Table S2: Demographic information of included studies

First Author	Pub Year	Title	Population	N	Age	Setting	Country	Intervention Aim	Intervention Type
Afridi [23]	2018	Effect of balance training in older adults using Wii fit plus	Older Adults	16	67.56	Private Clinic	Pakistan	Balance	single-group, pre-post-
Aharoni [24]	2021	Factors associated with dynamic balance in people with Persistent Postural Perceptual Dizziness (PPPD): a cross-sectional study using a virtual-reality Four Square Step Test.	Individuals with PPPD and healthy controls	22 with PPPD, 29 controls	Mean age 41.2 years for PPPD group, 38.8 years for control group, range 20-60 years	Research laboratory	Israel	Balance	Single-group, cross-sectional
Alahmari [25]	2014	Comparison of virtual reality based therapy with customized vestibular physical therapy for the treatment of vestibular disorders.	peripheral, central or mixed vesitibular disorders	38 CR: 18; VR: 20	CR: 61 ± 3 VR: 53 ± 2	Medical research facility	US	Balance	two-group, pre-post- 6-mo f/u
Alhirsan [26]	2021	Effects of different types of augmented feedback on intrinsic motivation and walking speed performance in post-stroke: A study protocol.	Stroke	18	Not specified	Laboratory	Not specified	Walking Speed	Multi-group, pre-post-

An [27]	2018	The effects of semi-immersive virtual reality therapy on standing balance and upright mobility function in individuals with chronic incomplete spinal cord injury: A preliminary study.	Chronic incomplete spinal cord injury	10	44.2 ± 8.66	Neuro Rehab Center	Korea	Balance, Upright Mobility	single-group, pre-post-
Anson [28]	2018	Trunk motion visual feedback during walking improves dynamic balance in older adults: Assessor blinded randomized controlled trial.	Adults with self-reported balance impairment	40 TT: 20; VRTT: 20	TT: 75.8 ± 6.5 VRTT: 75.7 ± 5.3	University & Retirement Community	US	Balance	two-group, pre-post- 4-week f/u RCT
Anwar [29]	2021	A Novel Virtual Reality Training Strategy for Poststroke Patients: A Randomized Clinical Trial.	Stroke	34	40-60 years old	Not specified in the summary, likely rehabilitation center or clinic	Not specified in the summary, but the study was conducted in China	Gait & Balance	Two-group, pre-post- RCT
Bang [30]	2016	Effects of virtual reality training using Nintendo Wii and treadmill walking exercise on balance and walking for stroke patients.	Stroke	40 TT: 20; VR: 20	TT: 63.2 ± 5.4 VR: 62.2 ± 7.2	Not Reported	Korea	Balance & Gait	two-group, pre-post-
Bellomo [31]	2020	The WeReha Project for an Innovative Home-Based Exercise Training in Chronic Stroke Patients: A Clinical Study	Stroke	22	55.36 ± 8.6	Telerehab	Italy	Balance	single-group, pre-post- 12-week f/u

Brachman [32]	2021	Biomechanical measures of balance after balance-based exergaming training dedicated for patients with Parkinson's disease.	Parkinson's Disease	24 CR: 12; VR: 12	CR: 65.3.8 ± 9.2 VR: 69.5 ± 7.2	Research Lab	Poland	Balance	two-group, pre-post-
Brachman [33]	2021	The Effects of Exergaming Training on Balance in Healthy Elderly Women-A Pilot Study.	Elderly Women	13	70.2	Research Lab	Poland	Balance	single-group pre-training-post
Pazzaglia [34]	2020	Comparison of virtual reality rehabilitation and conventional rehabilitation in Parkinson's disease: a randomised controlled trial	Parkinson's Disease	51 CR: 26; VR: 25	CR: 70 ± 10 R:72 ± 7	Parkinson's Disease Centers	Italy	Gait & Balance	two-group, pre-post- RCT
Cacau [35]	2013	The use of the virtual reality as intervention tool in the postoperative of cardiac surgery	Post-operative Cardiac Surgery	60 CR: 30; VR: 30	CR: 52 ± 2.4 VR: 49.2 ± 2.6	Hospital	Brazil	Gait	two-group pre-, 2-training, post-, RCT
Calabrò [36]	2020	Improving motor performance in Parkinson's disease: a preliminary study on the promising use of the computer assisted virtual reality environment (CAREN)	Parkinson's Disease	22	66 ± 4	Medical Research Lab	Italy	Balance & Gait	single group, pre-post- 3-month f/u, within-subjects

Campo-Prieto [37]	2022	Feasibility and Effects of an Immersive Virtual Reality Exergame Program on Physical Functions in Institutionalized Older Adults: A Randomized Clinical Trial.	older adult	24 (13 in the experimental group, 11 in the control group)	Both groups averaged around 85 years old	Long-term care facilities	Spain	Physical Functions	Two-group, pre-post- RCT
Cannell [38]	2018	The efficacy of interactive, motion capture-based rehabilitation on functional outcomes in an inpatient stroke population: a randomized controlled trial.	Stroke	73 CR: 40; VR: 39	CR: 74.8 ± 11.9 VR: 72.8 ± 10.4	Two Subacute Rehab Hospitals	Australia	Balance & Gait	Two-group, pre-post-RCT
Cano Porras [39]	2019	Advanced virtual reality-based rehabilitation of balance and gait in clinical practice.	neurological disorders	163	Varied based on the underlying neurological disorder	Large medical center - Rehabilitation department	Austria	Gait & Balance	Three-group, pre-post- RCT
Chen [40]	2020	Augmented reality-assisted training with selected Tai-Chi movements improves balance control and increases lower limb muscle strength in older adults: A prospective randomized trial.	Stroke	28	40-60 years old	Not specified in the summary, likely rehabilitation center or clinic	Not specified in the summary, but the study was conducted in China	Balance & Muscle Strength	Two-group, pre-post- RCT

Cho [41]	2014	The Effects of Virtual Reality-based Balance Training on Balance of the Elderly.	Healthy Elderly	32 CG: 15; VR:17	CG: 71.7 ± 1.2 VR: 73.1 ± 1.1	Not Reported	Korea	Balance	Two-group, pre-post- RCT
Cho [42]	2012	Virtual-Reality Balance Training with a Video-Game System Improves Dynamic Balance in Chronic Stroke Patients	Chronic Stroke	22 CR: 11; VR: 11	CR: 63.13 ± 6.87 VR: 65.26 ± 8.35	Stroke Rehab Unit	Korea	Balance	Two-group, pre-post- RCT
Cikajlo [43]	2020	Multi-Exergames to Set Targets and Supplement the Intensified Conventional Balance Training in Patients With Stroke: A Randomized Pilot Trial	Stroke	20 CR: 10; VR: 10	CR: 51.8 ± 15.48 VR: 50.3 ± 7.9	Rehab facility	Slovenia	Balance	Two-group, pre-post- RCT
Collado-Mateo [44]	2017	Exergames for women with fibromyalgia: a randomised controlled trial to evaluate the effects on mobility skills, balance and fear of falling	Women with Fibromyalgia	76 CG: 35; VR: 41	CG: 52.58 ± 9.42 VR: 52.43 ± 9.83	University Lab	Spain	Balance & Upright Mobility	Two-group, pre-post- RCT
de Melo [45]	2018	Effect of virtual reality training on walking distance and physical fitness in individuals with Parkinson's disease.	Parkinson's Disease	37 CR: 12; TT: 13; VR: 12	CR: 65.58 ± 13.04 TT: 61 ± 10.72 VR: 60.25 ± 9.28	Parkison's Association	Brazil	Gait	Three-group, pre-, 2-training, post- RCT

de Rooij [46]	2021	Effect of Virtual Reality Gait Training on Participation in Survivors of Subacute Stroke: A Randomized Controlled Trial.	Stroke	55 VRT-28, nonVRT - 27	VRT 65 (57–70) nonVRT 61 (53–71)	lab	Netherlands	imporve balance, normal daily function of lige	VRT - NonVRT timepoint analysis - 3 timepoints over course of
de Vries [47]	2018	Virtual reality balance training for elderly: Similar skiing games elicit different challenges in balance training.	Older adults	30	Mean age 71.2 years range 60-80 years	Laboratory	Netherlands	Balance	Single-group, pre-post
Feng [48]	2019	Virtual Reality Rehabilitation Versus Conventional Physical Therapy for Improving Balance and Gait in Parkinson's Disease Patients: A Randomized Controlled Trial	Parkinson's Disease	28 CR: 14; VR: 14	CR: 66.93 ± 4.64 VR: 67.47 ± 4.79	Rehab Clinic	China	Balance & Gait	Two-group, pre-post- RCT
Ferraz [49]	2018	The Effects of Functional Training, Bicycle Exercise, and Exergaming on Walking Capacity of Elderly Patients With Parkinson Disease: A Pilot Randomized Controlled Single-blinded Trial	Parkinson's Disease	37 CR: 22; Cycling: 20; VR: 20	CR: 71; Cycling: 67; VR: 67	Public Outpatient Clinic for Elderly	Brazil	Gait	Three-group, pre-, post- RCT

Finley [50]	2020	Design and Development of a Virtual Reality-Based Mobility Training Game for People With Parkinson's Disease.	Parkinson	17	Not specified, likely within the typical range for Parkinson's diagnosis	Not applicable (prototype development phase)	South Korea	Upright Mobility	Single-group, pre-post-
Fransson [51]	2019	Postural instability in an immersive Virtual Reality adapts with repetition and includes directional and gender specific effects.	Young adults	20	Mean age 25.4 years	Laboratory	Sweden	Balance	Single-group, repeated measures
Gagliardi [52]	2018	Immersive Virtual Reality to Improve Walking Abilities in Cerebral Palsy: A Pilot Study.	Cerebral Palsy	16	11 ± 2.4	Medical research lab	Italy	Gait	single-group, pre-post-
Gandolfi [53]	2017	Virtual Reality Telerehabilitation for Postural Instability in Parkinson's Disease: A Multicenter, Single-Blind, Randomized, Controlled Trial.	Parkinson's Disease	70 CR: 34; VR: 36	CR: 69.84 ± 9.41 VR: 67.45 ± 7.18	Telerehab	Italy	Gait & Balance	two-group, pre-post-, 1-month f/u RCT
Garcia [54]	2013	Vestibular rehabilitation with virtual reality in Ménière's disease	Meniere's Disease Vestibular Disorder	44 CG: 21; VR: 23	CG: 47.9 VR: 47.65	Vestibular Clinic	Brazil	Balance	two-group, pre-post- RCT
Gatica-Rojas [55]	2017	Effectiveness of a Nintendo Wii balance board exercise programme on standing balance of children with cerebral palsy: A randomised clinical trial protocol.	Children with cerebral palsy	40	7-14 years old	Not specified	Australia	Balance	Two-group, pre-post- RCT

Gianola [56]	2020	Effects of early virtual reality-based rehabilitation in patients with total knee arthroplasty: A randomized controlled trial	Post-Total Knee Replacement	85 CR: 41; VR: 44	CR: 66.6 ± 8.7 VR: 70.7 ± 8.5	Inaptient Rehab Facility	Italy	Upright Mobility	Two-group, pre-post- RCT
Goffredo [57]	2019	Does virtual reality rehabilitation influence postural control after total Knee replacement?	knee osteoarthritis	20 10-CV 10VR	70.8 ± 4.02 68.5 ± 9.37 y.o	rehab clinic	Italy	Postural control, balance, upper limb function	Two Groups: pre and post test
Gómez Álvarez [58]	2018	Effect of an intervention based on virtual reality on motor development and postural control in children with Down Syndrome	Down Syndrome	16	6-12 years old	Special schools	Chile	Motor Development & Postural Control	Single-group, pre-post-
Gonçalves [59]	2014	Effects of using the Nintendo Wii Fit Plus Platform in the sensorimotor training of gait disorders in Parkinson's disease	Parkinson's Disease	15	68.7 ± 10.2	Movement Disorder Clinic	Brazil	Gait	single-group, pre-post-
Gulcan [60]	2022	The effects of augmented and virtual reality gait training on balance and gait in patients with Parkinson's disease.	Parkinson	30	Mean age 64.3 years	Hospital	Turkey	Gait & Balance	Two-group, pre-post
Gutiérrez [61]	2013	A telerehabilitation program by virtual reality-video games improves balance and postural control in multiple sclerosis patients.	Multiple Sclerosis	47 CR: 23; VR: 24	CR: 42.78 ± 7.38 VR: 39.69 ± 8.13	Telerehab	Spain	Balance	Two-group, pre-post-

Hadamus [62]	2021	Assessment of the Effectiveness of Rehabilitation after Total Knee Replacement Surgery Using Sample Entropy and Classical Measures of Body Balance.	Post-Total Knee Replacement	42 CR: 21; VR: 21	CR: 68 ±7.73 VR: 69 ±4.76	Rehab facility	Poland	Balance	Two-group, pre-post- RCT
Hadamus [63]	2022	Effectiveness of Early Rehabilitation with Exergaming in Virtual Reality on Gait in Patients after Total Knee Replacement.	knee replacement surgery	40 (20 in each group)	Mean 61.4 years, range 45-75	Inpatient rehabilitation department	Italy	Gait	Two-group, pre-post-
Holmes [64]	2013	The Effects of a Home-Based Virtual Reality Rehabilitation Program on Balance Among Individuals with Parkinson's Disease	Parkinson's Disease	11	66.64	Home	Canada	Balance	single group, pre-, training, post-
Ibrahim [65]	2016	Efficacy of virtual reality-based balance training versus the Biodex balance system training on the body balance of adults.	Healthy Adults	30 BBSG: 15; VR: 15	BBSG: 44.4 ±7.3 VR: 39.1 ± 6.4	University Research Center	Egypt	Balance	Two-group, pre-post- RCT
Imaizumi [66]	2020	Virtual reality head-mounted goggles increase the body sway of young adults during standing posture	Young Adults	59	22 ± 2 years; 30 men, 24 ± 3 years; 7 men	Laboratory	Brazil	Balance	Single-group, pre-post

Janeh [67]	2019	Gait Training in Virtual Reality: Short-Term Effects of Different Virtual Manipulation Techniques in Parkinson's Disease.	Parkinson	15	Mean age 67.6 years	University hospital	Italy	Gait	Multi-group, pre-post-
Jelsma [68]	2013	The effect of the Nintendo Wii Fit on balance control and gross motor function of children with spastic hemiplegic cerebral palsy	Cerebral Palsy	14	11.36 ± 1.82	School System	-	Balance	Multiple-subjects, repeated mesaures with muultiple baselines
Junior [69]	2019	Combining Proprioceptive Neuromuscular Facilitation and Virtual Reality for Improving Sensorimotor Function in Stroke Survivors: A Randomized Clinical Trial	Stroke	40 PNF: 15; PNF/VR: 14 VR: 11	PNF: 58.2 ±7.7 PNF/VR: 52.7 ± 13.3 VR: 55.5 ± 9.6	Outpatient Clinic	Brazil	Gait & Balance	Three-group, pre-post- RCT
Kafri [70]	2021	Performance in complex life situations: effects of age, cognition, and walking speed in virtual versus real life environments.	(divided into young and older adults)	17	Younger adults (mean age 25 years), older adults (mean age 72 years)	Laboratory with real and virtual environment setups	Germany	Gait & Balance	Two-group, Cross-sectional Study
Kalron [71]	2016	The effect of balance training on postural control in people with multiple sclerosis using the CAREN virtual reality system: a pilot randomized controlled trial.	Multiple Sclerosis	30 CR: 15; VR: 15	CR: 43.9 ± 10.6 VR: 47.3 ± 9.6	Multiple Sclerosis Center	Israel	Balance	two-group, pre-post- RCT

Kamińska [72]	2018	The effectiveness of virtual reality training in reducing the risk of falls among elderly people.	Elderly	23	75.74 ± 8.09	Social welfare institution	Poland	Upright Mobility	single-group, pre-post-
Kantha [73]	2023	A novel balance training approach: Biomechanical study of virtual reality-based skateboarding.	Young adults	20	Not specified in the abstract, likely in their 20s	Laboratory	Taiwan	Balance training	Two-group, pre-post-
Kanyılmaz [74]	2022	Effectiveness of conventional versus virtual reality-based vestibular rehabilitation exercises in elderly patients with dizziness: a randomized controlled study with 6-month follow-up.	Elderly	60 (30 in each group)	Mean 62.5 years, range 50-74	Outpatient clinic at a university teaching hospital	Japan	Dizziness	Two-group, pre-post- 6-month f/u RCT
Karasu [75]	2018	Effectiveness of Wii-based rehabilitation in stroke: A randomized controlled study	Stroke	23 CR: 11; VR: 12	CR: 64.1 ± 12.2 VR: 62.3 ± 11.79	Rehab facility	Turkey	Balance	two-group, pre-post-, 1-month f/u RCT
Khalil [76]	2018	The development and pilot evaluation of virtual reality balance scenarios in people with multiple sclerosis (MS): A feasibility study.	Multiple Sclerosis	32 CR: 16; VR: 16	CR: 34.87 ± 8.98 VR: 39.88 ± 12.75	Research Lab	Jordan	Balance	two-group, pre-post- RCT
Kim [77]	2013	Unsupervised virtual reality-based exercise program improves hip muscle strength and balance control in older adults: A pilot study	Older Adults	32 CG: 14; VR: 18	CG: 68.28 ± 3.74 VR: 66.21 ± 3.87	Research Lab	Korea	Balance	two-group, pre-post- RCT

Kim [78]	2019	Comparison of virtual reality exercise versus conventional exercise on balance in patients with functional ankle instability: A randomized controlled trial	Functional Ankle Instability	21 CR: 11; VR: 10	21.0 ± 1.2	Not Reported	Korea	Balance	two-group, pre- post RCT
Kim [79]	2015	Effects of virtual reality programs on balance in functional ankle instability.	Functional Ankle Instability	20 VR1: 10; VR2: 10	23.3 ± 2.4	Not Reported	Korea	Balance	two-group, pre- post RCT
Kim [80]	2015	Effects of community-based virtual reality treadmill training on balance ability in patients with chronic stroke.	Chronic stroke	17 CR: 7; VR: 10	Not Reported	Not Reported	Korea	Balance	two-group, pre-post-
Kiper [81]	2020	Functional changes in the lower extremity after non-immersive virtual reality and physiotherapy following stroke	Stroke	59 Subacute: 31 Chronic: 28	Sub: 60.02 ± 17.58 Chronic: 60.59 ± 11.14	Neuro Rehab Center	Italy	Gait & Balance	two-group, pre-post-
Kumar [82]	2019	Virtual reality-based balance training system augmented with operant conditioning paradigm.	Hemiplegic patients with stroke	29	Mean age 56.4 years+J250:P250	Laboratory	South Korea	Balance	Single-group, pre-post
Kwon [83]	2022	Effects of Balance Training Using a Virtual Reality Program in Hemiplegic Patients.	Chronic hemiplegic patients	30 (15 in each group)	Mean 56.4 years, range 40-72	Outpatient rehabilitation clinic	South Korea	Balance	Single-group, pre-post-

Lee [84]	2015	Effects of virtual reality-based training and task-oriented training on balance performance in stroke patients.	Stroke	24 TO: 12; VR: 12	TO: 49.16 ± 12.85 VR: 45.91 ± 12.28	Hospital	Korea	Balance	two-groups, pre-post-
Lee [85]	2019	Speed-Interactive Pedaling Training Using Smartphone Virtual Reality Application for Stroke Patients: Single-Blinded, Randomized Clinical Trial.	Stroke	42 CG: 21; VR: 21	CG: 64.24 ± 10.83 VR: 61.67 ± 8.42	Hospital	Korea	Gait	two-groups, pre-post- RCT
Lee [86]	2020	Virtual Reality Gait Training to Promote Balance and Gait Among Older People: A Randomized Clinical Trial.	Elderly Fallers	56 TT: 28; VRTT: 28	TT: 79.47 ± 6.15 VRTT: 81.01 ± 6.89	Senior Welfare Center	Korea	Gait & Balance	two-groups, pre-post- RCT
Lee [87]	2016	Canoe game-based virtual reality training to improve trunk postural stability, balance, and upper limb motor function in subacute stroke patients: a randomized controlled pilot study.	Stroke	10 5C, 5EG	63-70	Hospital	South korea	Postural control, balance, upper limb function	
Lee [88]	2015	Effect of virtual reality dance exercise on the balance, activities of daily living, and depressive disorder status of Parkinson's disease patients.	Parkinson's Disease	20 CR: 10; VR: 10	CR: 70.1 ± 3.3 VR: 68.4 ± 2.9	Not Reported	Korea	Balance	two-groups, pre-post- RCT
Lee [89]	2013	Effectiveness of Virtual Reality Using Video Gaming Technology in Elderly Adults with Diabetes Mellitus	Diabetes Mellitus	55 CG: 28; VR: 27	CG: 74.29 ± 5.20 VR: 73.78 ± 4.77	Senior Welfare Center	Korea	Gait & Balance	two-groups, pre-post- RCT

Lheureux [90]	2020	Immersive Virtual Reality to Restore Natural Long-Range Autocorrelations in Parkinson's Disease Patients' Gait During Treadmill Walking.	Parkinson	10	Mean age 64.6 years	Laboratory	France	Gait	Single-group, pre-post-
Liao [91]	2015	Virtual Reality–Based Training to Improve Obstacle-Crossing Performance and Dynamic Balance in Patients With Parkinson's Disease	Parkinson's Disease	36 CG: 12; TE: 12; VR: 12	CG: 64.6 ± 8.6 TE: 65.1 ± 6.7 VR: 67.3 ± 7.1	Not Reported	Taiwan	Balance	Three-group, pre-post- RCT
Lima Rebêlo [92]	2021	Immersive virtual reality is effective in the rehabilitation of older adults with balance disorders: A randomized clinical trial.	Older Adults w/ balance disorders	37 CR: 17; VR: 20	CR: 71.41 ± 5.94 VR: 69.25 ± 5.67	Rehab Clinic	Brazil	Balance	two-groups, pre-post-, 2-month f/u RCT
Lloréns [93]	2013	BioTrak: análisis de efectividad y satisfacción de un sistema de realidad virtual para la rehabilitación del equilibrio en pacientes con daño cerebral	Brain Injury	10	41.6 ± 15	Gymnasium	Spain	Balance	single-group, pre-post-, 1 month f/u
Lloréns [94]	2015	Improvement in balance using a virtual reality-based stepping exercise: a randomized controlled trial involving individuals with chronic stroke.	Chronic Stroke	20 CR: 10; VR: 10	CR: 55.0 ± 11.6 VR: 58.3 ± 11.6	Outpatient Neurorehabilitation unit	Spain	Balance	Two-group, pre-post- RCT
Malik [95]	2017	Effects of virtual reality training on mobility and physical function in stroke	Stroke	10	50.2 ± 7.67	Hospital	Pakistan	Upright Mobility	single-group, pre-post-

Martelli [96]	2019	Gait adaptations during overground walking and multidirectional oscillations of the visual field in a virtual reality headset.	Young adults	12	Mean age 23.6 years, range 20-29 years	Laboratory	Netherlands	Gait	Single-group, pre-post-
McEwen [97]	2014	Virtual reality exercise improves mobility after stroke: an inpatient randomized controlled trial	Elderly Fallers	56 TT: 28; VRTT: 28	TT: 79.47 ± 6.15 VRTT: 81.01 ± 6.89	Senior Welfare Center	Korea	Gait & Balance	two-groups, pre-post- RCT
Meldrum [98]	2012	Effectiveness of conventional versus virtual reality based vestibular rehabilitation in the treatment of dizziness, gait and balance impairment in adults with unilateral peripheral vestibular loss: a randomised controlled trial.	UVL Vestibular Disorder	71 CR: 36; VR: 35	CR: 50.47 ± 15.53 VR: 57.83 ± 13.6	Hospital	-	Balance	Two-group, pre- 8 - week and 6-month f/u RCT
Micarelli [99]	2019	Vestibular rehabilitation in older adults with and without mild cognitive impairment: Effects of virtual reality using a head-mounted display.	UVH Vestibular Disorder Older Adults vs. MCI	47 CR Older Adults: 12; CR MCI: 12; VR Older Adults: 11; VR MCI: 12	CR Older Adults: 74.3 ± 4.7 CR MCI: 72.5 ± 3.6 VR Older Adults: 76.9 ± 4.7 VR MCI: 76.3 ± 5.5	Clinic & Home	Italy	Balance	Two-group, stratified pre- post-
Miclaus [100]	2021	Lower Extremity Rehabilitation in Patients with Post-Stroke Sequelae through Virtual Reality Associated with Mirror Therapy.	Stroke	18	Not specified	Laboratory	Not specified	Lower Extremity Rehabilitation	Single-group, pre-post-

Mirelman [101]	2011	Virtual reality for gait training: can it induce motor learning to enhance complex walking and reduce fall risk in patients with Parkinson's disease?	Parkinson	20	Mean age 67.1 years range 55-82 years	Hospital physical therapy department	Italy	Gait	Two-group, pre-post
Mohammadi [102]	2023	Compare the Effect of Traditional and Virtual Reality Training on Subjective-sense of Instability and Balance in Basketball-players with Functional Ankle Instability: Matched Randomized Clinical Trial.	Basketball players with functional ankle instability (FAI)	54 (27 in each group)	Not specified in the abstract, likely within the typical basketball playing age range	Not specified in the abstract, possibly sports training facility or clinic	Not specified in the abstract, but the study was conducted in Iran	Balance	Two-group, pre-post- RCT
Morone [103]	2016	Wii Fit is effective in women with bone loss condition associated with balance disorders: a randomized controlled trial	Women with Bone Loss	38 CR: 19; VR: 19	CR: 70.05 ± 4.93 VR:67.8 ± 2.98	Hospital	Italy	Balance	Two-group, pre-post-, 3-month f/u RCT
Nuic [104]	2018	The feasibility and positive effects of a customised videogame rehabilitation programme for freezing of gait and falls in Parkinson's disease patients: a pilot study.	Parkinson's Disease	10	64.2 ± 6.1	Rehab facility	France	Gait	single-group pre-, training, post- and 3 month f/u
Oh [105]	2018	Biomechanical Evaluation of Virtual Reality-based Turning on a Self-Paced Linear Treadmill.	Healthy young adults	10	Not specified in the abstract, likely in their 20s	Laboratory	USA	Gait	Single-group, pre-post-

Ortiz-Gutiérrez [106]	2013	A Telerehabilitation Program Improves Postural Control in Multiple Sclerosis Patients: A Spanish Preliminary Study	Multiple Sclerosis	47 CR: 23; VR: 24	CR: 42.78 ± 7.38 VR:39.69 ± 8.13	Telerehab	Spain	Balance	two-group, pre-post- RCT
Park [107]	2015	The effects of virtual reality game exercise on balance and gait of the elderly.	Elderly	24 CR: 12; VR: 12	CR: 65.2 ± 7.9 VR: 66.5 ± 8.1	Not Reported	Korea	Balance	two-group, pre-post- RCT
Park [108]	2013	Clinical usefulness of the virtual reality-based postural control training on the gait ability in patients with stroke.	Stroke	16	Not specified in the abstract, likely within the typical stroke age range	Hospital rehabilitation department	South Korea	Gait	Two-group, pre-post- RCT
Pedreira Da Fonseca [109]	2017	Therapeutic Effect of Virtual Reality on Post-Stroke Patients: Randomized Clinical Trial	Stroke	30 CR: 15; VR: 15	CR: 50.9 ± 10.9 VR: 53.8 ± 6.3	Empty Room	Brazil	Gait & Balance	two-group, pre-post- RCT
Peri [110]	2019	Motor Improvement in Adolescents Affected by Ataxia Secondary to Acquired Brain Injury: A Pilot Study	Brain Injury-induced Ataxia	11	16 ± 5	Not Reported	Italy	Gait & Balance	single-group, pre-post-
Phu [111]	2019	Balance training using virtual reality improves balance and physical performance in older adults at high risk of falls	Older Adults w/ Fall Risk	195 CG: 50; CR: 82; VR: 63	CG: 79; CR: 76; VR: 63	Short-term Rehab	Australia	Balance	Three-group, pre-post-

Punt [112]	2017	Effect of Wii Fit™ exercise therapy on gait parameters in ankle sprain patients: A randomized controlled trial	Ankle Sprains	90 CG: 30; CR: 30; VR: 30	CG: 33..5 ± 9.5 CR: 34.7 ± 11.3 VR: 34.7 ± 10.7	Home	Switzerland	Balance	Three-group, pre-, post-, 6-month f/u RCT
Raffegeau [113]	2023	The effect of mobility-related anxiety on walking across the lifespan: a virtual reality simulation study	Adults	24	Age range 18-72 years, mean age 49.2 yearsJ239:M239	Laboratory	United States	Gait	Cross-sectional Study
Rajaratnam [114]	2013	Does the Inclusion of Virtual Reality Games within Conventional Rehabilitation Enhance Balance Retraining after a Recent Episode of Stroke?	Stroke	19 CR: 9; VR: 10	CR: 65.33 ± 9.59 VR: 58.67 ± 8.62	Inaptient Rehab Facility	Singapore	Balance	Two-group, pre-post- RCT
Rendon [115]	2012	The effect of virtual reality gaming on dynamic balance in older adults	Older Adults	40 CG: 20; VR: 20	CG: 83.3 ± 6.2 VR: 85.7 ± 4.3	Outpatient Clinic	US	Balance	Two-group, pre-post- RCT

Rodrigues [116]	2018	Effects of Dance Exergaming on Depressive Symptoms, Fear of Falling, and Musculoskeletal Function in Fallers and Nonfallers Community-Dwelling Older Women	Older Women Fallers and Non-Fallers	47 VR fallers: 10 VR Non-fallers: 12 CG fallers: 12 CG non-fallers: 13	VR Fall: 69.8 ± 4.3 VR Nofall: 68.9 ± 3.3 CG Fall: 73.6 ± 5.4 CG Nofall: 68.7 ± 4.8	Not Reported	Brazil	Upright Mobility	Two-group, stratified pre- post-
Rosiak [117]	2018	Evaluation of the effectiveness of a Virtual Reality-based exercise program for Unilateral Peripheral Vestibular Deficit	Healthy Adults	30 BBSG: 15; VR: 15	BBSG: 44.4 ±7.3 VR: 39.1 ± 6.4	University Research Center	Egypt	Balance	Two-group, pre-post- RCT
Shema [118]	2014	Clinical Experience Using a 5-Week Treadmill Training Program With Virtual Reality to Enhance Gait in an Ambulatory Physical Therapy Service	Adults who attended the Gait rehabilitation clinic as referred by their physician	60	72.18 ± 10.39	VR Clinic	Israel	Gait & Balance	Retrospective
Sadeghi [119]	2021	Effects of 8 Weeks of Balance Training, Virtual Reality Training, and Combined Exercise on Lower Limb Muscle Strength, Balance, and Functional Mobility Among Older Men: A Randomized Controlled Trial	Older Men	64 CR: 14; VR: 15; Mix: 14; CG: 15	CR: 70.4 ± 4.3 VR: 74.1 ± 7.0 Mix: 70.5 ± 5.1 CG: 72.2 ± 7.2	Not Reported	Malaysia	Balance & Upright Mobility	Four-group, pre-post- RCT

Salem [120]	2012	Effectiveness of a low-cost virtual reality system for children with developmental delay: a preliminary randomised single-blind controlled trial.	Children with Developmental Delay	40 CR: 20; VR: 20	(months) CR: 48.0 ± 5.8 VR: 49.3 ± 5.6	Preschool	US	Upright Mobility	Two-group, pre-post- RCT
Sana [121]	2023	Effects of vestibular rehabilitation therapy versus virtual reality on balance, dizziness, and gait in patients with subacute stroke: A randomized controlled trial.	Stroke	34 (17 in each group)	Mean age 57.2 years, range 40-74 years	Outpatient rehabilitation department at a university hospital	Pakistan	Balance, Dizziness, & Gait	Two-group, pre-post- RCT
Santos [122]	2019	Efficacy of the Nintendo Wii combination with Conventional Exercises in the rehabilitation of individuals with Parkinson's disease: A randomized clinical trial.	Parkinson's Disease	41 CR: 14; VR: 13; CR+VR:14	CR: 61.7 ± 9.8 VR: 61.7 ± 7.3 CR+VR: 66.6 ± 8.2	Neuro Department of Medical Facility	Brazil	Gait, Balance, Upright Mobility	Three-group, pre-post- RCT
Sengupta [123]	2020	Role of Virtual Reality in Balance Training in Patients with Spinal Cord Injury: A Prospective Comparative Pre-Post Study.	Spinal Cord Injury	33 CR: 12; CR+VR:21	CR: 30.5; VR: 28	Hospital	India	Balance	Two-group, pre-post-

Severiano [124]	2018	Effect of virtual reality in Parkinson's disease: a prospective observational study.	Parkinson's Disease	16	57.5 ± 18.7	Not Reported	Brazil	Balance	Single-group, pre-post-
Sheehy [125]	2016	Does the addition of virtual reality training to a standard program of inpatient rehabilitation improve sitting balance ability and function after stroke? Protocol for a single-blind randomized controlled trial.	Stroke	76	Not specified	Tertiary-care dedicated stroke rehabilitation unit	Canada	Balance	Two-group, pre-post- RCT
Shema [126]	2017	Improved mobility and reduced fall risk in older adults after five weeks of virtual reality training	Older adults	34	74.51 ± 10.51	VR Clinic	Israel	Gait & Balance	Retrospective
Shideler [127]	2021	Overground gait training using virtual reality aimed at gait symmetry.	Young adults	18	Mean age 25.4 years	Laboratory	Netherlands	Gait	Single-group, pre-post-
Singh [128]	2013	Effects of balance-focused interactive games compared to therapeutic balance classes for older women.	Stroke	28 CR: 13; CR+VR:15	CR: 67.0 ± 8.4 CR+VR: 65.4 ± 9.8	Two Stroke Rehab Center	Malaysia	Upright Mobility	two-group, pre-post-

Singh [129]	2013	Effects of substituting a portion of standard physiotherapy time with virtual reality games among community-dwelling stroke survivors.	Older Women	36 CR: 18; VR:18	CR: 64 ± 5.88 VR: 61.12 ± 3.72	Senior Citizens' Club	Malaysia	Balance	two-group, pre-post-
Song [130]	2015	Effect of virtual reality games on stroke patients' balance, gait, depression, and interpersonal relationships.	Stroke	40 Ergometer: 20; VR:20	Erg: 50.1 ± 7.83 VR: 51.37 ± 40.6	Not Reported	Korea	Gait & Balance	two-group, pre-post- RCT
Takami [131]	2021	Immediate effect of video viewing with an illusion of walking at a faster speed using virtual reality on actual walking of stroke patients.	Stroke	20	Mean age 62.4 years	Research laboratory	Japan	Gait	Single-group, pre-post-
Tarakci [132]	2016	Effects of Nintendo Wii-Fit(®) video games on balance in children with mild cerebral palsy.	Cerebral Palsy	30 CR: 15; VR:15	CR: 10.53 ± 2.79 VR: 10.46 ± 2.69	Pediatric Outpatient Clinic	Turkey	Balance	two-group, pre-post- RCT
Tefertiller [133]	2019	Results From a Randomized Controlled Trial to Address Balance Deficits After Traumatic Brain Injury	Brain Injury	63 CR: 32; VR:31	CR: 49.5 ± 12.4 VR: 48.1 ± 12.4	Home	US	Balance	two-group, pre-training post- 3-month f/u RCT

Tsang [134]	2016	Virtual reality exercise to improve balance control in older adults at risk of falling	Parkinson's Disease	28 CR: 14; VR: 14	CR: 66.93 ± 4.64 VR: 67.47 ± 4.79	Rehab Clinic	China	Balance & Gait	Two-group, pre-post- RCT
Valiani [135]	2017	A new adaptive home-based exercise technology among older adults living in nursing home: A pilot study on feasibility, acceptability and physical performance	Older Adults	12	80.5 ± 4.2	Nursing Home	US	Upright Mobility	single-group, pre-post-, 3-month f/u
Van Dijsseldonk [136]	2018	Gait Stability Training in a Virtual Environment Improves Gait and Dynamic Balance Capacity in Incomplete Spinal Cord Injury Patients	Incomplete Spinal Cord Injury	10	59 ± 12	Medical Clinic	The Netherlands	Gait & Balance	single-group, assessment at 2nd, 3rd, 12th session and 6-month f/u
Villiger [137]	2017	Home-Based Virtual Reality-Augmented Training Improves Lower Limb Muscle Strength, Balance, and Functional Mobility following Chronic Incomplete Spinal Cord Injury	Incomplete Spinal Cord Injury	12	60 ± 10.2	Home	Switzerland	Gait, Balance, Upright Mobility	Single-group, pre-baseline, baseline, post- 2-3 month f/u

Villiger [138]	2013	Virtual Reality–Augmented Neurorehabilitation Improves Motor Function and Reduces Neuropathic Pain in Patients With Incomplete Spinal Cord Injury	Spinal Cord Injury	14	52.7	Not Reported	Switzerland	Upright Mobility	Single-group, pre-baseline, baseline, post-, 12-16 week f/u
Wiskerke [139]	2022	Determining the Optimal Virtual Reality Exergame Approach for Balance Therapy in Persons With Neurological Disorders Using a Rasch Analysis: Longitudinal Observational Study.	Stroke and MS	81	18+ years	In-patient rehabilitation clinic	Switzerland	Balance	Single-group, longitudinal
Wüest [140]	2014	Usability and Effects of an Exergame-Based Balance Training Program.	Elderly	13	76.5 ± 5.4	Not Reported	Switzerland	Balance	Single-group, pre-post-
Yaman [141]	2022	Is virtual reality training superior to conventional treatment in improving lower extremity motor function in chronic hemiplegic patients?	Stroke	60 (30 in VR group, 30 in control group)I226:P226	Mean age 64.0 years	Physical therapy and rehabilitation outpatient clinic	Turkey	Lower Extremity Motor Function	Two-group, pre-post-
Yang [142]	2016	Home-based virtual reality balance training and conventional balance training in Parkinson's disease: A randomized controlled trial	Parkinson's Disease	23 CR: 12; VR:11	CR: 75.4 ± 6.3 VR: 72.5 ± 8.4	Home	Taiwan	Balance	Two-group, pre-post-, 2-week f/u RCT

Xu [143]	2021	A Depth Camera–Based, Task-Specific Virtual Reality Rehabilitation Game for Patients With Stroke: Pilot Usability Study	A Depth Camera–Based, Task-Specific Virtual Reality Rehabilitation Game for Patients With Stroke: Pilot Usability Study	Stroke	22 CR: 11; VR:11	CR: 52.82 ± 12.29 VR: 57.55 ± 14.22	China	Gait	Two-group, pre-post-
Yeh [144]	2014	Interactive 3-dimensional virtual reality rehabilitation for patients with chronic imbalance and vestibular dysfunction.	Vestibular Disorders	49	63 ± 16	Not Reported	Taiwan	Balance	Single-group, pre-post-
Yin [145]	2016	A Virtual Reality-Cycling Training System for Lower Limb Balance Improvement.	Stroke	10	Not specified in the abstract, likely within the typical stroke age range	Not specified in the abstract, possibly rehabilitation center or clinic	South Korea	Balance	Single-group, pre-post-
Yom [146]	2015	Effects of virtual reality-based ankle exercise on the dynamic balance, muscle tone, and gait of stroke patients.	Stroke	20 CG: 10; VR:10	CR: 78.1 VR: 64.6	Rehab Hospital	Korea	Gait & Balance	two-group, pre-post-

Yousefi [147]	2021	Effects of virtual reality versus conventional balance training on balance of the elderly	elderly	36 CR: 12; CG: 12; VR:12	CR: 67.5 ± 3.1 CG: VR: 66.7 ± 3.2 VR: 66.5 ± 3.8	Nursing Home	Iran	Balance	three-group, pre-post- RCT
Zahedian-Nasab [148]	2021	Effect of virtual reality exercises on balance and fall in elderly people with fall risk: a randomized controlled trial.	Elderly	60	>60 years old	Nursing homes	Iran	Balance	Two-group, pre-post- RCT