**Appendix S3. Baseline demographic and clinical characteristics of study participants.**

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| **Author, Year** | **Country of origin** | **No. of participants;**  **male/female** | **Age(y),**  **Range/**  **Mean(SD)/**  **median(25th-75th percentiles)** | **Weight(kg)/Height(cm)/BMI(kg/m2) Mean(SD)/**  **median(25th-75th percentiles)** | **Etiology(****infarction****/hemorrhage)** | **Lesion side(right/left)** | **Onset period(m), Mean(SD)** | **Functional level of participants** | **Outcome measures** | **Adverse events** | **T****ime points** |
| Jeon M J, 201917 | Korea | 14  G1:4/3; G2:3/4 | G1:54.14(7.20);  G2:53.71(10.98) | Weight:  G1:65.29(9.60);  G2:63.86(8.43);  Height:  G1:165.57(10.10);  G2:163.71(11.54) | G1:6/1  G2:5/2 | G1:4/3  G2:4/3 | G1:0.33(0.26);  G2:0.27(0.10) | K-MMSE≥24 | 1.Upper limb function:MFT;  2.Balance:BBS;  3.ADL:K-MBI; | Not mentioned | Baseline;  4 weeks |
| Barcala L, 201316 | Brazil | 20  G1:5/5; G2:4/6 | G1:65.20(12.50);  G2:63.50(14.50) | Weight:  G1:62.70(8.20);  G2:76.50(5.30);  Height:  G1:158.00(310.00);  G2:163.00(240.00);  BMI:  G1:19.40(2.80);  G2:22.40(1.50) | G1:9/1  G2:9/1 | G1:6/4  G2:7/3 | G1:12.30(7.10);  G2:15.20(6.60) | Brunnstrom stage:  G1:3.70(0.60);  G2:3.60(0.80) | 1.Balance:BBS, stabilometric exam;  2.Functionality:TUG;  3.ADL:FIM;  4.Body symmetry:baropodometric exam | Not mentioned | Baseline;  5 weeks |
| Cho K H, 201215 | Korea | 22  G1:8/3; G2:6/5 | G1:65.26(8.35);  G2:63.13(6.87) | Weight:  G1:63.95(9.32);  G2:62.29(7.59);  Height:  G1:165.91(5.48);  G2:164.45(7.25) | G1:7/4;  G2:6/5 | G1:10/1; G2:8/3 | G1:12.54(2.58);  G2:12.63(2.54) | ability to walk 10 meters independently with or without assistive-devices | 1.Balance:postural sway velocity,BBS;  2.Functionality:TUG | Not mentioned | Baseline;  6 weeks |
| Yu J H, 201619 | South Korea | 20  G1:7/3; G2:5/5 | G1:64.80(5.67);  G2:62.70(5.10) | Weight:  G1:64.99(8.75);  G2:62.45(6.83);  Height:  G1:165.70(5.73);  G2:163.70(7.18) | G1:6/4;  G2:6/4 | G1:9/1;  G2:7/3 | G1:12.40(2.67);  G2:12.80(2.61) | K-MMSE≥24 | 1.Balance:BBS;  2.Functionality:TUG;  3.ADL:MBI | Not mentioned | Baseline;  6 weeks |
| Lee H Y, 201514 | Korea | 24  G1:8/4; G2:8/4 | G1:45.91(12.28);  G2:49.16(12.85) | Weight:  G1:63.58(12.95);  G2:65.16(13.18);  Height:  G1:169.66(7.19);  G2:166.08(10.16) | Not mentioned | Not mentioned | total＞6.00 | ability to walk 10 meters independently with or without assistive-devices | 1.Balance:COP path length,COP velocity;  2.Functionality:FRT | Not mentioned | Baseline;  6 weeks |
| Lee H C, 201722 | China | 47  G1:16/10; G2:18/3 | G1:58.30(11.60);  G2:55.00(11.60) | Not mentioned | G1:16/10; G2:14/7 | G1:15/11  G2:10/11 | G1:27.99(23.71);  G2:21.77(19.66) | ability to stand for 15min;  Brunnstrom stage≥III | 1.Balance:BBS,ABC;  2.Functionality:FRT,TUG;  3.ADL:MBI;  4.QOL:SIS;  5.Feasibility:M-PAES | G1:  soreness of the upper limbs(6);  muscle hypertonicity(5);  dizziness(6);  leg pain(2);  G2: soreness of the lower limbs(10);  upper limbs(5);  muscle hypertonicity(7);  dizziness(2);  shoulder pain(4);  lower back pain(2) | Baseline;  6 weeks |
| Lloréns R, 201521 | Spain | 20  G1:4/6; G2:5/5 | G1:59.35(8.95);  G2:55.76(9.59) | Weight:  G1:80.10(11.90);  G2:72.80(13.00);  Height:  G1:166.00(10.00);  G2:162.00(10.00);  BMI:  G1:28.80(3.10);  G2:27.80(4.80) | G1:7/3;  G2:6/4 | Not mentioned | G1:13.58(7.75);  G2:19.59(7.40) | ability to maintain stride-standing position for 30 seconds without holding onto | 1.Balance:BBS,TPOMA-balance,BBA;  2.Gait:TPOMA-gait,10MWT; | Not mentioned | Baselines;  4 weeks |
| Marques-Sule E, 202122 | Spain | 29  G1:9/6; G2:9/5 | G1:61.50(8.40);  G2:58.20(7.40) | BMI:  G1:29.10(3.60);  G2:29.00(2.90) | Not mentioned | Not mentioned | total＞12.00 | not mentioned | 1.Functionality:TUG;  2.Balance:TPOMA,BBS;  3.ADL:FMA-UL,BI,FAI; | None | Baselines;  4 weeks |
| Yatar G I, 201523 | Turkey | 30  G1:6/9; G2:7/8 | G1:62.80(10.87);  G2:56.60(16.42) | BMI:  G1:29.14(4.52);  G2:28.30(4.56) | Not mentioned | G1:8/7  G2:7/8 | G1:44.40(53.04);  G2:50.76(58.32) | MRS>3 | 1.Balance:weight distribution,COP,BBS,ABC;  2.Functionality:TUG,FRT;  3.Gait:DGI;  4.ADL:FAI | Not mentioned | Baselines;  4 weeks;  8 weeks |
| Song G B, 201524 | Korea | 40  G1:10/10; G2:12/8 | G1:51.37(40.60);  G2:50.10(7.83) | Weight:  G1:64.12(13.12);  G2:72.80(13.00);  Height:  G1:167.00(9.53);  G2:169.20(13.12) | Not mentioned | G1:11/9; G2:8/12 | G1:14.75(6.06);  G2:14.30(3.40) | K-MMSE≥24 | 1.Balance:weight distribution,anterior range LOS,posterior range LOS;  2.Functionality:TUG;  3.Gait:10MWT;  4.Psychology:BDI,RCS | Not mentioned | Baselines;  8 weeks |
| Choi D, 201825 | Korea | 28  G1:9/5; G2:8/6 | G1:49.50(23.00);  G2:51.00(13.75) | Weight:  G1:65.00(10.00);  G2:64.00(10.50);  Height:  G1:169.00(14.00);  G2:160.00(11.00) | G1:10/4; G2:8/6 | G1:6/8;  G2:5/9 | total＞12.00 | ability to stand for 30 mins independently | 1.Visual perception：MVPT-3;  2.Balance:BBS;  3.Functionality:TUG;  4.Gait:10MWT | Not mentioned | 1 week before training;  6 weeks |
| Morone G, 201418 | Italy | 50  Not mentioned | G1:58.36(9.62);  G2:61.96(10.31) | Not mentioned | Not mentioned | G1:11/14; G2:18/7 | G1:2.03(1.22);  G2:1.39(1.23) | FAC ≥ 2 | 1.ADL:BI;  2.Gait:FAC;  3.Balance:BBS | Not mentioned | Baselines;  4 weeks;  8 weeks |
| Kim J H, 200926 | Korea | 24  G1:6/6; G2:7/5 | G1:52.42(10.09);  G2:51.75(7.09) | Not mentioned | G1:6/6; G2:5/7 | G1:6/6; G2:7/5 | G1:25.91(9.96);  G2:24.25(8.87) | ability to stand for 30 mins and walk indoors independently | 1.Balance:BBS,BPM;  2.Gait:10MWT;  3.Motor:MMAS | Not mentioned | Baselines;  4 weeks |
| de Rooij IJM, 2021 | Netherlands | 52  G1:18/10; G2:18/6 | G1:65.00(57.00-70.00)  G2:61.00(53.00-71.00) | Weight:  G1:77.00(69.00-88.00);  G2:75.00(68.00-88.00);  Height:  G1:175.00(167.00-180.00);  G2:176.00(167.00-185.00) | G1:24/4; G2:20/4 | G1:6/6; G2:7/5 | G1:2.80(2.30-3.67);  G2:2.20(1.70-3.43) | FAC ≥ 3 | 1.ADL:USER-P;  2.Physical functioning: SIS-16;  3.Fatigue:FSS;  4.Anxiety and depression:HADS;  5.Falls efficacy:FESI;  6.QOL:SSQLS;  7.Functional mobility:TUG;  8.Gait:6MWT;  9.Dynamic balance:Mini-BESTest; | G1:  near falls(3), dizziness(1);  fatigue(3);  muscle stiffness or pain in the legs(4);  G2:  near falls(3);  breathing difficulty(1);  dizziness(4);  fatigue(4);  pain in the legs or back(3); | Baselines;  6 weeks;  12 weeks |

G1:virtual reality-based balance group; G2:control group; BMI:body mass index; K-MMSE: Korean Mini-Mental Status Examination; MFT:manual function test; BBS:berg balance scale; ADL:activities of daily living; K-BMI:Korean version of the Modified Barthel Index; TUG:timed up and go test; FIM:functional independence measure; COP:center of pressure; FRT:functional reach test; ABC:activities-specific balance confidence scale; QOL:quality of life; SIS:stroke impact scale; M-PAES:modified physical activity enjoyment scale; TPOMA:Tinetti performance-oriented mobility assessment;10MWT:10-m walking test; BBA:brunel balance assessment; FMA-UL: Fugl-Meyer assessment for upper limb; BI:Barthel Index; FAI:Frenchay activity index; MRS:Modified Rankin Scale; DGI:dynamic gait index; 2MWT:2-m walking test; CMSA-Leg:Chedoke McMaster stroke assessment leg domain; LOS:limit of stability; BDI:Beck Depression Inventory; RCS: relationship change scale; SFES: short falls efficacy scale; UL-MAS:upper limb-motor assessment scale; MVPT-3: motor-free visual perception test-3; mFRT:modified functional reach test; EO:eyes opened; EC:eyes closed; PL:path length; SV:sway velocity; FAC:functional ambulation category; BPM:balance performance monitor; MMAS:modified motor assessment scale; USER-P:Utrecht scale for evaluation of rehabilitation-participation; SIS-16: Stroke Impact Scale-16; FSS:fatigue severity scale; HADS:Hospital anxiety and depression scale; FESI:Falls efficacy scale international; SSQLS:Stroke specific quality of life scale; 6MWT:6-minute walking test; Mini-BESTest: Mini Balance Evaluation Systems test;