

Abstract Booklet

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Oral Presentations - Mini Talks (Abstract Presentations)

OP1 - Development and internal validation of a dynamic prediction model for the recovery of functioning during initial rehabilitation in Switzerland: Preliminary results

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Introduction

Most functioning prediction models in spinal cord injury (SCI) predict the outcome at a fixed point in the future, based on information collected earlier. This "one-time" approach has limited use for monitoring purposes, particularly since a person's functioning keeps changing during rehabilitation. Our aim was to develop and internally validate a model that can predict an individual's functioning recovery during initial rehabilitation and dynamically update these predictions as new functioning data becomes available.

Methodology

We used data from the Inception Cohort of the Swiss SCI Cohort Study (SwiSCI). Participants were assessed up to 4 times during initial rehabilitation at one of four specialized clinics. Functioning was measured using the total score of the Spinal Cord Independence Measure version III (SCIM).

We developed the model using a statistical method that can handle repeated measurements over time for each participant (linear mixed effects models). A resampling technique (bootstrapping) was used for internal validation, i.e. to assess prediction accuracy and calibration (i.e., how well predicted scores matched the actual scores). Also, we explored if these measures varied depending on how many SCIM assessments were available for updating, and across different participant groups (age, sex, etiology, etc.).

Results

The sample included 2030 participants. Median length of stay was 134 days (IQR=79-189 d) and median age at injury was 58 years (IQR=42-70 y). Most people were male (67.8%) and had a traumatic SCI (56.5%).

Preliminary results showed that updating the predictions made them more accurate: The mean absolute prediction error decreased from 13.95 SCIM points (using baseline data) to 9.19 points (first update) and 8.62 points (second update). Accuracy tended to be slightly lower for people aged 60–74, with non-traumatic SCI, with high-level tetraplegia, or less severe injuries (AIS C/D), and higher for those with lower-level or more severe injuries (AIS A/B).

Discussion and conclusion

To our knowledge, this is the first study in SCI research to use a dynamic approach to predicting functioning recovery. Results showed that updating predictions as new data comes in improves their accuracy. However, external validation is required to independently confirm our results.

Implications for practice

This study is a first step toward enabling individualized, dynamic monitoring of functioning during initial rehabilitation after SCI in Switzerland.

OP2 - Pressure relief performance of manual wheelchair users with complete spinal cord injury

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Introduction: Individuals with spinal cord injury (SCI) who rely on a wheelchair for mobility and activities of daily living are frequently affected by pressure injuries (PIs). This is often caused by prolonged sitting in a wheelchair, combined with impaired sensory and motor function. To prevent PIs, clinical guidelines recommend performing pressure relief (PR) regularly. These guidelines suggest a frequency of once every 15 minutes to once per hour, with a duration of 15 seconds to one minute. PR techniques include lifting the buttocks off the cushion by pushing up with both arms (PR lift), leaning forward, or leaning to the side. Despite its importance, there is little objective data on how individuals with SCI perform PR in daily life. This study aimed to objectively quantify the PR behaviour of manual wheelchair users with complete SCI in their daily lives.

Methods: Individuals with a complete SCI of at least five years' duration and the ability to perform PR independently were recruited. To measure PR behaviour, participants were equipped with a textile pressure measurement mat. This mat was placed underneath the wheelchair cushion and recorded pressure distribution continuously for three weeks at a frequency of 5 Hz. Using a machine-learning algorithm and individual calibration of PR techniques before and after the measurement, the frequency, duration, and technique of PR were determined.

Results: The study included 46 participants. Participants were predominantly male (39 ♂) and had paraplegia (40 with paraplegia). Mean (SD) age was 56 (13) years and time since injury 26 (16) years. Mean (SD) sitting time was 11 (3) hours per day. Per sitting hour, participants performed PR lifts 1 (2) times, leaned forward 5 (5) times, leaned right 5 (6) times, and leaned left 3 (5) times. The duration of PR for each technique was 9 (1) s for PR lifts, 14 (2) s for forward leans, 13 (3) s for right lean, and 13 (2) s for left leans.

Conclusions and implications: The results show that participants performed PR regularly. Unlike previous studies, the minimal clinical guidelines for PR frequency were met, but guidelines for duration were not. Since duration is crucial for the effectiveness of PR, this aspect requires additional emphasis during clinical instruction. Furthermore, PR lifts were the least frequently performed PR technique. This may be beneficial regarding shoulder fatigue and pain, which are common in people with SCI.

OP3- Acute Care and Rehabilitation after Low-Trauma Hip Fractures in older Adults - Pathways and Functional Outcomes: A Prospective Cohort Study

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Introduction

Older adults experiencing low-trauma hip fractures (LTHF) may not return to pre-fracture functioning. This study examined whether different LTHF types (femoral neck (FN-F); trochanteric (Tr-F); acetabular or periprosthetic (Ac/Pp-F) fractures) follow different healthcare pathways and achieve different functional outcomes.

Methods

Prospective cohort study using data from 2020–2023 including patients aged ≥ 65 years with low-trauma FN-F, Tr-F, or Ac/Pp-F undergoing inpatient rehabilitation. Pathways comprised chronological stays in acute care, inpatient rehabilitation, and temporary care homes, bounded by pre-fracture situation and discharge destination. Pairwise *Standardized Mean Differences* (SMDs) were calculated for between-group comparisons.

Results

Of 294 individuals (mean age 81.0 ± 7.4 years; 191 (65%) women; 152 Tr-F, 118 FN-F, and 24 Ac/Pp-F) four main pathway types were identified: 1) Acute care to inpatient rehabilitation in 208 (70.7%) individuals (FN-F 95; Tr-F 103; Ac/Pp-F 10); 2) temporary nursing home stay before rehabilitation in 25 (8.5%; FN-F 2; Tr-F 13; Ac/Pp-F 10); 3) temporary nursing home stay after rehabilitation in 17 (5.8%; FN-F 2; Tr-F 13; Ac/Pp-F 2); 4) re-hospitalization in 44 (15.0%; FN-F 19; Tr-F 23; Ac/Pp-F 2).

Median pathway length was 33.0 days (IQR 26.0–40.0) for FN-F, 35.0 (IQR 29.0–46.0) for Tr-F, and 60.5 (IQR 37.0–86.5) for Ac/Pp-F. Between-group differences in pathway type were moderate to large (SMDs: FN-F vs. TR-F = 0.47; FN-F vs. Ac/Pp-F = 1.25; TR-F vs. Ac/Pp-F = 0.84), and for length from small to large (SMDs: FN-F vs. TR-F = 0.36; FN-F vs. Ac/Pp-F = 1.2; TR-F vs. Ac/Pp-F = 0.69).

Overall, 246 (83.7%) individuals returned to a private living setting. 88 (29.9%) individuals required new or increased home support or care.

At discharge from rehabilitation, Functional Independence Measure showed small to moderate between-group differences (SMDs: FN-F vs. TR-F = 0.09; FN-F vs. Ac/Pp-F = 0.48; TR-F vs. Ac/Pp-F = 0.44), and Timed Up and Go test showed small differences (SMDs: FN-F vs. TR-F = 0.24; FN-F vs. Ac/Pp-F = 0.39; TR-F vs. Ac/Pp-F = 0.22).

Discussion

Treatment pathways respect specific fracture type needs, length of rehabilitation, and rehabilitation intervention, e.g. weight bearing, and functional outcomes can be alike including return to the primary living setting.

Implication for practice

Future rehabilitation should be tailored along these pathways to optimize care quality.

Poster Blitz - Mini Talks (Abstract Presentations)

PB1 / P1 - Prevalence and risk factors of pressure injuries in individuals with spinal cord injury in Switzerland

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Introduction: Individuals with a spinal cord injury (SCI) are frequently affected by pressure injuries (PIs). PIs contribute to significant morbidity, reduced quality of life, and independence, as well as substantial healthcare costs. While previous studies have documented a high prevalence, current data on the prevalence of PIs among people with SCI living in Switzerland are limited. The aim of this study was to determine the occurrence of PIs in the past year (period prevalence). Furthermore, factors associated with the PI period prevalence were identified.

Methods: Data from the survey of the Swiss Spinal Cord Injury Cohort Study (SwiSCI) from 2022 were analysed. The period prevalence of PIs was analysed descriptively. Potential risk factors were identified in the literature, including variables related to the person and lesion, health behaviour, secondary health problems, and independence. Subsequently, multivariate logistic regression was used to determine which of these factors were most relevant in the current data.

Results: In total, 1318 individuals participated in the survey (70% ♂; 70% paraplegia; 33% complete lesion; mean (SD) age 58 (15) years; time since onset of SCI 20 (14) years). The period prevalence of PIs was 15% (95% Wilson CI [13%, 17%]). Compared to individuals with incomplete paraplegia, increased odds of having a PI were observed in those with complete paraplegia (OR = 2.46; 95% CI [1.66, 3.66]) and those with complete tetraplegia (OR = 2.81; 95% CI [1.59, 4.99]). Compared to non-smokers, current or former smokers showed higher odds of having a PI (OR = 1.62; 95% CI [1.17, 2.24]). Higher functional independence (measured with the Spinal Cord Independence Measure) was associated with lower odds of having a PI (OR = 0.98; 95% CI [0.97, 0.99]). Finally, individuals receiving support at home showed higher odds of having a PI than those without support (OR = 2.06; 95% CI [1.28, 3.32]).

Conclusions and implications: This study demonstrates that the prevalence of PIs remains high. Furthermore, the following factors were associated with increased odds of having a PI: complete lesion, lower functional independence, receiving support at home, and being a current or former smoker. These results help identifying individuals who are at increased risk of developing PIs and highlight the potential need for closer monitoring and improving preventive behaviour of these individuals.

PB2 / P2 - Mapping the landscape of quality indicators in rehabilitation: An international scoping review

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Background: The 2023 World Health Assembly resolution on strengthening rehabilitation calls for the provision of high-quality rehabilitation services worldwide. However, no international standard for measuring rehabilitation quality exists to date.

Objective: This scoping review aimed to identify quality indicators worldwide that have been developed, implemented and/or validated for measuring rehabilitation quality. The indicators were intended to inform the development of indicators for monitoring the quality of rehabilitation services in Switzerland.

Methods: We conducted an Embase search that included peer-reviewed publications in English, French, or German (2015-2025) that reported on the development, implementation, evaluation and/or comparison of quality indicators for adult rehabilitation in Australia, Canada, France, Germany, Japan, Netherlands, Norway, Sweden, Switzerland, United States, and the United Kingdom. Publications that did not identify specific quality indicators were excluded. The indicators were categorized according to the Donabedian framework and consolidated into thematic clusters.

Results: The search retrieved 1'545 publications, of which 33 were included after the title/abstract screening and 14 after the full text review. The 107 quality indicators found were grouped into nine clusters. The majority were process indicators (75%), while outcome (14%) and structure (11%) indicators were less represented. The thematic cluster Assessment & Screening (N=25; 23.4%) covered the most quality indicators.

Conclusion: Current literature reflects international efforts toward developing quality indicators for rehabilitation, reflecting some imbalances: process indicators and efforts in high-resource countries dominate, while outcome and structure indicators and contributions from low- and middle-income countries are underrepresented. Consolidating 107 QIs into nine clusters offers a structured basis for developing indicators for monitoring rehabilitation quality in Switzerland and beyond.

Practice implications: A major step in developing a rehabilitation quality monitor system for Switzerland, the quality indicators identified in this review would facilitate the development of a national quality benchmark. Such a benchmark would enable each rehabilitation facility to compare themselves with other facilities and track its quality improvement over time, which in turn, is expected to foster continuous quality improvement efforts within rehabilitation facilities.

PB3 / P3 - Inter- and Intra-rater Reliability of the Shoulder Isometric Force Test Protocol

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Introduction

Shoulder strength testing is frequently used in clinical, scientific and sport settings. Numerous measurement protocols are available. However, protocols specifically adapted to the needs of wheelchair users remain scarce. Therefore, the aim of this study was to investigate the reliability of the Shoulder Isometric Force Test (SHIFT) protocol, which was developed to provide a feasible and efficient approach to shoulder strength assessment in wheelchair users with spinal cord injury (SCI).

Methodology

Twenty healthy volunteers with pain-free shoulders completed three strength testing sessions conducted by two testers. Isometric strength in seven directions of movement (DOM) was assessed using a dynamometer fixed to a wall-mounted rail. Reliability was evaluated using intraclass correlation coefficients (ICC) and minimal detectable change (MDC).

Results

Relative reliability was good to excellent across most DOM and rater conditions. Absolute reliability, expressed as MDC%, showed greater variability. Shoulder extension demonstrated comparably lower reliability values. In contrast, the combined shoulder abduction and external rotation (ABD+ER) task yielded the most favorable reliability outcomes across all analyses.

Discussion and Conclusion

Most DOM demonstrated high relative reliability. These findings indicate that the SHIFT protocol provides a robust framework for multidirectional shoulder strength assessment tailored to wheelchair users and is suitable for both research and applied contexts. Nevertheless, measurement error varied across DOM. Consequently, small individual changes should be interpreted with caution. The superior reliability values observed for the ABD+ER task suggests particular potential for monitoring clinically meaningful changes in shoulder strength over time. Further research is needed to establish the functional relevance of this measure and its sensitivity to clinically meaningful change.

Implications for practice

The SHIFT protocol was developed with the specific needs of wheelchair users with SCI in mind, providing a practical and resource-efficient approach to shoulder strength assessment. Among the tested DOM, shoulder rotations and particularly the ABD+ER task appear most suitable for individual monitoring. The ABD+ER measure consistently demonstrated superior measurement properties across all test conditions, highlighting its potential as a time-efficient outcome measure for both clinical practice and research.

PB4 / P4 - SwiSCI Kids: Development of a Pediatric Dataset Addressing Knowledge Gaps in Spinal Cord Injury in Switzerland

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Background

Traumatic spinal cord injuries (SCI) in children and adolescents are rare but associated with severe long-term consequences. Compared to adults, paediatric traumatic SCI differ in etiology, injury patterns, and clinical course (1), while important knowledge gaps remain regarding epidemiology, clinical trajectories, complications, and long-term outcomes. In Switzerland, systematically collected pediatric SCI are lacking (2). This highlights the urgent need for a dedicated pediatric dataset (SwiSCI Kids) to support the evidence-based development of care, rehabilitation, and prevention strategies. This study aims to present initial findings on prevalence, etiology, age at injury, and rehabilitation outcomes.

Methods

Based on a scoping review, analysis of existing cohorts, and collaboration with ISCoS (3), four Swiss SCI centers, the Affoltern Children's Rehabilitation Clinic, and Inselspital Bern, an evidence-based dataset for a pediatric SCI cohort was developed. Retrospective data collection included all patients aged ≤ 18 years with traumatic SCI hospitalized between January 2015 and December 2025. This interim analysis includes data from one center. Variables comprised demographics, injury etiology, lesion characteristics (AIS grade, neurological level), clinical course, surgical management, and length of stay.

Results

The interim analysis showed a total of 45 adolescents (mean age 15.4 years; 13 female) were included. Leading injury mechanisms were skiing (n=11), motorcycle accidents (n= 10), and car accidents (n=6). Most patients (43/45) underwent surgery. Injuries were cervical in 14 cases and thoracic/lumbar in 31 cases. AIS grades were A (n=23), B (n=7), C (n=10), and D (n=5). Neurological improvement at discharge was observed in 11 patients, with a mean SCIM increase of 17 points.

Conclusion

The SwiSCI Kids dataset provides the first structured data on pediatric SCI in Switzerland and addresses a critical knowledge gap. These findings support the development of targeted prevention strategies and contribute to optimizing treatment, rehabilitation, and long-term care for affected children and adolescents.

References

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PB7 / P7 - Cross-cultural implementation of participation in Phase III cardiac rehabilitation: Study design and preliminary recruitment status of a European multicentre randomized controlled trial

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Introduction

Cardiovascular diseases (CVD) remain the leading cause of mortality worldwide. Cardiac rehabilitation (CR) is a guideline-recommended intervention for secondary prevention. While Phase II CR is well established, evidence on Phase III CR remains limited despite its important role in maintaining long-term lifestyle changes and reducing recurrent cardiovascular events. The European COMPASS (CrOss-cultural Model for Postdischarge Assistance and Sustainable digital Solutions) project aims to improve continuity of care by evaluating a personalized digital post-discharge programme across different European healthcare settings.

Methodology

The COMPASS trial (NCT07252856) is a multicentre randomized controlled trial conducted in Switzerland, Italy, Portugal, and Belgium. Patients with atherosclerotic cardiovascular disease (ASCVD) completing Phase II CR are screened for eligibility (target sample size n=306). Eligible patients are randomized 1:1 to either usual country-specific Phase III care or the Digitally-Enhanced Extended PrEvention & Rehabilitation (DEEPER) intervention. Developed through co-creation, DEEPER provides tailored educational and exercise recommendations through a digital platform using Life's Crucial 9 (LC9)-based goal setting, digital biomarkers, and patient feedback. The primary outcome is change in LC9 score after 6 months. Recruitment and participant characteristics are analysed descriptively across countries.

Results

Recruitment is ongoing across all participating countries. Preliminary recruitment data include the number of screened, eligible, and enrolled patients, the proportion of eligible patients consenting to participate, and participant characteristics. Descriptive cross-country comparisons will provide initial insights into differences in recruitment and participation in Phase III CR across participating healthcare systems.

Discussion and conclusions

The preliminary recruitment results will provide an initial assessment of the feasibility of conducting a multi-centre randomized controlled trial across different European healthcare systems. Cross-cultural comparisons will support the interpretation of recruitment patterns and establish the basis for future analyses of participation in Phase III CR.

Implications for practice

Understanding cross-cultural differences in participation in Phase III CR may support the development of tailored strategies to strengthen long-term engagement across different healthcare settings.

Poster

P5 - Shoulder Health After Rehabilitation and Performance training (SHARP): a study protocol with manual wheelchair users with paraplegia

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Introduction

Manual wheelchair users (MWUs) rely heavily on their upper extremities for mobility, transfers, and pressure relief. This results in highly repetitive loading of the shoulder, leading to a high prevalence of shoulder pain. Many MWUs have a spinal cord injury, and often the transition from walking to wheelchair use is abrupt, requiring targeted training during initial rehabilitation. However, little is known about shoulder progression during the subacute phase after discharge.

This study aims to investigate changes in shoulder joint capacity and daily life behavior in MWUs with paraplegia during the first year after initial rehabilitation. Additionally, it evaluates the effects and optimal timepoint of a personalized shoulder strength training.

Methodology

This monocentric randomized trial with a delayed-start design follows participants after discharge from initial rehabilitation. Six measurement timepoints are scheduled over 15 months, starting two weeks before discharge and continuing at three-month intervals. Participants are adults with paraplegia (T2 or below) using a manual wheelchair. The intervention, consisting of resistance band exercises targeting major shoulder muscles, is initiated either three months or one year after discharge and performed twice weekly for 12 weeks with progressive load adjustments.

At all timepoints, shoulder capacity is assessed through strength, range of motion, and pain provocation tests. Questionnaires evaluate independence, participation, and quality of life. Daily shoulder load is quantified using wearable sensors placed on the wheelchair and wrist, combined with heart rate and pressure measurements over one week in the participants' home environment. Shoulder pain and physical activity are additionally assessed via questionnaires. Magnetic resonance imaging is performed before and after the intervention phases to assess structural changes, including potential pathology and muscle quality.

Results

Data collection just started; no results are available.

Discussion and conclusion

The study is expected to provide insights into real-life shoulder loading after rehabilitation and its potential mismatch with capacity.

Implications for practice

Findings will support the adaptation of evidence-based rehabilitation guidelines and clarify whether immediate or delayed training is more beneficial. This might help lead to better long term shoulder health and quality of life in MWUs with paraplegia.

P6 - „Freeing the Mind, Not Solving the Problem“: A Qualitative Analysis of Expectations and Experiences with an Intelligent Wheelchair Cushion

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Introduction

Pressure injuries are clinically relevant and burdensome complications for people with spinal cord injury and require continuous prevention. Intelligent wheelchair cushions may support prevention through automatic pressure relief and digital functions. However, users' expectations, everyday experiences, and acceptance criteria remain insufficiently understood. This study aims to explore wheelchair users' expectations and experiences with an intelligent cushion and to derive user-centered and person-centered minimum requirements for future cost-efficient development.

Methodology

As part of an ongoing study, qualitative interviews were conducted with wheelchair users with spinal cord injury before using an intelligent cushion and after a six-week trial period. Data was analyzed using thematic analysis, guided by technology acceptance model and activity-oriented perspectives on the integration of assistive technologies into daily life.

Results

The preliminary analysis includes 26 pre-interviews and 13 post-interviews. Users did not expect the cushion to “solve” a chronic problem. Instead, the central expectation was mental relief, often described as thinking less about the risk of pressure injuries or “freeing the mind.” Post-interviews suggest that trust develops through stable everyday experiences, such as no deterioration in skin condition and an increased sense of safety during prolonged sitting. The main perceived benefit was a reduction in ongoing mental burden rather than a change in concrete activities. Intelligent functions were neither taken for granted nor rejected in principle, but evaluated pragmatically according to whether they supported safety, trust, and relief or created additional effort.

Discussion and conclusion

From the users' perspective, the clinical value of an intelligent wheelchair cushion lies primarily in mental relief and perceived safety, not in technical problem-solving.

Implications for practice

Future development should prioritize person-centered, everyday-relevant, supportive, and cost-efficient functions that complement existing prevention practices.

P8 - Communicating Behaviour Change Techniques Through Graphic Medicine: A Digital Comic-Based Feasibility Study

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Introduction

Behaviour Change Techniques (BCTs) provide an evidence-based framework for promoting physical activity among patients with chronic conditions (umbrella review). An experts' consensus has suggested that 66 of the 93 BCTs proposed by Michie et al (Ref) can be effectively delivered through short digital text messages. However, text-based materials may not always engage patients or support sustained behaviour change. Graphic medicine, which combines narrative and visual communication through comics, has the potential to improve attention, comprehension, and personal relevance, thereby increasing patient engagement. This study explores the feasibility of communicating BCTs digitally through comics and identifies which BCTs are perceived as most useful by people living with chronic diseases.

Methodology

Ninety-three comics were developed, each representing one BCT from the Behaviour Change Technique Taxonomy v1 into short, patient-centred stories to promote daily walking. The comics were created through an iterative co-design process with people living with chronic diseases, incorporating repeated patient feedback to improve clarity, relevance, and acceptability.

The comics will be delivered through a digital platform on a weekly basis as part of two phase III rehabilitation trials (NCT07597031, NCT07252856). To reduce participant burden, each participant will receive a random subset of 31 of the 93 comics over the six-month intervention period. After viewing each comic, participants will complete standardised ratings assessing comprehensibility, perceived usefulness, and intention to apply the illustrated BCT.

Results

Data collection is ongoing. The study will identify which BCTs communicated through comics are perceived as most understandable, useful, and motivating to be applied by patients.

Discussion and Conclusions

This study will provide initial evidence on whether comics are a suitable medium for communicating BCTs and whether some BCTs are better suited to visual storytelling than others. The findings will also provide insights into which behaviour change strategies are particularly amenable to visual communication.

Implications for Practice

Identifying which BCTs are best suited for comic-based communication may inform the design of engaging, patient-centred digital interventions to promote physical activity and self-management in people with chronic diseases.

P9 - Development of an Arm-Leg Synchronised Robotic System for Improved Walking Rehabilitation

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Introduction: Neurological impairments such as stroke often disrupt gait and reduce mobility. Robotic-assisted systems are increasingly applied in gait rehabilitation. However, most systems focus only on the lower limbs and overlook the role of interlimb neural coupling, which suggests that coordinated arm swing may enhance gait recovery. This project aims to develop an arm-leg synchronised gait trainer to support more physiological walking patterns and enable investigation of arm–leg interactions during gait restoration.

Methodology: A user-centred design approach involving interviews with clinicians and patients guided the development of a novel tendon-driven gait trainer, which features 2-DOF (degrees of freedom) body-weight support, 2-DOF active arm assistance, and 3-DOF shank support. Physiological arm–leg coordinated movement during normal gait was implemented as the target movement pattern. An admittance-based control strategy was implemented to control the assistance level, ranging from passive guidance to near-transparent interaction.

Results: Most interviewed clinicians (n = 11) considered the inclusion of arm swing a meaningful enhancement to current gait therapy. A fully operational prototype was developed and demonstrated synchronised arm-leg movement in passive mode, achieving coordinated walking at cadences up to 100 steps/min. In transparent mode, preliminary tests showed that a participant could walk freely with low interaction forces (the root mean square error: 25 N horizontal, 13 N vertical), although some residual forces remained.

Discussion and conclusions: This work demonstrates the feasibility of a robotic system that integrates physiological arm swing with lower-limb gait assistance. Passive mode validated synchronised arm-leg motion, while transparent mode showed potential for supporting patients with residual motor ability to move naturally. Future work will evaluate technical performance in broader user groups and investigate the therapeutic role of arm-leg coupling in neurological gait rehabilitation.

Implications for practice: The clinical interview feedback supports a shift towards whole-body, arm-leg synchronised gait rehabilitation, moving beyond the conventional lower-limb-only approaches. The system provides an innovative platform for investigating interlimb neural coupling and its contribution to gait recovery.

P10 - Download Wisely: A Structured Approach to Assessing Health App Quality

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Introduction

Health apps often combined with wearable sensors are increasingly relevant in rehabilitation and in physiotherapy, but app store ratings and download numbers do not reliably reflect quality, safety, data protection, or scientific validity. This is critical for mHealth applications that collect sensitive health data and may influence therapeutic processes. Therefore, clinicians and patients need a structural judgement of the quality and usability of these tools.

Methodology

We developed a practical checklist for evaluating health apps and wearables in physiotherapy. It is based on the quality principles published by eHealth Suisse, which were formulated as a conceptual framework rather than an applicable assessment instrument. The current work operationalized these principles into concrete criteria. The checklist also integrates the System Usability Scale and adds items addressing medical device classification and the accessibility of quality-related information.

Results

The resulting checklist translates nine general quality principles into a structured tool for practical assessment. It covers transparency, appropriateness, risk adequacy, ethical acceptability, legal compliance, content validity, technical adequacy, usability, and resource efficiency. Criteria are scored, with greater weight assigned to particularly important aspects, resulting in a maximum score of 100 points. The scalable checklist was adapted specifically for physiotherapy-related apps and wearables and developed with input from potential users. In addition, a prototype website was created to present the evaluation results transparently.

Discussion and conclusions

The checklist helps bridge the gap between broad quality frameworks and the practical needs of rehabilitation professionals and patients. By converting abstract principles into concrete, understandable questions, it supports more consistent and transparent appraisal of digital tools used in rehabilitation and physiotherapy. At the same time, consistent interpretation of the criteria requires training for those performing the evaluations.

Implications for practice

For rehabilitation professionals, this checklist offers a feasible way to assess digital applications before integrating them into therapy or recommending them to patients. It may support more informed decisions, improve confidence in the selection of apps and wearables, and strengthen the safe and meaningful use of digital tools in rehabilitation settings.

P11 - The Benefits of Digital Treatment Monitoring During Rehabilitation – A Mixed-Method Cohort Study

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Introduction

Generic PROMs capture subjective symptoms and quality of life, whereas musculoskeletal questionnaires often neglect comprehensive functional limitations. The relevance of PROMs across digital generations remains unclear. To bridge these gaps, the ICF-based Activity-Index systematically documents activity limitations, enhances patient-provider communication, and supports data-driven outcomes. This prospective, multicenter, mixed-methods cohort study aimed to

1. evaluate the usability, communication, clinical utility, and therapists' adherence regarding the PROM-Activity-Index app during musculoskeletal rehabilitation and
2. to analyze complaints, activity limitations, and quality-of-life outcomes to assess therapeutic effectiveness.

Methodology

Included were 200 patients with musculoskeletal disorders across four Swiss physical therapy centers over 2–12 weeks. Longitudinal digital PROM data were collected via smartphone, supplemented by baseline and post-treatment assessments (EQ-5D-5L, usability scales). Main outcomes were subjective symptoms, activity limitations, and patient-provider communication. Focus group interviews were applied to evaluate therapeutic adherence to the Activity-Index app. Quantitative analysis used descriptive statistics and multivariate regression; qualitative data underwent structured deductive and inductive content analysis.

Results

Of 200 patients, 147 were analyzed (108 complete; 28 non-user dropouts; 4 merging failures). Usability was excellent (mean System Usability Scale: 81.1/100). Validation against EQ-5D showed moderate correlations for health (Activity Index Q8 vs. EQ-5D VAS; $r=0.5$) and pain (Activity Index Q2 vs. EQ-5D Q4; $r=0.5$). Qualitative analysis confirmed clinical workflow, tracking, and communication benefits. Visual charts and automated reports drove therapist adherence, though report utility was underrecognized.

Discussion and conclusions

Smartphone-based PROM management with the Activity-Index is highly feasible, but integration into electronic health records is crucial to streamline administration. Since therapists lack familiarity with standardized feedback, embedding this into clinical routine requires targeted training and enhanced introduction strategies.

Implications for practice

The Activity-Index app enables data-based and continuous therapy documentation in daily practice, which reduces inefficient interventions and optimizes quality assurance.