

# Influence of Electronic Communication Devices, Assistive Technologies, and Internet Use on Social Integration of Individuals Living With Tetraplegia

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**PURPOSE:** Approximately 59.5% of individuals experiencing a spinal cord injury (SCI) are either classified as incomplete (47.2%) or complete (12.3%) injuries, often resulting in more severe impairments when compared to paraplegia level injuries. After a traumatic SCI, 50% of individuals experience barriers to social participation and report having poor social participation after injury, with tetraplegia level injuries experiencing the poorest social participation rates of all SCIs. Advances in recent communication technologies and assistive technologies (ATs) for individuals with tetraplegia, who often experience upper extremity motor and/or sensory impairments, provide increased opportunities for social participation but have yet to be explored. Currently, there is limited evidence confirming that the use of ATs and the internet positively influence social integration (SI) following tetraplegia injury. The aim of this research study is to examine whether electronic communication devices (ECDs), ATs, and internet usage increase the odds of high SI in this population.

**DESIGN:** A secondary analysis was conducted on the largest ongoing longitudinal traumatic SCI prospective cohort study in the US, called the National Spinal Cord Injury Models Systems (NSCIMS). Inclusion criteria is experiencing an incomplete or complete tetraplegia injury, being at least one-year post-injury, and participated in the NSCIMS between 2011-2016 (the most recent data set publicly available). Exclusion criteria are having normal motor and sensory function after injury or have missing/unknown responses for the main predictor or outcome variables listed below. After criteria was applied, the final sample size was 2,984.

**METHOD:** The following variables were extracted and analyzed as predictor variables: self-reported use of an ECD (i.e.: smart phone, computer), internet, AT device, and demographics. The outcome variable used was the Craig Handicap and Reporting Technique (CHART) SI total score. CHART-SI total score is a valid and reliable instrument that assesses social participation across five customary relationships (romantic, family, friends, work, and strangers) and produces a total score ranging from 0 (lowest SI) to 100 (highest SI). In this study, the score was transformed to a binary variable of high SI ( $\geq 80$ ) and medium/low SI ( $< 80$ ). A binary logistic regression was conducted to determine if any of predictor variables predicted greater or lower odds of having high SI after tetraplegia injury.

**RESULTS:** The use of ECD, AT, and internet combined, increased the odds of having high SI after tetraplegia injury by 300% (OR: 2.99; 95% CI [2.07, 4.23];  $p < .01$ ) when compared to participants that did not use any type of device or the internet. Odds of experiencing high SI when white was found to be significantly higher when compared to individuals who are black, with blacks having 36% lower odds of having high SI (OR: 0.64; 95% CI [0.49, 0.84];  $p < .01$ ), highlighting a disparity experienced by black individuals. A high SI disparity was also found for Hispanics (OR: 0.47; 95% CI [0.29, 0.75]);  $p < .01$ ), who experienced 53% lower odds of high SI when compared to non-Hispanic ethnicities.

**CONCLUSION:** Obtaining access and the ability to independently use an ECD and the internet via AT, provides individuals with tetraplegia the opportunity to access social participation in a virtual environment with minimal barriers and gives them a chance to formulate meaningful connections. Occupational therapy practitioners can assess ECD independence to determine if and what type of AT device is needed to access these social opportunities. These results also provide awareness of the demographic characteristics of individuals at-risk of experiencing low SI after injury.

## References

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