Development of a Spinal Cord Injury Virtual Coach to Improve Skin Care

N.K. Latham1,2, B.V. Houlihan1, H. Trinh3, A. Shamekhi3, T. Ellis1, S. Everhart-Skeels1, J. Zazula, T. DeAngeles1, N. Sullivan1, A.M. Jette1, T.W. Bickmore3

1Boston University; 2Brigham and Women’s Hospital; and 3Northeastern University, Boston MA.

Background

- Pressure ulcers continue to be one of the most prevalent and problematic secondary conditions for people with SCI.
- Virtual coaches are animated characters that emulate face-to-face interactions using theoretically based counseling.
- People interact with a virtual coach on computers or other electronic devices.
- Virtual coaches have been found to be effective in improving health behaviors in clinical trials in many different populations and patient groups.
- Objective: To develop the first virtual coach for individuals with SCI focused on behaviors to prevent pressure ulcers.

Aims

1. To create the first SCI Virtual Coach to provide support, education, and coaching after inpatient rehabilitation to promote skin care management (Phase 1).
2. To explore and revise the Coach’s usability through a series of individual lab-based interview sessions (Phase 2).
3. To evaluate feasibility in a proof of concept Phase III pilot study randomized controlled trial measuring acceptability, adherence, and exploring the preliminary evidence of efficacy (Phase 3).

Features of Prototype SCI Virtual Coach

- Coach is an able-bodied woman named Tanya
- Every daily conversation includes:
  - Brief intro and greeting
  - Emotional check-in
  - Short social chat to build rapport
  - Behavior check in: Skin checks, bed/chair relief
- Longer weekly conversation also includes education on skin care topics in one of six areas:
  1. Skin Inspection
  2. Bed pressure relief
  3. Chair pressure relief
  4. Bowel/bladder leakage
  5. Equipment assessment
  6. Chair assessment
- Images and videos integrated, including audio and video from real people with SCI describing their experiences

Methods

Figure 1. Example Virtual SCI Coach

Phase 1 - Develop Coach

- A peer panel of persons with SCI worked with the research team to help select coach characteristics, content of the dialogues and other design elements.
- Iterative process to develop the coach:
  - Input was sought from the peer panel
  - Development took place
  - The peer panel provided feedback
  - Modifications were made based on feedback

Phase 2 - Lab-based testing

- Subjects were 8 male/2 female; 7 tetraplegic/3 paraplegic; 2.5-10 years post-injury.
- Subjects like flexibility, interactive nature, and self-paced learning.
- Strong interest in adding sensitive topic areas, especially sexuality and bowel/bladder management to learn privately from the Coach.
- Videos and pictures were helpful, with the videos of other people with SCI explaining their experiences being the most positive.
- Element of humor appreciated and enhanced for pilot.

Phase 3 - Pilot

- Enrollment/baseline assessment complete for all participants (N=40).
- Intervention group (n=20) home visits completed for Coach set up.

Results

Phase 1 – Development – Panelist Feedback:
- Both genders had a strong preference for a female coach.
- Some mixed feelings around able-bodied vs. not but chose able-bodied for those not ready to accept injury.
- Important to include:
  1. Videos of actual people with SCI.
  2. Coach feedback about users’ progress in setting goals and utilizing the Coach as incentive for ongoing use.
  3. Emotional check in for Coach to acknowledge strong feelings of adjustment to injury to encourage engagement.

Phase 2 – Lab-based Testing:
- Subjects were 8 male/2 female; 7 tetraplegic/3 paraplegic; 2.5-10 years post-injury.
- Subjects like flexibility, interactive nature, and self-paced learning.
- Strong interest in adding sensitive topic areas, especially sexuality and bowel/bladder management to learn privately from the Coach.
- Videos and pictures were helpful, with the videos of other people with SCI explaining their experiences being the most positive.
- Element of humor appreciated and enhanced for pilot.

Phase 3 – Pilot:
- Enrollment/baseline assessment complete for all participants (N=40).
- Intervention group (n=20) home visits completed for Coach set up.

Conclusions

- The first virtual coach for persons with SCI has been developed.
- During lab-based testing, consumers generally liked Tanya.
- Videos and pictures were helpful, with the videos of other people with SCI explaining their experiences being the most positive.
- Element of humor appreciated and enhanced for pilot.
- If findings are promising, efficacy of the SCI Virtual Coach to improve skin care and reduce pressure ulcer risk in people with recent SCI will be evaluated in a phase III RCT.

Funding

This research was supported by the Craig H. Neilsen Foundation.