Author Year Country Research Design Score Total Sample Size	Methods	Outcome
Karmarkar et al. 2011 USA Pre-Post N=39	**Population:** Mean age: 62.5 yr; Gender: males=37, females=2; Level of Injury: cervical=12, thoracic=11, lumbosacral=4, other=11; Mean time since injury: 29.4 yr. **Intervention:** Participants' wheelchairs were fitted with a customized data-logging device to measure mobility during the National Veterans Wheelchair Games (NVWG). **Outcome Measures:** Wheelchair-related mobility variables.	1. Both the manual wheelchair (MWC) and power wheelchair (PWC) participants had significantly higher mobility during the NVWG, compared to in their home and community, regarding distance traveled (MWC $p<0.001$, PWC $p=0.004$), wheelchair propulsion velocity (MWC $p<0.001$, PWC $p=0.002$), continuous wheelchair drive distance (MWC $p<0.002$, PWC $p=0.006$) continuous wheelchair drive time (MWC $p<0.001$, PWC $p=0.005$), number of stops every 500m (MWC $p<0.001$, PWC $p=0.002$). 2. There was no significant difference in MWC and PWC groups in number of events participated for all sports activities ($p=0.12$).
Tsai 2014 USA Case Series N=2986	**Population:** Mean age: 40.0 yr; Gender: males=2362, females=623; Severity of injury: AIS A/B=2529 C=457; Mean time since inury: 6 yr. **Intervention:** Data was gathered from the National Spinal Cord Injury Database (NSCID). Participation and employment status were assessed from follow up interviews. Initial interviews were conducted on SCI patients from 18 centers of the Model Spinal Cord Injury System in the US from 2004-2010. **Outcome Measures:** Craig handicap assessment and reporting technique-short form questionnaire (CHART-SF) and employment status to measure social participation, and evaluate the association with type of mobility device used (manual w/c; externally powered wheelchair (i.e., power w/c, or power assist wheels) and driving vehicle).	1. Positive correlations noted between using an externally powered wheelchair and age, age at injury, being Females, higher injury level and having an indwelling catheter. 2. Negative correlations were observed between using an external powered wheelchair and being employed, AIS A/B, upper limb strength, and FIM scores. 3. Positive correlations were observed between using a modified vehicle and being employed, AIS A/B, upper limb strength, FIM scores, and years since injury. 4. CHART-SF and likelihood of employment were negatively correlated with age, age at injury, using an external powered wheelchair, having a catheter indwelling in the bladder, and pain. 5. CHART-SF and likelihood of employment were positively correlated with years since injury, using a modified vehicle, upper limb strength, using intermittent bladder catheterization, and FIM scores. 6. CHART-SF and employment were positively correlated with using a modified vehicle

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		compared to not possessing or driving a modified vehicle. 7. Participants who used a modified vehicle had approximately: 2 days more out of home per wk, two more business associates, and 1 additional friend contacted at least once a mo compared to participants not possessing a modified vehicle.
Pettersson 2015 Sweden Observational N=48	**Population:** Median Age: 64 yr; Gender: males=33, females=15; Level of injury: tetraplegia=26, paraplegia=22. **Intervention:** All participants were administered a Swedish aging with a spinal cord injury study (SASCIS) specific questionnaire. **Outcome Measures:** SASCIS: Patient characteristics, Environmental barriers and accessibility component of the Housing Enabler assessment, Impact on participation and autonomy (IPA) assessment.	1. Patients with powered mobility devices (PMD) used their device significantly more for outdoor and indoor use compared to just outdoor ($p<0.0005$). 2. Patients who used their PMD's outdoors only had a significantly lower functional limitation due to a prevalence of reduced fine motor skills compared to those who used their PMD's indoor and outdoor ($p=0.009$). 3. Patients who used their PMD's outdoors only had a significantly lower functional limitation due to a prevalence of poor balance compared to those who used their PMD's indoor and outdoor ($p=0.018$). 4. Patients who used their PMD's outdoors and those who used their PMD's outdoors and indoors listed the same 3 environmental barriers as generating the most accessibility problems (mailbox, high threshold/steps, and wall-mounted cupboards/shelves). 5. Patients reported fewer autonomy restrictions present indoors compared to outdoors. 6. Patients reported the greatest autonomy restriction for going on trips and vacations when one wants.
Phang et al. 2012 Canada Observational N=54	**Population:** Mean age: 47.7 yr; Gender: males=43, females=11; Level of injury: paraplegia=41, tetraplegia=13; Level of severity: complete=27, incomplete=27, AIS: A=27, B=1, C=15, D=11, E=0. **Intervention:** Participants completed a questionnaire. **Outcome Measure:** Leisure Time Physical Activity, Wheelchair Skills Test (WST), Wheelchair-use self-efficacy.	1. There was a significant positive relationship between wheelchair skills and leisure time physical activity, and wheelchair-use self-efficacy ($p<0.05$ for both). 2. There was no significance in the relationship between wheelchair-use self-efficacy and leisure time physical activity ($p>0.05$).

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Oyster et al. 2011 USA Observational N=132	**Population:** Mean age: 39.4 yr; Gender: males=106, females=26; Level of injury: paraplegia=94, tetraplegia=38; Mean time since injury: 11.2 yr. **Intervention:** Participants completed a questionnaire, and were fitted with a custom-designed data-logging device on their wheelchair to monitor their routine daily activities. **Outcome Measures:** Craig Handicap Assessment Recording Technique (CHART), Wheelchair mobility.	1. Age was significantly related to wheelchair mobility (p=0.01). 2. Body Mass Index and duration of injury, level of SCI, income, education, and sex were not found to be related to wheelchair mobility. 3. Participants who used ultralight-weight manual wheelchairs had significantly improved wheelchair mobility (p=0.05) compared to other types. 4. According to CHART sub-scores, duration of injury, physical independence, and occupation were significantly correlated to mobility (p<0.05).
Cooper 2011 USA Observational N=16	**Population:** Mean age: 49.1 yr; Gender: males=15, females=1; Level of injury: tetraplegia=9, paraplegia=7; Type of w/c used: manual wheelchair (MWC)=7, power wheelchair (PWC)=9; Mean time since injury: 18.9 yr. **Intervention:** A survey (PARTS/M) was administered to SCI participants who were participating in the National Veteran's Wheelchair Games to capture frequency of community participation in the areas of leaving home, transportation, active recreation, leisure activities, and socializing. A data logging device was attached to each participant's own wheelchair, which recorded their wheelchair activities in their community environment for 2 wk (distance travelled, speed, number of stops and drive time). **Outcome Measures:** Participation survey/mobility (PARTS/M) questionnaire; movement activity from data logger.	1. Subjects travelled an average distance of 3374.07±1677.22 m at an average speed of 0.77±0.17 m/s. 2. Subjects stopped an average of 146.73±91.96 times per day. 3. Subjects drove an average of 68.65± min/d with a range of 11 to 107 min 4. Community participation were calculated for only 14 participants due to missing data; scores averaged at 11.98±2.98. 5. For MWC there was a significant positive correlation between average speed travelled and the community participation areas of transportation (r_1 =.837, p=0.19, p<0.05) and socialization (r_1 =.772, p=0.042, p<0.05); there was also a trend towards a correlation between average speed travelled and total community participation scores (p<0.10). 6. For PWC there was a trend towards significance between average speed travelled and leisure activities (r_1=.636, p-0.006). 7. No significant differences between wheelchair types were observed in regard to distance travelled and community participation.

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Hatchett et al. 2009 USA Observational N=67	**Population:** Mean age: 35 yr; Gender: males=60, females=7; Level of injury: paraplegia=67; Mean time since injury: 9.9 yr. **Intervention:** Analysis to determine impact of gender on shoulder muscle strength and community wheelchair (WC) usage in individuals with paraplegia. **Outcome Measures:** Maximal isometric peak torque measured using a Biodex System 3 Pro dynomometer, Shoulder flexion, Extension, Abduction, Adduction, Internal rotation, External rotation using a lever which participants pushed or pulled, Community WC usage was measured using the Topeak® bicycle odometer system.	1. There was a significant difference in normalized shoulder torque between men and women where women were 62%–96% weaker than men ($p<0.0001$). 2. In both men and women, the shoulder adductors were the strongest muscle group (men=46.8 N·m/kg, women=28.0N·m/kg), followed by the shoulder extensors (men=44.6 N·m/kg, women=27.4 N·m/kg). 3. Shoulder external rotators were the weakest muscle groups (men=21.7 N·m/kg, women=12.6 N·m/kg). 4. Significant difference in the average daily distance traveled in the community, with men propelling their WCs 3.1±1.7 km/day and women propelling 1.8±1.2 km/day ($p<0.05$). 5. In post hoc analysis, strongest predictor of average daily distance travelled was normalized external rotation torque (R=0.368, R^2=0.136, p=0.008). 6. No significant difference in average velocity of propulsion between men and women (55.9±14.8 m/min and 48.7±9.2 m/min, respectively).
Tolerico 2007 USA Observational N=52	**Population:** Mean age: 46.8 yr; Gender: males=47, females=5; Injury etiology: SCI=40, muscular dystrophy=1, multiple sclerosis=5, post polio syndrome=1, TBI=1, Guillain-Barre syndrome=1, amputation=3; Range of duration of w/c use: 1-45 yr. **Intervention:** A datalogger attached to participants' primary manual wheelchair tracked distance propelled, speed propelled, occupancy during the National Veteran's Wheelchair Games and an additional week in their home environment following the games for a total of either 13 or 20 days. Demographic information was gathered by survey. **Outcome Measures:** Demographic survey including items for age, type of injury/disability, race/ethnicity, gender, type	1. 98% (n=51) of participants used ultra-lightweight wheelchairs 2. Subjects travelled an average distance of 2457.0±1195.7 m at an average speed of 0.79±0.19 m/s for an average of 8.3±3.3 hr/day. 3. Subjects accumulated an average of 47.9±21.4 min/day of movement with their primary wheelchair in a home environment over the day. 4. No significant differences in mobility characteristics, activity levels and level of SCI 5. There was a significant difference in speed, distance and duration during an average day at the games compared to at home ($p<0.001$).

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	of wheelchair used including make and model, number of years using a wheelchair; for the 2nd and 3rd years questions about employment status, ability to use transportation independently, body weight, primary residential setting, feelings on accessibility and satisfaction with primary wheelchair was added. Movement data from data logger included	6. Patients' employment status was significant associated with the average distance travelled (p=0.002), average accumulated min/day (p=0.006), and maximum daily distance travelled between consecutive stops (p=0.01). 7. Patients reported an average body mass of 85.4±16.0 kg, which did not correlate to mobility characteristics or activity levels. 8. No significant differences were observed in the patients' residential setting, satisfaction with primary wheelchair, and perceived influence of community on activities when compared with mobility characteristics and activity levels.
Chaves 2004 USA Observational N=70	**Population:** Mean age: 41 yr; Gender: men=55, women=15; Level of injury; tetraplegia=29, paraplegia=38; Mean time since injury: 14 yr. **Intervention:** A survey was administered to SCI participants discharged from two major rehabilitation centres, one in Pittsburgh (Pitts) and one in St, Louis (SL). **Outcome Measures:** Participation survey/mobility (PARTS/M) questionnaire using 3 of the 25 major life activities: 1) moving around inside the home which including getting in/out of bed, of the wheelchair and going from room to room2) leaving the home and 3) transportation including accessing and using different forms of transportation.	1. 95% (n=38) of participants with paraplegia used manual wheelchairs; 55%(n=29) of people with tetraplegia used power wheelchairs 2. Participants with paraplegia perceived pain as a limiting factor for transportation use significantly more than people with tetraplegia (tetra=3%, para=21%, p=0.047). 3. There was a trend towards a lack of equipment being a limiting factor for transportation use for people with tetraplegia more so than for people with paraplegia subjects (tetra=7%, para=3%, p=0.099). 4. Significant differences were seen between the two test sites with regards to: 1) the type of wheelchair used (p<0.05) where Pitts used more manual wheelchairs (Pitts=87%, SL=67%) and SL used more power wheelchairs (Pitts=13%, SL=33%), 2) A greater percent of SL participants reported wheelchair seating (Pitts=5%, SL=24%, p=0.0285), social attitudes (Pitts=0%, SL=18%, p=0.007), and self-concept (Pitts=0%, SL=15%, p=0.015) as limiting factors for leaving the home; 3) Significantly greater percent of SL patients reported social attitudes as a limiting factor

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		for transportation (Pitts=0%, SL=15%, p=0.017).