

Research In Focus: A Weekly Digest of New Research from the NIDILRR Community

Self-Paced Web-Based Transfer Training Shows Promise to Help Wheelchair Users Improve Transfer Techniques

A study funded by the National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR).

For full-time wheelchair users, the ability to safely transfer to and from their wheelchair is important to achieving independence. For example, they may need to transfer in and out of bed, on and off shower and toilet seats, and into and out of motor vehicles. On average, full-time wheelchair users transfer to and from their chairs 15-20 times per day. This transfer frequency increases risk for injuries to their arms and shoulders. Research suggests that using proper transfer techniques may decrease that risk, but many full-time wheelchair users may not be using the safest transfer techniques. In recent years, the amount of time newly injured patients spend in inpatient rehabilitation has declined, which may leave less time for learning and practicing these techniques. Barriers to accessing outpatient services after discharge and financial challenges may also contribute to the lack of proper transfer training for many full-time wheelchair users. In a NIDILRR-funded study, researchers tested a web-based wheelchair transfer training program as an alternative to in-person training. The program had been successfully tested with full-time wheelchair users in a laboratory setting. For this study, researchers wanted to see how effective a web-based transfer training program might be for improving knowledge and use of safe and efficient transfer techniques by full-time wheelchair users in a real-world setting.

Researchers from the [University of Pittsburgh Model Center on Spinal Cord Injury](#) and the project [Translating Transfer Training and Wheelchair Maintenance into Practice](#) enrolled 72 full-time wheelchair users in this study. The participants were between ages 18-75, had a diagnosis of spinal cord injury or other disorders such as multiple sclerosis or spina bifida and used a wheelchair as the primary mode of mobility (defined as wheelchair use of > 40 hours/week). All of the participants were able to transfer in and out of their chairs independently. The participants were split and randomly assigned to two groups: the immediate intervention group (IIG) and the waitlist-control group (WLCG).

The researchers obtained baseline demographic information, pain measurements, and knowledge and use of safe transfer techniques from all participants. Demographic information included age, race, sex, diagnosis, education level, household income, wheelchair type, years since diagnosis, number of transfers per day, and whether they used a sliding board for transfers. To measure participants' pain, researchers used the Wheelchair User's Shoulder Pain Index (WUSPI). Participants were asked to rate their pain during 15 activities such as transferring to and from their wheelchair, dressing, lifting objects, work or school activities, driving, and chores, on a scale of 0 (no pain) to 10 (worst pain ever experienced), then all of the items were totaled for a score of 0-150.

Use of safe and efficient transfer techniques was assessed using the Transfer Assessment Instrument (TAI-Q), a self-assessment questionnaire. For the TAI-Q, participants used their preferred transfer technique, then completed the online questionnaire, answering questions about how they set up their wheelchair to transfer to another surface, how they positioned their body for the transfer, how they completed the transfer between surfaces (i.e. leaning forward, backward, or staying upright), and any assistive technology they used such as a slide board or lift. Each response was scored between 0 and 1, with higher points indicating a more ergonomic transfer technique, and the total was calculated for a TAI-Q score.

After the baseline assessment, the IIG group was instructed to start their participation in the web-based transfer training program immediately thereafter (i.e., no more than three days after baseline assessment). The web-based training program focused specifically on three transfer phases: wheelchair set-up, body set-up, and moving out of the chair and onto the new surface (flight/landing). The participants watched videos, read descriptions, and completed interactive activities for each phase of the transfer. The training was self-paced and took about an hour to complete. Immediately after completing the training, the IIG participants completed a TAI-Q, then again one month after they completed the training.

Participants in the WLCG group were instructed to wait one month after their baseline assessments, then completed a second TAI-Q assessment. Six months after their baseline assessment they completed a third TAI-Q assessment and then immediately took the training. They then completed another TAI-Q immediately after completing the training and again one month after they completed the training.

After completing the study, the researchers found that:

- Participants in both the IIG and WLCG groups increased their use of safe and efficient transfer techniques between baseline assessment and one month after baseline, but the IIG participants showed slightly more improvement.
- Participants in the WLCG group increased their knowledge and use of safe transfer techniques from pre-training (6-month post-baseline) to immediately post-training and sustained that improvement 1-month post-training.
- Participants in both groups who had lower TAI-Q scores (i.e., use less safe and efficient transfer techniques) and higher WUSPI (i.e., more shoulder pain with activity) were most likely to improve their TAI-Q scores at 1-month post-training.

The authors noted that more than two-thirds of the participants in this study were at least 10 years post-injury, which suggests that even people who are long-time wheelchair users can benefit from a transfer training program like this one. The finding that the WLCG group were showing some improvement between the baseline assessment and 1-month post-baseline assessment (before they had access to the training) may indicate that participating in several TAI-Q assessments alone may have

helped them learn more about safe transfer techniques. Adding to this, the authors noted that the WLCG group's additional TAI-Q improvement after completing the web-based training following the 6-month delay suggested that the training may have added to the knowledge gained from doing the assessments.

In this study, participants were able to improve the knowledge and use of safe and efficient wheelchair transfer techniques using the self-paced, web-based program. This was true regardless of their age, income, education, or other demographic factors, suggesting the web-based training may be beneficial to a broad population. Those with existing shoulder pain can learn and implement these techniques to reduce their risk of further injury, and even long-time wheelchair users may benefit from the training as a "refresher." The authors noted that web-based transfer training fits well with increasing interest in telehealth and telerehabilitation to expand access to healthcare but acknowledged that not everyone has the same access to a computer or smart device with reliable Internet so providers may need to ensure their patients can access these programs. This web-based transfer training program shows promise to help full-time wheelchair users improve their skills at home and reduce their risk of injury, including people who may not have access to a clinic or physical therapist due to insurance, financial constraints, or access to transportation.

[To Learn More](#)

The [Web-Based Transfer Training Program](#) is available free of charge from the University of Pittsburgh Model Center on Spinal Cord Injury, along with a [Web-Based Wheelchair Maintenance Training Program](#). You can access these programs with or without participating in ongoing studies.

The Model Systems Knowledge Translation Center (MSKTC) offers a collection of [evidence-based resources for people with spinal cord injury](#), including this set on [safe transfer techniques](#).

[To Learn More About this Study](#)

Rigot S.K, DiGiovine, K.M., Boninger, M.L., Hibbs, R., Smith, I., Worobey, L.A. (2021) [Effectiveness of A Web-Based Direct-to-User Transfer Training Program: A Randomized Controlled Trial](#). Archives of Physical Medicine and Rehabilitation (2021). This article is available from the NARIC collection under Accession Number J86679.

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