Table 1 Characteristics of studies utilizing virtual reality

	Researcher	Sample	Experimental design	Groups	Intensity frequency duration	Assessment	Outcomes measures		p-value	Follow-up	PEDro score
1	Yang et al.[36]	23 PD patients	RCT	VR balance board therapy (n=11)	50min 2times/week 6weeks	Baseline Post-Intervention 2-weeks follow-up	BBS	↑*	p<0.001	↑*	7/10/2018
							DGI	↑	p<0.001	↑	
							TUG	↑*	p<0.001	-	
							PDQ-39	↑*	p=0.007	-	
							UPDRS III	-	p=0.345	-	
				Conventional Physiotherapy (n=12)	50min 2times/week 6weeks		BBS	↑	p<0.001	↑	
							DGI	↑	p<0.001	↑	
							TUG	↑	p<0.001	-	
							PDQ-39	↑	p=0.007	-	
							UPDRS III	-	p=0.345	-	
2	Liao et al.[33]	36 PD patients (35 follow-up)	RCT	VR Wii Fit (n=12)	60min 2times/week 6weeks	Baseline Post-Intervention 2-weeks follow-up	OCP	↑	p<0.05	↑	7/10/2018
							LOS	↑	p<0.05	↑	
							SOT	↑*	p<0.05	↑*	
							PDQ-39	↑*	p<0.05	↑*	
							FES-I	↑*	p<0.05	↑*	
							TUG	↑*	p<0.05	↑*	
				Traditional Exercise (n=12)	60min 2times/week 6weeks		OCP	-	NS	-	
							LOS	-	NS	-	
							SOT	↑*	p<0.05	↑*	
							PDQ-39	↑	p<0.05	↑*	
							FES-I	↑*	p<0.05	↑*	
							TUG	↑*	p<0.05	↑*	
				Passive Control group (n=12)	Fall prevention education		OCP	-	NS	-	
							LOS	-	NS	-	
							SOT	-	NS	-	
							PDQ-39	-	NS	-	
							FES-I	-	NS	-	
							TUG	-	NS	-	
3	Liao et al.[34]	36 PD patients (35 follow-up)	RCT	VR Wii Fit (n=12)	60min 2times/week 6weeks	Baseline Post-Intervention 2-weeks follow-up 1-month follow-up	LWP	↑*	p<0.05	↑*	7/10/2018
							FGA	↑*	p<0.05	↑*	
							MS	↑*	p<0.05	↑*	
							SOT	↑*	p<0.05	↑*	
				Traditional Exercise (n=12)	60min 2times/week 6weeks		LWP	↑*	p<0.05	↑*	
							FGA	↑*	p<0.05	↑*	
							MS	↑*	p<0.05	↑*	
							SOT	↑	p<0.05	↑	
				Passive Control group (n=12)	Fall prevention education		LWP	-	NS	-	
							FGA	-	NS	-	
							MS	-	NS	-	
							SOT	-	NS	-	
4	Yen et al.[20]	42 PD patients (32 follow-up)	RCT	Customized VR balance board therapy (n=14)	30min 2times/week 6weeks	Baseline Post-Intervention 4-weeks follow-up	SOT	↑	p<0.001	↑	7/10/2018
							VRT	-	NS	-	
				Conventional	30min		SOT	↑	p<0.001	↑	

				Balance Training (n=14)	2times/week 6weeks		VRT	-	NS	-	
				Passive Control group (n=14)	-		SOT	-	NS	-	
							VRT	-	NS	-	
5	Gandolfi et al.[44]	76 PD patients (70 follow-up)	RCT	TeleWii Intervention group (n=38)	50min 2times/week 6weeks 7weeks	Baseline Post-Intervention 1-month follow-up	BBS	↑*	p<0.001	↑	6/10/2018
							ABC	↑	p<0.001	↑	
							10MWT	↑	p=0.02	-	
							DGI	↑	p=0.005	↑	
							PDQ-8	↑	p<0.001	↑	
				Sensory Integration Balance Training (n=38)	50min 3times/week 7weeks		BBS	↑	p<0.001	↑	
							ABC	↑	p<0.001	↑	
							10MWT	↑	p=0.02	-	
							DGI	↑	p<0.001	↑	
							PDQ-8	↑	p=0.016	↑	
6	Lee et al.[32]	20 PD patients	RCT	Wii K-Pop Dance Festival (n=10)	75min 5times/week 6weeks	Baseline Post-Intervention	BBS	↑*	p<0.05	-	4/10/2018
							MBI	↑*	p<0.05		
							BDI	↑*	p<0.05		
				Passive Control Group (n=10)	45min 5times/week 6weeks		BBS	-	NS	-	
							MBI	-	NS		
							BDI	-	NS		
7	Van Den Heuvel et al.[31]	33 PD patients (31 follow-up)	RCT	Visual Feedback Training (n=17)	60min 2times/week 6weeks 5weeks	Baseline Post-Intervention 6-weeks follow-up	FRT	↑	NS	↑	8/10/2018
							BBS	↑	NS	↑	
							SLS	↑	NS	↑	
							10MWT	↑	NS	↑	
							UPDRS	-	NS	-	
							FES	-	NS	-	
							PDQ-39	-	NS	-	
							HAD	-	NS	-	
							MFI	-	NS	-	
				Conventional Balance Training (n=16)	60min 2times/week 5weeks		FRT	↑	NS	↑	
							BBS	↑	NS	↑	
							SLS test	↑	NS	↑	
							10MWT	↑	NS	↑	
							UPDRS	-	NS	-	
							FES	-	NS	-	
							PDQ-39	-	NS	-	
							HAD	-	NS	-	
							MFI	-	NS	-	
8	Ribas et al.[39]	20 PD patients	RCT	VR Wii Fit (n=10)	30min 2times/week 6weeks 12weeks	Baseline Post-Intervention 60-days follow-up	BBS	↑	p=0.033	-	10-Jul
							FSS	↑	p=0.002	-	
							6MWT	-	NS	-	
							PDQ-39	-	NS	-	
				Conventional Physiotherapy (n=10)	30min 2times/week 12weeks		BBS	-	NS	-	
							FSS	-	NS	-	
							6MWT	-	NS	-	
							PDQ-39	-	NS	-	

9	Pompeu et al.[24]	32 PD patients	RCT	VR Wii Fit (n=16)	60min 2times/week 7weeks	Baseline Post-Intervention 60-days follow-up	UPDRS II	↑	p<0.05	↑		10-May
							BBS	↑	p<0.05	↑		
							UST	↑	p<0.05	↑		
							MCA	↑	p<0.05	↑		
				Conventional Physiotherapy (n=16)	60min 2times/week 7weeks		UPDRS II	↑	p<0.05	↑		
							BBS	↑	p<0.05	↑		
							UST	↑	p<0.05	↑		
							MCA	↑	p<0.05	↑		
10	Shen & Mak[43]	51 PD patients (44 3month follow-up; 35 12month follow-up)	RCT	Computerized Dancing System (n=26)	60min 3times/week 4weeks + 20min 5times/week 4weeks + 60min 3times/week 4weeks	Baseline Post-Intervention 3-months follow-up 12-months follow-up	ABC	↑	p=0.025	↑	↑	10-Jul
							Gait speed	↑	p<0.017	↑	↑	
							Stride length	↑	p<0.017	↑	↑	
							SLS	-	NS	-	-	
				Active Control Group (n=25)	60min 3times/week 4weeks +20min 5times/week 4weeks +60min 3times/week 4weeks		ABC	-	p=0.370	-	-	
							Gait speed	↑	p<0.017	↑	↑	
							Stride length	-	p=0.083	-	-	
							SLS	-	NS	-	-	
11	Pedreira et al.[26]	44 PD patients	RCT	Nintento Wii (n=22)	50min 3times/week 4weeks	Baseline Post-Intervention	UPDRS	↑	p<0.05	-		10-Jun
							PDQ-39	↑	p=0.012			
				Conventional Physiotherapy (n=22)	50min 3times/week 4weeks		UPDRS	-	NS	-		
							PDQ-39	-	p=0.733			

↑Significant improvement compared to baseline
- Not (significant) improvement compared to baseline
* Significant difference between/among groups

Abbreviations: PD, Parkinson's disease; RCT, randomized controlled trials; NS, not stated; BBS, berg balance scale; DGI, dynamic gait index; TUG, timed up and go; PDQ-39/PDQ-8, Parkinson's disease questionnaire - 39/8; UPDRS, unified Parkinson's disease rating scale; OCP, obstacle-crossing performance; LOS, limits of stability; SOT, sensory organization test; FES, falls efficacy scale; LWP, level walking performance; FGA, functional gait assessment; MS, muscle strength; VRT, verbal reaction time; ABC, activities-specific balance confidence; 10MWT, 10-meter walk test; MBI, modified barthel index; BDI, beck depression inventory; FRT, functional reach test; SLS, single leg stance; HAD, hospital anxiety and depression; MFI, multidimensional fatigue inventory; 6MWT, 6-minute walk test; FSS, fatigue severity scale; UST, unipedal stance test; MCA, montreal cognitive assessment

Table 2 Characteristics of studies utilizing treadmill training

	Researcher	**Sample**	**Experimental design**	**Groups**	**Intensity frequency duration**	**Assessment**	**Outcomes measures**	**p-value**	**Follow-up**	**PEDro Score**
1	Picelli et al.[36]	17 PD patients	RCT	Treadmill Training group (n=9)	45min 3times/week 4weeks	Baseline Post-Intervention	FAB	↑ p=0.011	-	8/10/2018
							6MWT	↑ p=0.008		
							MCA	↑ p=0.017		
							TMT A	↑ p=0.018		
							TMT B	↑ p=0.008		
							MI	↑ p=0.010		
							10MWT	↑ p=0.008		
							BDI	↑ p=0.012		
							UPDRS	↑ p=0.013		
				Control group (n=8)	-		FAB	- p=0.705	-	
							6MWT	- p=0.362		

								MCA	-	p=0.227		
								TMT A	-	p=0.735		
								TMT B	-	p=0.345		
								MI	-	p=1.000		
								10MWT	-	p=0.624		
								BDI	-	p=0.914		
								UPDRS	-	p=0.285		
2	Picelli et al.[41]	60 PD patients	RCT	Robotic Gait Training (n=20)	45min 3times/week 4weeks	Baseline Post-Intervention 3-month follow-up		10MWT	↑	p=0.004	↑	7/10/2018
								6MWT	↑	p=0.015	↑	
								Stride length	↑	p<0.001	↑	
								Cadence	↑	p<0.001	↑	
								BBS	↑	p<0.001	↑	
								PFS	↑	p=0.001	↑	
								UPDRS	↑	p=0.022	↑	
				Treadmill Training (n=20)	45min 3times/week 4weeks			10MWT	↑	p=0.004	↑	
								6MWT	↑	p=0.015	↑	
								Stride length	↑	p<0.001	↑	
								Cadence	↑	p<0.001	↑	
								BBS	↑	p<0.001	↑	
								PFS	↑	p=0.001	↑*	
								UPDRS	↑	p=0.022	↑*	
				Conventional Gait Training (n=20)	45min 3times/week 4weeks			10MWT	-	NS	-	
								6MWT	-	NS	-	
								Stride length	-	NS	-	
								Cadence	-	NS	-	
								BBS	-	NS	-	
								PFS	-	NS	-	
								UPDRS	-	NS	-	
3	Harro et al.[28]	20 PD patients (19 follow-up)	RCT	Speed-Dependent Treadmill Training group (n=10)	30min 3times/week 6weeks	Baseline Post-Intervention 3-month follow-up		CGS	-	p=0.13	-	10-Jun
								FGS	↑	p=0.01	↑	
								6MWT	↑	p=0.03	-	
								FGA	↑	p=0.001	↑	
				Rhythmic Auditory-Cued group (n=10)	30min 3times/week 6weeks			CGS	↑	p=0.02	↑	
								FGS	-	p=0.08	↑	
								6MWT	↑	p=0.01	↑	
								FGA	↑	p=0.003	↑	
4	Schlick et al.[35]	20 PD patients (13 follow-up)	RCT	Treadmill Training with visual cues (n=10)	20-45min 2-3times/week 5weeks	Baseline Post-Intervention 2-month follow-up		Gait speed	↑	p=0.000	-	10-Jun
								Stride length	↑	p=0.001	-	
								Cadence	-	p=0.665	-	
								TUG	↑	p=0.006	-	
								FGQ	-	NS	↑	
								UPDRS III	↑	p=0.019	-	
				Treadmill Training (n=10)	20-45min 2-3times/week			Gait speed	↑	p=0.001	-	
								Stride length	↑	p=0.002	-	

					5weeks		Cadence	-	p=0.650	-	
							TUG	-	NS	-	
							FGQ	-	NS	↑	
							UPDRS III	-	NS	-	
5	Chaiwanichsiri et al.[19]	30 PD patients	RCT	Treadmill Training with music cues +Home walking program (n=10)	30min 3times/week 8weeks + 30min 3times/week 8weeks	Baseline Post-Intervention	Step length	↑	p=0.037	-	10-Jun
							Stride length	↑	p=0.042		
							Cadence	-	p=0.426		
							6MWT	↑	p=0.001		
							Gait speed	-	p=0.06		
							6MWD	-	p=0.561		
							TUG	↑	p=0.039		
							SLS	-	NS		
				Treadmill Training + Home walking program (n=10)	30min 3times/week 8weeks + 30min 3times/week 8weeks		Step length	-	NS	-	
							Stride length	-	NS		
							Cadence	-	NS		
							6MWT	↑	p=0.029		
							Gait speed	-	p=0.06		
							6MWD	-	NS		
							TUG	↑	p=0.039		
							SLS	-	NS		
				Home walking program (n=10)	30min 6times/week 8weeks		Step length	-	NS	-	
							Stride length	-	NS		
							Cadence	-	NS		
							6MWT	-	NS		
							Gait speed	-	NS		
							6MWD	-	NS		
							TUG	-	NS		
							SLS	-	NS		
6	Cakit et al.[10]	54 PD patients	RCT	Treadmill Training (n=27)	30±5min 8weeks	Baseline Post-Intervention	BBS	↑	p<0.01	-	10-May
							DGI	↑	p<0.01		
							FES	↑	p<0.01		
				Control group (n=27)	-		BBS	-	NS	-	
							DGI	-	NS		
							FES	-	NS		
7	Kurtais et al.[17]	24 PD patients	RCT	Gait Treadmill Training (n=12)	40min 3times/week 6weeks	Baseline Post-Intervention	20MWT	↑	p=0.012	-	10-May
							TU-T	↑	p=0.005		
							TAC	↑	p=0.003		

							CS	↑ p=0.008		
							Chair Arising	↑ p=0.002		
							OFS-R	↑ p=0.050		
							OFS-L	- p=0.182		
				Control group (n=12)	-		20MWT	- p=0.286	-	
							TU-T	- p=0.182		
							TAC	- p=0.929		
							CS	- p=0.284		
							Chair Arising	- p=0.721		
							OFS-R	↑ p=0.041		
							OFS-L	- p=0.373		
8	Bello et al.[25]	22 PD patients	RCT	Treadmill Training group (n=11)	24min 3times/week 5weeks	Baseline Post-Intervention 1-month follow-up	PGS	↑ p<0.001	↑	10-Apr
							PC	↑ p<0.001	↑	
							PSL	↑ p<0.05	↑	
							MGS	- NS	-	
							MC	- NS	-	
							MSL	↑ p<0.010	↑	
							TUG	↑ p<0.05	-	
							UPDRS	- NS	-	
				Overground group (n=11)	24min 3times/week 5weeks		PGS	↑ p<0.001	-	
							PC	↑ p<0.001		
							PSL	- NS		
							MGS	- NS		
							MC	- NS		
							MSL	- NS		
							TUG	- NS		
							UPDRS	- NS		
9	Canning et al.[22]	18 PD patients (17 follow-up)	RCT	Home-based Treadmill Walking (n=9)	30-40min 4times/week	Baseline Post-Intervention 6-weeks follow-up	6MWT	- NS	-	10-Aug
							PDQ-39	- NS	↑	
							Gait speed	- NS	-	
							UPDRS	- NS		
							VAS-F	↑ p<0.05	-	
				Control group (n=9)	-		6MWT	- NS	-	
							PDQ-39	- NS	-	
							Gait speed	- NS	-	
							UPDRS	- NS	-	
							VAS-F	- NS	-	
10	Harro et al.[29]	20 PD patients (19 follow-up)	RCT	Speed-Dependent Treadmill Training group (n=10)	30min 3times/week 6weeks	Baseline Post-Intervention 3-month follow-up	RST	↑ p=0.045	↑	10-Jun
							BBS	- p=0.12	-	
							LOS	↑ p=0.046	-	
							MCT	- p=0.89	-	
							SOT	↑ p=0.019	-	
							SOT-Falls	↑ p=0.045	-	
							ABC-16	- p=0.23	-	
							PDQ-39	↑ p=0.016	-	
				Rhythmic Auditory-Cued	30min		RST	↑ p=0.037	↑	

				group (n=10)	3times/week 6weeks		BBS	↑	p=0.017	↑		
							LOS	-	p=0.86	-		
							MCT	-	p=0.91	-		
							SOT	↑	p=0.049	↑		
							SOT-Falls	-	p=0.22	-		
							ABC-16	-	p=0.24	-		
							PDQ-39	-	NS	-		
11	Pelosin et al.[38]	30 PD patients	RCT	Treadmill Training – Low frequency (n=10)	45min 2times/week 10 sessions	Baseline Post-Intervention 2-month follow-up 4-month follow-up	10MWT	↑	p<0.001	↑↑--↑	- ↑---	6/10
							TUG	↑	p=0.001			
							BBS	-	NS			
							FES	↑	p=0.013			
							Falls number	↑	p=0.011			
				Treadmill Training – Intermediate frequency (n=10)	45min 3times/week 10 sessions		10MWT	↑	p<0.001	↑	-	
							TUG	↑	p<0.001	↑	↑	
							BBS	-	NS	-	-	
							FES	↑	p<0.001	↑	-	
							Falls number	↑	p=0.002	↑	↑	
				Treadmill Training – High frequency (n=10)	45min 3times/week 10 sessions		10MWT	-	p=0.80	-	-	
							TUG	-	p=0.212	-	-	
							BBS	-	NS	-	-	
							FES	-	p=0.79	-	-	
							Falls number	-	p=0.653	-	-	
12	Nadeau et al.[30]	45 PD patients	RCT	Speed Treadmill Training (n=17)	60min 3times/week 24weeks	Baseline Mid-Intervention (12weeks) Post-Intervention	Gait speed	↑	p<0.01	↑		10-Apr
							Stride length	↑	p<0.001	↑		
							Cadence	-	NS	↑		
							Step width	-	p=0.36	-		
							6MWT	↑	p<0.05	↑		
							MDS-UPDRS	-	NS	-		
							PDQ-39	-	p=0.07	-		
							MMSE	-	p=0.12	-		
							BDI-II	-	p=0.09	-		
							ABC	-	p=0.12	-		
				Mixed Treadmill Training (n=14)	60min 3times/week 24weeks		Gait speed	↑	p<0.01	↑		
							Stride length	-	NS	↑		
							Cadence	↑	p<0.05	↑		
							Step width	-	p=0.49	-		
							6MWT	↑	p<0.05	-		
							MDS-UPDRS	-	NS	-		
							PDQ-39	-	p=0.07	-		
							MMSE	-	p=0.12	-		
							BDI-II	-	p=0.09	-		
							ABC	-	p=0.12	-		
				Control group (n=14)	60min 3times/week 24weeks		Gait speed	-	p=0.90	-		
							Stride length	-	NS	-		
							Cadence	-	NS	-		
							Step width	-	NS	-		

							6MWT	-	NS	-		
							MDS-UPDRS	-	NS	-		
							PDQ-39	-	NS	-		
							MMSE	-	NS	-		
							BDI-II	-	NS	-		
							ABC	-	NS	-		
13	Carda et al.[21]	30 PD patients (28 follow-up)	RCT	Treadmill Training (n=15)	30min 3times/weeks 4weeks	Baseline Post-Intervention 3-month follow-up 6-month follow-up	6MWT	↑	p<0.05	↑	↑	10-Aug
							10MWT	↑	p<0.001	↑	↑	
							TUG	↑	p<0.01	↑	↑	
							UPDRS III	-	NS	-	-	
							SF-12 PCS	-	NS	-	-	
							SF-12 MCS	-	NS	-	-	
				Robot-assisted Gait Training (n=15)	30min 3times/weeks 4weeks		6MWT	↑	p<0.05	↑	↑	
							10MWT	-	NS	↑	↑	
							TUG	↑	p<0.05	↑	↑	
							UPDRS III	-	NS	-	-	
							SF-12 PCS	-	NS	-	-	
							SF-12 MCS	-	NS	-	-	
14	Sale et al.[27]	20 PD patients	RCT	Robot-assisted Gait Training (n=10)	45min 5times/week 4weeks	Baseline Post-Intervention	Gait speed	-	p=0.102	-		10-Aug
							Cadence	-	p=0.195			
							Step width	-	p=0.188			
							Step length	↑	p=0.039			
							Stride length	-	p=0.426			
				Treadmill Training (n=10)	45min 5times/week 4weeks		Gait speed	↑	p=0.020			
							Cadence	-	NS			
							Step width	-	NS			
							Step length	↑	p=0.020			
							Stride length	↑	p=0.020	-		
15	Fisher et al.[16]	30 PD patietnts	RCT	High Intensity group - Treadmill Training (n=10)	45min 3times/week 8weeks	Baseline Post-Intervention	Gait speed	↑	NS			10-May
							Step length	↑	NS			
							Stride length	↑	NS			
							Step width	-	NS			
							Cadence	-	NS			
				Low Intensity group - Conventional Physiotherapy (n=10)	45min 3times/week 8weeks		Gait speed	-	NS			
							Step length	-	NS	-		
							Stride length Step width	-	NS			
							Cadence	-	NS			
							Step width	-	NS			
				Zero intensity group – education (n=10)	60min 6 sessions 8weeks		Gait speed	-	NS			
							Step length	-	NS			
							Stride length Step width	↑	NS			
							Cadence	-	NS			
							Step width	-	NS			
16	Frazzitta et al.[18]	40 PD patients	RCT	Treadmill Training with visual &	20min 7times/week	Baseline Post-Intervention	UPDRS III	↑ *	p<0.001	-		10-May

				audial cues (n=20)	4weeks		6MWT	↑ *	p<0.001		
							Gait speed	↑ *	p<0.001		
							Stride cycle	↑ *	p<0.001		
				Conventional Gait Training with visual & audial cues (n=20)	20min 7times/week 4weeks		UPDRS III	↑	p<0.001	-	
							6MWT	↑	p<0.001		
							Gait speed	↑	p<0.001		
							Stride cycle	↑	p<0.001		
17	Shulman et al.[42]	80 PD patients	RCT	Treadmill Training – Higher intensity (n=26)	30min 3times/week 12weeks	Baseline Post-Intervention	6MWT	-	p=0.07	-	10-Apr
							10MCS	-	p=0.16		
							10MFS	↑	p=0.049		
							15MFS	-	p=0.09		
							MS	-	p=0.33		
				Treadmill Training – Lower intensity (n=26)	50min 3times/week 12weeks		6MWT	↑	p=0.001	-	
							10MCS	-	p=0.06		
							10MFS	↑	p=0.02		
							15MFS	↑	p=0.008		
							MS	-	p=0.61		
				Stretching and Resistance Training (n=28)	3times/week 12weeks		6MWT	↑	p=0.019	-	
							10MCS	-	p=0.91		
							10MFS	-	p=0.63		
							15MFS	-	p=0.93		
							MS	↑	p<0.001		
18	El-Tamawy et al. [23]	30 PD patients	RCT	Treadmill Training with vibratory stimuli & PNF (n=15)	51-70min 3times/week 8weeks	Baseline Post-Intervention	Gait speed	↑ *	p=0.001	-	10-Jun
							Distance	↑ *	p=0.005		
							Stride length	↑ *	p=0.005		
							Cadence	↑ *	p=0.001		
				Conventional Physiotherapy (n=15)	45min 3times/week 8weeks		Gait speed	↑	p=0.001	-	
							Distance	↑	p=0.001		
							Stride length	↑	p=0.001		
							Cadence	↑	p=0.001		

↑ Significant improvement compared to baseline
- Not (significant) improvement compared to baseline
* Significant difference between/among groups

Abbreviations: PD, Parkinon's disease; RCT, randomized controlled trial; NS, not stated; FAB-it, frontal assessment battery; 6MWT, 6-minute walk test; MCA, montreal cognitive assessment; TMT A – B, trail marking test part A – part B; MI, memory with interference; 10MWT, 10-meter walk test; BDI, beck depression index; UPDRS, unified parkinson's disease rating scale; BBS, berg balance scale; PFS, parkinson's fatigue scale; TUG, timed up and go; FGQ, freezing of gait-questionnaire; CGS, comfortable gait speed; FGS, fast gait speed; FGA, functional gait assessment; SLS, single leg stance; DGI, dynamic gait index; FES, falls efficacy scale; 20MWT, 20-meter walking time; TU-T, timed up and turn; TAC, turning around a chair; CS, climbing stairs; OFS-R, one foot standing-right; OFS-L, one foot standing left; PGS, preferred gait speed; PC, preferred cadence; PSL, preferred stride length; MGS, maximal gait speed; MC, maximal cadence; MSL, maximal stride length; VAS-F, visual analogue scale to evaluate fatigue severity; RST, rapid step-up test; LOS, limits of stability; MCT, motor control test; sot, sensory organization test; ABC-16, activities-specific balance confidence; PDQ-39, parkinson's disease questinnaire-39; MDS-UPDRS, movement disorder society-unified parkinson's disease rating scale; MMSE,mini-mental scale examination; SF-12 PCS, short form-12 physical health composite score; SF-12 MCS, short form-12 mental health composite score; 10MCS, 10-meter comfortable speed; 10MFS, 10-meter fast speed; 15MFS, 15-meter fast speed; MS, muscle strength