Table 3. Exercise-Based Interventions

Author Year Country Research Design Score Total Sample Size	**Methods**	**Outcome**
Jorjafaki et al. 2022 Iran RCT Level 2 PEDro=4 N=45	**Objective:** To compare the effectiveness of virtual reality-based (VR) rehabilitation exercises and reflexology in reducing the fatigue rate of veterans with paraplegia. **Population:** 45 veterans with paraplegia, with a use of a wheelchair for daily work, with a history of exercise for at least the last 6 months, and with a fatigue level of 45.57 Mean age 54.3 years Level of injury: T12-L4 **Treatment:** Participants were randomly assigned to one of three groups: • Experimental condition I (n=15): Upper limb VR games (e.g., Xbox/Kinect boxing). Sessions lasted 50 min, were performed 3 times per week, for 6 weeks. • Experimental condition II (n=15): Reflexology massage therapy. Sessions lasted 30 min (10 min of relaxation techniques and 15 min of reflexology massage), were performed 3 times per week, for 6 weeks. • Control condition (n=15): No details provided. **Outcome Measures:** Fatigue Severity Scale (FSS)	1. Decrease in fatigue severity in both VR and massage groups (p≤0.001) compared with control group. 2. No difference in reducing fatigue between massage (28.9 ± 20.65) and VR (27.8 ± 93.97) (p=0.99).

	was measured at baseline and after the program (6 weeks).	
Nightingale et al. 2018 UK RCT Level 2 PEDro=5 N=21	**Objective:** To assess the influence of a home-based exercise intervention on indices of health-related quality of life in persons with SCI. **Population:** 21 participants with SCI and non-physically active 15M, 6F Mean (SD) age 47 (8) years Injury level: Below T4 (paraplegia) Mean (SD) time since injury 16 (11) years **Treatment:** Participants were randomly assigned to one of the following two groups: • Experimental group (n=13): Home-based exercise intervention with arm-crank (moderate intensity: 60%-65% VO_2 peak). Sessions lasted 45 min, were performed 4 times per week, for 6 weeks. Control group (n=8): Lifestyle maintenance **Outcome Measures:** FSS and global fatigue (FSS visual analog fatigue scale) were measured at baseline and immediately after the program (6 weeks).	1. The change of the FSS was significantly different between groups (interaction effect; p=0.036), with a significant reduction in the intervention group (p=0.027). 2. Trend for an interaction effect (p=0.084) in global fatigue. 3. These measures of fatigue demonstrated large effect sizes in favor of intervention: • FSS: Cohen's *d* =-0.99 [90% CI=-1.75, -0.22]. • Global fatigue: Cohen's *d*=0.92 [90% CI=0.08, 1.76]
Vestergaard et al. 2022 Denmark Pre-post Level 4	**Objective:** To assess safety and feasibility of hybrid high-intensity interval training (HIIT) using Functional Electrical Stimulation (FES) leg cycling	1. There was a decrease in fatigue ranging from: • 15% (for general fatigue). • 26% for physical fatigue. • 42% for reduced activity.

N=8	and arm ski ergometer in people with SCI. **Population:** 8 participants with paraplegia 7M, 1F Mean (SD) age 42.8 (15.11) Etiology: Traumatic or non-traumatic Level of injury: T4 (n=1), T5 (n=1), T7 (n=1), T8 (n=2), T10 (n=1), L1 (n=1), and L2 (n=1) Motor completeness of injury: Complete (n=3), incomplete (n=5) Mean time since injury 14.5 years **Treatment:** Hybrid HIIT protocol, in the form of FES leg cycling combined with arm ski ergometer. Dosage: 4 x 4 min intervals/session, 3 time per week, 8 weeks Intensity: 90% peak watts **Outcome Measure:** MFI-20 was measured at baseline and after the program (8 weeks).	• 33% for reduced motivation. • 20% for mental fatigue.
Shem et al. 2016 USA Pre-post Level 4 N=26	**Objective:** To evaluate the feasibility, benefits, and long-term effects of a seated Tai Chi Chih program for people with spinal cord disorder who cannot safely participate in a standing Tai Chi exercise program. **Population:** 26 participants with spinal cord disorder and sufficient arm movement to be able to participate in the Tai Chi program 14M, 12F Mean (SD) age 49.8 (13.0) Etiology: Traumatic and non-traumatic Level of injury: C3 (n=1), C4-	1. There were no detectable changes in MFIS between the first and the last sessions (MFIS average change=2.00, SD=7.57). 2. Only nine participants completed half of the sessions and the long-term surveys.

	C5 (n=1), C5 (n=2), C5-C6 (n=3), C6 (n=1), C6-C7 (n=4), T8 (n=1), T12-L1 (n=1), L3-L4 (n=1), N/A (n=10) Tetraplegia (n=16), paraplegia (n=6), unknown (n=4) AIS: AIS A (n=4), AIS B (n=2), AIS C (n=2), N/A (n=18) Mean (SD) time since Injury 25.1 (18.9) years **Treatment:** Customized seated Tai Chi program (T'ai Chi Chih). Sessions lasted 90 min, were performed once per week and for 12 weeks. **Outcome Measure:** MFIS was measured at baseline, after each session and after the program (12 weeks).	
Curtis et al. 2015 Canada Pre-post Level 4 N=11	**Objective:** To evaluate a modified yoga program for people with SCI, in terms of both participant experiences and also with respect to program satisfaction. **Population:** 11 participants with SCI 1M, 10F Mean (SD) age 48.4 (15.0) years Etiology: Traumatic (n=6), non-traumatic (n=3), and not reported (n=2) Level of injury: Tetraplegia (n=2), paraplegia (n=6), unknown (n=1), not reported (n=2) Motor completeness of injury: Complete (n=3), incomplete (n=6), unknown (n=1), not reported (n=1) Mean (SD) time since injury 157.4 (191.8) months. **Treatment:** Modified Yoga program. Session lasted 25- to 60-min, were performed	1. There were not statistically significant differences between baseline and exit scores on fatigue ($p>0.05$).

	once a week, and for 8 weeks. **Outcome Measure:** FSS was measured at baseline and after the program (8 weeks).	
Azurdia et al. 2022 USA Pre-post Level 4 N=11	**Objective:** To investigate the effects of using VR during exercise on pain and fatigue in individuals with SCI. **Population:** 11 people with chronic SCI. 5M, 6F Mean age (43.29+–17.5 years) **Treatment:** Three sessions of VR arm ergometer exercise training, 6 minutes each. Exercise intensity was at 60-70% of age-predicted maximum heart rate, or a rating of 11-15 on the Borg's RPE scale. **Outcome Measures:** Heart rate, Blood Pressure, Borg's Rate of Perceived Exertion scale (RPE), Pain Self-Efficacy Questionnaire (PSEQ), Fatigue Severity Scale (FSS), and Fatigue Assessment Scale (FAS).	1. Participants demonstrated significant decreases in all parameters: fatigue (F1, 10=10.487, p<0.009), pain (F1, 10=9.494, p<0.012), heart rate (F1, 10=9.264, p<0.012), and RPE rating (F1, 10=9.046, p<0.013) except for blood pressure (F1, 10=0.025, p<0.878). 2. VR sessions decreased pain by 56% and fatigue by 54%, respectively, as compared with the non-VR exercise sessions.