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| **Annex 2**. Characteristics of included studies. | | | | | | | |
| Study | Country | Participants | Sample size  (n) | Age  (years) | Intervention | Duration of experiment | Outcomes |
| Gilda et al.  2016 | Brazil | ≥12 months after stroke onset  Grade 2 spasm at most | EG:4  CG:4 | EG:50.5  CG:59.5 | EG:Asynchronous AO+MI and conventional rehabilitation CG:Conventional rehabilitation | 60 minutes per session, once a week, for 4 weeks | FMA-UE |
| Choi et al.  2022 | South Korea | 2-8months after stroke onset  Upper limb paralysis | EG:22 CG:23 | EG:62.68±8.54  CG:63.43±9.57 | EG:Synchronous AO+MI and physical therapy  CG:AO and physical therapy | AO+MI/AO: 25 minutes per session, 5 times a week, for 8 weeks.  physical therapy: 30 minutes each day | FMA UE  WMFT  MAL  MEP amplitude |
| Green et al. 2023 | US | ≥1 months after stroke onset  paralysis of one upper limb | EG G1: 5 G2: 4 CG  G3: 4 G4: 5 | EG G1:71.4±7.1  G2:58.5±8.8 CG  G3:59.0±11.5 G4:60.8±11.2 | EG: G1:MI and body Exercises G2:Synchronous AO+MI and body Exercises CG: G3:Other forms of mental practice and body exercises G4:Conventional rehabilitation | 20 mental practice and 10 body exercises per session, 5 times a week, during hospitalization | WMFT FMA-UE |
| Magdalena et al. 2011 | UK | 1-6 months after stroke onset Persistent arm movement weakness | EG:41  CG: G1:39 G2:41 | EG:69.3±10.8  CG: G1:68.6±16.3 G2:64.4±15.9 | EG:Asynchronous AO+MI  CG: G2:Other forms of mental practice  G2:Sham control | 45 minutes per session, 3 times a week, for 4 weeks | ARAT Grip strength Barthel Index |
| Nam et al.  2019 | South Korea | 1-6 months after stroke onset  Wrist extensor below grade 2 | EG:10 CG:10 | EG:61.83±14.0 CG:59.63±15.0 | EG:Asynchronous AO+MI and conventional rehabilitation  CG:Conventional rehabilitation | 5 times a week for 4 weeks EG:AO+MI 20 minutes and conventional rehabilitation 30 minutes per session  CG:Conventional rehabilitation 50 minutes per session | FMA-UE  MFT  FIM |
| Hee et al.  2018 | South Korea | ≥ 3 months after stroke onset  Hand dyskinesia | EG:7 CG:7 | EG:52 (49–74) CG:66 (49–72) | EG:Asynchronous AO+MI  Modified constraint induced motion  CG:Listen to music  Modified constraint induced motion | AO+MI /Listen to music:10 minutes per session,5 times a week for 2 weeks  Modified restraint induced movement for more than 6 hours everyday | JTHFT  MEP latency and amplitude MAL |
| Kim et al.  2013 | South Korea | ≥ 6 months after stroke onset  hemiplegia | EG:  G1:9 G2:9 CG:9 | EG:  G1:55.3±12.1 G2:54.8±8.8 CG:59.8±8.9 | EG:  G1:AO  G2:MI CG:Conventional rehabilitation | 30 minutes per session, 5 times a week, for 4 weeks | TUG FRT WAQ  FAC |
| Daehee  et al.2013 | South Korea | ≥ 6 months after stroke onset Brunnstrom Phase 5 | EG:8 CG:  G1:9 G2:9 G3:7 | EG:63±3.7 CG  G1:62±1.5 G2:61±2.3 G3:60±5.9 | EG:Asynchronous AO+MI  CG:  G1:Body Exercises G2:AO and body exercises  G3:Sham control | 10 minutes per session, 5 times a week, for 3 weeks | Number of drinking motions in each period |
| Mauro  et al.2021 | Italy | ≤1 months after stroke onset  Upper limb paralysis | EG:16 CG:16 | G1:76.5 (13.7)  G2:64.5 (15.8) | EG:AO and body exercises CG:MI and body exercises | 60 minutes body exercises and 30 minutes AO/MI per session, 5 times a week, for 4 weeks | FMA-UE: BBT  FIM  MAS |
| Nuttawat  et al.2023 | Thailand | ≥ 6 months after stroke onset  Upper limb paralysis | EG:9  CG:8 | EG:61.11±7.16  CG:61.63±7.83 | EG:Asynchronous AO +MI and physical therapy  CG:MI and physical therapy | AO+MI/MI: 40 minutes per session,3 times a week, for 4 weeks.  physical therapy: 1 to 2 days a week | FMA-UE  ERD/ERS |
| Stephen J. et al.2021 | US | ≥3 months after stroke onset  Hand dyskinesia | EG:9  CG:9 | EG:57.4±10  CG:57.8±9.8 | EG: Asynchronous AO+MI and occupational therapy  CG: Occupational therapy | 3 times a week for 10 weeks  EG:AO+MI 30 minutes occupational therapy 15 minutes  CG:Occupational therapy 45 minutes | FMA-UE  ARAT  SIS-H |
| Yao et al. 2016 | China | ≤2 months after stroke onset  Hemiplegia of the right upper limb | EG:5  CG:5 | 59.8±4.94 | EG:Synchronous AO+MI and conventional rehabilitation  CG:Asynchronous AO+MI and conventional rehabilitation | 15 AO+MI each time, 6 times a day, 7 days a week for 4 weeks | FMA-UE  PST |
| Age and stroke course were expressed as mean±standard deviation or median (interquartile) or median (maximum, minimum)  AO+MI: AO combined with MI  FMA-UE:Fugl-Meyer assessment of upper extremity; WMFT:Wolf Motor Function Test; MAL:Motor Activity Log;MEP:motor evoked potential; ARAT:Action Research Arm Test; MFT;manual function test : JTHFT:Jebsen-Taylor hand function test; TUG:Timed Up and Go Test; FRT:Functional Reaching Test; WAQ:Walking Ability Questionnaire; FAC: Functional Ambulation Category; BBT:Box and Block Test; FIM:Functional Independence Measure; ERD/ERS:Event-related desynchronization or synchronization; SIS-H:Hand subscale of the Stroke Impact Scale; PTS:pinch strength test | | | | | | | |