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Objectives

Provide a preliminary efficacy assessment of **SCI-Ex**, a mobile app designed to support home exercise programs for individuals with spinal cord injury (SCI), by examining the relationships between app usage, exercise adherence, and changes in physical functioning and community participation; Identify areas for improvement in function and usability of the SCI-Ex app based on feedback from study participants.

Study Design

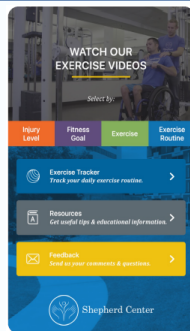
The study recruited over 100 Shepherd Center spinal cord injury (SCI) patients. Each participant was asked to download Shepherd Center’s free mobile smartphone app - **SCI-Ex** - to support the creation and completion of a customized home exercise program for 90 days. Participants were prompted to complete a baseline outcomes assessment immediately after downloading the app onto their mobile device, and they were prompted to complete follow-up outcomes assessments 30, 60, and 90 days after downloading the SCI-Ex app. At the 90-day timepoint, participants were also prompted to complete an app usability survey. Surveys were administered and completed via a secure online research platform (REDCap), and participants received a prompt with a link to each survey via their preferred communication method (email or text). App usage data was also tracked for each participant during the 90-day study period.

Outcome Measures

- **Spinal Cord Independence Measure III – Self Report (SCIM III SR):** a 17-item questionnaire assessing activities of daily living, respiration, bladder and bowel management, and indoor and community mobility
- **Craig Handicap Assessment and Reporting Technique – Short Form (CHART-SF):** 11 questions assessing physical independence, cognitive independence, functional mobility, and occupational functioning.

Interventions

- Download the SCI-Ex mobile app
- Create a customized exercise program using SCI-Ex
- Submit initial demographic information
- Conduct baseline and follow-up assessments (30-, 60-, 90-day post-baseline outcomes) of physical functioning, community participation, app usage, and self-reported exercise adherence
- Complete an app usability survey



Setting

- **Shepherd Center:** clinical site
- **MobileSmith:** mobile app and JSON development platform
- **REDCap:** secure, online research management and data collection platform

Participants

- Age 18 or older at time of enrollment
- Diagnosed with a traumatic or non-traumatic spinal cord injury
- Cleared for participation in a home-exercise program (HEP) by a physician
- Own a smartphone or other mobile device capable of downloading the SCI-Ex app
- Receive inpatient or outpatient SCI treatment at the Shepherd Center, or participate in aftercare fitness or rehabilitation programs (e.g. Shepherd’s ProMotion Fitness Center)

Results

Outcomes Comparison:
Frequent (N = 8) vs. Infrequent (N = 11) SCI-Ex Users

Outcome Measures	Baseline p-value for between-group difference	Change-Score (Δ) p-value for between-group difference
SCIM III - SR: Self-Care Score (0 - 20)	0.16	0.098
SCIM III - SR: Respiration & Sphincter Management Score (0 - 40)	0.03*	0.276
SCIM III - SR: Mobility Score (0 - 40)	0.04*	0.375
CHART - SF: Physical Independence Score (0 - 100)	0.24	0.492
CHART - SF: Cognitive Independence Score (0 - 100)	0.31	0.414
CHART - SF: Mobility Score (0 - 100)	0.44	0.349
CHART - SF: Occupational Functioning Score (0 - 100)	0.2	0.409

Conclusions

Usability Factors

Index Score (0 – 1)

Easy of Use	0.72
Intuitive Design	0.72
Supports Home-Exercise	0.66
Supports Recovery	0.63
Improves Quality of Life	0.63



- **Frequent SCI-Ex Users ($N_1 = 8$):**
 - 100% (8/8) participants reported using a wheelchair (WC) as their primary mobility method at baseline
- **Infrequent SCI-Ex Users ($N_2 = 11$)**
 - 76% (8/11) participants reported using a WC as their primary mobility method
 - 24% (3/11) reported using a WC as their primary mobility method but being able to walk (w/ or without aid) in some situations at baseline
- **SCI-Ex Non-Users ($N_0 = 24$)**
 - 67% (16/24) participants reported using a WC as their primary mobility method
 - 33% (8/24) reported the ability to walk (w/ or w/o aid) at baseline

POSTER GUIDELINES

- Posters must be A0 size (84.1x118.9cm or 33.1x46.8 inches), portrait format.
- The logo of the respective conference has to be placed on the top right corner of the poster (ICORR, IFESS, INRS, ISPO, RESNA)
- Setup time starts at 8am on Monday, June 24th. All posters must be set up at the latest by 8am on Tuesday, June 25th. Posters have to be taken down or will be removed and tossed at 4pm on Thursday, June 27th.
- Candidates for the best poster award need to be present in front of their poster during the poster viewing and judging session on June 26th from 8.45- 10am to be eligible for the award.
- In addition to the official poster viewing and judging session, scheduled for Wednesday morning, all poster presenters will be assigned certain slots during coffee breaks, during which they are expected to be present at their posters. The schedule will be published online after May 15th.
- Presenters MAY (not mandatory) choose to share their posters with congress attendees if they wish. All posters sent to Mojca Rodic (mrodic@kenes.com) by May 24th will be included in the conference app as downloads. For all others, abstracts/papers will be included only.

LATE POSTER GUIDELINES

- There is no RehabWeek template you need to use.
- Posters must be A0 size (84.1x118.9cm or 33.1x46.8 inches), portrait format.
- The logo of the RehabWeek has to be placed on the top right corner of the poster.
- Setup time starts at 8am on Monday, June 24th 2019. All posters must be set up at the latest by 8am on Tuesday, June 25th 2019. Posters have to be taken down or will be removed and tossed at 4pm on Thursday, June 27th 2019.
- Presenters of Late Breaking Posters are not assigned a specific time slot to present their posters, but may be present at their posters at any time



Authors: Nicole Thompson, John Morris, Tracey Wallace, Mike Jones, Frank DeRuyter

Shepherd Center, Rehabilitation Engineering Research Center for Community Living, Health and Function (LiveWell RERC)

Objectives

Implementing mRehab solutions for people recovering from traumatic injury or managing neurodegenerative diseases and other conditions requires informed engagement by rehabilitation clinicians. The Rehabilitation Engineering Research Center for Community Living, Health and Function (LiveWell RERC) conducted a survey of rehabilitation clinicians to discover and document the state of clinician knowledge, experience and needs for mRehab interventions and technologies.

Methods

The survey was conducted from January 14 to February 27, 2019 using convenience sampling methods and online data collection on the Survey Monkey web-based platform.

Participants

Respondents by Profession	Count (n=505)	Percentage (%)	Respondents by population served	Count (n=505)	Percentage (%)
Physician	13	2.6	ABI	375	74.3
Physician assistant	4	0.8	SCI	172	34.1
Nurse or nurse practitioner	9	1.8	NDD	300	59.4
Physical therapist	74	14.7	CVD	181	35.8
Occupational therapist	104	20.6	Musculoskeletal injury/disorder	198	39.2
Speech language pathologist	166	32.9	Cancer	178	35.2
Recreational therapist	57	11.3	Other	119	23.6
Exercise physiologist	2	0.4			
Counselor or social worker	8	1.6			
Psychologist	46	9.1			
Case manager or care coordinator	1	0.2			
Other	25	4.6			

Clinical environments of respondents	Counts (n=505)	Percentage (%)
Inpatient acute	146	28.9
Outpatient clinic	243	48
Skilled nursing facility	72	14.3
Home health	48	9.5
Other	73	14.5

Outcome Measures

- **Clinician Demographics**
- **Patient Needs:** post-acute and between-visits care
- **Perceptions on mRehab technology** use in clinical practice
 - Willingness to adopt
 - Barriers to adoption & implementation
 - Critical Use-Cases
- **Online health-coaching platforms**
- **Knowledge translation:** comfort & willingness to learn about new rehabilitation technology solutions

Results

Table 4: Post-Discharge or Between-Visit Therapeutic Intervention

	Post-Discharge % patients	Between Visits % patients
Physician or physician assistant	44.7	32.9
Nurse or nurse practitioner	59.7	54.1
Physical therapist	73.6	55.7
Occupational therapist	70.4	48.9
Speech language pathologist	75.3	57.8
Recreational therapist	79.7	68
Psychologist	83.4	53.9

Conclusions

The technologies needed to support mRehab have been maturing at a rapid pace. Meanwhile, clinicians almost universally recognize that many of their patients leave their clinic with unmet rehabilitation needs that could be met outside the clinic. Together these trends suggest accelerating adoption of mRehab technologies.

Obstacles remain for clinicians, particularly due to many (almost half) not yet feeling comfortable integrating mRehab technologies into their practice, and more than three-fourths (78%) reporting not being knowledgeable about mRehab technologies.

The potential benefit is recognized but providers need additional knowledge and support to comfortably incorporate these approaches into practice, understandable given the emerging state of the field. Because mRehab is developing rapidly in terms of technology, regulation/reimbursement and user acceptance,

the LiveWell RERC has created the Clinician Network on mRehab (ClinNet on mRehab) to track the experiences and needs of clinicians related to mRehab interventions and technologies.

At the end of the questionnaire for the survey data reported here, we asked respondents if they would be interested in joining the ClinNet on Rehab. Just under 300 respondents (59%) said yes. We will continue to engage this group going forward in order to map the contours of mRehab adoption, preferences and needs.