Author Year Country Research Design Score Total Sample Size	Methods	Outcome
Outcomes of Wheelchair Skills Training		
Yeo et al. 2018 Korea RCT PEDro=4 N=24	**Population:** *WSTP Group (n=13):* Mean age= 35.3 yr; Gender: males=10, females=3; Level of injury: C5-T1; Mean time since injury: 2.9 yr. *CG (n=11):* Mean age= 35.9 yr; Gender: males=9, females=2; Level of injury: C5-T1; Mean time since injury: 2.9 yr. **Intervention:** Manual wheelchair users were randomized to either the WSTP (consisting of hands-on demonstrations and practice of wheelchair skills), or the control group (CG) consisting of conventional exercise sessions. Interventions occurred 3x/wk for 8wks. **Outcome Measures:** Wheelchair Skills Test Questionnaire (WST-Q), Van Lieshout Test short version (VLT-SV) (measures arm and hand function).	1. Compared with the CG, the WSTP group improved in WST score at 4 and 8 wks. 2. Compared with the CG, the WSTP improved on the VLT-SV at 8 wks.
Kirby et al. 2016 Canada RCT PEDro=7 $N_{initial}$=106 $N_{initial}$=82	**Population:** *WSTP Group (n=53):* Mean age= 48.1 yr; Gender: males=51, females=2; Level of injury range: C-T; Mean time since injury: 16.6 yr. *EC Group (n=53):* Mean age= 47.1 yr; Gender: males=50, females=3; Level of injury range: C-T; Mean time since injury: 18.2 yr. **Intervention:** Participants were randomized to either the Wheelchair Skills Training Program (WSTP), or the Educational Control (EC) group. Each participant received 5 one-on-one WSTP or EC sessions for 30-45min. **Outcome Measures:** Wheelchair Skills Test (WST), Craig Handicap Assessment and Reporting Technique (CHART).	1. WST scores improved significantly in the WSTP group compared to EC group from baseline to follow-up (p<0.001). 2. CHART improved significantly for WST group compared to EC group from baseline to follow-up (p=0.21).
Worobey et al. 2016 USA RCT PEDro=7 $N_{initial}$=114 $N_{initial}$=79	**Population:** *WSTP Group (n=36):* Mean age= 40.1 yr; Gender: males=32, females=4; Level of injury: N/R; Mean time since injury: N/R. *CG (n=43):* Mean age= 41.0 yr; Gender: males=37, females=6; Level of injury: N/R; Mean time since injury: N/R. **Intervention:** Participants were randomized to either the Wheelchair Skills Training Program (WSTP) consisting of hands-on demonstrations and practice of wheelchair skills, or the control group (CG) consisting of PowerPoint presentation. WSTP group participated in six 90min	1. Compared with the active control group, the WSTP group improved in WST-Q capacity advanced score (p=0.02), but not in WST-Q capacity or WST-Q performance total scores (p=0.068, p=0.873, respectively). 2. GAS score did not significantly differ between groups, however those who attended a greater number of classes had a higher GAS score (R=0.531, p=0.001).

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	classes. The CG participated in two 1hr active control sessions. **Outcome Measures:** Wheelchair Skills Test Questionnaire (WST-Q), Goal Attainment Scale (GAS)	
Routhier et al. 2012 Canada RCT PEDro=7 N=39	**Population:** *Wheelchair Skills Training Program (WSTP) group*: Mean age: 48.9 yr, Gender: males=13, females=6; Mean height: 164.5 cm; Mean weight: 83.7 kg. *Control group:* Mean age: 43.1 yr, Gender: males=13, females=6; Mean height: 163.5 cm; Mean weight: 70.2 kg. **Intervention:** Participants were randomly put into either the control group or WSTP group. Both groups were given standard care but the WSTP group was also given a mean of 5.9 training sessions with standard care. **Outcome measures:** Wheelchair Skills testing.	1. Total P(WSTP versus control at t2): p=0.030. 2. P(t2 versust3): WSTP p=0.990, Control p=0.641. 3. WSTP training shows improvement in wheelchair skill right after the training particularly in community skills level but the Statistical significance was not reached between groups at 3 mo follow-up.
Ozturk & Dokuztug 2011 Turkey RCT PEDro=5 N=24	**Population:** *Training Group (n=14):* Mean age: 38.8 yr; Gender: males=5, females=9. *Control Group (n=10):* Mean age: 28.7 yr; Gender: males=6, females=4. Injury etiology: SCI=13, Other=11. **Intervention:** Participants, who were manual wheelchair users (rear-wheel drive), were randomly assigned to either the training or control (no training) group. The training group received the Wheelchair Skills Program (45 min, 3x/wk for 4 wk). Supervised by a physiotherapist, sessions targeted basic skills and progressed to more advanced wheelchair skills. Session content was developed after a trainer observed the individual in their living environment. **Outcome Measures:** Wheelchair Skills Test (WST).	1. The mean time between baseline and follow-up was 35.5±6.4 days in the training group and 30.8±3.6 days in the control group (p=0.013). 2. Within-group analysis showed a significant increase in WST performance scores for both the training (p=0.002) and control groups (p=0.01); however, statistically significant improvements for WST Safety scores were only found in the training group (p=0.001). 3. Comparing between groups, when controlling for baseline WST values, the performance and safety scores remained significantly higher in the training group (p=0.001 and p<0.001, respectively).
	Evaluation of wheelchair skills training approaches	
Lalumiere et al. 2018 Canada RCT Crossover PEDro=4 N=18	**Population:** Mean age= 39.3 yr; Gender: males=17, females=1; Level of injury range: N/R; Mean time since injury= 11.7 yr. **Intervention:** Manual wheelchair (MWC) users performed wheelies on four different rolling resistances: natural hard floor (NAT), 5-cm thick soft foam (LOW), 5-cm	1. The MDIST measure values significantly increased (p≤0.001) between the NAT versus LOW and MED versus HIGH conditions. 2. The MVELO values significantly increased (p≤0.008) between the NAT versus LOW, LOW versus

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	thick memory foam (MOD), rear wheels blocked by wooden blocks (HIGH). The order of the tests was random. Measurements were taken pre and post intervention. **Outcome Measures:** Center of pressure (CoP), center of pressure mean distance (MDIST), center of pressure mean velocity (MVELO), elliptical area (AREA-CE), mean power frequency (FREQ-50%), centroidal frequency (CFREQ), frequency dispersion (FREQ-D).	MOD, and MOD versus HIGH conditions. 3. The AREA-CE significantly decreased ($p \leq 0.002$) between the NAT versus LOW and MED versus HIGH conditions. 4. FREQ-50%, CFREQ and FREQ-D all significantly increased ($p \leq 0.002$, respectively) in NAT versus LOW and MOD versus HIGH conditions.
Wang et al. 2015 USA RCT PEDro=5 N=21	**Population:** *Experimental Group (n=9):* Mean age: 33.2 yr; Gender: males=6, females=3; Level of Injury: T1-L1=9. *Controls (n=9):* Mean age: 34.5 yr; Gender: males=6, females=3; Level of Injury: T2-12=9. **Intervention:** Patients were randomly allocated to an experimental group with immediate video feedback during wheelchair training or a control group with conventional training. Three skills were taught: ramp wheelie and curb. The experimental group observed a video of a model performing the target skill and then attempted to perform the skill whilst being filmed. Patients then reviewed the model video and their own performance to identify differences in performance. All training sessions were conducted 2/wk until the patient had mastered the target skill they had been working on. A skill competency test was administered after 3-4 wks of training followed by a retention test 1 wk after passing the competency test. A transfer test (doing the skill in a different environment) was completed 1d after passing the retention test. **Outcome Measures:** Time spent completing wheelchair skills during training and testing, Number of occurrences requiring spotter assistance, Success rates during testing.	1. There were no significant differences between groups concerning training time required to complete each skill and in the number of spotter assistance for all three tasks, however, the experimental group required significantly less spotter assistance during the curb skill training ($p < 0.05$). 2. No significant differences were found between groups regarding completion time of the curb skill and the ramp skill during all three tests but the experimental group completed the wheelie skill significantly quicker than the control group during the competency test ($p < 0.05$). There were no significant differences in completion time for the wheelie skill during the retention and transfer tests. 3. The experimental group required more spotter assistance for the curb skill and yielded a significantly lower success rate than the controls (both $p < 0.05$) during the transfer test.