



Berner
Fachhochschule



Abstracts der Master-Thesen 2025 Master of Science in Physiotherapie

Editorial

Sehr geehrte*r Leser*in

2 Es ist mir eine grosse Freude, Ihnen den Abstractband der Master-Thesen des Studiengangs Master of Science in Physiotherapie (MScPT) für das Jahr 2025 vorzustellen. Diese Tradition ermöglicht uns, die herausragenden Leistungen unserer Studierenden zu würdigen und ihre innovativen Forschungsarbeiten zu präsentieren.

Wie die Entwicklungen in den letzten Jahren zeigen, wird die Zukunft der Physiotherapie durch technologische Innovationen wie Künstliche Intelligenz, Robotik und Virtual Reality geprägt. Diese Technologien verbessern die Behandlungsqualität und ermöglichen personalisierte Therapiepläne.

Evidenzbasierte Praxis gewinnt weiterhin an Bedeutung, unterstützt durch systematische Reviews und randomisierte kontrollierte Studien. Die interdisziplinäre Zusammenarbeit zwischen verschiedenen Gesundheitsberufen wird intensiviert, um ganzheitliche Gesundheitskonzepte zu entwickeln.

Prävention und Gesundheitsförderung spielen zentrale Rollen, um Krankheiten vorzubeugen und die Lebensqualität zu verbessern. Die berufliche Weiterentwicklung der Physiotherapie wird durch bessere Vergütung, mehr Autonomie und stärkere Einbindung in die Patient*innenversorgung gefördert.

Mit einer alternden Bevölkerung wird die Nachfrage nach physiotherapeutischen Dienstleistungen weiter steigen. Unsere Absolvent*innen sind bereit, diese Herausforderungen anzunehmen und die Zukunft der Physiotherapie aktiv mitzugestalten.

Ich danke meinem Team sowie den Dozierenden und Betreuenden für ihre Unterstützung und gratuliere den MScPT-Absolvierenden herzlich zu ihren gelungenen Master-Thesen und ihrem Abschluss!

Mit freundlichen Grüssen,
Prof. Dr. Amir Tal



Prof. Dr.
Amir Tal
amir.tal@bfh.ch

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Marc Beer

Bern University of Applied Sciences, School of Health Professions,
Discipline of Physiotherapy, Bern, Switzerland

Two Tests to Assess Quadriceps Strength in the Physiotherapy Clinic: Comparison of Measurement Properties

5

Abstract

Background: Quadriceps strength must be monitored during rehabilitation after knee injury. Physiotherapists in private clinics can measure isometric strength with a fixed hand-held dynamometer (HHD), or isotonic strength with a 1-repetition maximum test (1RM) on a leg extension machine. But which test must be used preferably? Evidence is lacking about which test identifies side-to-side deficits more efficiently, correlates better with vertical jump height and has lower measurement error. This study aims to compare diagnostic accuracy, construct validity and intra-rater measurement error of HHD and 1RM in people who sustained a knee injury or surgery in the last 2 years.

Methods: Participants completed the protocol two times within 7 days. Quadriceps strength was measured with HHD and 1RM, alongside the single leg vertical hop (SLVH). Limb symmetry indexes (LSI) of each strength test were compared with a paired t-test to assess diagnostic accuracy. To facilitate interpretation, the smallest detectable change (SDC90) of LSI was estimated. Spearman's rho was calculated to correlate strength values with jump height for construct validity. The SDC90 of strength values was calculated to compare intra-rater measurement error between strength tests.

Results: 20 participants were included. Mean LSI was 3.6% [95CI 0.4, 6.9] lower for HHD ($p=0.03$) than 1RM, but only 9/40 lower limbs had differences exceeding the SDC90 of LSI. Correlations with the SLVH were fair for HHD (0.37, 0.47) and moderately strong for 1RM (0.65, 0.60). Most SDC90 of strength values were similar (12.3 – 13.3%), except HHD for uninvolved limbs (7.6%).

Conclusions: For return to sport decisions, both tests should be used initially to identify which one measures lower LSIs. To measure quadriceps strength related to jump height, 1RM should be used. To monitor strength levels, changes below 13% should be considered as measurement error for both tests.

Co-Autor:

Heiner Baur
PhD¹

¹Bern University of Applied Sciences, School of Health Professions, Discipline of Physiotherapy, Bern, Switzerland

Betreuungsperson:

Heiner Baur
PhD¹

Francesco Bellotto

Bern University of Applied Sciences, School of Health Professions,
Discipline of Physiotherapy, Bern, Switzerland

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Among Adults with Persistent Vestibular Disorders, How Does Person-Centered Rehabilitation Affect Function and Health-Related Quality of Life Compared with Standard Care Rehabilitation? A Systematic Review and Meta-Analysis

Abstract

Objective: Persistent vestibular symptoms, such as dizziness and imbalance, can significantly impair quality of life and daily functioning. While vestibular rehabilitation is supported by strong evidence, the integration of person-centered approaches remains poorly defined. This systematic review and meta-analysis aimed to evaluate the effectiveness of person-centered vestibular rehabilitation compared to standard care in improving function and quality of life among adults with persistent vestibular disorders.

Methods: A comprehensive literature search was conducted across five databases (PubMed, Embase, Cochrane Library, CINAHL, Web of Science) between October–November 2024 and updated in February 2025. Controlled studies or randomized controlled trials (RCTs) comparing person-centered vestibular rehabilitation against standard care were eligible. Two reviewers independently screened records, extracted data, and assessed risk of bias using the Cochrane Risk of Bias 2.0 tool. Meta-analyses were performed on Dizziness Handicap Inventory (DHI) and EQ-5D Visual Analogue Scale (VAS) outcomes. The certainty of evidence was assessed narratively according to GRADE. The review was conducted in accordance with PRISMA guidelines.

Results: Of 46 records screened, two RCTs met the inclusion criteria: the INVEST and MEND trials, both enrolling patients with Persistent Postural-Perceptual Dizziness (PPPD). Both trials reported statistically significant within-group improvements in dizziness-related disability and quality of life. However, neither showed statistically significant between-group differences. Pooled between-group mean differences were 6.56 points for DHI (95% CI: 0.88–12.24) and 6.84 points for EQ-5D VAS (95% CI: 1.12–12.57), favoring person-centered care. Yet, both effects remained below the established minimal clinically important difference (MCID) thresholds (DHI \approx 18; EQ-5D VAS \approx 7–10).

Conclusions: Based on two RCTs, person-centered vestibular rehabilitation may improve dizziness-related disability and quality of life in PPPD. However, pooled effects were below MCID thresholds, and the certainty of evidence was low to moderate. Future research should prioritize validated frameworks to define and measure person-centered care in this context.

Co-Autor*innen:

Balz Winteler
PT, MSc¹

Silvia Minder
PT, MSc¹

Hassen Kerkeni
MD²

¹Bern University of Applied Sciences, School of Health Professions, Discipline of Physiotherapy, Bern, Switzerland

²Inselspital Bern, Bern University Hospital, Neurology Department, Bern, Switzerland

Betreuungsperson:

Balz Winteler
PT, MSc¹

Anthony Bise

Bern University of Applied Sciences, School of Health Professions,
Discipline of Physiotherapy, Bern, Switzerland

Functional Testing to Predict Adaptive Normative Values for the Prevention of Upper Limb and Trunk Issues in Volleyball and Ice-Hockey Players – A Reliability and Feasibility Study

7

Abstract

Objective: To evaluate the reliability of the Star Excursion Trunk Test (SETT) and assess the feasibility of a study protocol for establishing reference intervals for upper limb and trunk stability tests in Swiss volleyball and ice hockey players.

Participants: Volleyball and ice hockey players aged 14-65 years.

Interventions: Participants completed the following standardized tests: Upper Quadrant Y-Balance Test (UQ-YBT), Closed Kinetic Chain Upper Extremity Test (CKCUET), SETT and Hip Bridge Endurance Test for Glutes (HBG). The Star Excursion Trunk Test was administered twice by different raters to assess reliability.

Main outcome measures: Inter-rater reliability of the SETT using intraclass correlation coefficients (ICCs), standard error of measurement (SEM), and Bland-Altman analysis. Feasibility of the study protocol was assessed using a traffic light system. Multiple regression models were developed to explore relationships between participant characteristics and test performance.

Results: Twenty-five participants completed the full test battery. The SETT demonstrated good to excellent inter-rater reliability, with the lateral right position showing the highest reliability (ICC = 0.925; 95% CI: 0.841-0.966; SEM = 2.50 cm) and the anterolateral left position showing the lowest (ICC = 0.757; 95% CI: 0.532-0.883; SEM = 4.85 cm). Bland-Altman analysis revealed a bias of -0.67 cm with limits of agreement from -11.81 to 10.47 cm. UQ-YBT and HBG regression models were statistically significant, explaining 73% and 38% of the variance. Models for CKCUET and SETT were not significant.

Conclusion: The SETT demonstrated good to excellent reliability across all measurement positions. While the study protocol was feasible, establishing reference intervals requires a larger sample size and methodological refinements. The findings support the use of the SETT as a reliable assessment tool and provide a foundation for future reference interval studies.

Keywords: Return to sport, functional testing, feasibility study, norm values, reference intervals, reliability

Co-Autoren:

Roger Hilfiker
PT, PhD¹

Julien Genou
PT, BSc²

¹Physiotherapie
Tschopp & Hilfiker,
Brig-Glis, Switzerland

²Bern University of
Applied Sciences,
School of Health Professions,
Discipline of
Physiotherapy, Bern,
Switzerland

Betreuungsperson:

Roger Hilfiker
PT, PhD¹

Natalie Blaser

Bern University of Applied Sciences, Department of Health Professions,
Discipline of Physiotherapy, Bern, Switzerland

8 Personality Traits and Learning Transfer in Physiotherapy Clinical Education: An Exploratory Mixed-Methods Study

Abstract

Background: Knowledge transfer in physiotherapy education is largely shaped by the relationship between students and clinical instructors. Personality traits influence the learning climate and collaboration. This study examines how personality matching affects clinical placements and to what extent the assessed traits align with a theoretically derived ideal profile.

Methods: This exploratory mixed-methods study developed two instruments: a matching matrix to evaluate personality congruence and a reference profile of profession-related traits. Quantitative data were collected from 43 student–instructor pairs. In addition, focus groups with clinical instructors captured subjective perspectives on matching, training needs, and professional requirements.

Results: No significant association was found between personality matching and grades assigned by clinical instructors (matching: $M = 5.27$, $SD = 0.52$; non-matching: $M = 5.20$, $SD = 0.53$; $p = 0.86$). However, students rated their experience significantly more positively when matched ($M = 5.80$, $SD = 0.55$) compared to non-matched situations ($M = 5.00$, $SD = 0.71$; $p = 0.0035$; $r = 0.44$). Learning climate ($M = 9.26$, $SD = 0.73$) and adaptability/reflection ($M = 9.20$, $SD = 0.77$) were perceived as particularly beneficial in matched pairs. The comparison with the theoretical profile revealed significant deviations: agreeableness was weighted more strongly (26.1% vs. 20%) and conscientiousness less (23.5% vs. 32%) (both $p < 0.001$).

Conclusion: Personality matching appears to positively influence the subjective experience of clinical placements, particularly the learning climate. Raising awareness of personality differences – e.g., through targeted training – may enhance the quality of clinical instruction. Given the wide diversity of physiotherapy practice settings, a rigid ideal profile seems inadequate. A reflective approach to interpersonal dynamics is key in educational contexts.

Keywords: Personality traits, transfer, physiotherapy, matching, Big Five model

Co-Autorin:

Irene König
PT, PhD¹

¹Bern University of Applied Sciences, Department of Health Professions, Bern, Switzerland

Betreuungsperson:

Irene König
PT, PhD¹

Samuel Briand

Bern University of Applied Sciences, School of Health Professions,
Discipline of Physiotherapy, Bern, Switzerland

One-Year Changes in Anthropometry, Strength, Functional Capacities, Cognition, and Quality of Life After Bariatric Surgery

9

Abstract

Introduction: Obesity is considered as a chronic disease with health consequences. Bariatric surgery is known to induce significant weight loss in individuals with severe obesity. However, its impact on muscular strength, functional capacity, cognitive function, and quality of life remain underexplored. This study aimed to evaluate these changes at three-, six- and twelve-month following a Roux-en-Y gastric bypass (RYGB).

Methods: The study followed a longitudinal design over a one-year follow-up. Twenty-five patients undergoing RYGB surgery were assessed at pre-surgery, three-, six- and twelve-month post-surgery. Measured outcomes included body weight, Body Mass Index (BMI), waist circumference, absolute and relative strength of the muscle quadriceps femoris, Six Minute Walk Test (6MWT), Five Times Sit-to-Stand (5STS), Functional Reach Test (FRT), Trail Making Tests (TMT parts A & B), and Impact of Weight on Quality of Life Questionnaire-Lite (IWQOL-Lite) scores. Repeated measures ANOVA were used to analyze changes over time, followed by post-hoc comparisons for adjusted p-values and Cohen's d for effect size calculations.

Results: The repeated measures ANOVA showed statistically significant decreases for body weight ($F(1.53, 36.71) = 205.28, p < 0.001$), BMI ($F(1.53, 36.73) = 229.07, p < 0.001$), waist circumference ($F(1.47, 35.20) = 34.62, p < 0.001$) and absolute strength ($F(2.2, 52.76) = 7.15, p < 0.001$) over the twelve-month period. Statistically significant improvements were found for relative strength ($F(3, 72) = 6.18, p < 0.001$), 6MWT ($F(3, 72) = 19.19, p < 0.001$), 5STS ($F(1.48, 35.53) = 6.80, p < 0.05$) and IWQOL-Lite total score ($F(3, 63) = 37.69, p < 0.001$). The FRT and TMT remained stable with no significant change. Post-hoc comparisons showed that the most statistically significant changes occurred during the three and six months after surgery for weight, BMI, waist circumference, absolute strength, 6MWT and most IWQOL-Lite subdomains.

Conclusion: The results highlight the importance of post-surgery interventions during at least the first three to six months to limit absolute strength reduction.

Co-Autorinnen:

Simone Gafner
PT, PhD¹

Sophie Carrard
PT, MSc¹

¹School of Health Sciences, University of Applied Sciences and Arts of Western Switzerland, Sion, Switzerland

Betreuungsperson:

Simone Gafner
PT, PhD¹

Andrea M. Britschgi

Bern University of Applied Sciences, School of Health Professions,
Discipline of Physiotherapy, Movement Laboratory, Bern, Switzerland

10 Neuromuscular Control During Gait in Adults Following Femoral Derotation Osteotomy for Posterior Extra-Articular Hip Impingement

Abstract

Background: High femoral anteversion ($>25^\circ$, Murphy Method) is associated with increased internal hip rotation and compensatory gait patterns, potentially contributing to joint instability and posterior hip impingement symptoms. Subtrochanteric femoral derotation osteotomy (SFDO) is indicated when conservative treatments fail. Its long-term effects on neuromuscular control during gait remain largely unexplored.

Research questions: Does muscle activation of gluteus medius, biceps femoris, rectus femoris, and vastus medialis differ between adults treated with SFDO and healthy controls? Does increased gait speed cause asymmetries in muscle activation between operated and non-operated limbs?

Methods: A retrospective cross-sectional study was conducted comparing adults following SFDO ≥ 5 years ago with healthy controls. Neuromuscular and spatiotemporal parameters were assessed using surface electromyography and three-dimensional gait analysis under two different gait speed conditions. Additionally, patient-reported outcome measures (PROMs), hip rotation mobility, and three provocation tests were evaluated.

Results: Nine females treated with SFDO (age 30.6 ± 4.0 y) and 21 controls (13 females, 8 males; 33.1 ± 7.0 y) were included. EMG analysis revealed no significant differences in muscle activation between groups across the observed muscles. Increased gait speed did not result in significant inter-limb differences within the SFDO group. PROMs indicated a mean Subjective Hip Value of 0.83 ± 0.18 , an iHOT-12 score of 82.6 ± 18.1 , and a UCLA activity score of 8.2 ± 2.0 . Hip rotation mobility was similar in both groups (internal: SFDO $41.3^\circ \pm 8.6^\circ$, controls $39.4^\circ \pm 6.5^\circ$, $p = 0.54$; external: SFDO $43.0^\circ \pm 8.0^\circ$, controls $40.0^\circ \pm 6.3^\circ$, $p = 0.32$).

Significance: This study suggests that neuromuscular control is within normal limits in SFDO patients ≥ 5 years post-surgery, with favorable patient-reported outcomes and restored hip rotational capacity.

Keywords: femoral derotation osteotomy, gait analysis, neuromuscular control, posterior extra-articular hip impingement

Co-Autor*innen:

Patric Eichelberger
PhD¹

Denise Imsand
PT, BSc²

Tilman K. Kaim
MD³

Till D. Lerch
MD, PhD³

Emanuel F. Liechti
MD, PhD⁴

¹Bern University of Applied Sciences, School of Health Professions, Discipline of Physiotherapy, Movement Laboratory, Bern, Switzerland

²Paris Lodron University, Department of Sport and Movement Science, Salzburg, Austria

³Inselspital Bern, Bern University Hospital, Institute for Diagnostic, Interventional and Pediatric Radiology, Bern, Switzerland

⁴Inselspital Bern, Bern University Hospital, Department of Orthopedic Surgery and Traumatology, Bern, Switzerland

Betreuungsperson:

Patric Eichelberger
PhD¹

Validation of physiotherapy-specific situations as starting point

Abstract

Background: Medical education faces the challenge of preparing students not only with theoretical knowledge but also with practical skills for their professional careers. Competency-based medical education in Switzerland, including the PROFILES framework, utilizes Entrustable Professional Activities (EPAs) and Situations as Starting Point (SSPs) to gradually guide students toward independent responsibility. While these approaches are well established in medicine, they are still new in physiotherapy, which is why the Bern University of Applied Sciences is developing corresponding EPAs. As part of this master thesis, SSPs for the musculoskeletal field were developed based on the International Classification of Functioning, Disability, and Health (ICF).

Objective: This study aims to examine the applicability of these physiotherapy-specific SSPs in daily clinical practice with students.

Method: This qualitative study validated physiotherapy-specific SSPs through three focus groups consisting of experts from education, clinical practice, and professional associations. Data were collected via online semi-structured interviews with focus group discussions. The Knowledge Mapping technique was used to visualize the data, which was then evaluated using content analysis.

Results: Three main categories emerged from the 17 participants in the focus groups, further refined into eight subcategories using a focus illustration map. The main category Structure of SSPs was divided into four subcategories: categorization, complexity, body regions, and professional practice. The second main category, Implementation of SSPs, included granularity and complexity. The third main category, SSPs as a structuring element in the curriculum, was divided into structuring element in practical training and module planning and learning content.

Conclusion: The results indicate that physiotherapy-specific SSPs provide a clear structure that support students in their education and serve as a reference point, particularly in practical training. Future research should focus on further developing SSPs and their integration with EPAs to optimize competency-based education in physiotherapy.

Co-Autorin:

Irene König
PT, PhD¹

¹Bern University of Applied Sciences, School of Health Professions, Discipline of Physiotherapy, Bern, Switzerland

Betreuungsperson:

Irene König
PT, PhD¹

Pauline Fladung

Bern University of Applied Sciences, School of Health Professions,
Discipline of Physiotherapy, Bern, Switzerland

12 Influence of the Menstrual Cycle on a Return to Sport Performance Test «Quality First»

Abstract

Women are more likely to rupture the anterior cruciate ligament than men. Hormonal fluctuations have recently been discussed as an influencing factor, since it appears that more anterior cruciate ligament (ACL) injuries occur during the late follicular (LF) phase compared to the mid luteal (ML) phase. Despite this, there is limited evidence to suggest whether hormonal changes may influence the outcome of a physical performance test tool, such as the «Quality First» assessment. This study investigated the influence of menstrual cycle (MC) phases on movement quality and performance using the «Quality First» assessment tool. A sample of 20 non-athletic women was tested in the late follicular (LF) and mid-luteal (ML) phases, determined via self-reported cycle tracking and luteinizing hormone (LH) urine testing. Participants performed the «Quality First» assessment to assess the outcomes of movement quality and performance during three single leg jumps: vertical hop (VH), single leg hop for distance (SHD) and side hop (SH). Movement quality was evaluated through a 2D video analysis using the scoring system of the «Quality First» assessment, and physical performance was assessed using a measurement tape for jump distance (cm), an application for jump height measurements, and a retrospective video analysis to estimate the frequency of correct jumps. A Wilcoxon rank test revealed significantly lower movement quality scores in the LF phase, particularly in knee valgus after vertical hopping ($p = 0.01$, $r = 0.6$). At the same time, the paired t-test for dependent samples used for performance outcomes showed negligible to small differences ($r = 0.08 - 0.4$) between phases. A Spearman correlation analysis confirmed a minimal association between movement quality and performance ($r = -0.55$ to 0.36 for the dominant leg, and -0.35 to 0.35 for the non-dominant leg). Despite methodological limitations, including a small sample size and testing in only one MC, the findings of a significantly lower «Quality First» score from the VH ($p = 0.01$) at the LF phase and the overall lower score when comparing the LF phase with the ML phase suggest a potential influence of hormonal fluctuations on a decreased movement quality at the LF phase. This highlights the relevance of menstrual phase-aware RTS testing, although further research is needed across multiple cycles and larger cohorts.

Keywords: menstrual cycle; physical performance test; return to sport test; knee joint laxity; injury risk

Co-Autor:

Heiner Baur
PhD¹

¹Bern University of Applied Sciences, School of Health Professions, Discipline of Physiotherapy, Bern, Switzerland

Betreuungsperson:

Heiner Baur
PhD¹

Julien Genoud

Bern University of Applied Sciences, School of Health Professions,
Discipline of Physiotherapy, Bern, Switzerland

Test and Prevention for Lower Limb and Trunk Issues for Volleyball and Ice Hockey Players in Switzerland, a Feasibility Study

13

Abstract

Objective: To determine the feasibility of establishing reference intervals for a cluster of stability tests used in physiotherapy practice and to identify the optimal protocol conditions for a future definitive study.

Participants: Volleyball and ice hockey players aged 14-65 years old.

Interventions: Participants completed eight standardized stability tests (four lower limb, two upper limb, two trunk) using the T-training carpet measurement tool.

Main outcome measures: Primary outcomes included feasibility metrics (recruitment, eligibility, allocation, consent, attendance, and completion rates) and protocol uncertainties. Secondary outcomes assessed the influence of demographic factors on test performance and determined required sample size for establishing reference intervals.

Results: All feasibility criteria achieved satisfactory thresholds (green status) except for the recruitment rate, which required minor improvements (amber status). Twenty-six participants (N=26) completed the full test battery. The data collection system via a custom Shiny App needed improvements in specific functionality. Sample size calculation determined that 249 participants would be required for the definitive study, with testing sessions requiring 40-60 minutes per participant.

Conclusions: This feasibility study demonstrated that establishing reference intervals for stability tests is achievable with modifications. The data entry system requires improvements regarding user interface and data security. Additionally, a more comprehensive recruitment strategy must be implemented for the future larger reference interval study.

Keywords: feasibility study, stability cluster, reference interval, protocol evaluation, test and prevention

Co-Autoren:

Roger Hilfiker
PT, PhD¹

Anthony Bise
PT, BSc²

¹Physiotherapy
Tschopp & Hilfiker,
Brig-Glis, Switzerland

²Bern University of
Applied Sciences,
School of Health Professions,
Discipline of
Physiotherapy, Bern,
Switzerland

Betreuungsperson:

Roger Hilfiker
PT, PhD¹

Sébastien Güdel

Bern University of Applied Sciences, School of Health Professions,
Discipline of Physiotherapy, Bern, Switzerland

14 Effects of Partial Weight Bearing on Hip Joint Biomechanics During Stair Ascent and Descent in Adults: A Pilot Study

Abstract

Background: Weight-bearing restrictions of the lower limb are frequently prescribed after orthopedic trauma or surgery, such as lower-limb fracture or osteotomy. However, there is a lack of data concerning the biomechanical effects on the hip joint during ascending and descending stairs, even though this is an important activity of daily living.

Objective: The aim of this study is to identify the effects on the biomechanics of the hip joint and the occurring forces acting on the hip joint during stair ascent and descent with unilateral partial weight bearing in adults.

Method: Twenty-one healthy adults ascended and descended stairs with four different weight-bearing indications. Three-dimensional motion capture system with integrated force plates and force measurement insoles were used for data collection. Musculoskeletal modelling and descriptive statistics were conducted. Data of seven participants on descending stairs was considered for the results. Hip angles data from the Conventional Gait Model 2 and OpenSim gait2392 model was in majority consistent.

Results: Descending stairs generated hip joint contact forces roughly four times the own body weight force. On the side to be discharged, heterogeneity was found in the force data and the greater the unloading, the smaller the hip joint contact force was. Walking cadence and walking speed decreased during partial load application compared to full load condition.

Conclusion: To obtain more consistent hip joint angle and hip joint contact force data and enable analysis of stair ascension as well as from more data of initially measured participants, further development of the study, particularly in data procession methodology, is necessary.

Keywords: hip joint, stairs, partial weight bearing, biomechanics, joint contact force

Co-Autor*innen:

Patric Eichelberger
PhD¹

Sonia Weissteiner
PT, BSc²

¹Bern University of Applied Sciences, School of Health Professions, Discipline of Physiotherapy, Movement Laboratory, Bern, Switzerland

²Bern University of Applied Sciences, School of Health Professions, Discipline of Physiotherapy, Bern, Switzerland

Betreuungsperson:

Patric Eichelberger
PhD¹

Functional Restrictions in Activities of Daily Living With Partial Weight-Bearing – A Cross-Sectional Pilot Study

Abstract

Background: Hip fractures are common, and surgeons usually prescribe postoperative partial weight-bearing (PWB). Such restrictions increase morbidity and mortality. This cross-sectional pilot study assesses how PWB affects functional mobility in everyday activities and evaluates how people deal with crutches.

Method: Included were healthy adults (> 18 years) without acute impairment of the limbs or the trunk. They conducted the short form Continuous-Scale Physical Functional Performance Test (CS-PFP 10) without restrictions. Then, they were instructed to bear no more than 20 kilograms on one leg and redid the test with crutches. Functional mobility was calculated as CS-PFP 10 total score and subscores of the domains upper body strength, upper body flexibility, lower body strength, balance and coordination, and endurance. The values of the tests without and with PWB were compared using the t-test for dependent samples. Movement strategies and crutch use with PWB were presented descriptively.

Results: 20 volunteers (age 40.4 ± 16.6 years, body weight 67.0 ± 12.3 kg) participated. With PWB, they scored significantly lower in the CS-PFP 10 total scores (72.2 ± 9.8 vs. 38.4 ± 14.1) and all five subscores. The difference was greatest in balance and coordination (69.9 ± 10.2 vs. 34.6 ± 15.1) and endurance (70.8 ± 10.1 vs. 34.2 ± 15.0). With PWB, the participants performed worst in lower body strength (34.6 ± 14.8), balance and coordination (34.6 ± 15.1), and endurance (34.2 ± 15.0). In movement analysis, several different strategies were observable in the tasks «Pan Carry», «Scarves», «Floor Sweep», «Laundry», and «Floor Sit». The tasks «Jacket», «Reach», «Stair Climb», «Groceries», and «Walk» were solved similarly.

Conclusion: PWB significantly reduces functional mobility in everyday activities. To enhance patients' independence, postoperative physiotherapy should instruct safe and tailored strategies for more complex tasks. The CS-PFP 10 is feasible with PWB in clinical practice or research.

Co-Autor*innen:

Heiner Baur
PhD¹

Tanya Hauswirth
PT, BSc¹

¹Bern University of Applied Sciences, School of Health Professions, Discipline of Physiotherapy, Bern Movement Lab, Bern, Switzerland

Betreuungsperson:

Heiner Baur
PhD¹

Simon Honsell

Bern University of Applied Sciences, School of Health Professions,
Discipline of Physiotherapy, Bern, Switzerland

16 Pain Knowledge and Beliefs Predict Guideline Adherence Among Physiotherapists

Abstract

Background: The high prevalence of low back pain (LBP) is attributed to deficits in the quality of healthcare, including physiotherapy (PT). Adherence to guidelines for the treatment of people with LBP by PT professionals is insufficient. The reasons for this are not yet fully understood.

Aim: This study aimed to determine the extent to which PT professionals' knowledge of pain and postural-structural-biomechanical (PSB) beliefs explain adherence to guidelines in the treatment of people with LBP.

Method: An online survey was conducted among 184 PT professionals in Switzerland. The survey included the German version of the revised Neurophysiology of Pain Questionnaire (rNPQ-D) to measure knowledge about pain, the Essential Knowledge of Pain Questionnaire (EKPQ) to assess PSB beliefs and a LBP case vignette to assess guideline adherence. The data was analysed using multiple linear regression.

Results: The rNPQ-D score ($B = 0.333$; $p = 0.019$) and the EKPQ score ($B = 0.450$; $p < 0.001$) proved to be significant predictors and together explained 21.16% of the variance in the score of the LBP case vignette ($p < 0.001$). Higher knowledge about pain and less prevalent PSB beliefs were associated with greater adherence to guidelines.

Discussion: Targeted training in pain neurophysiology and the deconstruction of PSB-orientated thinking could help to promote guideline adherence of PT professionals among people with LBP. Based on behavioural theories, future research should identify further factors influencing the adherence of PT professionals to guidelines.

Keywords: Pain knowledge, Clinical decisions, Low back pain, Physical therapy, Biopsychosocial

Co-Autoren:

Slavko Rogan
PhD¹

Kay-Uwe Hanusch
PT, PhD¹

¹Bern University of Applied Sciences, School of Health Professions, Discipline of Physiotherapy, Bern, Switzerland

Betreuungsperson:

Slavko Rogan
PhD¹

Nino Janki

Bern University of Applied Sciences, School of Health Professions,
Discipline of Physiotherapy, Bern, Switzerland
REHAB Basel, Clinic for Neurorehabilitation and Paraplegiology, Basel, Switzerland

Pain Prevalence, Phenotypes & Management of Patients Undergoing Neurological Rehabilitation: A Cross-Sectional Observational Study

17

Abstract

Objective: To evaluate prevalence and phenotypes of pain in inpatients with neurological disorder and to describe interprofessional pain management and patient satisfaction in a Swiss neurorehabilitation clinic.

Participants: Inpatients with diagnosed neurological disorder, >18, with Montreal Cognitive Assessment (MoCA) >19 for self-report and <19 for observational assessment.

Intervention: Patients with MoCA >19 completed a supported self-report questionnaire, assessing pain prevalence, phenotypes (nociceptive, nociplastic and neuropathic) and management. Patients with MoCA <19 were assessed using the Zurich Observational Pain Assessment (ZOPA). Healthcare professionals completed a questionnaire on pain management.

Main measures: Primary outcome was pain prevalence. Secondary outcomes were prevalence of main and additional pain phenotypes, severity of pain, association with neurological disorder, patient satisfaction, evaluation of interprofessional pain management and type of prescribed pain medication.

Results: A total of 79 inpatients were included (57 with questionnaire, 22 with ZOPA). Overall pain prevalence was 58.2% (95%-CI 47.2%-68.5%). All patients had multiple pain phenotypes (38.5% all 3; 61.5% 2), nociceptive (61.5%) and nociplastic pain (30.8%) were most frequent. Mean pain intensity overall was 3.1 (95%-CI 2.2-4, on Numeric Rating Scale 0-10). 89.5% of healthcare professionals reported assessing pain, 42.1% applying standardised procedures. Interprofessional pain management was rated «very good» or «good» by 64.9% of patients.

Conclusion: The results indicate a high pain prevalence and complex phenotypes in patients with neurological disorders. While interprofessional pain management is valued, standardised assessment and documentation require improvement. Future research should validate practical tools for pain phenotypes differentiation and develop implementation strategies for interprofessional teams.

Keywords: Pain, prevalence, phenotypes, neurological disorders, inter-professional relations.

Co-Autor*innen:

Clare Maguire
PT, PhD^{1,2}

Kay-Uwe Hanusch
PT, PhD²

¹REHAB Basel, Clinic
for Neurorehabilitation
and Paraplegiology,
Basel, Switzerland

²Bern University of
Applied Sciences,
School of Health Pro-
fessions, Discipline of
Physiotherapy, Bern,
Switzerland

Betreuungsperson:

Clare Maguire
PT, PhD^{1,2}

Tom Klotti

Bern University of Applied Sciences, School of Health Professions, Bern, Switzerland

18 Perspectives of Male Patients on Early Physiotherapy in a Swiss Emergency Department: A Qualitative Analysis

Abstract

Background: Emergency departments (EDs) in Switzerland are increasingly confronted with non-life-threatening conditions, including musculoskeletal (MSK) complaints. While physiotherapists are integrated into ED care in several international contexts, this practice is still emerging in Switzerland.

Objective: This study explores how males with MSK complaints perceive early physiotherapy (PT) interventions in a Swiss university hospital ED, providing a gendered complement to previous work on females.

Method: Using an interpretative phenomenological approach (IPA), 11 semi-structured interviews were conducted within a standardized ED setting, where physiotherapists were consulted following triage and medical assessment.

Results: The analysis revealed five interconnected themes: (1) the experience prior to PT, marked by uncertainty and emotional strain; (2) PT as an unexpected but welcome intervention; (3) the therapeutic encounter, characterized by empathy, professionalism, and hands-on care; (4) perceived physical and emotional outcomes; and (5) broader reflections on PT's value in the ED context. Participants emphasized the humanizing and supportive nature of the PT encounter, often describing relief from pain and anxiety. Even when the therapeutic effect was difficult to isolate from other treatments, the intervention was valued as a meaningful and timely contribution to care.

Conclusion: These findings support the integration of physiotherapists into EDs as a patient-centred strategy with particular relevance to MSK management. Further research should explore broader populations and system-level implementation strategies.

Co-Autor*innen:

Balz Winteler
PT, MSc^{1,2}

John Zürcher
PT, BSc¹

David Beckwée
PT, PhD³

¹Bern University of Applied Sciences, School of Health Professions, Discipline of Physiotherapy, Bern, Switzerland

²Inselspital Bern, Bern University Hospital, Institute of Physiotherapy, Bern, Switzerland

³Vrije Universiteit Brussel, Brussels Health Campus, Brussels, Belgium

Betreuungsperson:

Balz Winteler
PT, MSc^{1,2}

Benjamin Moser

Bern University of Applied Sciences, School of Health Professions,
Discipline of Physiotherapy, Bern, Switzerland

Effectiveness of a 12-Week Training Routine for Injury Prevention in Skateboarding: A Pilot Randomized Controlled Trial 19

Abstract

Introduction: Skateboarding has evolved into a global sport with increasing popularity and complexity, raising concerns about injury risks. Although prior studies suggest high injury rates among skateboarders, there is no available evidence on the effectiveness of sport-specific training for injury prevention. This pilot study aims to evaluate the feasibility and potential impact of a 12-week functional training program for skateboarders in Switzerland.

Methods: A total of 38 adult skateboarders (aged 18–40) were randomly assigned to an intervention group (IG) or control group (CG). The IG completed a 12-week online training program targeting mobility, strength, and balance, in addition to regular skateboarding. Injury occurrence and subjective balance confidence were assessed at baseline, post-intervention, and at a 12-week follow-up using an online questionnaire including a skateboard adapted version of the Activities-specific Balance Confidence (ABC) Scale. Feasibility metrics and user feedback were collected.

Results: No statistically significant differences were observed between groups regarding injury reduction or ABC Scale outcomes. However, the IG showed a non-significant trend toward fewer injuries across all measurement periods, especially from baseline to follow-up. Differences in baseline injury status were observed between groups. Questionnaire clarity was rated positively by 74.2% and most participants found the recall period for injuries feasible.

Conclusion: Although the IG did not show statistically significant lesser injuries in comparison to the CG, the observed trend toward injury reduction suggests potential benefits of functional training for skateboarders. The study design proved generally feasible; however, future research should aim to monitor adherence strategies, ensure better baseline group balance, validate assessment tools, and include a larger sample size to assess intervention effects.

Keywords: Skateboarding, injury, prevention, training, exercise, pilot study, randomized controlled trial (RCT)

Co-Autor*innen:

Aglaja Busch
MSc¹

Patric Eichelberger
PhD¹

¹Bern University of Applied Sciences, School of Health Professions, Division of Physiotherapy, Bern Movement Lab, Bern, Switzerland

Betreuungsperson:

Aglaja Busch
MSc¹

Quentin Brossard

Bern University of Applied Sciences, School of Health Professions,
Discipline of Physiotherapy Bern, Switzerland

20 Knowledge and Attitudes Towards Concussions Among Staff and Players of the Elit U17 and U20 Ice Hockey Teams in Switzerland

Abstract

Background: Each year, between 1.1 and 1.9 million young athletes in the United States suffer concussions, primarily in contact sports such as ice hockey. These injuries can have harmful consequences in the short, medium, and long term. In Switzerland, there is a lack of data regarding concussions in junior hockey.

Purpose: To examine the knowledge and attitudes of players, coaches, and medical staff regarding the general definition of concussions, their signs and symptoms, and factors influencing player compliance.

Methods: Data were collected from junior ice hockey leagues in Switzerland (U17 Elit and U20 Elit). An online survey tool was used. The survey included the Rosenbaum Concussion Knowledge and Attitudes Survey (RoCKAS) and additional questions examining concussion education and factors influencing attitudes toward concussions.

Results: The average score on the Concussion Knowledge Index (CKI) was 16.75 ± 2.7 out of 25, indicating moderate to good knowledge. The average score on the Concussion Attitudes Index (CAI) was 61.14 ± 6.75 out of 75, reflecting generally positive attitudes toward concussion management. However, 43.6% of players reported that they would continue to play despite a headache caused by a minor concussion. Regarding factors influencing post-concussion protocol, 60% of players cited the importance of the game.

Conclusion: This study shows generally satisfactory knowledge and attitudes. However, notable differences exist between players, coaches, and medical staff. The results reveal risky behaviours among players, the majority of whom have not undergone specific training.

Keywords: Attitudes, Concussions, Junior Ice Hockey, Knowledge, Switzerland

Co-Autoren:

Joane Le Carré
MSc¹

Philippe Vuistiner
MSc¹

¹CRR SUVA, Research
Department, Sitten,
Switzerland

Betreuungsperson:

Bertrand Léger
PhD¹

Outdoor-Interventions as Supportive Treatment for Adolescents with Post-Traumatic Stress Disorder – a Mixed-Method Analysis

Abstract

Introduction and objectives: Post-traumatic stress disorder (PTSD) is described as a prevalent, multisystemic condition with a wide range of symptoms and comorbidities that leads to severe life restrictions and burdens. Outdoor interventions (OIs), which can have a stabilising effect on emotion regulation processes, can be used physiotherapeutically to support trauma-focused (first-line) therapy. A few studies have already pointed to factors influencing OIs, which should be taken into account by practitioners. Deepening this topic, the study's aim is to comprehensively analyse factors influencing OIs within the age group 14–18 years, which has so far been underrepresented in studies.

Methods: A mixed-method approach was applied. The main focus was on a qualitative content analysis of 5 interviews (á 52-77 min) with practising health experts in German-speaking countries. Preparation and coding of transcripts were carried out by two independent coders; code frequencies were summarised. Results were schematically organised using the EPIS model constructs.

Results: Health experts reported multiple inhibiting and facilitating influencing factors, amongst which there are various interrelations and directions of impact. The analysed influencing factor categories include the setting of the intervention; infrastructure; client-, PTSD-, and specialist-specific factors; professionalisation; and relationships. Specialist preparation, funding options, reflexion, social and relational dynamics, and the motivation of professionals and clients were described in particular detail.

Discussion and Conclusions: In line with current literature, interviewed experts reported on different factors influencing OIs. PTSD- and OI-specific training, as well as crisis management courses and local knowledge, are recommended. Research regarding specific influencing factors, facilitation options for OIs, and the perspective of those affected is needed.

Keywords: post-traumatic stress disorder, outdoor-interventions, nature, therapy influencing factors, qualitative content analysis, professionalisation

Co-Autorinnen:

Dorit van Meel
PhD¹

Lena Simone Schmidt
BSc²

¹Zurich University of Applied Sciences, School of Life Sciences and Facility Management, Wädenswil, Switzerland

²Bern University of Applied Sciences, School of Health Professions, Discipline of Physiotherapy Bern, Switzerland

Betreuungsperson:

Dorit van Meel
PhD¹

Lena Schmid

University of Zurich, Institute of Biomedical Ethics and History of Medicine (IBME),
Zürich, Switzerland

22 Dialogue on Equal Terms: The Importance of Conversation in the Physiotherapeutic Relationship With People Living With Chronic Pain – A Qualitative Exploratory Analysis

Abstract

Background: The way physiotherapists talk to patients with chronic pain plays a central role in building a therapeutic relationship. It serves to convey information, and it is an important therapeutic intervention that should be emphasised more in both education and clinical practice. As an interactive process, conversation forms the foundation for a therapeutic relationship, fosters interpersonal trust, and enables a shared understanding of the pain experience.

Purpose: This study aims to explore how physiotherapists in the German-speaking part of Switzerland experience and describe conversations with patients suffering from chronic pain – regarding to their significance for the therapeutic relationship in outpatient settings.

Methods: A qualitative, exploratory study design was employed. The study involved seven semi-structured interviews with experienced physiotherapists specialized in treating patients with chronic pain. The interviews were transcribed and analyzed using Interpretative Phenomenological Analysis.

Results: The analysis revealed four central themes: 1) the role of dialogue in physiotherapy when treating patients with chronic pain, 2) the impact of therapeutic relationship and attitude on treatment, 3) value-based therapy and its significance for patient-centered therapies, and 4) professional identity and self-concept in pain physiotherapy.

Discussion: Conversation with patients experiencing chronic pain is a key therapeutic skill in physiotherapy. It strengthens trust, promotes self-efficacy, and supports patient-centered therapy planning. The study shows that communication is understood as an effective intervention that requires time, reflection, and specific training.

Conclusion: Physiotherapists describe therapeutic conversation not merely as a tool, but as an integral component of physiotherapeutic practice.

Keywords: dialog, conversation, therapeutic relationship, physical therapy, chronic pain

Co-Autorin:

Andrea Glässel
PT, MSc, MPH, MAE^{1,2}

¹University of Zurich
Institute of Biomedical
Ethics and History
of Medicine (IBME),
Zürich, Switzerland

²Institute of Public
Health ZHAW, Zürich
and Winterthur, Swit-
zerland

Betreuungsperson:

Andrea Glässel
PT, MSc, MPH, MAE^{1,2}

Raphael Gion Strähl

Bern University of Applied Sciences, School of Health Professions,
Discipline of Physiotherapy Bern, Switzerland

Custom Rail System-Guided Ultrasound Imaging of the Paravertebral Muscle: An Intra- and Interrater Reliability Study 23

Abstract

Objective: This study aimed to evaluate the intra- and inter-rater reliability of a custom build rail-guided ultrasound (US) system using the handheld Vscan Air CL to measure cross-sectional area (CSA) and muscle thickness (MT) of paravertebral muscles bilaterally at spinal levels L4, L1, and T8.

Methods: Twelve healthy adults (5 female, 7 male) were measured bilaterally at three spinal levels by a single rater on two occasions within one week to assess intra-rater reliability. For inter-rater reliability, five participants were additionally assessed by a second rater. The rail system ensured consistent contact force of the probe (0.5 kg) and segmental alignment. The probe's central rotation allowed for transverse CSA and longitudinal MT images in the same position. Images were analyzed using Image J. Reliability was assessed via intraclass correlation coefficients (ICC) (1,1) for intra-rater and ICC (3,1) for inter-rater reliability, along with root mean squared error (RMSE), bias, and 95% limits of agreement (LoA) from Bland–Altman plots.

Results: Intra-rater reliability was excellent for CSA (ICC = 0.994) and good for MT (ICC = 0.882). Inter-rater reliability was similarly high (CSA: ICC = 0.952; MT: ICC = 0.877). Bland–Altman analysis showed minimal bias (intra: 0.02 cm² CSA, -0.10 cm MT; inter: 0.24 cm² CSA, 0.10 cm MT), narrow LoA (intra: CSA -0.54 to 0.57 cm², MT -0.95 to 0.74 cm; inter: CSA -0.96 to 1.44 cm², MT -0.74 to 0.93 cm), and RMSE values < 0.7 for all measures.

Conclusion: The rail-guided US system enables consistent, repeatable assessment of the CSA and MT of the m. multifidus and m. splenius. Its mechanical guidance and standardized protocol significantly reduce variability and provide reliable data, suggesting this method as a viable alternative to MRI in musculoskeletal assessment.

Keywords: Ultrasound imaging, paravertebral muscles, cross-sectional area, muscle thickness, m. multifidus, m. spinalis

Co-Autor:

Stefan Schmid
PT, PhD¹

¹Bern University of Applied Sciences, School of Health Professions, Discipline of Physiotherapy, Bern Movement Lab, Bern, Switzerland

Betreuungsperson:

Stefan Schmid
PT, PhD¹

Sonia Weissteiner

Bern University of Applied Science, School of Health Professions
Discipline of Physiotherapy, Bern, Switzerland

24 Effects of Partial Weight Bearing on Knee Joint Biomechanics During Stair Ascent and Descent in Healthy Adults: A Pilot Study

Abstract

Background: Partial weight bearing (PWB) is commonly prescribed after knee trauma or surgery, yet its biomechanical implications—especially during stair ambulation—remain poorly understood.

Objective: This pilot study aimed to assess the feasibility of using musculoskeletal modeling to quantify knee joint contact forces (JCFs) during stair ascent and descent under varying PWB conditions in healthy adults.

Methods: Twenty participants (mean age 28.3 ± 5.3 years; mean weight 62.4 ± 11.28 kg) performed stair ascent and descent under four loading conditions (100%, 75%, 50%, and 20% body weight) using forearm crutches and a three-point gait. We collected marker-based motion capture and force insole data and analysed them in OpenSim using a custom-modified gait2392 model.

Results: While data collection was feasible for all participants, we obtained biomechanically plausible simulation results only for stair descent and only for seven participants, due to technical limitations in estimating ground reaction forces (GRFs) and Centre of Pressure (CoP). During stair descent, peak knee JCFs decreased from 4.4 times body weight at full loading to 1.6, 1.08, and 0.66 times at 75%, 50%, and 20% loading, respectively. Reductions in JCFs were not proportional to the external load.

Conclusions: These findings suggest that even moderate load reductions can substantially decrease internal knee loading. Further refinement of the modeling approach is required to ensure accurate, reliable, and valid estimation of knee JCFs.

Keywords: knee joint; biomechanics; partial weight bearing; stair ascent and descent; musculoskeletal modeling

Co-Autoren:

Patric Eichelberger
PhD¹

Sébastien Güdel
PT, BSc¹

¹Bern University of Applied Sciences, Department of Health Professions, Discipline of Physiotherapy, Bern Movement Lab, Bern, Switzerland

Betreuungsperson:

Patric Eichelberger
PhD¹

Renata Zenhäusern

Bern University of Applied Sciences, School of Health Professions,
Discipline of Physiotherapy, Bern, Switzerland

Success Factors in Youth Football: A Qualitative Study at Footeco Oberwallis

25

Abstract

Background: The athletic development of young football players is influenced by more than just physical performance. Psychological, social, individual, and environmental aspects such as motivation, emotional stability, family support, and resilience play a crucial role in long-term success and well-being in sport.

Aim: This master's thesis aimed to identify and prioritize key success factors for youth football in the Footeco Oberwallis development program and to develop practical, context-specific recommendations.

Methods: A literature review formed the basis for a model of success factors across four dimensions: physical, psychological, social, and individual/environmental. In the first phase, a workshop using the Nominal Group Technique was conducted with athletes, parents, and coaches to collect and prioritize key factors. In the second phase, selected challenges were explored through a participatory action research workshop, in which tailored solutions were developed collaboratively. Special attention was given to the role of physiotherapists, particularly in relation to mental and physical assessments, ongoing health monitoring, and Return to Play after injuries.

Results: The results highlight the importance of factors beyond physical fitness and skills, including motivation, general health, emotional resilience, and a supportive environment shaped by family and coaching staff. Based on these insights, a Footeco-specific success factor model was developed, along with a practical annual program to strengthen collaboration between athletes, coaches, parents, and professionals.

Conclusions: The findings underscore that sustainable performance and well-being in youth football can only be achieved through a holistic, athlete-centered, and interdisciplinary approach that addresses all relevant influencing factors.

Keywords: athletic development in adolescents, psychosocial factors in sport, qualitative research, success factors in youth sports, youth football development

Co-Autor*innen:

Roger Hilfiker
PT, PhD¹

Karin van Holten
PhD²

¹Physiotherapie
Tschopp und Hilfiker,
Brig-Glis, Switzerland

²Bern University of
Applied Sciences,
School of Health Pro-
fessions, Institute for
Collaborative Practice
and Leadership in
Healthcare, Bern,
Switzerland

Betreuungsperson:

Roger Hilfiker
PT, PhD¹

John Zürcher

Bern University of Applied Sciences, School of Health Professions,
Discipline of Physiotherapy, Bern, Switzerland

26 Patients' Perspectives on Early Physiotherapy Interventions in the Emergency Department of a Swiss University Hospital

Abstract

Background: The number of emergency consultations in Swiss hospitals has increased significantly between 2012 and 2022. A substantial portion of these consultations (75%) do not involve life-threatening conditions. Internationally, physiotherapy is well-established in emergency care, but in Switzerland, it is still developing. An initial pilot project at a university hospital showed promising results. Additionally, gender-specific differences in medical care have been increasingly studied over the past two decades. This study considers these gender-specific differences and focuses on the female perspective, while also analyzing the male viewpoint in parallel.

Objective and Methodology: The aim of this study is to comprehensively evaluate the perspectives of female patients with musculoskeletal complaints on early physiotherapy interventions in the emergency department of a Swiss university hospital. Thirteen problem-centered interviews with female patients were recorded, transcribed, and analyzed using interpretative phenomenology. Recruitment and data collection took place between November 2023 and June 2024.

Results: The patients rated the physiotherapy care predominantly positively. Key themes included rapid pain relief, high professional competence, and empathetic communication by the physiotherapists. The patient-centered treatment planning was particularly appreciated. Critical aspects involved the lack of communication about treatment processes, the flow of information between professional groups, and structural deficits such as suboptimal infrastructure in the emergency department.

Conclusion: The integration of physiotherapy in the emergency department contributes to patient satisfaction and represents a valuable addition to medical and nursing care. Improvements in infrastructure and interprofessional communication could further enhance the benefits of physiotherapy. The results underscore the relevance of physiotherapy in emergency care and suggest that a broader introduction for patients with musculoskeletal pain could be well received.

Co-Autoren:

Balz Winteler
PT, MSc^{1,2}

Tom Klotti
PT, BSc¹

David Beckwée
PT, PhD³

¹Bern University of Applied Sciences, School of Health Professions, Discipline of Physiotherapy Bern, Switzerland

²Inselspital Bern, Bern University Hospital, Institute of Physiotherapy, Bern, Switzerland

³Vrije Universiteit Brussel, Brussels Health Campus, Brussels, Belgium

Betreuungsperson:

Balz Winteler
PT, MSc^{1,2}

Berner Fachhochschule
Departement Gesundheit
Fachbereich Physiotherapie
Murtenstrasse 10
3008 Bern

Telefon +41 31 848 35 68

adminmaster.gesundheit@bfh.ch
bfh.ch/msc-physiotherapie