	Participants played the balloon game and cave game for exercising hip and knee flexion/extension, and rhythm game for enhancing one-leg standing ability	The research assistant adjusted training levels individually	Microsoft Kinect sensor, 3D environment displayed on a large	Y

							screen, personal computer	
Kwok & Pua 2016 [19] **Singapore**	Exercising with Nintendo Wii Active games, additional home balance and strengthening exercises	N	Sessions were guided and supervised by a physical therapist and a therapist assistant	Y	Participants played Wii Active games using balance board and resistance band. Exercising included cardiovascular, strengthening, calisthenics and balance training. Additionally balance and strengthening exercising was done at home on non-intervention days and during follow-up period	NR	Nintendo Wii, Nintendo Wii Balance Board	N
Lauzé et al. 2017 [20], **Lauzé et al. 2018** [21] **Canada**	Exercising with Jintronix gaming system	N	Mainly at the beginning of intervention, a kinesiologist supervised 6 sessions, and other time was available for individual support over the phone or in person. Participants got various visual and audio feedback and guidance from gaming system	Y/N	Participants played according to individually tailored parameters. Session included warm-up period, aerobic, resistance and balance exercises, and cool-down period.	Individual degree of difficulty was adjusted by a kinesiologist according to the Web-portal reports	A computer and a TV screen or portable computer, Jintronix software, Microsoft Kinect, a TV screen	Y
Laver et al. 2012 [22] **Australia**	Exercising with Wii Fit games	N	Sessions were supervised by a physical therapist	Y	Participants played balance, strength and aerobic games while standing	NR	Nintendo Wii, Nintendo Wii Balance Board, wireless pointer	N
Lee & Shin 2013 [23] **Republic of Korea**	Exercising with PS2 EyeToy games in pairs	N	Sessions were guided and helped by a research assistant (exercise trainer). Participants got various visual and audio feedback and guidance from gaming system	Y	Participants had warm-up and cool-down periods and played six 2-3 minutes games (Wishi Washi: Window Washing, Keep Ups: Heading Game, Bowling, Bubble Pop, Boot Camp, and Kung Foo) that challenged balance, strength and aerobics. Participants were allowed to take a 5-min break after 3 games.	Participants started with 4 simple games for the first 2 weeks. From the third week, more challenging games (Kung Foo, Boot Camp) were added. Kung Foo game progressed to levels that are more difficult after participant completed previous stage.	PlayStation 2, Logitech motion-tracking camera, 25-inch liquid Crystal Display monitor	N
Lee et al. 2015 [24] **Republic of Korea**	Exercising with Xbox 360 games	N	A research assistant gave information on the exergame protocol on the first day of intervention. After that, research assistant supervised session, but did not interact with participants. Participants got various visual and audio feedback and guidance from gaming system	Y	Sessions included warm-up and cool-down exercises and games in where motions were based on tai chi. After 30 min of exercising, a 5-min break was given.	NR	Microsoft Kinect, Microsoft Xbox 360, a 1625.6mm monitor screen, Your Shape Fitness Evolved software	N

Lee et al. 2017 [25] Republic of Korea	Exercising with Wii Fit games in pairs	N	Sessions were monitored and instructed by six volunteer assistant, who also encourage participants to actively exergame. An avatar providing visual and auditory feedback while exergaming.	Y	Session included warm-up and cool-down periods, and six games (jogging for gait, swordplay for agility and balance, ski jump for balance, hula-hoop for balance and lower extremity strength, tennis for balance and agility, and step dance for gait and lower extremity strength) that were played competitively as circuit training.	NR	Nintendo Wii, Nintendo Wii Balance Board, Nintendo Wii joystick, a 42-inch LCD 3D TV, polarized glasses	N
Liao et al. [26] 2019 Taiwan	Exercising with Kinect-designed specific games in groups	N	Sessions were supervised by an experienced physical therapist	Y	To improve balance, stability, strength and endurance, session included Tai Chi, resistance, and aerobic exercises, and functional and cognitive tasks that simulated daily activities	Virtual tasks got more challenging after participants completed the simpler tasks.	Microsoft Kinect, VR glasses	Y
Liao, Chen & Wang [27] 2019 Taiwan	Exercising with Kinect-designed specific games in groups	N	Sessions were supervised by an experienced physical therapist	Y	Session included Tai Chi, resistance and aerobic exercises from PAPAMAMA program, and balance games (window cleaning, firework hitting, goldfish grasping), 20 minutes each.	Intensity was adjusted according to heart rate (50–75% of the maximal heart rate) and perceived exertion (13 to 14, equal to "somewhat hard")	Microsoft Kinect, Tano and LongGood software packages, a screen (230 cm × 230 cm)	Y
Lim et al. 2017 [28] Republic of Korea	Combined or balance exercises with Wii Fit Plus games	N	Sessions were supervised by an experienced physical therapist, who at the first session instructed exergame protocol to participants.	Y	Session included warm-up period before exergaming that included balance, strength, flexibility, and endurance games or alternatively just balance games	NR	Nintendo Wii, Nintendo Wii Balance Board	N
Lin et al. [29] 2007 Taiwan	Gamified proprioception exercises	N	Sessions were instructed by an experimenter, who provided verbal instructions and demonstrations	Y	Participants trained one leg at the time for 20 minutes, and had a 10-min break before training the other leg. Game included up-and-down and left-to-right movements that were controlled by the participant stepping onto pedals.	Games started with the slowest speed and progressed to faster speed after participants completed the slower tasks.	A personal computer, a colour computer screen, and a plantar control board (length and width: 57×57 cm, thick: 4cm, pedals: 8x9 cm)	Y
Maillot et al. 2012 [30] France	Exercising with Wii Fit games in pairs	N	Sessions were supervised by a physical trainer	Y	Session was divided into three periods in where participants played sport games that included tasks that required balance, stamina, cognitive judgment and combination of variety of skills. In first period participants played Tennis or Boxing game and Bowling game in three sessions, in second period Soccer Headers, Ski Jump and Marbles games, and in final period	Participants were advised to try to increase games' level of challenge and improve their performance during the intervention	Nintendo Wii, Nintendo Wii Remote and the Nunchuk, Nintendo Wii Balance Board	N

					Ski Slalom, Hula Hoop, Trampoline and Tennis Return of Serve.			
Maillot et al. 2014 [31] **France**	Exercising with Wii Fit games in pairs	N	NR	Y	Session was divided into two periods in where participants played sport games that included tasks that required balance and stamina. In first period, participants played Tennis or Boxing game, and in second period Soccer Headers, Ski Jump, Hula Hoop and Marbles games.	Participants were advised to try to increase games' level of challenge and improve their performance during the intervention	Nintendo Wii, Nintendo Wii Remote, Wii Nunchuk, Nintendo Wii Balance Board, a portable screen (76*102 cm)	N
Martel et al. 2018 [32] **Canada**	Exercising with Jintronix gaming system	N	A trained kinesiologist made six in-person supervision visits (sessions 1, 2, 4, 6, 12 and 18) and follow-up calls (weeks 4 and 8).	Y/N	Session included warm-up period, aerobic, strengthening and balance exercises, and cool-down period.	Individual degree of difficulty was adjusted by a kinesiologist according to the Web-portal reports	Jintronix software, Microsoft Kinect	Y
Micarelli et al. 2019 [33] **Italy**	Exercising with HMD games in addition to the Vestibular Rehabilitation	Y	At the beginning of protocol, participants were trained by an otoneurologist with expertise in HMD implementation.	N	Daily sessions included 20-minute exergaming while sitting on chair or sofa.	The trainers evaluated compliance, correct adjustments and performance twice a week in the clinic.	Track Speed Racing 3D game, the 5.2" display of a Windows Phone, the HMD 'Revelation' 3D VR Headset	N
Mirelman et al. 2016 [34] **Belgium, Israel, Italy, the Netherlands, and the UK**	Combined treadmill training with VR component	N	Session were supervised by a trainer. Participants got various visual and audio feedback and guidance from gaming system	Y	During session, participants walked on treadmill in computer simulated environment that included real-life challenges, consisting of obstacles, multiple pathways, and distractors that necessitated continual adjustment of steps.	Individualized progression was performed by adjusting treadmill's speed, duration of walking bouts, and size and frequency of the virtual obstacles and the distractors.	modified Microsoft Kinect, computer, large screen	Y
Monteiro-Junior et al. 2017 [35] **Brazil**	Exercising with Wii Fit games	N	Sessions were supervised by expert in sports medicine or physiotherapist	Y	In one session, the participant once played each of the following games: Rowing Squat, Penguim Slide, Basic Run Plus, Bump and Set, Heavy Bag, and Dance Basic 1.	NR	Nintendo Wii	N
Montero-Alía et al. 2019 [36] **Spain**	Exercising with Wii Fit games	N	Session were guided and managed by trained personnel. Participants got various visual and audio feedback and guidance from gaming system	Y	Participants played various balance exercises while standing barefoot on the balance board.	The personnel managed the sessions so that participants did all the exercises in each session for the time specified in the protocol. The number of repetitions varied for participants according to their agility.	Nintendo Wii, Nintendo Wii Balance Board	N

Morat et al. 2019 [37] Germany	Group exercising with Dividat Senso games under unstable conditions	N	A qualified study assistant guided sessions.	Y	The session included two to three pre-selected motor and cognitive games. The motor games in where the stepping was the main task were Objects, Shared, Simon, Flexi, Snake, Tetris, Habitats, Birds and Hexagon. Games with cognitive challenges were Ski and Rockect.	Progression was adjusted by increasing the degree of instability	Dividat Senso device (training platform 1.13 m*1.13 m with force sensors), screen combining Dividat Senso system with swinging Posturomed system	Y
Padala et al. 2012 [38] USA	Exercising with Wii Fit games	N	Session were guided by research personnel	Y	Sessions included warm-up and cool-down exercise (walk to and from room to gaming room), and strength, yoga, and balance games, 10 minutes each.	NR	Nintendo Wii, mobile television unit	N
Park et al. 2015 [39] Republic of Korea	Exercising with Wii Fit games	N	NR	Y	Sessions included training with Soccer Heading, Snowboard Slalom, and Table Tilt games, 10 minutes each.	NR	Nintendo Wii	N
Pichierri et al. 2012 [40] Switzerland	Resistance and balance training in groups and additional exercising with dancing game	Y	Sessions were supervised and conducted by the investigators	Y	Session included warm-up period (5 min), physical exercises (resistance training (25 min), balance exercises (10 min)) and video game dancing (10-15 min). In dancing, four 2-3 minutes song were played with a 30 seconds break after each song.	Progression was performed thru increasing number of repetitions and the load (weight vests) (physical exercises), and beats per minute and the difficulty level (video game dancing).	TX 6000 Metal DDR Platinum Pro, modification of the StepMania	N
Pitta et al. 2020 [41] / Santos et al. 2019 [42] Brazil	Vigorous exercising with Xbox 360 games	N	Sessions were guided by a qualified instructor guided who monitored exercise intensity and postures/movements during exergaming	Y	Session included following periods: warm-up (5 min), strength exercises (20 min), dynamic balance and cardiorespiratory exercises (10 min) and cool-down (5 min).	Progression was adjusted by increasing sets and repetitions of strength training (4 repetitions from 8 repetitions to 6 repetitions during the intervention period).	Microsoft Xbox 360, Microsoft Console, Kinect	N
Pluchino et al. 2012 [43] USA	Exercising with Wii Fit games	N	Participants got various visual and audio feedback and guidance from gaming system.	N	Session included warm-up (5 min), exercising with balance games (50 min) and cool-down (5-min).	Games started with easier levels of difficulty and progressed to advanced/higher levels after participants got maximum score of the level	Nintendo Wii, Nintendo Wii Balance Board	N
Ray et al. 2012 [44] USA	Exercising with Wii Fit games	N	Sessions were supervised by an assistant who supported participants ensuring their safety through gaming challenges	Y	Sessions included exercises using balance board and weighted vests.	Progression was adjusted by increasing weight of the vest every two weeks from 2 to 10 pound.	Nintendo Wii, Nintendo Wii Balance Board	N

Study	Intervention		Supervision/Instruction		Session	Intensity/Progression	Technology	
Rendon et al. 2012 [45] **USA**	Exercising with Wii Fit games	N	Sessions were supervised by a physical therapist who assisted participants and ensured their safety during exergaming	Y	Session included warm-up and cool-down periods, and exercising with three games that included lunges, single leg extensions and twists. Game sequence was altered week-to-week during intervention. Participants were allowed to have resting periods between games.	NR	Nintendo Wii, Nintendo Wii Remote, Nintendo Wii Balance Board	N
Rutkowski et al. 2019 [46] **Poland**	Standard pulmonary rehabilitation in groups and additional exercising with Xbox 360 games	Y	A physiotherapist supervised sessions. Participants got instructions from gaming system.	Y	Exergaming part of the session included 15-30 minutes exercising with four Kinect Adventures games at a basic level. Gaming involved rafting, cross-country running, hitting a ball projected towards the player, and a roller-coaster ride.	The heart rate level of the exercise was measured and when the participant did not reach the heart rate specified for the exercise, the exercise was continued.	Microsoft Xbox 360, Kinect , a projector with speakers	N
Sajid et al. 2016 [47] **USA**	Exercising with Wii Fit games	N	Participants received one teaching session given by an exercise physiologist	N	Session included individually tailored exercise program using different exercises modules of game technology	Intensity of games were increased after participant demonstrated increase in physical performance	Nintendo Wii	N
Santamaria et al. 2018 [48] **Costa Rica**	Video game dancing in groups	N	Participants got instructions how to operate the video game.	Y	During session, participants danced 14 songs in random order at the beginner's level.	NR	Nintendo Dance Dance Revolution (DDR®), control mats in front of screen, Nintendo Wii console	N
Sato et al. 2015 [49] **Japan**	Exercising with Kinect-designed specific games	N	A physical therapist, a student, and game development staff operated sessions. Gaming system gave audio feedback to participants.	Y	Sessions included exergaming with Apple, Tightrope, Balloon popping and One-leg standing games	The games had different levels of difficulty.	Microsoft Kinect, Microsoft Kinect SDK version 1.5, Unity version 3.4.2, a three-dimensional (3D) support tool/engine used with Kinect.	Y
Schoene et al. 2013 [50] **Australia**	Exercising with stepping game	N	Participants was instructed and they got manual how to operate and play the stepping game. During intervention, participants were contacted four times by phone and they were able to contact research staff when they needed help.	N	Participants played stepping game, in where they synchronizing their stepping with instructions presented on the screen while listening the music they had selected. Music was not synchronized with the game.	Games started with easier levels of difficulty and progressed to advanced/higher levels after participants performed well at current level	Modified DDR Stepmania, computer, television	N

Schwenk et al. 2014 [51] USA	Exercising with specific balance games	N	A study coordinator, who gave instructions of balance tasks at the first session, supervised sessions. Participants got sensor-based feedback from the gaming system.	Y	Sessions included 6 blocks with 20 cycles of exercise tasks and three series of obstacle crossing with 15 repetitions each. Participants got one-minute break between successive blocks.	By the judgement of supervisor, progression was adjusted by moving to more advanced tasks and by increasing obstacle height.	a 24-inch computer screen, game-based virtual interface (MatLab®), Psych toolbox V2.54, 5 wearable inertial sensors (LegSys™)	Y
Schättin et al. 2016 [52] Switzerland	Exercising with specific Dividat games in groups	N	Session were supervised and instructed by three post graduate students.	Y	Session included warm-up and cool-down periods (5 min each), 20 minute exercising with four different games.	Progression was adjusted individually by training intensity that should achieve a moderate to vigorous training level and by increasing difficulty level of the games.	Impact Dance Platform (87.5 ×87.5× 2.5 cm), desktop computer, projector	y
Segura-Orti et al. 2019 [53] Spain	Exercising with Kinect-designed specific games	N	Before first session, participants had instruction and test session. A physical therapist monitored exergaming sessions.	Y	Sessions included warm-up and cool-down sessions, 5 minutes each. 30 minutes exergaming was held in 3 minutes bouts, rest period between bouts. Intensity was held between "somewhat hard" to "hard" (RPE 13-15/20).	Progression was adjusted by increasing the number of exercise bouts (from 1 to 10) and the difficulty of game. The physical therapist adjusted game-break periods and level of difficulty depending on the participant's performance.	standard computer, a TV, Microsofts Kinect, adapted version of ACT (A la Caza del Tesoro) program	N
Singh et al. 2013 [54] Malaysia	Exercising with Wii Fit games	N	NR	Y	Session included warm-up and cool-down periods, 5 min each, and 30 minutes exercising with games Ski Slalom, Table Tilt, Penguin Slide, Soccer Heading, Tight Rope Walk, Perfect 10 and Tilt City.	Games started with beginners level and progressed to advanced/expert levels after participants performed well at current level	Nintendo Wii, Nintendo Wii Balance Board	N
Smaerup et al. 2015 [55] Denmark	Rehabilitation training at hospital and exercising with specific Mitii games at home	Y	Participants got oral and written instructions of Mitii home exercises. During study period, game technology instructed exercises.	Y/N	Individualized sessions included drag-and-drop and follow-the-leader exercises aiming to enhance endurance, gaze stability, reflexes, smooth-pursuit eye movements and postural control	Once a month the physical therapist contacted participants to adjust progression by increasing duration, speed, and task challenges of games	Internet-connected computer, web camera connected to a cloud-based interactive training system using the Adobe Flash technology, headband	Y
Smaerup et al. 2016 [56] Denmark	Exercising with specific Mitii games at home	N	Game technology instructed exercises and registered the duration of exercising. The physical therapist followed duration and contacted	N	Daily sessions included drag-and-drop and follow-the-leader games played in standing position for 20-30 minutes.	NR	Internet-connected computer, web camera connected to a cloud-based interactive training system using the	Y

			participants if they had not trained for seven days.				Adobe Flash technology, headband	
Stanmore et al. 2019 [57] **UK**	Exercising with Kinect-designed specific games and falls prevention exercising following program leaflet	Y	The physiotherapist advised the participants. Sessions were supervised by a physiotherapist or physiotherapist's assistant	Y	Sessions included exercising with games that suited the participant's starting level of ability and usual falls prevention exercises	Progression was tailored over the 12 weeks by increasing number of games within session, game challenge and duration.	laptop, Microsoft Kinect	Y
Sutanto et al. 2019 [58] **Indonesia**	Outpatient exercising program and exercising with Wii Fit program	Y	Supervised session with one-to-one exergaming instruction	Y	Session included 30 min cycle exercise training at intensity of 5 on modified 10-point Borg scale and 30 min exergaming with Yoga deep breathing, Yoga half-moon, Torso twist and Free run games.	NR	Nintendo Wii, Nintendo Wii Balance Board, flatscreen TV	N
Szturm et al. 2011 [59] **Canada**	Exercising with specific video games	N	NR	Y	Sessions included exercising with three games (Under Pressure, Memory Match and Balloon Burst) by making horizontal or vertical motions while standing on pressure mat.	Progression was adjusted individually by increasing movement amplitude, game speed, game task precision, and exercise duration.	FSA pressure mat, FSA interface box, laptop computer	Y
Tollar et al. 2019 [60] **Hungary**	Exercising with Xbox 360 games	N	Sessions were delivered by physical therapists who were trained and supervised by the principal investigator	Y	Sessions included warm-up and cool-down, 5 min each, and exergaming with three gaming modules (Reflex Ridge, Space Pop, Just Dance), 15 min each. Participants were allowed to have 5 min rest.	Training intensity was targeted to be 80% of maximum HR. When HR deviated ±5% from target, the Polar monitor gave feedback to participant.	Xbox 360	N
Toulotte et al. 2012 [61] **France**	Exercising with Wii Fit games	N	NR	Y	Games, such as heading soccer, ski jumping, yoga, downhill skiing, game balls and tightrope walker, were used for training, a chair in front of participant for safety.	Progression was adjusted individually with game levels	Nintendo Wii	N
Tsang & Fu 2016 [62] **China**	Exercising with the Wii Fit balance games	N	NR	Y	The Wii Fit balance training games included Soccer Heading, Table Tilt, and Balance Bubble.	NR	Nintendo Wii, Nintendo Wii Balance Board	N
Uzor & Baillie 2019 [63] **England**	Exercising with tailored exergame system in addition to standard care	N	Research assistant made home visit to ensure a safe environment and train participants to exergames	N	Participants trained with six exergames for strength (Pigeon Express, Horse Hurdles, Fire Rescue) and balance (River Gems, Panda Peak, Snow Flags).	Progression was adjusted by three levels of game difficulty (easy, normal, difficult).	2 IMU sensors, laptop computer, Recov-R software	Y

Villumsen et al. 2019 [64] **Denmark**	Aerobic and strength exercises with Xbox360 Sport and Adventure games	N	A physical therapist gave individual 90 min instruction before home training exergaming	N	Sessions included warm-up and cool-down period and aerobic and strength exercises by games.	To gradually increase intensity, use of free weights (0.5, 1.0 and 2.0 kg) were added to exergaming program	Microsoft Xbox 360 Kinect	N
Yeşilyaprak et al. 2016 [65] **Turkey**	Balance training with the VR rehabilitation system	N	Sessions were provided by a trained physical therapist. Participants followed visual and audio feedback of gaming system.	Y	Session included exergames for warm-up (5 min), training (35-45 min) and cool-down (5 min)	Progression was adjusted by closing eyes while gaming, and by reducing base of support and increasing speed, duration and challenge of games.	BTS NIRVANA VR Interactive System	Y
Yuen et al. 2019 [66] **USA**	Exercising with Wii Fit games	N	To support of participants, research assistant contacted them week after baseline assessment and once a month during intervention	N	Session included exergaming with intensity of moderate to heavy (3 to 5 on 10-point Borg scale)	NR	Nintendo Wii U, Nintendo Balance board	N
Y = Yes, N = No, NR = Not reported								

Figure C1. Risk of bias in studies (n=66) included in the review: (A) Randomization process, (B) Deviations from the intended interventions, (C) Missing outcome data, (D) Measurement of the outcome, (E) Selection of the reported results, (F) Overall.

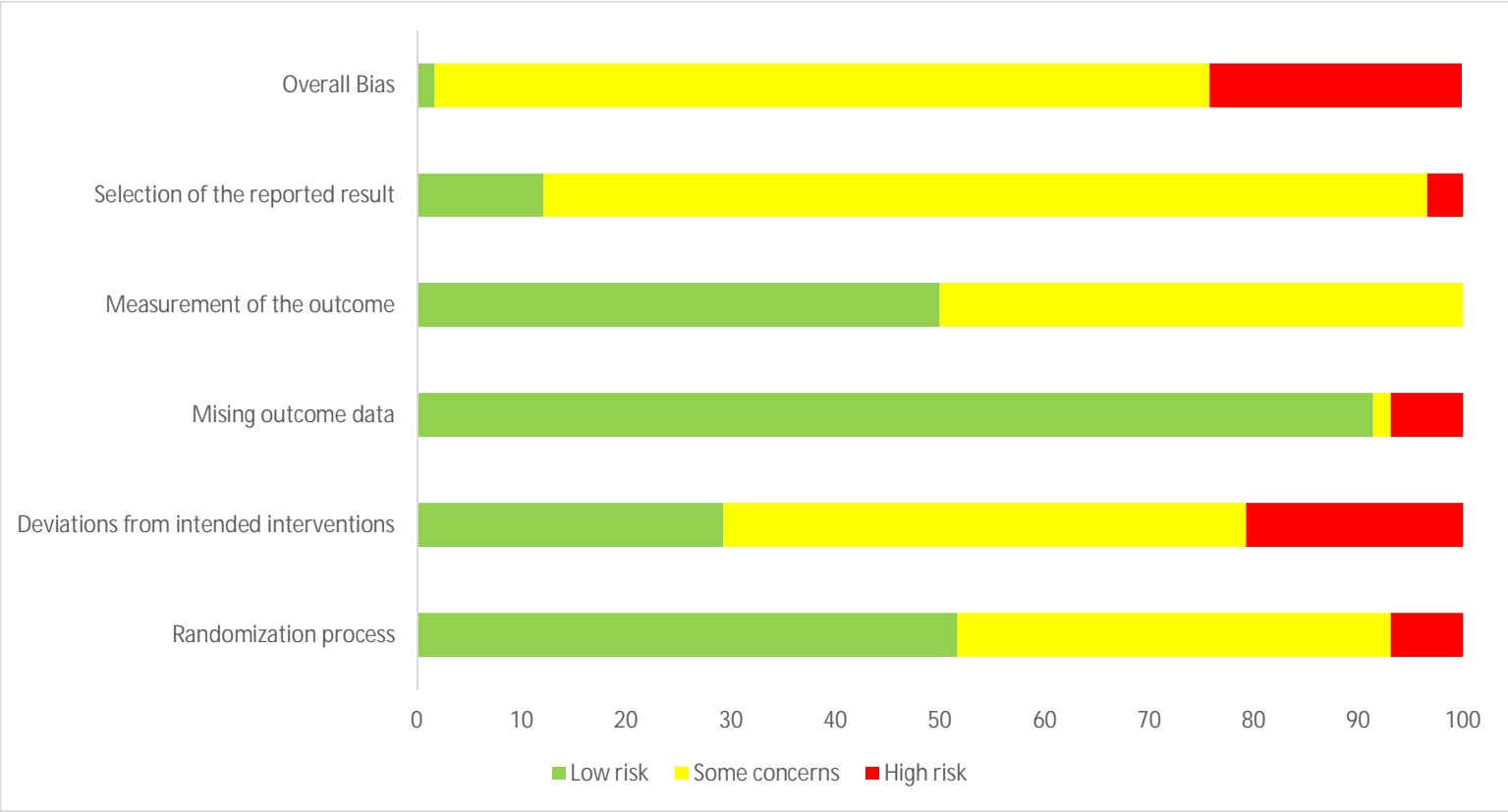**Figure C2.** Summary of risk of bias across RCTs (n=58) included in meta-analysis.

Table C3. Summary of Findings

Exergaming intervention compared to comparison group intervention[3]

Patients or population: Older adults aged 60 years or older with no common neurological condition
Settings: Varies
Intervention: Exergaming
Comparison: Other exercising protocol (other exergaming, other exercising, cognitive training) and no exercising protocol (control), i.e. active and inactive control respectively

Outcomes	SMD with 95% Confidence Interval Heterogeneity (I², p)	No of studies with high overall risk of bias[2]	No of Participants (Studies)	Publication bias[5]	Certainty of the evidence (GRADE)	Comments
Walking post intervention	-0.21 [-0.36, -0.06] 76.3%, <.0001	14	3102 (58)	Not serious	⊕⊕⊕◯Moderate[1]	Walking was assessed with validated and standardized meters (Timed Up & Go test, walking speed test, 2- and 6-minute walking test, Dynamic Gait Index, Functional Gait Assessment, Tinetti's Gait).
Walking post follow-up	-0.32 [-0.64, 0.00] 72.8%, <.0001	4	1028 (13)	Not serious	⊕⊕◯◯Low[14]	Walking was assessed with validated and standardized meters (Timed Up & Go test, walking speed test, 2-minute walking test, Functional Gait Assessment and Tinetti's Gait).

[1] Downgrading by one level due to inconsistency: Substantial heterogeneity.

[2] No downgrading due to risk of bias, as meta-regression analysis did not revealed significant association when high risk of bias was assessed by domains. In studies post intervention, high risk of bias was identified in randomization process (4), deviations from intended intervention (12), missing outcome data (4) and selection of the reported results (2). In studies post follow-up, high risk of bias was identified in randomization process (1), deviations from intended intervention (4) and missing outcome data (1).

[3] No downgrading due to indirectness; Correspondence to review's PICO criteria.

[4] Downgrading by one level due to imprecision: Wide confidence interval including null effect and small amount of studies.

[5] No downgrading due to publication bias: Asymmetry in the funnel plots indicated possibility of publication bias, but studies in favor of both groups has been published equally.

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