PAIN SCIENCE IN MOTION VI CONGRESS

INTERNATIONAL AND INTERDISCIPLINARY COLLOQUIUM ON RESEARCH METHODS IN PAIN SCIENCES

VRIJE UNIVERSITEIT BRUSSEL, BRUSSELS **28-30 MAY 2026**

www.painscienceinmotion.com

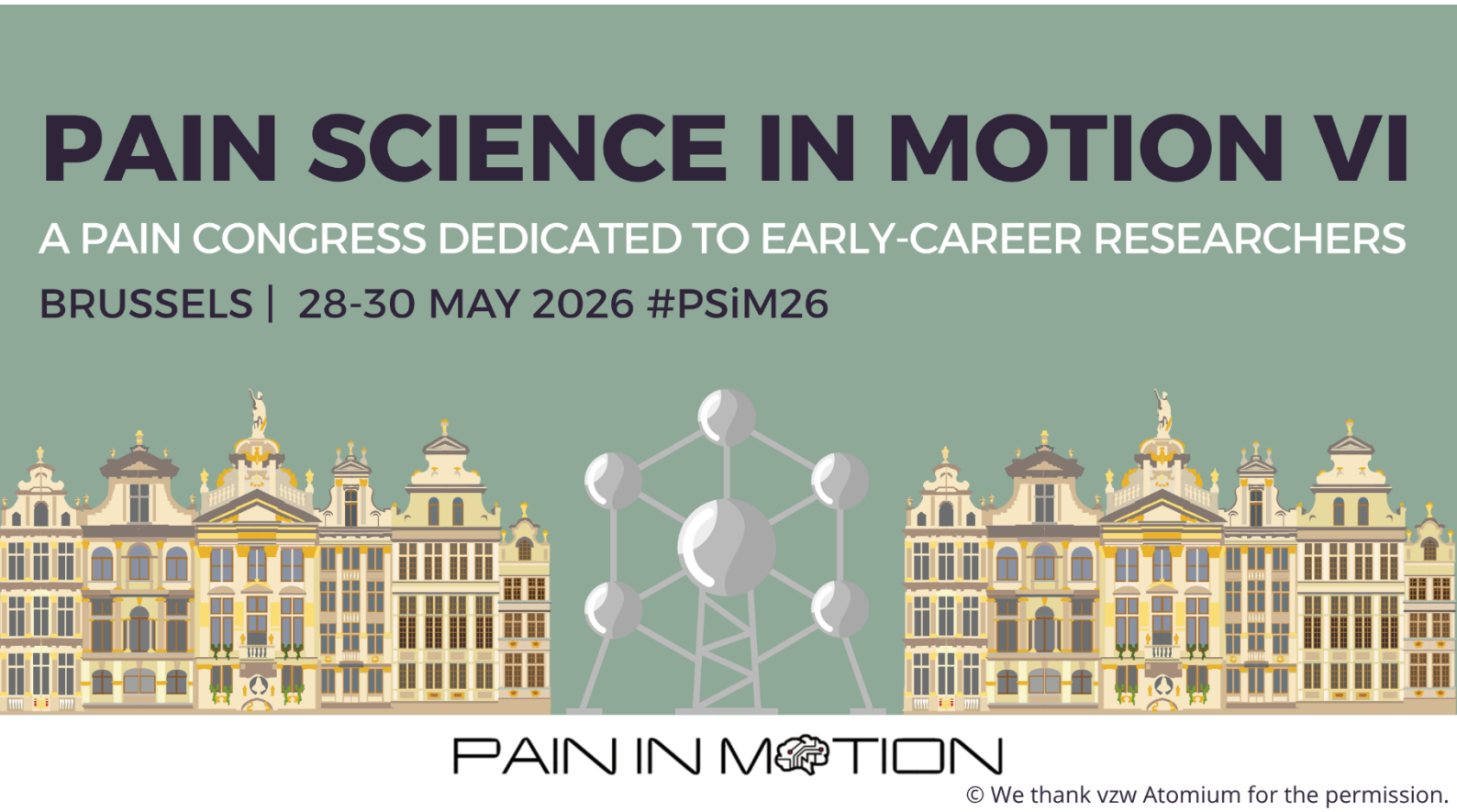

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TABLE OF CONTENTS

WELCOME

Dear fellow pain researchers and clinicians,

On behalf of the Scientific Committee and the Local Organizing Committee, we are delighted to welcome you to the Pain Science in Motion VI 2026 Congress, taking place in Brussels, Belgium from May 28-30, 2026.

The Pain Science in Motion Congress is a unique event that brings together early-career researchers, clinicians, and scholars who are passionate about the science of pain and its translation into clinical practice. The 2026 edition continues this tradition by offering a platform for dynamic interaction, critical reflection, and scientific exchange, stimulating discussion that moves pain science forward.

By bringing together junior and senior researchers, as well as clinicians from diverse disciplines in pain research, we strive to foster a stimulating and collaborative environment that encourages in-depth discussions on current challenges and future directions in the field.

The 2026 edition of the Pain Science in Motion Congress marks a special return to where it all began, as we are delighted to welcome you to the 6th edition of the congress at the Vrije Universiteit Brussel in Brussels, Belgium. This edition builds on the success of previous meetings held in 2015 (Brussels, Belgium), 2017 (Stockholm, Sweden), 2019 (Genoa, Italy), 2022 (Maastricht, The Netherlands), and 2024 (Las Vegas, USA). We are honored to host this new chapter in a city known for its rich history, cultural diversity, and strong academic tradition.

The two-day congress will be preceded by three clinical preconference courses delivered by leading experts alongside PhD researchers, aimed at deepening the knowledge and skills of clinicians and researchers on pain-related topics. The scientific program features keynote lectures and meet-the-expert sessions led by internationally recognized experts across various domains of pain research. Central to the program are the contributions of PhD/MSc/DPT researchers, who will present their work through oral and poster presentations, fostering dynamic and interactive discussions.

This program book provides a comprehensive overview of the scientific program and the included abstracts. The realization of this inspiring program would not have been possible without the dedication and enthusiasm of the scientific and organizing committees. We extend our sincere gratitude to all members for their invaluable contributions and commitment to ensuring the success of this congress.

For more information about past, present, and future editions of the Pain Science in Motion Congress, please visit www.paininmotion.be. If you are sharing your experience on social media, we encourage you to use the official hashtag: #PSiM26.

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Day 1 – 28 May 2026	
8:30-9:00	Registration
Pre-conference course 1: Pain Science Education – a versatile intervention	
9:00-10:30	Introduction to Pain Science Education (PSE) (Neuro)physiology of pain: background knowledge to provide PSE – part 1
10:30-11:00	Coffee break
11:00-12:30	(Neuro)physiology of pain: background knowledge to provide PSE – part 2
12:30-13:30	Lunch
13:30-15:00	PSE for chronic musculoskeletal pain: practical application and common barriers Perioperative PSE – part 1
15:00-15:30	Coffee break
15:30-17:00	Perioperative PSE – part 2 PSE in cancer patients and survivors
Pre-conference course 2: Beyond Pain – Physical Activity, Intensity & Recovery in Chronic Pain	
9:00-10:30	Introduction General effects, facilitators, and barriers of physical activity, and High Intensity Interval Training (HIIT)
10:30-11:00	Coffee break
11:00-12:30	HIIT in low back pain, and HRV & autonomic responses
12:30-13:30	Lunch
13:30-15:00	Physiology & inflammation Activity management after (breast)cancer related pain using behavior change techniques – part 1
15:00-15:30	Coffee break
15:30-17:00	Activity management after (breast)cancer related pain using behavior change techniques – part 2 Take home-messages

Day 2 – 29 May 2026			
8:00-8:30	Registration + welcome coffee		
8:30-8:50	Opening day 1		
8:50-9:35 *Room: I.2.01*	**Keynote 1: Michel Mertens** ***When the shoulder tells a bigger story: Rethinking musculoskeletal pain from a systemic perspective.***		
9:45-10:35 *Room: I.2.01*	**Oral Session 1A – Clinical pain and sensory assessment**		
	1A.1	Joren Vyverman	Individual differences in stress-pain responses: the dynamics of a complex interaction.
	1A.2	Rebecca Bianca Ramalho	Reliability of three movement-evoked pain methods in individuals with knee osteoarthritis.
	1A.3	Danny Koumans	Protocol for a Multifaced Approach of Assessing Upper Extremity Proprioception in Breast Cancer Patients with Chemotherapy-Induced Peripheral Neuropathy.
	1A.4	Pieter Jan Gräper	Sensory profiles may not be associated with somatosensory thresholds in low back pain: a prospective cohort study.
9:45-10:35 *Room: I.2.03*	**Oral Session 1B – Sensory processing and perception**		
	1B.1	Elise Cnockaert	Sensory profiling in primary headache disorders: examining interictal, diagnostic and headache frequency related alterations.
	1B.2	Tom Frankenstein	Is spatial summation of pain shaped by the perceived pain extent?
	1B.3	Giulia Stanco	Pain and bodily self-awareness: A Bayesian exploration of their bidirectional interplay.
	1B.4	Julie Dendauw	Knowing what we are talking about: defining and measuring psychological concepts in the field of chronic pain.
10:35-11:05	Coffee break		
11:05-12:10 *Room:* *I.1 Atrium*	**Poster Walk 1** **Exercise and rehabilitation interventions in chronic pain**		
	P1.1	Iris Meuwissen	Contributors to Adherence to Exercise Therapy in Non-Specific Chronic Low Back Pain: a Systematic Review of Qualitative and Quantitative Research.

	P1.2	Alexandru Berki-Stir	Exercise and Pain Relief in Chronic Low Back Pain: An Umbrella Review of Systematic Reviews.
	P1.3	Mark van Loo	Local and remote exercise induced hypoalgesia in knee osteoarthritis patients: a randomized cross-over study.
	P1.4	Nina Heijens	Implementing and evaluating a training program for healthcare providers in conservative knee and hip osteoarthritis management: a type 1 hybrid effectiveness-implementation study.
	P1.5	Dries Ceulemans	Defining the content of interdisciplinary rehabilitation for people with chronic low back pain: an international Delphi study.
	P1.6	Roland Reezigt	Do manual therapeutic techniques influence central pain processing mechanisms in people with neck pain? An observational study.
	P1.7	Syed Muhammad Shabbir Ali Naqvi	Effectiveness of Kinesio-Taping in patients with plantar fasciitis for pain reduction and function improvement: A Systematic Review & Meta-analysis.
	P1.8	Sophie Van Dijck	The Physio Perspective study: Exploring physiotherapists' knowledge, attitudes, beliefs and clinical decision making regarding physical activity in chronic pain management: a preliminary analysis.
	P1.9	Sophie Van Dijck	Discrepancies in Physical Activity Assessment Among Breast Cancer Survivors with Pain: IPAQ vs Accelerometer.
11:05-12:10 *Room:* *I.1 Atrium*	**Poster Walk 2** **Clinical assessment, diagnosis and phenotyping**		
	P2.1	Javier Matias-Soto	Clinical Phenotypes in Frozen Shoulder Based on Psychological and Sensory Phenotypes: Associations with Pain Over Time.
	P2.2	Nino Janki	Pain Prevalence, Phenotypes & Management of Patients Undergoing Neurological Rehabilitation: A Cross-Sectional Observational Study.
	P2.3	Robert van der Noord	Biopsychosocial clinical reasoning models for physiotherapy in patients with musculoskeletal pain - a systematic review.
	P2.4	Una McConville	Intra-rater Reliability of Quantitative Sensory Testing in Individuals with Knee Osteoarthritis.
	P2.5	Christian Ernest	Validation of digital measurement methods intended to measure physical capacity in people with lumbar spinal stenosis planned for surgery.
	P2.6	Tom Frankenstein	Survey study on pain distribution as a factor shaping health-care seeking behaviour.

	P2.7	Anupama Prabhu B	Tactile Acuity, Left–Right Judgement, and Temporal Summation in Acute versus Chronic Rotator Cuff-Related Shoulder Pain.
	P2.8	Anupama Prabhu B	Development of a clinical prediction model for chronic post-surgical shoulder pain following arthroscopic rotator cuff repair: a prospective cohort study.
	P2.9	Elise Cnockaert	Treatment approaches and their effectiveness for chronic pain according to the predominant pain mechanism: a study protocol.
11:05-12:10 *Room:* *I.2 Atrium*	**Poster Walk 3** **Pain behavior, lifestyle and patient-reported outcomes**		
	P3.1	Manon De Deyne	Sleep-MOMagement: Behavioural Interventions to Improve Postpartum Sleep – A Randomized Controlled Trial Protocol.
	P3.2	Matthijs Kok	What Do Patients Find Online? A Biopsychosocial and Nocebo Content Analysis of Google and ChatGPT results on Dutch Physiotherapy Websites.
	P3.3	Carolina Matiello Souza	Self-Efficacy, Disability, and Activity Avoidance in Chronic Shoulder Pain: Insights from a Cross-Sectional Study.
	P3.4	Amber Hulleman	How lifestyle factors are associated with pain intensity and pain-related disability in people with non-specific musculoskeletal pain.
	P3.5	Leonardo Sette Vieira	Post-Exercise Recovery Strategies on Pain and Fatigue: Preliminary Findings from a Systematic Review and Meta-Analysis with GRADE Recommendations.
	P3.6	Peter Yee-Lap To	Daily Associations of Sleep and Rest-activity Patterns with Pain Intensity in Adults with Chronic Pain
	P3.7	Sofie Van Wesemael	Symptom perception in individuals with chronic non-specific low back pain.
	P3.8	Joni Michiels	The impact of lifestyle and psychological factors on symptom modulation, autonomic function and pain sensitivity in patients with chronic pain.
11:05-12:10 *Room:* *I.2 Atrium*	**Poster Walk 4** **Psychology of pain: cognition, emotion and learning**		
	P4.1	Ishtiaq Ahmed	Quality of life, pain, and psychological factors in adolescents and young adults living beyond cancer: a systematic review and meta-analysis.
	P4.2	Javier Matias Soto	Psychological and Sensory Phenotypes in Frozen Shoulder: Associations with Pain Intensity Over Time.

	P4.3	Eline Peuskens	Does task- and context-specific fear of movement play a role in the development and persistence of pregnancy-related lumbopelvic pain?: Study protocol.
	P4.4	Luka Mattelin	The positive and negative “affect” of sleep on chronic pain: a systematic review of how positive and negative affect impact the day-to-day sleep-pain relationship.
	P4.5	Julie Dendauw	Defining key concepts within the field of pain psychology.
	P4.6	Verena Jongeleen	A biopsychosocial content analysis of Dutch rehabilitation and anaesthesiology websites for patients with non-specific neck, back, and chronic pain.
	P4.7	Olivia McNeill	Social Safety Learning in the Context of Pain.
	P4.8	Nadya Golovchanova	Persistent pain and work ability from a life-span perspective: a qualitative exploration of vulnerability and resilience.
12:10-13:10	Lunch		
13:10-13:55 *Room: I.2.01*	**Keynote 2: Carol Clark** ***Women's health in the context of pain.***		
14:05-14:55 *Room: I.2.01*	**Oral Session 2A – Brain structure and connectivity**		
	2A.1	Robrecht De Baere	Connecting the dots: unifying structural and functional neural networks in chronic pain using graph theory.
	2A.2	Jakob Poehlmann	Temporal Contrast Enhancement Emerges from Distinct Pain and Sound Filtering Mechanisms.
	2A.3	Elin Johansson	Is chronic pain keeping you awake? A case-control study exploring the neurobiological mechanisms underlying the relationship between chronic low back pain and insomnia.
	2A.4	Lionel Butry	Functional and structural brain topology in low back pain.
14:05-14:55 *Room: I.2.03*	**Oral Session 2B – Behavioral and lifestyle interventions**		
	2B.1	Fran Van de Poel	The effect of a multimodal lifestyle intervention in cancer survivors: a systematic review and meta-analysis.
	2B.2	Matteo Vanroose	An important step forward, understanding how lifestyle factors mediated by low-grade inflammation, contribute to chronic low back pain rehabilitation.
	2B.3	Zoë Maebe	The Interplay Between Sleep, Pain, and Weight in Overweight and Obese Adults: A Systematic Review.
	2B.4	Astrid Torrekens	The effect of personalized exercise interventions for the prevention of chemotherapy-induced peripheral neuropathy: protocol for a randomized controlled trial (CIPN-EX Trial).

14:55-15:25	Coffee break		
15:25-15:55 *I.2.01 / I.2.03*	**Meet the expert: Michel Mertens & Carol Clark**		
16:05-16:55 *Room: I.2.01*	**Oral Session 3A – Epigenetics and gene regulation**		
	3A.1	Jinane Ben Amar	Does altered DNA methylation of IGF1/GH axis genes underlie impaired glucose metabolism in chronic low back pain?
	3A.2	Arne Wyns	Unravelling Fundamental Epigenetic Mechanisms in the Development of Persistent Pain After Breast Cancer.
	3A.3	Huanyu Xiong	Unravelling the epigenetic mechanisms of exercise-induced pain in fibromyalgia: Epigenetic regulation of BDNF expression and its modulation by tDCS.
	3A.4	Jolien Hendrix	Joining forces of symptoms and the epigenome: a comprehensive characterization of ME/CFS and fibromyalgia.
16:05-16:55 *Room: I.2.03*	**Oral Session 3B – Etiology and systemic contributors**		
	3B.1	Joni Michiels	The relationship between glucose metabolism, pain sensitivity and quality of life in patients with chronic low back pain.
	3B.2	Aline Van Stallen	Circadian Factors and Pain: A Systematic Review of the Association between rest activity rhythm and pain-related outcomes.
	3B.3	Jente Van Campenhout	Mitochondrial dysfunction in Myalgic Encephalomyelitis/Chronic Fatigue Syndrome (ME/CFS): preliminary results on mitochondrial flux analyses.
	3B.4	Timo Meus	Linking Mechanistic Pain Profiling to Cardiac Autonomic Regulation in Individuals with Chronic Non-Specific Low Back Pain: A Cross-Sectional Analysis.
17:00-22:00	Social activity		

Day 3 – 30 May 2026			
8:00-8:45	Welcome coffee		
8:45-8:50	Opening day 2		
8:50-9:35 *Room: I.2.01*	**Keynote 3: Lorimer Moseley** ***Extending modern pain science education to other chronic overprotection disorders.***		
9:45-10:35 *Room: I.2.01*	**Oral Session 4A – Immune, autonomic and endocrine pathways**		
	4A.1	Arne Wyns	Hypermethylation of OPRM1: Deregulation of the Endogenous Opioid Pathway in Myalgic Encephalomyelitis/Chronic Fatigue Syndrome and Fibromyalgia.
	4A.2	Yanthe Buntinx	Decoding T cell dysfunction in chronic widespread pain: are exhaustion and senescence the answer?
	4A.3	Jolien Hendrix	Epigenetic regulation of autonomic dysfunction as a mechanisms underlying stress intolerance in fibromyalgia.
	4A.4	Jinane Ben Amar	Inflammatory mediators and the stress hormone cortisol as predictors of pain sensitivity in Myalgic Encephalomyelitis/Chronic fatigue syndrome and fibromyalgia.
9:45-10:35 *Room: I.2.03*	**Oral Session 4B – Psychological and cognitive pain processing**		
	4B.1	Esther van Benten	Exploring evolving health- and illnessbeliefs on pelvic girdle pain in first-time mothers: a longitudinal interpretative phenomenological approach.
	4B.2	Kenza Mostaqim	An exploration of the relationship between perceived injustice and pain severity in breast cancer survivors: a structural equation model.
	4B.3	Myrthe Gregoor	Preconception, prenatal, and postpartum psychological risk factors for pregnancy-related lumbopelvic pain: a systematic review.
	4B.4	Robrecht De Baere	Let's Talk Gender: Preliminary Focus Group Data Evaluating a Questionnaire on Gender and Pain Dynamics.
10:35-11:05	Coffee break		
11:05-12:10 *Room:* *I.1 Atrium*	**Poster Walk 5** **Fundamental mechanisms and experimental pain science**		
	P5.1	Gloria Everaert	Bridging Muscle Biology and Function in Chronic Nonspecific Low Back Pain: Feasibility of a Multimodal Biopsy-Based Approach.

	P5.2	Casper Vananderoye	Experimental Sleep Disruption and Its Effects on Pain, Mood, and the Brain: A Systematic Review.
	P5.3	Joren Vyverman	Pain and the brain: examining the link between conditioned pain modulation and structural gray matter properties.
	P5.4	Daria Nowak	Spatial summation of pain: A paradoxical trigger of inhibitory mechanisms.
	P5.5	Michał Katra	Unilateral and bilateral spatial summation of pain across graded innocuous and noxious temperatures.
	P5.6	Cara Meijer	When touch is painful: a novel tactile fear conditioning paradigm imaging the neural correlates of pain-related fear in patients with chronic pain.
	P5.7	Egbert Jeffrey Buning	Exploring personal variables to better understand the variability in pain sensitivity measurements.
	P5.8	Ron Bottema	Excellent reproducibility of heat pain thresholds for methods of limits, methods of levels and adaptive staircase, irrespective of stimulus slope or duration – a cross sectional study in pain-free participants.
	P5.9	Emma Geerits	The role of maternal weight, body composition, systemic inflammation, and mental health in pregnancy-related lumbopelvic pain: a study protocol.
11:05-12:10 *Room:* *I.1 Atrium*	**Poster Walk 6** **Education, implementation and health services in pain care**		
	P6.1	Anke Beerstra	Information about low back and neck pain on Dutch physiotherapist's websites - a 5 year follow up study.
	P6.2	Iris Meuwissen	Effects of Pain Science Education on self-efficacy and fear avoidance in people with nonspecific Chronic Low Back Pain.
	P6.3	Carolina Matiello Souza	Activation for Health Self-Management in Chronic Shoulder Pain Patients.
	P6.4	Ana Catarina Navarro Ramalho	Screening and referral practices for anxiety and depression among patients with chronic musculoskeletal pain within private physiotherapy practices: a qualitative study.
	P6.5	Erwin Hendriks	Mediating factors on the effect of a multidisciplinary rehabilitation program for individuals with chronic whiplash-associated disorders.
	P6.6	Bettina Eiger	Keeping It Simple Study – effectiveness of PNE4Adults pain science education in the municipality: A multicenter randomized controlled clinical trial.
	P6.7	Lore Smeets	Toward a Perceived Injustice–Targeted Pain Science Education 2.0: Breast Cancer Survivors' Experienced Barriers, Facilitators, and Needs after the Intervention.
	P6.8	Irene Rodriguez Andonaegui	Integrating Persistent Pain Management Training into the Physiotherapy Degree.

	P6.9	Tove Axelsson-Landberg	ReActivate: Physiotherapeutic intervention for adolescents and young adults with persistent musculoskeletal pain. A single-case experimental design.
11:05-12:10 *Room:* *I.2 Atrium*	**Poster Walk 7** **Pain management, biomarkers and etiology**		
	P7.1	Peter Yee-Lap To	Latent physical activity profiles of people with chronic pain: Associations with pain severity, sleep and accelerometer-measured rest-activity rhythm.
	P7.2	Elke Wuyts	Pain medication use disorder (PMUD), towards a new framework in pain management: a review.
	P7.3	Marcela Camargo Tozzo	Autonomic predictors of pain and disability in chronic shoulder pain: longitudinal follow-up at three and six months.
	P7.4	Roland Reezigt	Exploring personal variables to better understand the variability in dynamic experimental pain measurements - a cross-sectional study among healthy participants.
	P7.5	Jade Mosselmans	Blood-Based Biomarkers in Chemotherapy-Induced Peripheral Neuropathy (CIPN): A Systematic Review.
	P7.6	Katja Junge	Effect of a one-time manual therapy intervention on electrocutaneous pain perception in healthy individuals across local and remote areas.
	P7.7	Min Yang	Association of Chronic Pain and Its Widespreadness with Mortality and Life Expectancy among Long-Term Survivors of Adolescent and Young Adult Cancer: An Observational Study.
11:05-12:10 *Room:* *I.2 Atrium*	**Poster Walk 8** **Multidisciplinary, digital and advanced rehabilitation approaches**		
	P8.1	Ander Cervantes-Benítez	Immersive virtual reality and pain control: An experimental study protocol with healthy participants to describe the mechanisms of brain activity.
	P8.2	Ander Cervantes-Benítez	Electroencephalography biomarkers during physiotherapy for chronic non-specific neck pain: A longitudinal study protocol.
	P8.3	Kirsty Musch	Effects of multidisciplinary rehabilitation in primary care for chronic musculoskeletal pain: a cohort study.
	P8.4	Kenza Mostaqim	Ready, Set, Prehab! Feasibility of a Multimodal Patient-Centered Teleprehabilitation Program for Breast Cancer Patients.
	P8.5	Dries Ceulemans	Rehabilitation Professionals' Experiences with Rehabilitation for people with Persistent Spinal Pain Syndrome Type 2 following Spinal Cord Stimulation.
	P8.6	Eva Poolman	Effectiveness of in-person physiotherapy blended with digital health consisting of pain education and behavioural activation for people with spinal pain.
12:10-13:10	Lunch		

13:10-13:55 *Room: I.2.01*	**Keynote 4: Colette Ridehalgh** ***Advances in nerve-related Musculoskeletal pain: a Physiotherapist's slant.***		
14:05-14:55 *Room: I.2.01*	**Oral Session 5A – Self-management, eHealth and implementation**		
	5A.1	Clarisse Bath	Effectiveness of an ehealth self-management support program for persistent pain after breast cancer treatment: protocol of the PECAN study.
	5A.2	Han van Dijk	Enactment of biopsychosocial care for patients with chronic pain in private practice physiotherapy following specialized training for physiotherapists.
	5A.3	Marthe Van Overbeke	Process evaluation of an eHealth and a face-to-face self-management support program for persistent pain after breast cancer treatment.
	5A.4	Zoë Maebe	Improving Access to Sleep Care in Chronic Spinal Pain: A Randomized Controlled Trial of Stepped Care Cognitive Behavioral Therapy for Insomnia.
14:05-14:55 *Room: I.2.03*	**Oral Session 5B – Pain behavior, activity and participation**		
	5B.1	Beate Schüßler	The Effect of Experimentally Induced Acute Pain on Lumbar Movement Control: a single blinded three-arm cross-over randomized control trial.
	5B.2	Julie van Eetvelde	Self-reported work ability and the association with psychosocial factors: a cross-sectional study.
	5B.3	Stefanie Beinert	Addressing Gender and Diversity Inequalities in Chronic Pain: A Cross-Border, Participatory and Multi-Method Approach.
	5B.4	Annet Doomen	Reliability of Accelerometer-Derived Parameters Describing Activity–Rest Patterns in Individuals With and Without Chronic Pain.
14:55-15:25	Coffee break		
15:25-15:55 *I.2.01 / I.2.03*	**Meet the expert: Lorimer Moseley & Colette Ridehalgh**		
16:05-16:50 *Pilar box*	Societal Impact for Pain Science Award - Lorimer Moseley PSIM award ceremony + closing		

Individual differences in stress-pain responses: the dynamics of a complex interaction

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Introduction: Stress and pain are two adaptive mechanisms fundamental to human behavior and cognition. They are bidirectionally related to each other and several factors modifying this interaction were identified. However, how stable individual differences in pain-related distress, such as individual dispositions for pain catastrophizing, and person-specific pain sensitivities are associated with the strength of stress responses remains unclear. This preregistered study closes this gap by investigating how trait pain-related distress and changes in pain sensitivity relate to stress response strength.

Methods: Trait pain-related distress was assessed in 148 healthy males with the Pain Catastrophizing Scale, the Tampa Scale of Kinesiophobia, and the Fear of Pain Questionnaire. Baseline blood pressure, pulse rate, α-amylase levels, and cortisol levels were acquired as well as initial heat pain thresholds and tolerances. Afterwards, participants were randomly assigned either to a group that underwent the Maastricht Acute Stress Task or to a control group performing the placebo version of this task. Finally, all stress indicators and experimental pain outcomes were reassessed after the task.

Results: Individuals with lower kinesiophobia demonstrated higher stress-induced increases in α-amylase. Furthermore, stress-induced changes in pain sensitivity showed high variability, and no link emerged between these changes and the stress response. Finally, among individuals with a stronger tendency to catastrophize or fear pain, larger increases in α-amylase were associated with larger post-stressor increases in pain threshold, indicating reduced pain sensitivity.

Process evaluation: Limitations of our work include deviations from the planned sample size due to the COVID-19 pandemic, and a practical limit for assessing pain tolerance (maximum temperature: 49 °C to avoid harm), which constrains interpretation of stress-related changes in pain tolerance. However, the finally achieved power was acceptable/good (i.e., power of .93).

Conclusion: Our study suggests that stable individual differences may influence the stress–pain link beyond physiology. This underscores the importance of considering trait differences in future research with the ultimate goal of tailoring prevention and treatment for patients with chronic pain.

Reliability of three movement-evoked pain methods in individuals with knee osteoarthritis

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[1] Physiotherapy Department of the Federal University of São Carlos, Brazil

Introduction: Movement-evoked pain (MEP) is a useful measure for chronic pain conditions, particularly knee osteoarthritis (KOA), where one of the main complaints is pain during activity. MEP encompasses pain during movement as well as pain that occurs immediately after an activity. Despite its significance, there is no consensus method for calculating MEP, and there is no proof of the accuracy of various approaches. This study examined the test-retest reliability of three MEP calculation methods in KOA patients.

Methods: During two visits with a 7-day interval between it, 111 individuals with KOA finished a battery of standardized tasks that included the core set performance-based tests recommended by Osteoarthritis Research Society International: 40-m fast-paced walk test, 30-second chair stand test, and stair climb test. The sequence order was randomized and followed in both visits. The Numeric Pain Rating Scale (NPRS) was used to measure pain intensity both at rest and following each task. Three methods of calculating MEP were assessed: MEP-avg (average post-movement pain), MEP-max (maximum pain across tasks), and MEP-index (post-movement minus rest). Intraclass correlation coefficients (ICC) were used to evaluate test-retest reliability, and the smallest detectable change (SDC) and standard error of measurement (SEM) were computed.

Results: Participants had mean age of 59.9 (8.6), mean pain intensity pain of 6.7 (2.1) and 50.5% were male. MEP-max (ICC = 0.70, 95% CI 0.59–0.78) and MEP-avg (ICC = 0.84, 95% CI 0.77–0.89) had excellent reliability, while MEP-index (ICC = 0.38, 95% CI 0.11–0.57) had poor reliability. For MEP-max, SEM and SDC were 1.43 and 3.9, for MEP-avg, 1.33 and 3.7, and for MEP-index, 1.53 and 4.2.

Process evaluation: Some limitations should be acknowledged. The majority of the sample had moderate pain, which may have decreased between-subject variability and underestimated ICC values. Furthermore, only one instrument (NPRS) was used to evaluate MEP, which limited the evaluation's scope and its comparability to studies that used different instruments. Future studies should examine MEP reliability in more diverse KOA populations and take into account the use of several evaluation tools.

Conclusion: MEP-avg showed higher reliability and lower SDC than MEP-index and MEP-max, making it the preferred method for clinical research and practice.

Protocol for a multifaced approach of assessing upper extremity proprioception in breast cancer patients with chemotherapy-induced peripheral neuropathy

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Introduction: Chemotherapy-induced peripheral neuropathy (CIPN) is a frequent and disabling side effect of cancer treatment. CIPN often leads to neuropathic pain, sensory loss, and motor dysfunction, substantially affecting patients' quality of life. Current clinical assessments, such as quantitative sensory testing (QST), provide valuable insights into somatosensory alterations but are limited in their ability to evaluate proprioceptive function. As altered proprioception may contribute to movement-related pain and functional impairment, a more comprehensive assessment of proprioceptive function is needed.

Methods: In this cross-sectional study, we will assess proprioceptive function in three groups: (1) breast cancer patients who have undergone surgery and platinum- or taxane-based chemotherapy, (2) breast cancer patients who underwent surgery only, and (3) age- and sex-matched healthy controls. Proprioceptive function will be measured using three approaches: the standardized QST protocol from the German Research Network on Neuropathic Pain (DFNS), and an extensive assessment of proprioceptive function of proximal and distal limbs through robotic assessment with the KINARM system and a video-based setup using pose-estimation software (DeepLabCut). Moreover, we will assess total relative arm volume and shoulder range of motion through clinical assessment as well as CIPN symptoms, pain, upper limb function, and fatigue through questionnaires.

Hypotheses: We hypothesize that chemotherapy-treated patients will exhibit greater proprioceptive deficits compared to both surgery-only patients and healthy controls. Furthermore, we expect to find associations between altered proprioceptive processing and other somatosensory function, including pain and tingling sensations.

Process evaluation: The study is currently in the late preparation phase. Early observations highlight the challenges of assessing proprioception in a clinical population, particularly regarding patient fatigue, pain, and variability in motor ability. Ongoing pilot testing is being used to refine the study protocol to ensure feasibility and tolerability for participants.

Conclusion: This study aims to advance understanding of CIPN-related alterations in proprioceptive and somatosensory function. Gaining insight into these mechanisms may contribute to improved symptom management and the development of targeted rehabilitation strategies for patients experiencing neuropathic symptoms following chemotherapy.

Sensory profiles may not be associated with somatosensory thresholds in low back pain: a prospective cohort study.

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Introduction: When acute low back pain (LBP) becomes chronic, central nervous system sensitization may occur, which is associated with trait sensory profiles (SPs). SPs assess somatosensory thresholds, sensory preferences, and behavior in response to stimulation. However, their relationship with somatosensory thresholds has not yet been examined using quantitative sensory testing (QST). This study aims to explore the association between somatosensory thresholds and SPs.

Methods: Somatosensory thresholds in patients with LBP are assessed using the Central Sensitization Inventory (CSI), Pain Sensitization Questionnaire (PSQ), and QST measures (Mechanical detection threshold, Pain Pressure Threshold, Dynamic Mechanical Allodynia, Temporal Summation, Vibration Detection Threshold, Conditioned Pain Modulation) and associated with SPs (Low Registration, Sensation Seeking, Sensory Sensitive, Sensation Avoiding).

Results: Clinically meaningful associations have been identified between three SPs and the CSI (Pearson's r= 0.48-.067; p<0.001), opposed to the PSQ and QST measurements.

Process evaluation: Several confounding factors and effect modifiers may have led to bias, like personal factors, such as patient expectations (the Hawthorne effect), psychological predispositions, physical conditions, and environmental circumstances (contextual bias), such as researcher influences (experimenter bias), and testing conditions (contextual bias). To minimize risk of bias, a pre-existing measurement protocol has been used, adapted from various peer-reviewed studies. In addition, QST represents semi-objective measurements, reaffirming that their subjective nature influences outcomes and is particularly prone to confounding and effect modification, emphasizing the importance of standardization in test procedures, environmental conditions, and researcher behavior to produce more reliable and accurate outcomes.

Conclusion: Associations between SPs and somatosensory threshold levels cannot be confirmed. Instead, SPs may be indicative of personality traits and psychological predispositions rather than somatosensory thresholds.

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Sensory profiling in primary headache disorders: examining interictal, diagnostic and headache frequency related alterations

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Introduction: Migraine and tensions-type headache (TTH) are among the most prevalent primary headache (PH) disorders and are associated with substantial disability worldwide. Although the ictal phase is characterized by altered sensory processing and pain sensitivity[1,2], it remains unclear whether such alterations persist interictally and to what extent interictal migraine and TTH share similar or distinct sensory profiles. Therefore, the aim of this study was to examine whether 1) similarities or differences in sensory profiles exist between people with migraine and TTH during the interictal phase, and 2) sensory alterations are dependent on headache frequency.

Methods: Sixty-five patients with primary headache (32 migraine, 33 TTH) were studied in the interictal headache phase, together with 51 age-and-sex assigned at birth-matched pain-free controls (C). Static and dynamic quantitative sensory testing (QST) was performed to assess thermal and pressure sensitivity at the most painful location at the head (frontal region above the eyebrow in migraine, temporalis muscle in TTH), thenar, and anterior tibial muscle, temporal summation of pain (TS-pain) and conditioned pain modulation (CPM). Between-group differences were evaluated using the Wilcoxon test or the Kruskal-Wallis test followed by Dunn's post hoc procedure. A Bonferroni correction was applied to adjust for multiple comparisons. Effect sizes were calculated using Cliff's Delta or η2, as appropriate.

Results: The primary headache group did not differ from controls on static QST measures, with the exception of the cold pain threshold (CPT) at the head, which was higher in the headache group (padj=.042). When subdivided by headache diagnosis, significant group differences emerged for cold detection threshold (CDT), heat detection threshold (HDT), CPT, and pressure pain threshold. Migraine patients were more sensitive than both controls and TTH patients at the head and the thenar, except for PPT, for which TTH patients were more sensitive (all padj<.023). Compared with controls, TTH patients were less sensitive to thermal stimuli but more sensitive to pressure (all padj<.036). For dynamic QST, no group differences were observed in TS-pain or CPM. Further subdivision of the TTH group by headache frequency revealed no differences in any QST parameter.

Process evaluation: We encountered equipment limitations; for instance, the TSA-2's lower bound of 0 °C prevented many patients from reaching their CPT. Moreover, the CPM protocol itself is questionable, as the expected CPM effect was not evident even in pain-free controls.

Conclusion: Primary headache disorders are associated with altered sensory processing and pain sensitivity during the interictal headache phase, primarily at the head, with migraine and TTH exhibiting distinct sensory profiles. This reflects different underlying pathophysiological mechanisms, yet both may share a component of human assumed central sensitization in the interictal phase.

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Is spatial summation of pain shaped by the perceived pain extent?

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Introduction: Spatial summation of pain (SSp) refers to the increase in perceived pain intensity as the area of noxious stimulation enlarges. While SSp is well established, it remains unclear whether this effect is primarily driven by the objectively controlled area of stimulation (nociceptive input) or by the subjectively perceived pain extent originating from central processes.

Methods: Healthy, pain-free adults (18–65 years) participated in a within-subject experiment. Noxious stimuli were applied on the volar forearm by using Thermal Cutaneous Stimulator (TCS; André Dufour, University of Strasbourg). Five contact areas of increasing size (1.78–8.88 cm^2) were applied in randomised order. Depending on the trial, participants rated continuously either pain intensity (CoVAS), unpleasantness (CoVAS) or extent of pain (digital drawing task). In total, subjects received 30 heat stimuli. A multilevel mediation analysis tested whether pain extent mediated the relationship between stimulated area and pain intensity.

Results: A total of 54 participants were included. The ANOVA revealed clear spatial summation: larger stimulated areas elicited significantly higher pain intensity ($F(4,535) = 64.73$, $p < 0.001$). Mediation analysis showed a significant effect of the objectively stimulated area (X) on perceived pain extent (M) (path a: $\beta = 2.31$, $p < 0.001$) and on pain intensity (Y) (direct effect c': $\beta = 3.35$, $p < 0.001$). However, pain extent did not significantly predict pain intensity (path b: $\beta = –0.11$, $p = 0.52$), and the indirect mediation effect was non-significant (ab: $\beta = 0.10$, $p = 0.35$).

Process evaluation: The paradigm proved feasible, and thermal stimulations were well tolerated. The main methodological challenge arose from the contact heat setup: participants could clearly perceive the physical boundaries of the thermode probe, which may have biased their judgments of stimulus size and pain spread. Future studies may address this limitation by using laser heat stimulation, where no tactile borders are detectable. This could help ensure that participants' ratings are driven purely by thermal and painful sensations rather than by cutaneous mechanoreceptive cues.

Conclusion: The study confirms robust spatial summation of pain and pain radiation induced by noxious heat stimuli. The effect of stimulated area on pain intensity appears to be primarily direct and is not mediated by the perceived pain extent. This suggests that SSp is not exclusively a supraspinal phenomenon.

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Pain and bodily self-awareness: A Bayesian exploration of their bidirectional interplay

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Introduction: Pain is a multidimensional, embodied experience that signals potential bodily threats and preserves bodily integrity. Yet its relationship with bodily self-awareness - specifically the Sense of Agency (SoA) over one's actions and the Sense of Ownership (SoO) over one's body[1] - remains poorly integrated at the theoretical and empirical level. This PRISMA-guided systematic review adopts a Predictive Coding perspective[2] to examine how pain, SoA and SoO may arise from shared inferential mechanisms integrating sensorimotor expectations and actual input.

Methods: A systematic PubMed search (June 2025) identified 53 eligible studies investigating reciprocal influences between pain perception and bodily self-awareness. Experiments were classified by pain type, dependent variable and manipulation (agency, ownership or pain). Qualitative synthesis was complemented by Bayesian binomial analyses quantifying the evidence for directional effects - specifically, the impact of agency and ownership manipulations on pain perception, and conversely, of pain manipulations on SoA and SoO.

Results: Bayesian analyses revealed distinct patterns. For agency manipulations, pain reductions occurred in a minority of cases, with only anecdotal evidence for a systematic analgesic effect. For ownership manipulations, pain perception remained stable, with strong evidence favouring no change; analgesic effects emerged primarily when SoO over one's own body part was altered through spatial or visual incongruence. Conversely, pain manipulations yielded only anecdotal evidence for reduced SoA, while SoO remains robust, with strong evidence for no change. In chronic pain, findings and populations were too heterogeneous to draw systematic conclusions.

Process evaluation: The heterogeneity of paradigms and measures, especially for SoA, limited comparability and highlights the need for more quantitative, targeted studies. However, the Bayesian framework helped to formalize assumptions, quantify evidence and compare effects across manipulations.

Conclusion: Our findings are consistent with a bidirectional Predictive Coding framework2 in which pain acts as a bottom-up signal that can modulate bodily self-awareness, while SoO provides a stable top-down context for evaluating nociceptive input, and SoA interacts with pain locally at the sensorimotor level. Clarifying these mechanisms may help integrate current evidence into unified models of bodily self and guide mechanism-based interventions.

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Knowing what we are talking about: defining and measuring psychological concepts in the field of chronic pain

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Introduction: Psychological factors play a pivotal role in the development and persistence of chronic musculoskeletal pain. However, psychological constructs are often vaguely defined and measured with self-report instruments lacking clear conceptual grounding. This project addresses these issues by identifying key constructs, evaluating self-report measures and formalizing the findings in a machine-readable ontology.

Methods: The first phase examines the intended purposes of self-report instruments used in chronic pain. In parallel, we aim to clarify the landscape of psychological constructs relevant to chronic pain and its impact. Through literature reviews and stakeholder input, we will identify and define key psychological constructs, as well as clarify the intended purposes of the instruments used to assess them. Definitions will be refined iteratively and stored in open repositories. In phase two, we will identify and evaluate self-report measures for selected constructs. Evaluation will include expert assessment of the content validity of each instrument, using two distinct methodologies: cognitive interviews and discriminant content validity methods. In phase three, acquired knowledge will be formalized in a computer-readable ontology to enable transparent mapping of constructs, items and instrument purposes.

Hypotheses: We hypothesize that many self-report instruments do not adequately reflect the constructs they claim to measure. Comparing intended use with item content will reveal systematic mismatches. We also expect that clarifying key psychological concepts will expose inconsistencies in how they are defined and applied.

Process evaluation: There is considerable variation in how psychological constructs are defined and how self-report instruments are used. This creates challenges such as overlapping concepts, conceptual overload and aligning theoretical and practical priorities. The project's iterative design allows these issues to be addressed progressively, with ongoing stakeholder input.

Conclusion: This project offers a structured and transparent approach to defining psychological constructs and evaluating their measurement in chronic pain research. By clarifying what we are measuring and why, it contributes to a more valid and theory-driven foundation for psychological assessment. No results are presented yet; the focus is on methodological rigour and conceptual clarity.

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Connecting the dots: unifying structural and functional neural networks in chronic pain using graph theory

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Introduction: Previous neuroimaging research has revealed functional and structural brain differences in individuals experiencing chronic primary pain.[1] However, there is a limited understanding of how altered brain regions interact and give rise to dysfunctional pain modulation across the pain continuum. Furthermore, systematic integration of functional and structural brain data is lacking.

Methods: This study aims to construct a neural-connectome for four groups along the pain continuum, i.e. fibromyalgia, recurrent low back pain, chronic low back pain and pain-free controls. These connectomes consist of pre-defined regions of interest (ROIs), based on prior explorative research and theoretical literature. Specifically, the ROIs include classic nociceptive areas (e.g. primary and secondary sensorimotor cortices), limbic areas (e.g. thalamus, amygdala & hippocampus) and other areas that have previously been identified in chronic primary pain populations (e.g. prefrontal cortex & orbitofrontal cortex). These connectomes integrate functional (i.e. resting state functional Magnetic Resonance Imaging) and structural (i.e. diffusion weighted imaging) data, through a unified graph theory approach of these connectivity matrices. Graph theory allows for evaluating both local (i.e. communication with nearby regions) and global (i.e. communication across the entire network) efficiency. Furthermore, a conditioned pain modulation (CPM) paradigm will be used to examine relations with endogenous pain modulatory efficacy.

Results & Hypotheses: Preliminary results will be presented on these graph theory measures and are hypothesized to be increasingly altered across the pain continuum, in relation to pain duration and extent. We hypothesize that increased efficiency between limbic network nodes will be associated with decreased CPM efficiency.

Process evaluation: At time of submission of this abstract, the main challenge has been to define an extensive, yet appropriately limited, list of ROIs. Furthermore, adequate pre-processing strategies for functional resting state data are being explored.

Conclusion: Due to the methodological innovations of a unified graph theory approach across the pain continuum, the findings of this study could elucidate new neural mechanisms underlying (dysfunctional) endogenous pain modulation.

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Temporal contrast enhancement emerges from distinct pain and sound filtering mechanisms

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Introduction: Humans receive numerous sensory inputs that differ in perception depending on factors such as intensity, salience, and context. Within the temporal domain, filtering mechanisms dynamically modulate stimulus processing as a function of repetition, temporal structure, and related contingencies. Higher-order sensory experiences such as pain also undergo temporal filtering, exemplified by temporal contrast enhancement (TCE) – a paradigm producing strong pain inhibition, whose underlying mechanisms remain unclear. Given the prevalence of filtering mechanisms across sensory domains, it remains an open question whether TCE is specific to pain or can be elicited in other modalities. Accordingly, we aimed to compare behavioral and neurophysiological responses within an identical experimental paradigm using either painful heat stimulation or unpleasant auditory stimulation. This was done to examine whether TCE can be elicited in other modalities and whether the observed effects are driven by common neurophysiological mechanisms.

Methods: Sixty-two healthy and pain-free participants were recruited to participate in either a behavioral focused or neurophysiological focused experiment. They underwent a typical TCE-specific stimulation paradigm in painful heat or auditory stimuli.

Results: Both modalities induced significant behavioral TCE effects, however, these effects did not correlate across modalities and showed distinct temporal dynamics within each modality. Neurophysiological measures revealed that thermal stimulation elicited pronounced changes in pupillary dynamics and alpha power desynchronization in electroencephalography.

Process evaluation: Transferring the TCE paradigm from heat pain to auditory stimulation was successful but challenging. In the neurophysiological experiment, it was opted for fixed stimulus intensities over calibrated ones, since these seem to be better suited to the assessment of neurophysiological outcomes. However, it should be noted that this approach is not without its limitations, particularly regarding the methodological challenge of comparing aversiveness between painful and non-painful stimuli.

Conclusion: This research indicates that TCE does not reflect pain-specific processes, but rather a general temporal filtering mechanism as indicated by behavior. Only nociceptive heat induced profound pupillary reactions and alpha-power desynchronization, indicating strong bottom-up and top-down processes in nociception.

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Is chronic pain keeping you awake? A case-control study exploring the neurobiological mechanisms underlying the relationship between chronic low back pain and insomnia

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Introduction: To fall and stay asleep, our brain must consider the environment safe enough to disconnect our conscious awareness from both the outside world and the processes taking place inside us. Pain, on the other hand, is experienced when the brain considers the external or internal environment as potentially harmful. Unsurprisingly given this contrast in perceived environmental "threat", more than half the population with chronic pain reports difficulties initiating and/or maintaining sleep, a condition referred to as insomnia. This case-control study aims to evaluate whether this interplay between chronic pain and insomnia is related to the neurobiological state of the brain, with a specific focus on chronic low back pain (CLBP). We hypothesize that higher brain activity and neuroinflammatory levels will be observed in regions associated with sensory (pain) modulation, salience- and self-referential processing in individuals with CLBP and insomnia in isolation, whereas an interaction effect is expected in individuals experiencing both conditions simultaneously.

Methods: Eighty participants across four groups (n = 20 per group) will be recruited, including individuals with (1) CLBP and chronic insomnia, (2) CLBP and good sleep habits, (3) no pain and chronic insomnia, and (4) no pain and good sleep habits (i.e., healthy controls). Manual and computerized pressure algometry will first be used to measure discomfort and pain tolerance thresholds and endogenous pain modulation, whereafter an overnight polysomnography will follow. Upon awakening, magnetic resonance spectroscopy, diffusion-weighted imaging, and (pain) task-based functional magnetic resonance imaging will be performed to measure markers of neuroinflammation, as well as the activity within and across regions associated with sensory (pain) modulation, salience- and self-referential processing.

Process evaluation: During the development of this study, a logistic reorganization forced a change in the primary outcome measure; originally being positron emission tomography-derived total distribution volume of the translocator protein. However, this change led to the development of a novel imaging protocol optimized to measure markers of neuroinflammation non-invasively.

Conclusion: This study aims to explore the relationship between chronic (low back) pain and sleep disturbances from a neurobiological perspective, thereby offering novel mechanistic insights to (low back) pain chronification.

Functional and structural brain topology in low back pain

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Introduction: The pain experience emerges from coordinated activity across interconnected brain networks. Non-specific low back pain (LBP) has been linked to widespread functional and structural brain alterations. However, their network-level characteristics remain poorly defined. This study will investigate LBP-associated alterations in network topology and structure-function coupling.

Methods: This cross-sectional study includes patients with non-specific LBP and pain-free controls from the PREDICT-LBP [1] project, enrolled 08/2023–12/2025. LBP patients were subdivided into LBP+ (pain on the day of assessment) and LBP– (no pain on the day of assessment). Resting-state fMRI and diffusion-weighted MRI, acquired on a Philips Achieva 3T or Siemens Prisma 3T system, were utilised to assess functional connectivity (FC) and structural connectivity (SC), respectively. The Brainnetome atlas was used to parcellate the brain into 246 regions. NeuroComBat was used to harmonise FC and SC across the two scanners. Graph theory analysis will be applied to investigate global and nodal network properties (i.e. characteristic path length, clustering coefficient, global efficiency, local efficiency, modularity, strength) across network densities of 5–40%. Structure-function coupling (SFC) of a brain region will be defined as the Spearman correlation between its vector of SC and its vector of FC. (Robust) ANCOVA will be used to assess group differences, controlling for age and sex. In an explorative approach, significant brain alterations will be correlated with clinical/behavioural measures.

Hypotheses: Based on a prior meta-analysis of chronic pain patients [2], LBP patients are expected to show reduced local efficiency in functional global topology but no changes in structural topology. SFC is hypothesised to be altered in somatomotor and salience regions.

Process evaluation and preliminary results: Until November 2025, 341 participants (LBP+: 210, LBP–: 62, CG: 69) were included in the study. Preprocessing and data quality assessment of FC and SC were completed in 335 and 155 participants, respectively. Preliminary results of functional global network properties indicate no group difference between the control group and LBP patients. Data analysis is expected to be finished at the time of the 'Pain Science in Motion 2026' conference.

Conclusion: This study will enhance our understanding of central pain mechanisms in LBP and may inform the development of neuroimaging markers.

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The effect of a multimodal lifestyle intervention in cancer survivors: a systematic review and meta-analysis

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Introduction: Cancer survivors often experience long-term symptoms such as pain, fatigue, and sleep disturbances, which impair quality of life (QoL). Lifestyle interventions targeting domains like physical activity, diet, sleep, and stress management show benefits, yet most studies focus on single components. Evidence on multimodal approaches combining multiple lifestyle factors remains limited. This systematic review and meta-analysis evaluated the effects of interventions integrating three or more lifestyle components compared with those addressing none, one, or two components in cancer survivors.

Methods: A systematic search identified randomized controlled trials (RCTs) in cancer survivors including ≥3 lifestyle components (e.g., physical activity, diet, smoking, alcohol, sleep, stress). Primary outcomes were QoL, pain, fatigue, insomnia, cortisol, and sleep quality. Mean (MD) or standardized mean differences (SMD; Hedges' g) were pooled using random-effects models (REML) with Hartung–Knapp–Sidik–Jonkman adjustments for <5 studies. Heterogeneity was assessed via I^2 and 95% prediction intervals, and evidence quality rated using GRADE.

Results: Eleven studies (n = 2,147) met inclusion criteria. Post-intervention, multimodal interventions improved QoL (SMD = 0.11 [0.00; 0.23]), pain (SMD = –0.28 [–0.55; –0.01]), and fatigue (SMD = –0.18 [–0.28; –0.08]) with low heterogeneity. No significant effects were found for insomnia or sleep duration. At follow-up, fatigue reduction persisted (SMD = –0.24 [–0.45; –0.04]), while effects on QoL, pain, and sleep were inconclusive.

Process evaluation: Most interventions were face-to-face or blended programmes combining behavioural counselling, supervised exercise, and nutritional education. Large variation in duration and adherence was observed. Only three studies addressed pain or sleep management, highlighting the need for more comprehensive multimodal designs integrating these elements.

Conclusion: Multimodal lifestyle interventions combining ≥3 behavioural components appear to alleviate fatigue and may improve QoL and pain in cancer survivors. Although evidence for insomnia and sleep outcomes remains inconclusive, integrated multidisciplinary programmes show promise for addressing the complex symptom burden of cancer survivorship.

An important step forward, understanding how lifestyle factors mediated by low-grade inflammation, contribute to chronic low back pain rehabilitation

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Introduction: Chronic low backpain (CLBP) and overweight or obesity frequently co-occur. Growing evidence supports a dose-response relationship between higher BMI, increased fat mass, and greater pain intensity and disability. This highlights body composition as a promising target for CLBP management. Proof-of-concept suggests that combining dietary change with exercise therapy yields superior outcomes-such as greater reductions in pain and disability-compared to dietary or exercise therapy alone. Concurrently, research implicates chronic low-grade inflammation as plausible mechanistic link between CLBP and unhealthy body composition. Despite these insights, no adequately powered, high-quality trial has evaluated the effectiveness of such combined intervention in the CLBP population, nor examined the mediating role of systemic inflammation. Therefore this study aims to elucidate the role of chronic low-grade inflammation in the effectiveness of a treatment integrating a behavioural weight reduction program with best-evidence physiotherapy for CLBP.

Methods: Participants will be recruited from the ongoing BO2WL-trial (NCT05811624), which investigates whether adding a behavioral weight reduction program to pain neuroscience education (PNE) and cognition-targeted exercise therapy (CTET) (experimental) results in greater pain reductions compared to PNE and CTET (control) in individuals with CLBP and comorbid overweight or obesity. To explore underlying mechanisms, outcomes will be assessed at baseline and post-intervention in both study arms. Measures will include pain intensity (Brief Pain Inventory) and systemic inflammation, operationalized among others through circulating suPAR concentrations obtained from blood samples. Structural equation modelling in R will be used for analysis.

Hypothesis: We hypothesize that participants in the experimental arm will experience greater pain reduction, and that this effect will be mediated by a reduction in systemic inflammation.
Process evaluation: This will be the first study to investigate the mediating role of chronic low-grade inflammation in the treatment response of individuals with CLBP and overweight or obesity. However, limited sample size warrants cautious interpretation.

Conclusion: This study will advance understanding of the role of low-grade inflammation in CLBP and may inform more comprehensive, mechanism-based treatment strategies targeting both pain and metabolic health in this growing patient population.

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The interplay between sleep, pain, and weight in overweight and obese adults: a systematic review

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Introduction: Individuals suffering (chronic) pain are at increased risk of overweight and obesity. A key independent factor associated with these conditions is poor sleep. Sleep disturbances can both exacerbate pain sensitivity and contribute to obesity, whereas obesity and pain can, in turn, impair sleep quality. Despite recognition of this triadic relationship, the impact of weight loss interventions on sleep and pain remains unclear. This systematic review aims to examine the interplay between sleep, pain, and weight or body composition parameters in adults with overweight or obesity undergoing a weight reduction program.

Methods: The review follows PRISMA guidelines and is registered in PROSPERO. PubMed and Web of Science were searched until 22 April 2025 using search terms focused on obesity/overweight, sleep, and pain. Eligible studies included adults aged 18–70 years with BMI over 25 kg/m^2 experiencing acute or chronic pain and reporting outcomes on sleep, pain, and weight or body composition. Intervention had to target conservative, non-pharmacological weight loss. Exclusion criteria were severe comorbid conditions, pregnancy, non-human studies, and case reports, reviews, and cross-sectional studies. Screening and risk of bias assessment were conducted independently by two reviewers. Results are not yet available, but will be ready to be presented at the symposium. Currently, the review is at the stage of risk of bias assessment for 12 eligible studies.

Process evaluation: Defining the exact inclusion and exclusion criteria proved challenging, as the topic has not been well-documented. The specification of eligible study types and interventions was therefore defined by the findings of an initial global screening rather than predetermined criteria. Through clear communication and critical reflection with co-authors based on this preliminary screening, we were able to refine and specify the scope of the study effectively.

Conclusion: This review will be the first to integrate evidence from weight reduction interventions targeting nutrition and physical activity, and their effects on sleep, pain, body composition, and weight in adults with overweight or obesity. It is expected that improvements in weight, body composition, and physical activity will be associated with better sleep, reduced pain, and enhanced well-being, highlighting the importance of integrated and multidisciplinary approaches to optimize health outcomes.

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The effect of personalized exercise interventions for the prevention of chemotherapy-induced peripheral neuropathy: protocol for a randomized controlled trial (CIPN-EX Trial)

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Introduction: Chemotherapy-induced peripheral neuropathy (CIPN) is a common and debilitating side effect of neurotoxic cancer treatments, primarily affecting sensory and motor functions in hands and feet. CIPN can interfere with daily activities and cancer treatment. Exercise is a promising strategy for CIPN prevention, but is not included in international guidelines due to limited evidence. This randomized controlled trial aims to determine the effectiveness of a personalized exercise program combining sensorimotor, strength, and aerobic training in preventing CIPN in patients receiving taxane- or platinum-based chemotherapy. A secondary aim is to conduct a process evaluation to investigate barriers and facilitators of the program.

Methods: Breast and colon cancer patients (n=206) scheduled for taxane- or platinum-based chemotherapy are being randomized to usual care (control) or exercise (intervention). All participants receive an educational session on physical activity during chemotherapy and an activity tracker for 24 weeks. The intervention group will follow a 12-week personalized exercise program: supervised sensorimotor and strength training twice weekly plus home-based aerobic sessions. The program is based on oncology exercise guidelines and the PREFERABLE II LION study (NCT06270628).

Results: Primary outcome CIPN sensory symptoms (QLQ-CIPN20) will be analyzed at 12 weeks using a linear mixed model. Secondary outcomes (motor and autonomic CIPN symptoms, CIPN signs, chemotherapy dose intensity, physical and psychosocial functioning) will be assessed at 12 and 24 weeks. Qualitative interviews with patients and health care providers will be analyzed using inductive and deductive approaches to identify barriers and facilitators.

Process evaluation: Recruitment is ongoing. Participants reported high satisfaction with the intervention but noted transportation as a barrier to consistent attendance. To enhance feasibility and adherence, the option of remote sessions was included from the beginning of the study protocol, allowing all participants to receive the intervention under uniform conditions while maintaining a target of at least one, preferably two, in-person sessions per week.

Conclusion: This trial will provide evidence on the effectiveness of exercise for CIPN prevention during chemotherapy and identify factors influencing adherence and implementation. These results may inform evidence-based exercise recommendations and support the integration of exercise into supportive cancer care to reduce the burden of CIPN.

Does altered DNA methylation of IGF1/GH axis genes underlie impaired glucose metabolism in chronic low back pain?

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Introduction: Chronic low back pain (CLBP) is the leading cause of disability and is characterized by persisting pain in the lumbar region. Our group previously showed that CLBP patients exhibit elevated postprandial glycemic response after consuming a moderate glycemic index beverage, suggesting impaired glucose metabolism as a potential CLBP comorbidity. The insulin-like growth factor 1 (IGF1)/growth hormone (GH) axis plays a key role in glucose metabolism, being crucial for maintaining normal insulin sensitivity and reducing blood glucose levels. Epigenetic modifications, particularly DNA methylation changes within this axis, may contribute to the impaired glucose metabolism observed in CLBP patients. Hence, this study investigates whether patients with CLBP display altered DNA methylation in IGF1/GH axis genes, possibly explaining CLBP-related impaired glucose metabolism.

Methods: 62 patients with CLBP and 62 age- and sex-matched healthy controls will be enrolled in a randomized cross-over experiment. Participants will undergo baseline assessments, including questionnaires to assess demographics, symptom severity and quality of life. Fasting blood samples will be collected to measure baseline blood glucose levels and assess DNA methylation in IGF1/GH axis genes. Following baseline sampling, participants will be asked to consume either a low- or high- glycemic index beverage, i.e, isomatulose or oral glucose, respectively. Blood will be recollected two hours post beverage intake to assess postprandial glucose levels. The following week, participants will receive the alternate beverage to repeat the process in reverse order.

Results: We hypothesize that CLBP patients exhibit increased DNA methylation of IGF1/GH axis genes, resulting in altered protein expression and potentially contributing to impaired glucose metabolism.

Conclusion: This study will allow us to determine the role of epigenetics in the altered glucose metabolism observed in CLBP patients.

Process evaluation: At present, the study protocol is under preparation for submission to the UZ Brussels ethics committee. Data collection will begin following ethical approval.

Unravelling fundamental epigenetic mechanisms in the development of persistent pain after breast cancer

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Introduction: Persistent pain after breast cancer surgery (PPBCS) affects approximately 40% of all survivors. With a 5-year survival rate of 90% for breast cancer, PPBCS poses an enormous socioeconomic healthcare burden. Although PPBCS remains poorly understood and understudied, it is in fact one of the main determinants of both quality of life and life expectancy after breast cancer. Recent studies suggest that genetic and epigenetic changes, particularly in neuromodulatory pain pathways, may play a role. This collaborative effort aims to investigate these mechanisms, focusing on epigenetic changes linked to PPBCS and how they relate to clinical outcomes.

Methods: 140 Breast cancer patients undergoing surgery (and adjuvant therapy) were enrolled in this prospective cohort study. Patients were assessed at 3 timepoints (preoperative, two weeks, and ≥6 months postoperative) and included blood withdrawal for biologic analysis, a demographic and clinical questionnaire battery, and quantitative sensory testing (QST) measurements. From whole blood samples, DNA was extracted and subsequently bisulfite converted. Illumina Sequencing will be employed to measure DNA methylation on the promoter regions of our target genes: OPRM1, COMT, BDNF, DRD2, and SCL6A4.

Expected results: We hypothesize that DNA methylation on our target genes changes dynamically after surgery and that this could predict the development PPBCS. Additionally, we hypothesize that these changes in DNA methylation are associated with clinical and QST outcomes.

Process evaluation: The cohort is extremely well characterized, and the available biobank is substantial. Sample preparation (dilution and bisulfite conversion) and clinical data clean-up were performed during a three-month research stay in New Zealand. Primer validation is pending and due to be finished by December 25. Effective results and a drafted paper should be ready by the Conference start date.

Conclusion: With this collaborative effort we will strive to unravel the fundamental biological mechanisms of persistent pain in breast cancer patients undergoing treatment. To the best of our knowledge, we will be the first to evaluate the epigenetic landscape in the context of persistent pain in breast cancer patients in a prospective manner.

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Unravelling the epigenetic mechanisms of exercise-induced pain in fibromyalgia: Epigenetic regulation of BDNF expression and its modulation by tDCS

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Introduction: Exercise often worsens pain and fatigue in fibromyalgia (FM), limiting adherence to physical activity. Epigenetic regulation of brain-derived neurotrophic factor (BDNF) - a key mediator of neuroplasticity and pain processing - may link exercise to symptom flares. Transcranial direct current stimulation (tDCS) can modulate neuroplasticity and may influence epigenetic pathways, offering a mechanistic route to alter BDNF dynamics during exercise.

Hypotheses: We hypothesize that BDNF genetics, DNA methylation, and protein expression contribute to exercise-induced pain in FM. Concurrent tDCS during exercise will shift BDNF-related methylation/expression toward a less pronociceptive profile and reduce exercise-induced pain increases. We further hypothesize that these tDCS effects differ between individuals with FM and healthy controls (HCs).

Methods: In a triple-blind, randomized, crossover study, 60 adults with FM and 60 HCs will complete two visits ≥1 week apart: (1) submaximal aerobic exercise paired with active tDCS and (2) the same exercise paired with sham tDCS. Allocation is concealed. Assessments include questionnaires, quantitative sensory testing, and blood withdrawal before and after each session. Pain is measured with the Numerical Rating Scale and the Brief Pain Inventory. Serum BDNF is quantified via ELISA; BDNF polymorphism and DNA methylation are assessed in blood by pyrosequencing. Delayed responses are captured via online symptom surveys at 8 h, 24 h, 48 h, and 7 days post-exercise. Analyses will use linear mixed-effects models to estimate within-person effects of condition (active vs sham) and between-group effects (FM vs HC), with prespecified mediation (BDNF methylation/expression as mediators of pain outcomes) and moderation (baseline biology/lifestyle) analyses.

Process evaluation: Recruitment and data collection are underway. Because exercise may transiently increase pain and fatigue, we anticipate attrition; the sample size accommodates a 20% dropout. A Patient and Public Involvement panel co-reviews participant materials to optimize burden, language, and pacing; reasons for withdrawal are tracked to refine retention.

Conclusion: This study tests whether BDNF epigenetic regulation links exercise to symptom exacerbation in FM and whether tDCS offers a mechanistic, non-drug modulation pathway. Findings could yield biomarkers of exercise intolerance and inform personalized strategies to keep people with FM active without worsening pain.

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Joining forces of symptoms and the epigenome: a comprehensive characterization of ME/CFS and fibromyalgia

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Introduction: Myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS) and fibromyalgia (FM) are highly co-morbid conditions characterised by shared symptoms, including widespread pain, fatigue and cognitive challenges. Although their exact pathophysiological mechanisms remain elusive, evidence suggests the involvement of multiple interacting biological systems. Epigenome wide DNA methylation offers a hypothesis-free approach to identify dysregulated pathways by revealing differences in gene regulation between patients and healthy controls. Advanced statistical analysis further enables the linking of epigenetic profiles to specific symptoms domains, enhancing the clinical relevance of the findings. This cross-sectional study therefore aims to comprehensively characterise ME/CFS and FM through epigenetic profiling in relation to symptomatology.

Methods: Women with ME/CFS (n=77), women with FM (n=46) and age- and BMI-matched healthy women (n=77) participated in a cross-sectional study. Clinical assessment included validated questionnaires covering general health, psychological factors, lifestyle, and symptom severity. Quantitative sensory testing was conducted on the hand and leg, assessing thermal detection and pain thresholds (TSA II Neurosensory Analyser), as well as pressure pain thresholds and temporal summation (digital algometer). Epigenome-wide DNA methylation profiling was performed in peripheral blood mononuclear cells using the Infinium MethylationEPIC v2.0 BeadChip. Differently methylated regions (DMRs) will be identified, adjusting for age, BMI and baseline pain symptoms, and subsequently analysed using pathway enrichment analysis to pinpoint the pathways and biological systems most represented among these DMRs. Moreover, multilevel analysis will assess whether our outcomes, individually and/or combined, can predict symptom severity.

Hypothesis: We expect that pathway analysis of DMRs will reveal biological systems previously reported to be dysregulated in ME/CFS and FM. Such findings would provide converging epigenetic evidence supporting earlier observations and contribute to a more integrated understanding of these complex conditions.

Process evaluation: Data collection finished in April 2025. Data analysis are ongoing, and all results will be presented at the congress.

Conclusion: This study will provide new insights into the biological underpinnings of ME/CFS and FM, and may help identify epigenetic signatures associated with symptom severity.

The relationship between glucose metabolism, pain sensitivity and quality of life in patients with chronic low back pain

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Introduction: Chronic low back pain (CLBP) is a prevalent condition in which patients experience daily low back pain for more than three months. Prior research indicates that CLBP patients present with impaired glucose metabolism, characterized by decreased insulin sensitivity and increased fasting glucose and postprandial glycemic response (PPGR). A potential pathway through which the glucose metabolism is linked to CLBP is the insulin-like growth factor 1 (IGF1)/growth hormone (GH) axis. This axis plays an important role in both glucose metabolism and pain modulation. With our project, we aim to elucidate the relationship between impaired glucose metabolism, pain sensitivity and quality of life in CLBP patients in comparison to healthy controls.

Methods: 62 CLBP patients and 62 healthy controls will be enrolled in our 3-week randomized, double-blind cross-over study. They will be provided with dietary diaries, a real-time actigraph and a continuous blood glucose monitor to measure real-life nutrition, sleep and physical activity, and glycemic responses, respectively. Furthermore, during two visits, PPGR will be measured in a standardized way using two drinks: a glucose beverage with high glycemic index (GI) and an isomaltulose beverage with low GI. Pain sensitivity will be measured through examination of pain thresholds for heat, pressure and electricity. Additionally, the participants will complete validated questionnaires covering pain sensitivity questionnaire, quality of life, and lifestyle factors. During the third week, PPGR will be monitored after real-life and standardized meals.

Hypothesis: We hypothesize that an impaired glucose metabolism, indicated by an increased PPGR, is associated with lower pain thresholds and a decreased quality-of-life in patients with CLBP.

Process evaluation: Momentarily, we are preparing all documents for ethical approval. This project is expected to commence in spring 2026. Therefore, the presentation of this abstract will entail a protocol presentation.

Conclusion: A better understanding of the relationship between impaired glucose metabolism and chronic pain can pave the way towards personalised medicine targeting treatment specifically towards improving glucose metabolism, when needed.

Circadian factors and pain: a systematic review of the association between rest activity rhythm and pain related outcomes

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Introduction: The rest-activity rhythm (RAR) is an important marker of circadian regulation, typically assessed via actigraphy. Emerging evidence suggests that RAR characteristics, including amplitude, stability, and regularity, may influence pain-related outcomes. While broader circadian factors such as chronotype have been linked to pain, no review has systematically examined associations between RAR and pain outcomes. This review aims to provide an overview of current approaches to measuring and defining RAR and to synthesize evidence on its associations with pain outcomes across healthy and clinical populations, including individuals with acute and chronic pain.

Methods: Observational studies reporting associations between RAR and pain-related outcomes — including pain intensity, sensitivity, duration, frequency, and interference — were included. Studies were identified through systematic searches of PubMed, Embase, and Web of Science, and screening was conducted by two independent reviewers. Risk of bias was assessed using the ROBINS-E tool. Findings will be summarized narratively, with emphasis on differences in RAR assessment methods, definitions, and reported associations with pain.

Hypotheses: We hypothesize that disrupted rest-activity rhythms are associated with worse pain-related outcomes.

Process evaluation: We have published a protocol, completed the systematic search, and performed risk-of-bias assessments of included studies. The main challenge so far is substantial heterogeneity: many studies address circadian parameters and pain across diverse populations and use varied measurement methods and RAR definitions. This heterogeneity limits opportunities for quantitative pooling and necessitates a primarily narrative synthesis.

Conclusion: By clarifying how RAR is assessed and linked to pain, this review will advance understanding of circadian mechanisms underlying pain and inform future research and chronobiologically informed pain-management strategies.

Mitochondrial dysfunction in Myalgic Encephalomyelitis/Chronic Fatigue Syndrome (ME/CFS): preliminary results on mitochondrial flux analyses

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Introduction: Mitochondria have been considered the powerhouses of the cell and are central players of cellular health and disease. Emerging evidence suggest that mitochondrial dysfunction may be implicated in chronic pain conditions. Myalgic Encephalomyelitis/Chronic Fatigue Syndrome (ME/CFS) is a debilitating disorder characterized by severe fatigue, pain and post-exertional malaise (PEM), drastically impacting the quality of life of patients. Given the central role of mitochondria in energy metabolism, their dysfunction has been hypothesized as an underlying pathological mechanism. We aim to investigate whether the level of mitochondrial dysfunction correlates to symptom severity.

Methods: A randomized cross-over study included patients with ME/CFS (N=25) and age- and BMI-matched healthy controls (HCs, N=25). Participants underwent a single bout of submaximal exercise (Aerobic Power Index) and an orthostatic test (Active standing test). Mitochondrial function in peripheral blood mononuclear cells (PBMCs) was assessed using the Seahorse XF Analyser, a novel analytical platform for investigating cellular metabolism, before and after each procedure. Key parameters, including basal respiration, ATP-linked respiration, spare respiratory capacity, and non-mitochondrial respiration, were analysed.

Results: Preliminary findings indicate that differences in mitochondrial function between patients with ME/CFS and HCs become more pronounced after a submaximal physical exercise test or active standing test. Additionally, my results highlight the connection between mitochondrial and autonomic function, as differences in mitochondrial functions are observed after the active standing test as well. I anticipate that changes in mitochondrial parameters will correlate with symptom severity, including pain and PEM, both at baseline and in response to physical stressors.

Process evaluation: To date, 75% of recruitment is complete and 55% of mitochondrial analysis are finalized. Recruitment of the remaining participants is ongoing, with additional sites being explored.

Conclusion: These preliminary results suggest a potential link between mitochondrial dysfunction and symptom severity in patients with ME/CFS and emphasizes the importance of assessing mitochondrial function after physical exercise. Understanding the relationship between mitochondrial function and symptom burden may provide insights into the underlying pathophysiology of ME/CFS.

Linking mechanistic pain profiling to cardiac autonomic regulation in individuals with chronic non-specific low back pain: a cross-sectional analysis

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Introduction: Chronic non-specific low back pain (CNSLBP) is globally the leading cause of disability. However, the underlying mechanisms of pain chronification are not fully understood, particularly regarding the interaction between altered pain processing and autonomic nervous system dysregulation. In turn, this may contribute to sustained pain and impaired autonomic control. Therefore, this study aims to investigate associations between quantitative sensory testing (QST)-derived indices of pain processing and cardiac autonomic regulation via heart rate variability (HRV), in individuals with CNSLBP.

Methods: Adults with CNSLBP underwent standardized baseline assessments comprising validated self-reported questionnaires and objective measures of HRV and QST. HRV was recorded during five-minute supine rest using Polar H10 sensors and was analyzed with Kubios HRV. HRV indices included time-domain and frequency-domain parameters. QST protocols (thermal and mechanical) were applied at both symptomatic (lumbar region) and remote sites (contralateral forearm). Participants were recruited from the in-hospital tertiary care setting through physicians at Jessa Hospital (Hasselt, Belgium) and the Antwerp University Hospital (Antwerp, Belgium). Statistical analyses included descriptive summaries, Pearson/Spearman correlations, and multiple regression models, controlling for a priori covariates (age, sex, BMI, pain intensity, disability, CRP, and physical activity) chosen for their established relevance in the literature to pain and autonomic function.

Hypotheses: We hypothesize that reduced HRV is associated with lower pain thresholds, higher temporal summation of pain, and diminished conditioned pain modulation, as evaluated through QST.

Process evaluation: Enrollment of participants and data collection are ongoing. Recruitment of CNSLBP patients from tertiary hospitals is feasible with coordinated clinical support. To date, data of 54 individuals with CNSLBP have been collected, and optimizing referral and scheduling processes will further enhance recruitment and data quality.

Conclusions: This study aims to advance our understanding of the neurophysiological coupling between pain processing and cardiac autonomic function in CNSLBP. Uncovering these mechanisms may inform strategies for future RCT design and individualized pain assessment and management approaches.

Hypermethylation of OPRM1: deregulation of the endogenous opioid pathway in Myalgic Encephalomyelitis/Chronic Fatigue Syndrome and Fibromyalgia

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Introduction: Myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS) and fibromyalgia (FM) are debilitating disorders with overlapping symptoms such as chronic pain, fatigue, and cognitive impairments. Dysregulation of the endogenous opioid system, particularly μ-opioid receptor function, may contribute to their pathophysiology. We aimed to investigate whether epigenetic modifications, such as μ-opioid receptor 1 gene (OPRM1) promoter methylation, could contribute to this dysfunction.

Methods: We employed a repeated-measures study design to control for within-subject variability, while also retaining high power. Our cohort consisted of 28 ME/CFS/FM patients and 26 matched healthy controls. All participants visited the hospital twice within four days. Assessments included a blood draw for epigenetic analysis, a clinical questionnaire battery, and quantitative sensory testing (QST). Whole blood samples were processed, and DNA was extracted. Global DNA (hydroxy)methylation was assessed using liquid chromatography/tandem mass spectrometry. Bisulfite converted DNA, used to conserve the methylation profile, was sequenced using targeted pyrosequencing technology. Regions of interest included the promoter regions of the OPRM1, COMT, and BDNF genes.

Results: ME/CFS/FM patients reported significantly worse symptom outcomes. No differences in global (hydroxy)methylation were found. Patients showed significantly higher OPRM1 promoter methylation, which remained after adjusting for symptom severity and QST findings. Across timepoints, OPRM1 methylation showed a consistent, moderate, correlation with BDNF Promoter I and Exon III methylation.

Process evaluation: This article is finished and has been submitted to a peer-reviewed Q1 journal. During this project, we were not in the position to extend our analysis to other molecular levels, such as RNA and protein. Additionally, 3CpGs were selected, while the whole OPRM1 promoter region consists of circa 50 CpGs. These aspects form limitations of our study, and future project should incorporate standardised state-of-the-art methodology and a well characterized population.

Conclusion: This is, to the best of our knowledge, the first study to investigate OPRM1 methylation in ME/CFS/FM patients. These patients showed increased methylation of the OPRM1 promoter, confirming previous findings. This strengthens our hypothesis of a dysregulated opioidergic system as part of the complex pathophysiology of these disorders.

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Decoding T cell dysfunction in chronic widespread pain: are exhaustion and senescence the answer?

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Introduction: Chronic widespread pain (CWP) is a hallmark of several debilitating conditions and is increasingly linked to immune dysregulation. Mounting evidence suggests a role for T cells in CWP pathophysiology, yet research remains limited due to small sample sizes and nonspecific analyses, hindering insights into specific immune processes. In particular, T cell exhaustion and senescence – two fundamental immune states – remain understudied in CWP. These processes, extensively described in cancer and chronic infections, involve distinct alterations in T cell activity that impair immune function. The debilitating condition Myalgic Encephalomyelitis/Chronic Fatigue Syndrome (ME/CFS) shares substantial symptom overlap with other chronic pain disorders, including fibromyalgia. In addition to CWP, patients experience a broad range of symptoms, yet its pathophysiology remains poorly understood. We aim to bridge this gap by conducting an in-depth characterization of T cell dysfunction in ME/CFS, focusing on the potential link between T cell exhaustion, senescence and CWP.

Methods: Peripheral blood samples from female patients with ME/CFS (N=60) and age- and BMI-matched healthy controls (N=60) are being collected and biobanked, allowing us to study disease mechanisms without additional burden. Extensive immune profiling by flow cytometry will characterize T cell phenotypes, using established markers of T cell exhaustion (e.g., PD-1, Tim-3) and senescence (e.g., CD57, KLRG1). Additional proliferative assays will investigate the functionality of T cells, exploring exhaustion and senescence in more depth.

Results: We hypothesize that patients with CWP display distinct signatures of T cell exhaustion and senescence compared to healthy controls.

Process evaluation: A comprehensive 16-marker flow cytometry panel is currently being validated. Antibody titrations are complete for all but three markers, and compensation experiments are next. No major delays are expected. Completion of compensation assays will finalize panel validation, allowing us to analyse patient samples.

Conclusion: By providing a detailed characterization of T cell exhaustion and senescence in CWP, these findings may enhance our understanding of its pathophysiology and help identify biomarkers, ultimately contributing to improved diagnosis.

Epigenetic regulation of autonomic dysfunction as a mechanisms underlying stress intolerance in fibromyalgia

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Introduction: Many patients with fibromyalgia (FM) experience stress intolerance (ie. an exacerbation of symptoms in response to stress). Neurophysiological (e.g. heart rate variability) and biological (e.g. catecholamine levels) markers indicate autonomic dysfunction at rest and in response to stress, which may underlie this stress sensitivity. Yet, the driving mechanisms remain unclear. Prior studies identified increased DNA methylation genes encoding catecholamine-degrading enzymes in patients with FM, suggesting an epigenetic contribution to autonomic regulation. Building on these findings, this project is the first to mechanistically link epigenetic regulation to both biological and neurophysiological markers of autonomic function, as well as symptom severity, in FM, offering new insights into the biological basis of stress intolerance.

Methods: Women with FM (n=46) and age- and BMI-matched healthy women (n=41) participated in a randomised cross-over study. The experimental procedure induced mental stress via the Montreal Imaging Stress Test while the control procedure consists of relaxation breathing. DNA methylation of genes encoding catecholamine-degrading enzymes, catecholamine levels, pain thresholds, and symptom severity were measured before and 10 minutes after each procedure. Symptom severity was also monitored online one day and seven days after their visits. Neurophysiological autonomic outcomes, including heart rate (variability) and blood pressure, were continuously measured before, during and after each procedure.

Results: Preliminary heart rate variability analysis indicate that patients with FM have a blunted autonomic stress response, and delayed physiological and psychological recovery compared to healthy controls. Between-group differences in biological and neurophysiological outcomes will be assessed using linear mixed models adjusted for age, BMI and baseline pain symptoms. Prediction models will assess whether DNA methylation of genes encoding catecholamine-degrading enzymes can predict catecholamine levels, neurophysiological outcomes, and symptom severity at baseline and in response to stress.

Process evaluation: Data analysis are ongoing. Despite some participant drop-outs, the study was successfully completed by 43 patients and 37 healthy controls.

Conclusion: This study will advance understanding of the mechanisms driving a dysregulated autonomic stress response in FM, offering a foundation for more targeted therapeutic approaches.

Inflammatory mediators and the stress hormone cortisol as predictors of pain sensitivity in Myalgic Encephalomyelitis/Chronic fatigue syndrome and fibromyalgia

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Introduction: Myalgic Encephalomyelitis/Chronic fatigue syndrome (ME/CFS) and fibromyalgia (FM) are characterized by persistent fatigue, widespread pain, and cognitive impairments. Comorbidity is frequent, with about 70% of ME/CFS patients meeting FM diagnostic criteria. Central sensitization is thought to drive the enhanced pain perception in these patients, with the brain -derived neurotrophic factor (BDNF) contributing to this process. BDNF also modulates inflammation, exhibiting pro- and anti- inflammatory effects. Cortisol, a key stress hormone with anti-inflammatory properties, also influences pain perception. This study investigated the role of the inflammatory mediators BDNF, IL-6, TGF-β, TNF-α, and the stress hormone cortisol, in pain modulation among ME/CFS/FM patients and explored whether these factors predict pain sensitivity.

Methods: 28 ME/CFS/FM patients and 26 healthy controls participated in a repeated-measures study with short inter-assessment interval to account for intra-individual variability. Across four days, all participants completed two laboratory visits. Clinical questionnaires were used to assess symptom severity, pain perception and quality of life. Patients underwent blood collection to quantify serum BDNF, IL-6, TGF-β and TNF-α levels using ELISA, while saliva cortisol levels were analyzed using Liquid Chromatography Tandem Mass Spectrometry. Pain sensitivity was determined by assessing thermal and pain thresholds at the neck, hand and leg using the TSA-II Neurosensory Analyzer and an algometer. Finally, conditioned pain modulation (CPM) was evaluated using the hot water immersion test. Therefore, the patients' non-dominant hand was immersed in 45°C water for 5 minutes, while 3 cold and 3 heat stimuli were applied. Participants rated pain intensity, allowing assessment of pain inhibition.

Results: ME/CFS/FM patients exhibited increased serum BDNF levels along with lower pain thresholds across all tested sites. However, no differences were observed in CPM responses. Ongoing analyses will reveal differences in the other biological parameters and assess their potential to predict pain sensitivity.

Conclusion: Preliminary results suggest that elevated serum BDNF levels may underlie and predict reduced pain thresholds in ME/CFS/FM.

Process evaluation: Preliminary analyses have been completed, but further analyses are required to examine IL-6, TGF-β, TNF-α and cortisol levels and their association with pain sensitivity in ME/CFS/FM.

Exploring evolving health- and illnessbeliefs on pelvic girdle pain in first-time mothers: a longitudinal interpretative phenomenological approach

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Introduction: Pregnancy-related Pelvic Girdle Pain (PPGP) is common and can challenge primiparous women's understanding of their bodily sensations. Health- and illness beliefs towards this condition are studied(1), yet little is known about how these beliefs develop through clinical interaction. This study explored how health- and illness beliefs regarding PPGP emerge around a first physiotherapy consultation.

Methods: Thirteen primiparous women participated in a longitudinal qualitative study with three data points: a pre- and post consultation interview and an audio recording of their physiotherapy consultation. Data were analysed using Longitudinal Interpretative Phenomenological Analysis (LIPA), a novel extension of IPA(2). Its application in clinical encounters is to capture evolving beliefs over time is relatively new. Analysis followed three stages: 1) idiographic case analysis developing Personal Experiential Themes (PETs); 2) cross-case analysis identifying Group Experiential Themes (GETs); 3) longitudinal conceptualisation to develop Longitudinal Experiential Concepts (LECs).

Results: Five PETs reflected individual experiences (seeking clarity, validation for complaints, legitimizing rest, acknowledging pregnancy, affirming pre-pregnancy self). Four GETs captured shared patterns (information overload, pregnancy ideals, biomedical framing, legitimacy of help-seeking). Three LECs evolved: physiotherapists as medium for 1) self-reliance; 2) to hand over control; 3) for precautionary meaning-making. These show how women move along a continuum between self-reliance and reliance on professional expertise. Across LECs, physiotherapists consistently provided explanation, advice, and exercises, while trajectories depended on participants' initial locus of control and agency.

Process evaluation: Conducting this study was intensive but methodologically valuable. Three interviews per participant and a larger-than-typical LIPA sample allowed PETs to emerge recurrently, providing robust building blocks for GETs and LECs. This demonstrates the rigor and transparency of LIPA and shows how idiographic and group-level, longitudinal processes can be captured around clinical encounters.

Conclusion: Health- and illness beliefs on PPGP in primiparous women develop in time through a dynamic interplay between locus of control and professional interaction. This study highlights the value of LIPA for research in women's health and pain science.

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An exploration of the relationship between perceived injustice and pain severity in breast cancer survivors: a structural equation model

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Introduction: Chronic pain affects one in three breast cancer survivors (BCS), yet psychosocial mechanisms underlying this symptom remain underexplored. Perceived injustice, the appraisal of one's suffering as unfair and irreparable, is increasingly recognized as a key determinant of pain outcomes. While its role has been established in musculoskeletal and neuropathic pain, no study has specifically examined its relationship with pain severity in BCS. Therefore, this study aims to investigate the direct and indirect associations between perceived injustice and pain severity in BCS.

Methods: A multidisciplinary team developed a directed acyclic graph (DAG) a priori, identifying perceived injustice (Injustice Experience Questionnaire) as the main exposure variable and pain severity (Brief Pain Inventory) as the main outcome variable, with the addition of explanatory variables including pain catastrophizing, acceptance, psychological distress, sleep quality, anger, and opioid use. Data from 156 female BCS were analyzed using structural equation modelling, with 95% confidence intervals estimated by Montecarlo simulation.

Results: Perceived injustice showed a moderate correlation with pain severity ($r=0.29$, $p\leq0.001$) but no significant univariate direct relationship ($\beta=0.186$, $p=0.102$). In the complete path model including the explanatory variables, perceived injustice was significantly related to pain severity ($\beta=0.304$ [0.136-0.477]), explaining 23.4% of its variance. The largest proportion of this effect was mediated through pain catastrophizing ($\beta=0.226$ [0.101-0.376]).

Process evaluation: Developing the DAG through multidisciplinary discussion ensured theoretical accuracy and clinical relevance. However, the cross-sectional design limited causal inference, and perceived injustice levels in this preselected sample were relatively low compared to other chronic pain populations. Despite the cross-sectional design and moderate sample size, Montecarlo simulations were used to strengthen statistical confidence.

Conclusion: Perceived injustice is significantly associated with higher pain severity in BCS, primarily through pain catastrophizing. This highlights perceived injustice as a clinically relevant cognitive-emotional target in survivorship care. Future multimodal interventions combining pain education, cognitive-behavioural, and acceptance-based strategies should address both perceived injustice and catastrophizing to optimize pain outcomes in cancer survivors.

Preconception, prenatal, and postpartum psychological risk factors for pregnancy-related lumbopelvic pain: a systematic review

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Introduction: Pregnancy-related lumbopelvic pain (PLPP) affects up to 86% of pregnant women. This condition can significantly impact daily functioning and work ability, and may persist for years after childbirth. Psychological factors are thought to contribute to PLPP, yet their role throughout the preconception, prenatal, and postpartum stages is not well understood. This systematic review aimed to identify psychological risk factors for PLPP during each of these stages.

Methods: After PROSPERO registration (CRD42025630798), we systematically searched five databases up to July 2025 for observational studies examining longitudinal associations between psychological factors and PLPP outcomes (presence, intensity, and disability) in women during the preconception, prenatal, and postpartum stages. Study quality was assessed using the Quality in Prognosis Studies tool, and certainty of evidence was evaluated with the GRADE approach. Due to heterogeneity in outcome measures and incomplete reporting, results were synthesized narratively.

Results: Thirteen studies were included, with nine showing a moderate risk of bias and four a high risk of bias. No studies investigated preconception psychological risk factors. During pregnancy, higher levels of perceived stress, depression, and pain catastrophizing, and the presence of emotional distress were associated with worse PLPP outcomes at a later time point in pregnancy. Higher prenatal neuroticism and lower extraversion and conscientiousness were associated with the presence of postpartum PLPP. No significant associations were found between postpartum psychological factors and PLPP in a later postpartum stage. The certainty of evidence for most factors was rated very low.

Process evaluation: Due to considerable methodological heterogeneity, the limited number of studies per psychological factor and time point, along with generally low study quality, careful decisions were needed regarding data synthesis and interpretation.

Conclusion: Current evidence regarding prenatal and postpartum psychological risk factors for PLPP is limited and inconsistent, with no available data for the preconception stage. Future research should use standardized measures, assess psychological factors prior to conception and symptom onset, and explore broader psychological profiles to enable stronger causal inferences. Strengthening this evidence may inform more targeted prevention and care for PLPP.

Let's talk gender: preliminary focus group data evaluating a questionnaire on gender and pain dynamics

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Introduction: Traditionally, pain research focussing on the effects of gender has been limited to gender conceptualised as sex assigned at birth and biological mechanisms. However, this framework does not adequately account for variations in gender identity or pain experience observed in the population. A comprehensive understanding of gender, including social expectations, cultural influences and individual perceptions, is needed for a thorough understanding of pain. The gender context model of pain proposes both intra- and interpersonal dynamics at work between gender and pain (Keogh, 2021), but no adequate tools are available to quantitatively test such interactions.

Methods: In this study, a validated questionnaire will be developed to quantitatively assess aspects of gender conceptualization, gender identity and gender role beliefs about pain. The rudimental questionnaire will be evaluated by an expert committee, after which it will be refined and presented to focus groups for feedback. This study includes five focus groups centered around relevant experiences for evaluating this tool: a focus group experiencing chronic pain, a gender diverse focus group, an ethnically or religiously diverse focus group, a neurodivergent focus group and a socio-economically diverse focus group. Additional feedback rounds between the expert committee and focus groups will be conducted until this so-called 'ping-pong' process reaches data saturation. Afterwards, the questionnaire will be tested for reliability and validity.

Results & Hypotheses: Preliminary data of the first feedback round by experts and focus groups will be presented. Re-occurring and general remarks by the expert committee will be shared, along with thematic analyses of focus group discussions. The expert committee has highlighted the need for thorough conceptualization of gender and providing clear definitions of this concept and related terminology used in the questionnaire to facilitate its use in a broad population. Gender diverse focus group members emphasized the importance of avoiding binaries in questions and integrating temporal aspects of gendered experiences.

Process evaluation: Barriers in this project include the formulation of clear definitions and setting up focus group meetings across time zones. Additionally, there is difficulty in translating general remarks to specific questionnaire items.

Conclusion: This validated questionnaire will provide pain researchers and clinicians an easy-to-use tool to map gender related aspects, which can be used alongside self-report and experimental pain measures to identify gender-pain interactions.

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Effectiveness of an ehealth self-management support program for persistent pain after breast cancer treatment: protocol of the PECAN study

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Introduction: Persistent pain following breast cancer treatment is a prevalent problem and poses significant challenges for patients' quality of life. The current state-of-the-art advocates for a biopsychosocial rehabilitation approach integrating pain science education with self-management support and the promotion of an active lifestyle. However, accessibility and costs remain barriers. An eHealth self-management support program presents a promising solution. The aim of this study is to investigate the effectiveness of an eHealth self-management support intervention for pain-related disability in breast cancer survivors with persistent pain.

Methods: Through a three-arm multicentric randomized controlled trial, a total of 270 breast cancer survivors with persistent pain (pain present <3 months) will be randomized into three groups: an eHealth intervention group, a face-to-face group in a physical therapy setting and a usual care group. The primary outcome is self-reported pain-related disability (assessed by the Pain Disability Index) 6 months after baseline. In addition, pain, physical, emotional and socio-economical functioning will be evaluated as secondary outcomes up to 12 months after baseline.

Hypotheses: The study hypothesizes that the eHealth self-management support intervention is more effective than the usual care and that there is non-inferiority compared to the face-to-face intervention for persistent pain-related disability after breast cancer treatment.

Process evaluation: A strength of the study that already emerged is the reported satisfaction with the interventions despite some technical issues with the eHealth platform. Nonetheless, some limitations were also observed. Recruitment for the larger trial has been slow, largely due to hesitancy about the long follow-up period and multiple assessment points. Also, reluctance to be allocated to, or remain in, the control group has impacted both enrolment and retention.

Conclusion: The findings of this study may have important implications for improving the management of persistent pain after breast cancer treatment. By using eHealth technology, the program addresses key barriers such as, accessibility, cost, and patient engagement. Furthermore, this program enables tailored interventions that accommodate the diverse biopsychosocial needs of patients. Successful implementation of the eHealth program could offer a valuable solution for pain management in this population.

Enactment of biopsychosocial care for patients with chronic pain in private practice physiotherapy following specialized training for physiotherapists

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Introduction: Physiotherapeutic care for patients with chronic pain (CP) needs to be more aligned with a biopsychosocial (BPS) approach. A work-integrated learning (WIL) program was developed to train physiotherapists in using the BPS approach. From an implementation perspective the enactment (whether participants use newly learned skills in daily practice) is of great importance. This study aims to evaluate the enactment of BPS care for patients with CP following the WIL-program.

Methods: Phase 1: Develop and validate an instrument, following the NIH Behavior Change Consortium framework, to assess enactment during physiotherapeutic consultations (1). The instrument development steps will be informed by Walton et al. and adapted from the Overall Fidelity Enactment Scale for Complex Interventions (OFES-CI) (2,3). Phase 2: Train assessors to analyze audio recordings of physiotherapy consultations of multiple physiotherapists that have participated in the WIL program. A qualitative description of the enactment of BPS care based on the results of this analysis will be drafted and interpreted using scientific literature from both an implementation as an educational science perspective.

Hypothesis: From phase 1, an instrument to assess the enactment of a BPS approach, modeled on the OFES-CI, will be presented including its psychometric properties. We hypothesize that subject matter experts can reliably evaluate BPS-skills during brief interactions, and that global assessment scales may offer greater reliability and better detect differences in participants' overall performance compared to checklists that focus on individual skills. We also hypothesize to find a variation in the enactment of a BPS approach by the participants when it comes to the level of integration and personalization of the approach. Based on the literature we expect to find strong influence of prior experiences, contextual factors, and reflective stance on the level of enactment.

Process evaluation: Using a BPS approach is different from the use of a fixed protocol. The importance of individualized care makes the development of a checklist complicated. We therefore extrapolated principles to a global assessment scale and sourced expert assessors.

Conclusion: Assessing enactment for the implementation of a BPS approach is challenging. This study intends to develop a validated instrument and insight into the enactment of physiotherapists trained in a WIL-program.

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Process evaluation of an eHealth and a face-to-face self-management support program for persistent pain after breast cancer treatment

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Introduction: Persistent pain following breast cancer treatment is a prevalent problem and poses significant challenges for patients' quality of life. Due to the current lack of treatment options for this persisting pain in this population, the PECAN-project was set up, that aims at exploring the effectiveness of an eHealth self-management support program, incorporating pain science education and physical activity coaching. In this study, the eHealth intervention is compared to a similar face-to-face intervention led by a first-line physiotherapist. This study examines the feasibility of integration of both the eHealth and face-to-face interventions into routine healthcare practice. It constitutes the process evaluation that complements and supports the primary objectives of the PECAN trial.

Methods: This process evaluation will consist of three parts: implementation fidelity, contextual factors affecting implementation and outcomes and scalability of the intervention. Whereby, both quantitative (data analysis of the PECAN platform data) and qualitative (focus groups, interviews) measures will be utilized at nano- (patients and health care providers), micro- (individual health care organization) and meso-level (collaborations between primary and secondary care providers).

Hypotheses: This study hypothesizes that the implementation of these interventions into real-world settings is feasible, with due consideration of the influencing contextual factors.

Process evaluation: The qualitative component is still in a preparatory phase for the organization of the focus groups and interviews. Furthermore, several challenges have been encountered in the quantitative data analysis, necessitating revisions of the planned data analysis procedures.

Conclusion: The findings of this study could provide valuable insights into the feasibility and implementation of both the eHealth and face-to-face PECAN interventions into routine health care, when proven effective by the PECAN-trial. By identifying key contextual factors of implementation fidelity and furthermore exploring the feasibility of its integration in routine health care, this study could contribute to the management of persistent pain after breast cancer treatment.

Improving access to sleep care in chronic spinal pain: a randomized controlled trial of stepped care Cognitive Behavioral Therapy for Insomnia

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Introduction: Chronic spinal pain (CSP) is a highly prevalent health condition that substantially contributes to disability, reduced quality of life, and socioeconomic burden. Insomnia is reported in 53–90% of individuals with CSP and is bidirectionally linked to pain. Cognitive behavioral therapy for insomnia (CBT-i) is the gold-standard treatment, yet its accessibility remains limited due to a lack of trained providers and implementation barriers. A stepped care CBT-i approach, starting with an accessible 1-hour session and progressing to standard CBT-i when needed, has shown promising effects in other CBT interventions and other conditions. However, high quality trials evaluating its feasibility and effectiveness in people with CSP and comorbid insomnia are lacking, highlighting the need for further research.

Methods: In this three-arm randomized controlled trial, 129 adults with CSP and insomnia will be allocated to stepped care CBT-i, standard CBT-i, or usual care. Stepped care consists of a one-hour physiotherapist session, followed by standard CBT-i if remission is not achieved after one month. Standard CBT-i contains a 10-week validated online program with therapist support. Usual care participants continue their regular management. The primary outcome is insomnia remission at 6 months; secondary outcomes include cost-effectiveness, sleep and pain parameters, medication use, and adherence, with follow-up to 12 months.

Results: The trial is currently ongoing, with recruitment and interventions in progress. Currently 28 participants are included. No valid outcome data are available at this stage; however, preliminary findings will be presented at the symposium.

Process evaluation: During the startup phase, minor technical issues occurred with sleep measurements using the MUSE device, as some recordings were unintentionally interrupted. This was resolved by providing affected participants with an additional phone to ensure continuous data collection. Shift work, initially unassessed, was later added to the screening to better account for its impact on sleep. Conclusion: This study will provide the first high quality trial on stepped care CBT-i in CSP, aiming to improve accessibility while maintaining clinical effectiveness.

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The effect of experimentally induced acute pain on lumbar movement control: a single blinded three arm cross-over randomized control trial

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Introduction: Alterations in neuromuscular control are frequently observed in individuals with low back pain (LBP), yet it remains unclear whether acute nociceptive input alone is sufficient to disrupt lumbar movement control (LMC). This study examined the immediate effects of experimentally induced local and remote pain on LMC in healthy adults.

Methods: Forty-five healthy, pain-free participants underwent three experimental conditions in randomized order: hypertonic saline injection to the lumbar spine (inducing local pain), hypertonic saline injection to the arm (inducing remote pain), and isotonic saline injection to the lumbar spine (sham). A standardized, reliable and validated battery of lumbar movement control tests was performed before, during and after each condition. Perceived pain intensity was evaluated every 30 seconds using the numeric rating scale. Blinding procedures included concealed pain ratings, sealed randomization, and adhesive bandages covering all potential injection sites. Non-parametric statistics were used due to non-normal data distribution.

Results: Pain intensity was significantly lower under the sham condition than under either experimental condition ($p<0.001$), whereas no significant difference was found between the two experimental conditions ($p=0.105$). While initial analysis revealed a significant overall effect ($p=0.003$), post hoc pairwise comparisons showed no significant differences of movement control test results either within or between experimental conditions. Exploratory regression analyses revealed no significant effect of pain intensity on lumbar movement control.

Process evaluation: The methodology proved feasible and well tolerated, with no adverse events. The crossover design minimized inter-individual variability, and blinding of the assessor was successfully maintained. Nevertheless, the saline pain model induces non–movement-dependent pain and involves a lower perceived threat than real low back pain, potentially limiting its comparability with clinical pain. The healthy, young cohort and the binary scoring of LMC tests may have reduced sensitivity to subtle motor adaptations. Incorporating objective biomechanical assessments in future work may enhance detection of short-term neuromuscular responses.

Conclusion: Experimentally induced acute pain exerted no detectable effect on lumbar movement control. Across analyses, performance remained stable, indicating short-term robustness to transient nociceptive input.

Self-reported work ability and the association with psychosocial factors: a cross-sectional study

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Introduction: Chronic nonspecific low back pain (CNSLBP) is a leading cause of disability, accounting for 13% of all work absenteeism. CNSLBP also leads to reduced work participation worldwide. This study aimed to assess self-reported work ability of persons with CNSLBP, and to identify psychosocial variables associated with these outcomes at baseline.

Methods: In this cross-sectional baseline analysis, 70 CNSLBP patients starting a multimodal rehabilitation program within the TechnoHIT study (NCT06491121) will be included. Work ability will be assessed using the Work Ability Index (WAI). Psychosocial variables include self-efficacy, fear avoidance beliefs, and kinesiophobia, all measured with validated questionnaires; namely Self Efficacy for Exercise (SEE), Fear avoidance components scale (FACS), Tampa scale for kinesiophobia (TSK); as well as expectations to recover; measured using a single-item 0-100 scale. Associations between work ability and psychosocial factors will be assessed with a multiple linear regression analysis with WAI as the dependent variable and the psychosocial factors as independent variables.

Hypotheses: Higher levels of self-efficacy and expectations to recover will be positively associated with work ability, whereas higher levels of fear-avoidance and kinesiophobia will be negatively associated with work ability.

Process evaluation: The ongoing process focuses on collecting data. A key limitation so far has been challenging recruitment, which may affect sample size and timeline. However, we have currently enrolled 52 participants, and efforts are made to optimize patient enrollment.

Conclusion and future research prospects: This study will contribute to understanding the associations between psychosocial factors and self-reported work ability. Understanding this relationship may provide valuable insights into how individuals with CNSLBP cope with work demands and recovery, and how these specific factors can be targeted in rehabilitation. Future research should explore if these associations differ between working and non-working individuals, and how psychosocial variables can predict work outcomes. It would also be relevant to identify various rehabilitation approaches and their influence on these factors. Investigating the potential of specific forms of patient-centered exercise to enhance self-efficacy, reduce fear avoidance and kinesiophobia, and improve work participation could contribute to more targeted treatment strategies.

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Addressing gender and diversity inequalities in chronic pain: a cross-border, participatory and multi method approach

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Introduction: Chronic pain disproportionately affects women and individuals with low socio-economic status (SES), yet prevention remains gender-blind, failing to address structural determinants shaping pain experiences and treatment access. This project explores gender- and diversity-sensitive strategies within the cross-border "ExPEDition Schmerz" campaign using intersectional, participatory mixed-methods.

Methods: A cross-sectional survey (N=3317; NL: 1222; GER: 1286; BE: 809) assessed demographics, pain duration, biopsychosocial (BPS) literacy, healthcare utilization, medication use, and quality of life (EQ-5D-5L). Complementary work includes a scoping review of gender-informed interventions and a Pain-Cognition-Knowledge-Action (PACKA) questionnaire validation for low health literacy populations (N=250, test-retest).

Results: Women showed higher chronic pain prevalence (47.9% vs 41.0%, $p<0.001$) with progression toward chronicity: 63.4% at >1-year pain ($p=0.004$). Low-SES individuals reported highest prevalence (54.3% vs 39.5%, $p=0.014$). Higher BPS literacy correlated with increased opioid use (adjusted OR=1.48, $p<0.001$), particularly in Germany. Women used more pain medication (51.3% vs 39.4%) and sought comparable/higher care, yet had poorer outcomes: lower EQ-5D-5L scores (0.830 vs 0.854, $p<0.001$), representing ~214 QALYs lost over 10 years among 893 women. The scoping review confirmed a lack of gender-informed intervention components. PACKA validation enables culturally sensitive assessment in underserved populations.

Process evaluation: Designing culturally sensitive demographic items exposed structural bias in standard tools, requiring iterative refinement across three countries. Cross-border harmonization balanced measurement consistency with national healthcare contexts. The PACKA adaptation addressed power imbalances by centring voices of low health literacy populations. Ongoing participatory co-design with marginalised communities informs intervention development.

Conclusion: Access alone does not ensure equity: women showed higher care-seeking yet poorer outcomes, indicating systemic barriers. The unexpected BPS-opioid association challenges empowerment assumptions, revealing how beliefs may reflect healthcare constraints. Intersecting social gradients demand approaches beyond gender-blind strategies toward structural interventions grounded in lived realities through participatory methods and equity-weighted evaluation for equity-sensitive pain prevention.

Reliability of accelerometer-derived parameters describing activity–rest patterns in individuals with and without chronic pain

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Introduction: Patterns of activity and rest are important in chronic pain assessment, as understanding the dynamics of rest and activity allows clinicians to tailor interventions. Yet, conventional metrics that are commonly extracted from movement sensors – such as total sedentary or active time per day - fail to capture these patterns. This study aimed to determine the minimum number of accelerometer monitoring days required to reliably estimate parameters describing activity-rest patterns in persons with chronic pain (CP). To provide a reference, individuals without chronic pain (Healthy Participants; HP) were also included, as most of these metrics have not been studied in the general population.

Methods: Fifty candidate parameters were identified from literature and extracted from 14-day accelerometer recordings of 40 CP and 27 HP. Raw accelerometer data were converted to activity intensity using a validated deep learning algorithm. Collinearity was assessed using Pearson's correlation and parameters with r>0.85 were excluded. Inter-day reliability was evaluated using intraclass correlations (ICC 2.1) for measurement durations of 1–7 days, based on repeated measurements across two consecutive weeks. ICC values were classified as moderate (0.50-0.75), good (0.75-0.90), or excellent (≥0.90).

Results: Valid data were obtained from 34 CP and 22 HP. Due to insufficient datasets with 14 valid measurement days, the minimum threshold was set at 12 days. After collinearity check, 23 of 50 parameters remained. For CP five days yielded highest reliability (mean ICC = 0.71). Fourteen parameters achieved good reliability within five days, with no improvement beyond this duration. For HP, reliability peaked at six days (mean ICC = 0.73) with thirteen parameters reaching good reliability at this point.

Process evaluation: Challenges included recruitment, data quality and parameter selection. Recruiting sufficient CP required considerable effort, and obtaining datasets with adequate valid days proved challenging. The parameters analyzed so far are preliminary; ongoing work focuses on evaluating their clinical relevance and exploring additional or combined parameters for greater utility.

Conclusions: Many accelerometer-derived parameters describing activity–rest patterns can be estimated reliably within five measurement days. This finding aligns with previous research on conventional metrics in healthy and clinical populations. These results support the feasibility of short-duration accelerometry to capture clinically relevant activity-rest pattern parameters in individuals with chronic pain.

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Contributors to adherence to exercise therapy in non-specific chronic low back pain: a systematic review of qualitative and quantitative research

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Introduction: Chronic low back pain is the leading global cause of disability, with growing prevalence and socioeconomic burden. Despite strong evidence sup-porting exercise therapy (ET) as a primary treatment, adherence rates remain low, compromising outcomes and increasing healthcare costs. Research on contributing factors to adherence to ET in non-specific chronic low back pain (nsCLBP) is limited. This systematic review aimed to reconceptualize contributors to adherence, using a conceptual framework to explore their interrelations and complexity by integrating quantitative and qualitative research.

Methods: PubMed, Web of Science and Scopus were searched, followed by a two-phase screening process. Risk of Bias (RoB), certainty assessment and level of evidence were assessed independently.

Results: eight qualitative and eleven quantitative studies were included, the latter divided in nine RCT's and two cohort studies. Overall, eight included studies showed low RoB, seven showed some concerns, and four presented with high RoB. Synthesis identified internal, external, and intervention-related contributing factors. These factors were presented in a conceptual framework figure, highlighting that adherence should not be viewed as a binary concept but rather as a dynamic behaviour shaped by interrelated factors. Moderate-certainty evidence supports the impact of psychosocial factors, health care professional (HCP) characteristics, environmental and time-related factors, program design, progression, home-exercise program (HEP), modalities, and follow-up. Low-to-moderate evidence suggests beliefs, patient-related characteristics, and treatment setting also impact adherence. Low evidence indicates that feedback, symptoms and impairments, and confidence possibly impact adherence.

Conclusions: This systematic review highlights the complex, context-dependent interplay of factors impacting adherence to ET in individuals with nsCLBP. Overall, these findings under-score the need for personalized, context-sensitive interventions that address the broad spectrum of factors, while future research should focus on validated adherence assessment tools.

Exercise and pain relief in chronic low back pain: an umbrella review of systematic reviews

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Introduction: Chronic non-specific low back pain (CNSLBP) is commonly managed with exercise, but existing systematic reviews vary in scope and quality. This umbrella review aimed to (1) synthesize findings from systematic reviews on exercise or physical activity for adults with CNSLBP reporting pain intensity outcome, and (2) assess their methodological quality using AMSTAR 2.

Methods: An umbrella review of systematic reviews (with/without meta-analysis) was conducted. PubMed, EMBASE, Cochrane Library, CINAHL, and SportDiscus were searched (January 2010–August 2025) without language restrictions. Reviews including adults (≥18 years) with CNSLBP (≥12 weeks; no specific pathology) and evaluating any exercise intervention versus any comparator were eligible. Two reviewers independently screened, extracted data, and assessed quality using AMSTAR 2; disagreements were resolved by consensus. A narrative synthesis organized by exercise modality was performed, weighted by AMSTAR 2 confidence ratings.

Results: The database search identified 1,807 records (PubMed = 664, EMBASE = 403, Cochrane Library = 324, CINAHL = 277, SPORTDiscus = 139). After removing 773 duplicates, 1,034 records were screened. Following title and abstract screening, 887 full-text reviews were assessed for eligibility. Of these, 77 systematic reviews met all inclusion criteria and were included in the final synthesis and methodological quality assessment using the AMSTAR 2 tool.

Process evaluation: The review process was feasible but demanding due to the high volume of records, duplicate removal, and variability in exercise definitions and outcomes. Clear eligibility criteria, reviewer calibration, and structured extraction ensured consistency. Main challenges included heterogeneity and overlapping studies. Standardized outcome reporting is recommended for future reviews.

Conclusion: This umbrella review highlights extensive but heterogeneous evidence on exercise for CNSLBP. Although most reviews report pain reduction, methodological inconsistencies limit firm conclusions. Exercise remains central in management, but high-quality, standardized research is needed to identify the most effective exercise modalities.

Local and remote exercise induced hypoalgesia in knee osteoarthritis patients: a randomized cross-over study

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Introduction: The prevalence of knee osteoarthritis (KOA) related pain and disability is high, causing low quality-of-life and high healthcare demands(1). Exercise serves as the cornerstone for physical therapy in managing KOA; however, the optimal form and dose of exercise remain under debate(2). Therefore, clarifying the relationship between exercise and pain reduction is needed. Exercise induced hypoalgesia (EIH) is the main mechanism explaining the effect of exercise on pain(3). Within this study, we aim to investigate the influence of lower or upper body exercise on local and remote EIH in patients with KOA.

Methods: Randomized experimental cross-over study with 45 KOA patients aged 45-70 visiting primary physical therapy practices. Inclusion criteria: KOA based on the NICE criteria and referral for physiotherapy. Exclusion criteria: known cardiovascular disease, neurological/psychiatric disorder, recent joint surgery, joint replacement, and higher pain intensity elsewhere. Study parameters are local and remote EIH, pain intensity, duration of complaints, and central sensitization. Participants will complete digital questionnaires for demographic data, pain intensity, functional limitations, and central pain processing, and will also have physical measurements taken (PPTs at lower body and upper body locations pre- and post-exercise). EIH will be determined using PPTs, with a pre/post ratio >1.0 considered effective. Exercise conditions include two upper body (seated rowing exercise, high and low intensity) and one lower body (high-intensity cycling on an ergometer). Exercise duration is 15 minutes, with Borg scores collected at 5, 10 and 15 minutes. Participants will execute all exercise conditions, in randomized order. A one-week washout period will separate the execution of each exercise condition. Linear mixed-effects models will be used to examine the influence of exercise type on local and remote EIH, and whether this effect is moderated by pain intensity, duration of complaints, and central sensitization.

Hypothesis: High intensity exercises will yield stronger EIH effects than low intensity exercises. All exercise types will yield both local and remote EIH -effects.

Process evaluation: Five trained physical therapists will collect the data. Recruitment will occur from October 2025 to April 2026.

Conclusion: Results of this study may inform better exercise prescriptions for patients with KOA.

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Implementing and evaluating a training program for healthcare providers in conservative knee and hip osteoarthritis management: a type 1 hybrid effectiveness-implementation study

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Introduction: Although international treatment guidelines exist, most patients with knee and/or hip osteoarthritis (KHOA) do not receive the recommended evidence-based guideline core treatments. This highlights the need for an implementation program to improve the delivery of these interventions. The program focuses on improving healthcare providers' skills in patient education, tailored exercise, preoperative management, and appropriate referrals. It also promotes a biopsychosocial understanding of pain, integrates contemporary pain neuroscience into clinical reasoning, supports patient-centered management and facilitates effective multidisciplinary collaboration.

Methods: This ongoing type 1 hybrid effectiveness-implementation study involves the development and implementation of a multidisciplinary and monodisciplinary conservative training program. An interdisciplinary expert panel, including representatives from supporting organizations, provides guidance and input throughout the process. A total of 600 healthcare providers, primarily physiotherapists and general practitioners, will be trained. The training program uses a blended learning format concisting of one multidisciplinary session and one monodisciplinary session for physiotherapists, each including one e-learning and one face-to-face workshop. The primary outcomes are changes in knowledge and attitudes regarding evidence based care for patients with KHOA. Secondary outcomes include identifying barriers to implementation and training, quality, acceptability, satisfaction and usability. Assessments will be conducted prior to the workshops, immediately afterward and at 6 months follow-up, after participants have applied the training in practice. In addition, two focus groups will be organized to explore barriers and facilitators to implementation.

Results: The training program is expected to enhance healthcare providers' knowledge and skills in delivering evidence-based care for people with KHOA, emphasizing education, exercise therapy, lifestyle interventions and interdisciplinary collaboration.

Process evaluation: Ethical approval has been obtained and the training program has been developed. Recruitment and training of participants have recently started and are ongoing.

Conclusion: By training healthcare providers, this study aims to enhance the application of KHOA knowledge and skills in practice, ultimately improving patient care and resulting in expected healthcare cost savings through delayed surgery.

Defining the content of interdisciplinary rehabilitation for people with chronic low back pain: an international Delphi study

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Introduction: Interdisciplinary interventions for chronic low back pain are diverse, and there is a need to reach consensus on the content of rehabilitation.

Methods: A 3-round Delphi survey was conducted across international networks, a world physiotherapy specialty group, and the research team. The first round contained a checklist, based on previous research on interdisciplinary rehabilitation for people with chronic low back pain. Participants rated all items, subitems, clarifications, and questions on three content-validity indicators: (1) clarity and comprehensibility, (2) unique value, and (3) alignment with the overall goal. General questions were asked about the checklist, together with qualitative feedback and any missing items. A sensitivity analysis was conducted in anticipation of a possible overrepresentation of participants from a specific region.

Results: After three rounds, consensus was reached on all subitems. There was an overrepresentation of Belgian participants. The sensitivity analysis, removing Belgian responses, showed no or little differences in consensus scores. A consensus was reached on a comprehensive checklist comprising 11 key items essential to rehabilitation for people with chronic low back pain. Additionally, 32 subitems with corresponding questions were identified, ensuring coverage of all aspects of interdisciplinary rehabilitation for people with chronic low back pain.

Process evaluation: The consensus was mainly a European consensus with Belgian overrepresentation. Nonetheless, these results provide a basis for further research to adequately adapt rehabilitation to the personal needs of people suffering from chronic low back pain. More research is necessary before clinical use can be recommended.

Conclusion: Consensus was reached on a comprehensive, evidence-based checklist for research and clinical practice.

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Do manual therapeutic techniques influence central pain processing mechanisms in people with neck pain? An observational study

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Introduction: Neck pain is a prevalent and disabling condition, In the Netherlands, it represents one of the leading musculoskeletal causes of disability. Manual therapy is recommended in clinical guidelines and is (cost-)effective for reducing pain and disability, yet its underlying mechanisms remain unclear. Recent evidence suggests that neurophysiological mechanisms, rather than biomechanical factors, explain its effects. Within a biopsychosocial framework, central pain modulation processes such as Conditioned Pain Modulation (CPM) and Temporal Summation of Pain (TSP) have been proposed as potential mediators. Both mechanisms are often altered in patients with persistent pain, with enhanced TSP and diminished or facilitatory CPM reflecting a pro-nociceptive profile. Understanding how manual therapy joint techniques influence these mechanisms may help to refine treatment approaches. Therefore, this study aimed to explore the effect of manual therapy techniques on CPM and TSP in patients with neck pain.

Methods: In this cross-sectional observational study, patients with non-specific neck pain (≥4 weeks, NPRS >4) undergoing manual therapy participated during their regular treatment sessions. CPM and TSP were measured immediately before and after cervical mobilization and thoracic manipulation. CPM was assessed using pressure pain thresholds at the neck and tibialis anterior muscle before, during, and after a cold pressor test , while TSP was evaluated using repeated pin-prick stimuli on the painful area and hand. Both absolute and relative calculations were used for robustness. Participants completed questionnaires on demographics, pain, and psychosocial factors. Linear mixed models will assess pre- and post-intervention differences and explore whether manual therapy modulate CPM and TSP responses in patients with neck pain.

Results: Currently, 28 patients are included. No preliminary analyses are conducted.

Process evaluation: The rate of inclusion is slower than expected. The urgency to engage physiotherapists in recruiting eligible patients for the study appears to be low, potentially contributing to the low response rate

Conclusion: N/a

Effectiveness of Kinesio-Taping in patients with plantar fasciitis for pain reduction and function improvement: A Systematic Review & Meta-analysis

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Introduction: One of the main cause of foot pain among musculoskeletal injuries is plantar fasciitis (PF). Different therapeutic interventions are used in the management of PF. Nowadays, Kinesiotaping is the most prevalent and effective method, which is utilized for the management of PF patients, commonly in athletes. This systematic review aims to conduct a thorough qualitative and quantitative synthesis on the effects of KT in PF patients.

Methods: This systematic review followed the guidelines of Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA). Literature was searched in MEDLINE, SportDiscuss, Cochrane Library, PEDro databases and google scholar. This review included RCT's that were published in English language at which effectiveness of KT was reported in the management of PF. Screening was done using Covidence software after full text screening those studies were included that fulfills the eligibility criteria. Cochrane Risk of bias tool was used to evaluate the risk of bias in the included studies.

Results: Of 5987 studies which were identified, 7 from PEDro, 1,810 from the Cochrane Library, 1,154 from SportsDiscuss, 3,016 from MEDLINE, and 2,383 from Google Scholar. 28 studies were included for qualitative synthesis and 22 studies were included for quantitative synthesis. According to all of the included trials, KT and conventional physical therapy were significant effective in reducing pain for PF patients. However, KT was found to be the better option in reducing the pain. Hence, KT is an effective intervention in the management of people with PF.

Conclusion: It can be concluded that kinesiotaping and conventional physical therapies are effective in improving pain symptoms among PF patients. Overall, these findings suggest that there is no significant difference between kinesiotaping and conventional physical therapies for managing pain in PF patients. However, kinesiotaping was found to be more effective in terms of reducing pain as compared to conventional physical therapy in improving pain. However, further research is needed to explore the potential factors that contribute to the heterogeneity observed in the study results and to develop more targeted and effective interventions for this population.

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The Physio Perspective study: Exploring physiotherapists' knowledge, attitudes, beliefs and clinical decision making regarding physical activity in chronic pain management: a preliminary analysis

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Introduction: The Physio Perspective study investigates the state of rehabilitation for patients with persistent pain, focusing on physiotherapists' knowledge, attitudes, and clinical behavior. Although physical activity provides clear benefits, activity levels remain low, and physiotherapists play a key role in motivating patients and shaping exercise prescription. This study also evaluates whether a targeted e-learning module can influence physiotherapists' practice. Finally, we compare physiotherapists experienced in low back pain rehabilitation with those working in oncological rehabilitation, two distinct contexts united by persistent pain and the potential benefits of physical activity.

Methods: This longitudinal cohort study uses a pre/post design with data collected via an online survey. Participant characteristics (e.g., age, experience, work setting) are recorded. Knowledge of pain is assessed with the KNAP questionnaire, while a clinical case questionnaire evaluates decision-making and explicit beliefs and attitudes toward chronic pain management. An implicit association task measures implicit beliefs about the safety of activity. The same assessments are repeated after completion of the e-learning module. We aim to recruit 300 physiotherapists, equally divided between low back pain and oncological rehabilitation.

Hypotheses: We hypothesize that physiotherapists generally adopt a protective strategy in prescribing activity, that e-learning will improve knowledge, attitudes, and clinical decision-making, and that oncological rehabilitation physiotherapists will be more guideline-aware then those working with chronic low back pain due to more recent educational efforts of these participants.

Process evaluation: Recruitment is ongoing. Limitations include the absence of direct observation of exercise prescription and the potential for socially desirable responses. To address this, participants design exercise programs from predefined options, and implicit beliefs are assessed with an association task. Recruitment of oncological rehabilitation physiotherapists is challenging, which may limit sample balance and complicate comparative analyses.

Conclusion: By identifying current gaps and evaluating the impact of targeted education, the Physio Perspective study aims to inform strategies for improving pain management in physiotherapy practice.

Discrepancies in physical activity assessment among breast cancer survivors with pain: IPAQ vs accelerometer

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Introduction: Breast cancer survivors are faced with many challenges after end of treatment. It is estimated that approximately half of these survivors will experience ongoing complaints of pain. Physical activity (PA) is key in rehabilitation, but undertaking and maintaining an active lifestyle is a challenge. Assessment methods can be used in research, but equally also as part of self-monitoring, a helpful behaviour change technique. Subjective assessment methods such as questionnaires are easy and cheap but often over-estimate the amount of physical activity. An alternative are objective assessment methods such as the use of an accelerometer. Although, this often is experienced as less user-friendly.

Methods: PA will be assessed objectively (ActiGraph wGT3X-BT accelerometer) and subjectively (International Physical Activity Questionnaire (IPAQ-L)) in a sample of breast cancer survivors with persistent pain. Data analysis will look at the agreement between these two measurement methods and will look at possible associations between discrepancies in these methods and participant characteristics as well as pain-related and psychosocial variables.

Results/Hypotheses: We hypothesize that the IPAQ will over-estimate the physical activity, that psychosocial variables will influence over- or under-estimation and that pain-related variables will have a negative impact on the correct estimation of PA.

Process Evaluation: This study uses baseline data from the PECAN trial, a large RCT, which is time-intensive and this barrier affects recruitment. Data collection is ongoing, and a detailed analysis plan is being developed. Methodological challenges we already have encountered include unclear accelerometer cut-off points for PA intensity and aligning these with IPAQ data.

Conclusion: This study will provide insights into the validity of PA assessment methods in breast cancer survivors with ongoing pain and inform future interventions aimed at improving PA monitoring and support.

Clinical phenotypes in frozen shoulder based on psychological and sensory phenotypes: associations with pain over time

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Introduction: Frozen shoulder (FS) affects up to 5% of the general population and is characterized by severe pain and movement restriction. Pain-related psychological factors along with alterations in central pain processing may influence the pain experience of these people. This study aimed to identify phenotypes of people with FS based on baseline measures including pain intensity, shoulder pain and disability, pain-related psychological factors, and measures of central pain processing. A secondary objective was to evaluate whether these baseline phenotypes were associated with distinct longitudinal trajectories of pain intensity and pain-related disability over 9 months.

Methods: People with FS were assessed at baseline for clinical (pain intensity and shoulder pain and disability) and psychophysical variables (pain catastrophizing and hypervigilance, self-reported symptoms related to central sensitization, primary and secondary allodynia and hyperalgesia, and pain modulation). Pain intensity and pain-related disability was assessed at 3, 6, and 9 months follow up. A latent profile analysis was conducted using baseline clinical and psychophysical variables. Linear mixed models were then used to examine longitudinal trajectories of pain intensity and pain-related disability across phenotypes over 3, 6, and 9 months.

Results: A total of 149 people with FS were recruited. Two distinct phenotypes were identified, of which phenotype 1 (n=71) presented higher intensity, greater disability, and higher scores for pain catastrophizing, hypervigilance, and central sensitization-related symptoms at baseline compared to phenotype 2 (n=78). Over 9 months, trajectories differed by phenotype. Phenotype 1 exhibited a greater absolute reduction in both pain and disability, yet Phenotype 2 remained lower at all time points, including 9 months, for both outcomes.

Conclusions: This study highlights two distinct phenotypes in people with FS based on baseline clinical and psychophysical variables. These phenotypes showed distinct trajectories of pain and pain-related disability over 9 months, supporting the relevance of baseline phenotyping for understanding clinical heterogeneity in FS.

Pain prevalence, phenotypes & management of patients undergoing neurological rehabilitation: a cross sectional observational study

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Introduction: Pain is a common and persistent problem in patients with neurological disorders. Despite high prevalence and negative consequences for quality of life and the rehabilitation process, studies have shown that pain often remains outside the clinical focus in neurological rehabilitation (1). Prerequisites for effective pain treatment include accurate assessment & differentiation of the underlying pain mechanism and systematic documentation (2). This evidence-based approach to pain management is not adequately implemented in this patient group (3). The aim of the study was to evaluate pain prevalence & phenotypes and to describe interprofessional pain management and patient satisfaction of patients in a Swiss neurorehabilitation clinic.

Methods: Design: Cross-sectional observational study. Inpatients with diagnosed neurological disorder, >18. Patients with Montreal Cognitive Assessment (MoCA) >19 completed a supported self-report questionnaire assessing pain prevalence, phenotypes (nociceptive, nociplastic, neuropathic) and management. Patients with MoCA <19 were assessed with the Zurich Observational Pain Assessment (ZOPA). Healthcare professionals completed a pain management questionnaire. Primary outcome: Pain prevalence. Secondary outcomes: Prevalence of main/additional pain phenotypes, pain severity, association with neurological disorder, patient satisfaction, evaluation of interprofessional pain management and prescribed pain medication type.

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%). Patients completing questionnaire 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, mainly severity rather than mechanisms or phenotypes. Standardised, interprofessional procedures were considered to be lacking. Interprofessional pain management was rated “very good” or “good” by 64.9% of patients.

Conclusion: High pain prevalence and complex mixed phenotypes were measured. Standardised interprofessional management including differential pain diagnosis, treatment plans and documentation require improvement. Valid practical tools for phenotype differentiation and implementation strategies for interprofessional pain management require further research.

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Biopsychosocial clinical reasoning models for physiotherapy in patients with musculoskeletal pain - a systematic review

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Introduction: Clinical reasoning is the backbone of physiotherapy practice but can be challenging in musculoskeletal pain due to the complex interaction of biological, psychological and social factors. Biopsychosocial-informed reasoning models can support this process. Currently, a systematic overview of such models, including their comprehensiveness and quality, is lacking. Therefore, the aim of this study was to identify and evaluate biopsychosocial clinical reasoning models for physiotherapy in patients with musculoskeletal pain, including their clinimetric properties.

Methods: A systematic search was performed in PubMed, Embase, Web of Science, CINAHL following PRISMA 2020 guidelines. Two reviewers independently screened selected studies that: 1) peer-reviewed and in English; (2) described a physiotherapy-specific, patient-centered, biopsychosocial clinical reasoning model for musculoskeletal pain; and (3) led to a personal work hypothesis. Data on study characteristics, model components, and clinimetric properties were extracted.

Results: From 13,880 records, 8,823 remained after duplicates removal; 12 studies met Inclusion criteria. (Primarily) analysis reveals wide variation in key elements, reasoning skills and strategies. Only one model addressed all key elements (biopsychosocial, patient-centered, and musculoskeletal aspects). None covered all reasoning skills and strategies. Diagnostic (12/12) and narrative (9/12) were most common; emotional aspects (3/12), ethical reasoning (1/12), reflective practices (2/12) and teaching-related reasoning (4/12) were seldom included. Framework development was often insufficient transparent; only two models were involved in validation research.

Conclusion: Twelve biopsychosocial clinical reasoning models were identified for physiotherapy in musculoskeletal pain. Wide variation exists in the inclusion of biopsychosocial factors, reasoning skills, and strategies. Further refinement and validation are essential to develop robust, evidence-based frameworks supporting physiotherapists in delivering high-quality, biopsychosocial, patient-centered care.

Intra-rater Reliability of Quantitative Sensory Testing in Individuals with Knee Osteoarthritis

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Introduction: Osteoarthritis (OA) affects more than 595 million people worldwide and is a major cause of pain and disability. The modest association between joint pathology and pain severity suggests that altered pain processing contributes to symptom burden. Central sensitisation (CS), characterised by increased excitability within the central nervous system, has been identified as an important mechanism in chronic OA pain. Quantitative Sensory Testing (QST) provides a structured assessment of somatosensory function and supports the identification of altered pain processing. Although the German Research Network on Neuropathic Pain (DFNS) protocol standardises QST procedures, evidence for its reliability in knee OA is limited. This study therefore aimed to determine the intra-rater reliability of QST measures in a knee OA population.

Methods: A single-centre test–retest reliability study was conducted with 22 participants with clinically diagnosed knee OA. Each completed two identical QST sessions, 24 hours to 14 days apart, administered by the same trained examiner at Ulster University, Belfast. Testing followed the DFNS protocol at two sites: the most painful area of the affected knee and a contralateral control site. Measures included cold and warm detection thresholds, cold and heat pain thresholds, and pressure pain thresholds. Intra-class correlation coefficients (ICC, 95% CI) will be calculated, with Bland–Altman plots used to examine agreement.

Results (or hypotheses): It is hypothesised that pressure pain thresholds will demonstrate good-to-excellent reliability (ICC > 0.75) and thermal thresholds moderate-to-good reliability, consistent with previous research. Analysis is ongoing.

Process evaluation: Recruitment and testing were well tolerated, with no adverse events. Standardised site marking, examiner training, and adherence to DFNS procedures supported methodological consistency. Minor challenges included participant fatigue and maintaining test intervals; these were managed through flexible scheduling and clear instructions.

Conclusion: This study will provide contemporary data on the intra-rater reliability of thermal and pressure QST parameters in knee OA. Demonstrating acceptable reliability would support the consistent use of the DFNS protocol in this population and the feasibility of these measures for future research exploring sensory function in OA.

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Validation of digital measurement methods intended to measure physical capacity in people with lumbar spinal stenosis planned for surgery

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Introduction: Lumbar spinal stenosis (LSS) can cause back and leg pain and lead to physical inactivity. Physical capacity tests can provide information about functional ability, but geographical barriers can limit participation in assessments at a clinic. Video-based testing may increase accessibility, but evidence of validity and reliability in people with LSS has been lacking. The aim of this study was to evaluate the criterion validity and inter- and intra-rater reliability of the three physical capacity tests One-Leg Stand (OLS), Timed Up and Go (TUG), and 30-Second Sit-to-Stand (30s STS) via video call compared to assessment in clinic.

Methods: Thirty-five patients with LSS were recruited. Inclusion criteria were age over 18 years, scheduled for surgery for LSS, ability to communicate in Swedish, and access to a smartphone with camera. Each participant performed two trials of OLS, TUG and 30s STS during video call and two trials in clinic. Video assessments were recorded and then rated by an independent researcher. At least 25 participants provided complete data for the main analyses, thereby meeting the predefined sample size requirement. Criterion validity and reliability were analyzed using intraclass correlation coefficients (ICC). A priori acceptable level of agreement was defined as ICC ≥ 0.70.

Results: Criterion validity analyses between video and in clinic assessments showed good to excellent agreement across all physical capacity tests (OLS = 0.83, TUG = 0.88, 30s STS = 0.88). Intra-rater reliability was good to excellent in the video setting (OLS = 0.80, TUG = 0.96, 30s STS = 0.98) and excellent in the clinical setting (OLS = 0.97, TUG = 0.95, 30s STS = 0.96). Inter-rater reliability, assessed between the original video assessments and independent ratings of video-recordings, was excellent for all physical capacity tests (OLS = 0.98, TUG = 0.98, 30s STS = 0.98).

Process evaluation: These findings indicate that video assessment may serve as a reliable and valid alternative for remote evaluation of physical capacity. This may be particularly valuable when evaluation at a clinic is not feasible, and thereby may facilitate person-centered and equitable care. Further research is needed to evaluate the responsiveness of these tests to clinically meaningful change.

Conclusion: This study demonstrates good to excellent criterion validity, intra-rater reliability, and inter-rater reliability for video assessment of OLS, TUG, and 30-s STS in patients with LSS.

Survey study on pain distribution as a factor shaping health-care seeking behaviour

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Introduction: Pain distribution is a key yet poorly understood feature of many chronic pain conditions. Pain may be well-localized or widely distributed across multiple body areas, and these spatial patterns may shape how individuals interpret their symptoms. This study aimed at understanding beliefs regarding pain distribution, as these beliefs may influence decisions to seek healthcare.

Methods: A cross-sectional online survey (SoSci Survey; Germany) was used. Different pain distribution patterns were presented visually through body charts depicting four body regions (upper and lower extremity, lower back and multiple sites), each with three degrees of spatial extent. To contrast spatial beliefs with intensity of pain beliefs, for medium pain extent, three pain intensity levels were shown. Participants were asked to imagine experiencing the depicted pain for three to four weeks and then rate how likely (0–100) they would be to seek help or take medication. Additional items assessed pain features (if not pain-free) and descriptive characteristics. Data were analysed using R via R Studio: descriptive statistics and linear mixed models were used (fixed: pain size, area; random: subject; FDR-corrected post-hoc).

Results: Data from 441 participants were analysed. Linear mixed models indicated a significant main effect of the pain distribution level on the (self-reported) likelihood of seeking help ($F(2,439) = 446.75$, $p < 0.001$) and taking medication ($F(2,439) = 263.07$, $p < 0.001$). More widespread pain was associated with a higher likelihood of engaging in healthcare-seeking behaviour. A similar pattern was observed for higher pain intensity ($F(2,439) = 1432.61$, $p < 0.001$).

Process evaluation: Participants engaged well with the body-chart format, though some reported difficulty judging unfamiliar pain areas. The online survey format allowed efficient data collection, but limited control over participants' interpretation of scenarios. Future studies may benefit from in-person demonstrations or interactive elements to improve clarity.

Conclusion: The magnitude (extent) of pain distribution and body region appear to be key determinants of individuals' decisions to seek professional help or use medication. These findings highlight the importance of considering not only pain intensity but also spatial pain characteristics in understanding pain-related decision-making and suggest that spatial aspects warrant greater attention in both research and clinical practice.

Tactile acuity, left–right judgement, and temporal summation in acute versus chronic rotator cuff related shoulder pain

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Introduction: Rotator cuff-related shoulder pain (RCRSP) is a leading cause of shoulder dysfunction, with a lifetime prevalence of 30–50%. Understanding sensory and perceptual differences between acute and chronic presentations supports evidence-based physiotherapy by informing assessment and guiding appropriate sensory discrimination or pain-modulation strategies.

Methods: Twenty-seven participants (15 males, 12 females; mean age = 52.1 ± 6.45 years) with unilateral RCRSP were recruited from the physiotherapy outpatient department. Participants were classified as acute (less than 3 months, n = 11) or chronic (greater than or equal to 3 months, n = 16). Individuals with neurological or systemic conditions affecting sensory or pain processing were excluded. This cross-sectional comparative study assessed tactile acuity via two-point discrimination (2PD), LRD using the Recognise™ app, and TS via repeated mechanical stimulation using monofilament.

Results: Normality was examined with Shapiro–Wilk tests. Mann–Whitney U tests were used for group comparisons. No significant differences were observed between acute and chronic groups. Tactile acuity was similar for 2PD ascending ($t(25) = 0.94$, $p = 0.355$) and 2PD descending ($t(25) = 0.55$, $p = 0.589$). LRD accuracy and response time did not differ (Accuracy: $U = 73.0$, $p = 0.471$; Response time: $U = 84.5$, $p = 0.882$). TS scores were also comparable ($U = 82.0$, $p = 0.759$).

Process evaluation: Larger studies are required to confirm these findings. Studying how somatosensory features differ between individuals with acute and chronic pain can offer valuable insights into how pain shapes cortical processing.

Conclusion: Somatosensory measures did not differ between acute and chronic RCRSP, suggesting that pain duration alone may not be a significant factor influencing these findings.

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Development of a clinical prediction model for chronic post-surgical shoulder pain following arthroscopic rotator cuff repair: a prospective cohort study

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Introduction: Rotator cuff (RC) tears occur in 13% to 37% of the general population, and their prevalence increases with age. Arthroscopic rotator cuff repair (ARCR) is the standard surgical procedure for treating patients with RC tears who do not respond favorably to conservative care. However, a subgroup of patients can develop chronic post-surgical pain (CPSP) after ARCR. CPSP often disrupts daily activities and negatively affects quality of life, as well as emotional and physical well-being. Several modifiable and non-modifiable predictors of CPSP have been identified following ARCR. This study aimed to develop a preoperative clinical prediction model using modifiable factors for the occurrence of CPSP of the shoulder in patients undergoing ARCR.

Methods: This prospective cohort study was conducted at the Department of Physiotherapy, Kasturba Hospital, Manipal, India. Patients who underwent ARCR for degenerative or traumatic RC tears between August 2022 and November 2024 at a single institution were included. The inclusion criteria were ages between 18 and 70 years, with unilateral RC tears undergoing primary ARCR. Exclusion criteria included shoulder or upper quarter fractures, previous diagnosis of chronic pain conditions, open or mini-open RC repair, trauma to the head or neck, language barriers, revision repair, cervical radiculopathy, neurological disorders, systemic inflammatory conditions, psychological diagnoses on medication, use of antidepressants or anticonvulsants, and malignancy. Ten potential predictors were identified beforehand and included in the study. Post-surgical pain was measured using the numerical pain rating scale (NRS) at three times: 6 weeks, 3 months, and 6 months after ARCR. At each point, shoulder pain was recorded both at rest and during movement, specifically during active shoulder elevation in the scaption plane.

Results: A total of 170 participants were screened based on the inclusion and exclusion criteria; 103 completed the study. Binomial logistic regression analyzed the relationship between factors related to pain and no pain, based on pain at rest and during movement at six months. The association between all candidate predictors and CPSP was examined using bivariate logistic regression. The model for predicting CPSP at six months was built using a stepwise selection method. The CPSP subgroup showed significantly higher scores on the Central sensitization inventory ($p < 0.001$), Depression, anxiety, stress scale-21 ($p = 0.001$), and Pain catastrophizing scale ($p < 0.001$), as well as on the PPT Middle deltoid ($p = 0.007$), compared to the non-CPSP group.

Process evaluation: The model was developed using a group of otherwise healthy patients who experienced only CPSP. Preoperative and postoperative opioid medication history was not recorded. Similarly, individualized rehabilitation plans, adherence levels, and the incidence of secondary postoperative stiffness were not documented or analyzed. Although validated tools for psychosocial and sensory assessment were used, other factors such as sleep disturbance, coping strategies, or inflammatory markers were not evaluated. The small number of patients who developed CPSP, especially at rest, may limit the generalizability and stability of the prediction model.

Conclusion: This prediction model represents a valuable instrument for preoperative risk assessment and serves as a foundation for developing individualized pain management strategies. Its integration into clinical practice can promote a patient-centered and evidence-informed approach to early detection and management of CPSP.

Treatment approaches and their effectiveness for chronic pain according to the predominant pain mechanism: a study protocol

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Introduction: Pain can be classified by its predominant underlying mechanism, i.e. nociceptive, neuropathic or nociplastic, each with distinct pathophysiology and treatment needs. In secondary multidisciplinary settings a range of biomedical and biopsychosocial interventions are usually delivered for the treatment of chronic pain. This study aims to 1) evaluate the effectiveness of various therapeutic approaches on pain and disability; 2) identify prognostic factors of treatment outcomes; and 3) determine the most effective treatment per pain mechanism.

Methods: Chronic pain patients initiating therapy at the pain clinic of AZ Sint-Lucas Ghent, Belgium (April 2023-April 2026) will be recruited. Received treatments are registered and categorized (e.g. Baxter therapy, therapeutic facet joint infiltrations, interdisciplinary multimodal pain treatment (IMPT)). Baseline assessments at intake include demographics, medical history, Pain Disability Index (PDI), Pain Catastrophizing Scale, Checklist Individual Strength, Brief Illness Perception Questionnaire, Douleur Neuropathic 4 (DN4), painDETECT, Self-Completed Leeds Assessment of Neuropathic Symptoms and Sings (S-LANSS), Patient-Specific Complaints (PSC), Symptom Checklist 90, Central Sensitization Inventory, Tampa Scale of Kinesiophobia, Widespread Pain Index & Symptom Severity Scale (WPI/SS), Hospital Anxiety and Depression Scale (HADS), and static and dynamic quantitative sensory testing (QST) (pressure pain threshold, temporal summation of pain, exercise-induced hypoalgesia). Outcomes (pain and fatigue intensity/frequency, PDI, PSC, EuroQol Five Dimensions Health Questionnaire VAS) will be measured at 4 w, 10 w, 6 m, 12 m, and 18 m. Potential prognostic factors include fatigue, catastrophizing, psychological inflexibility, kinesiophobia, mental health symptoms, illness perceptions, sleep, cognitive difficulties, presence of migraine of tension-type headache, hypersensitivity, and comorbidities. The predominant pain mechanism will be determined via diagnosis, medical imaging, clinical examination, QST, self-report using the painDETECT, S-LANSS, DN4, WPI/SS). A data-driven approach using machine learning will be used to identify the most effective treatment interventions per predominant pain mechanisms and predictors of treatment efficacy.

Hypotheses: We hypothesize that patients with predominantly nociplastic pain will benefit particularly strongly from IMPT. In contrast, we expect that patients with predominantly nociceptive or neuropathic pain may show relatively greater additional benefit from adjunct biomedical interventions (e.g., therapeutic facet joint or epidural injections), although they may also respond to IMPT. Importantly, the expected treatment effects will depend on the selected outcome measures: whereas IMPT primarily aims to improve functioning and quality of life rather than achieving substantial pain reduction, biomedical interventions typically target pain relief more directly.

Process evaluation: Recruitment is nearly complete, though high refusal rates have limited sample size, and follow-up attrition is substantial. Clustering treatments by targeted pain mechanism has been challenging, as has determining the predominant underlying mechanism. Analysing treatment effects is complicated by the absence of fixed endpoints. Integrating the extensive data collected may benefit from machine learning approaches to identify relevant patterns.

Conclusion: This research adds significant value by adopting an innovative approach that leverages machine learning to analyse complex patient data. By identifying predictive factors and tailoring treatment strategies to specific pain mechanisms, this work has the potential to advance more effective and personalized care for chronic pain patients.

Sleep-MOMagement: behavioural interventions to improve postpartum sleep – a randomized controlled trial protocol

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Introduction: Two in five postpartum women experience chronic insomnia up to two years after childbirth. Despite its high prevalence, tailored interventions for first-time mothers remain scarce. The Sleep-MOMagement project evaluates the clinical and cost-effectiveness of two personalized behavioural interventions: Behavioural Sleep Management (BSM), focusing on circadian rhythm, sleep hygiene, and stimulus control; and Behavioural Aerobic Exercise Therapy (BAET), promoting moderate physical activity to improve sleep quality and circadian stability. Both will be compared to treatment as usual (TAU).

Methods: This ongoing randomized controlled trial will include 135 first-time mothers with postpartum insomnia, randomized to BSM, BAET, or TAU. Interventions will be delivered by physiotherapists and consist of 4 individualized counselling sessions emphasizing self-management over a six-week period. Assessments occur at baseline, post-intervention, three-, and six-months follow-up. The primary outcome is insomnia severity (Insomnia Severity Index). Secondary outcomes include subjective sleep quality (PSQI), objective sleep parameters (actigraphy GT3X), pain severity and interference (BPI), physical activity levels (International Physical Activity Questionnaire and actigraphy GT3X devices), depressive symptoms (EPDS) and anxiety symptoms (GAD), and maternal quality of life (EQ5D5L). A cost-utility analysis will assess cost-effectiveness, and a qualitative component will examine participant and therapist experiences, contextual factors, and potential mechanisms of behavioural change to support future implementation in routine postpartum care.

Results: Both behavioural interventions are expected to yield clinically meaningful reductions in insomnia severity versus TAU and improve secondary outcomes as well.

Process evaluation: Considerable time was spent obtaining ethical approval and developing study protocols. After ethical approval, therapists received standardized training to ensure intervention fidelity. Recruitment and baseline data collection began recently and are ongoing. As anticipated, recruitment of first-time mothers is challenging; therefore, additional strategies (e.g., stronger collaboration with midwifery practices, parenting networks, and a focus on social media outreach) are being implemented to enhance feasibility.

Conclusion: By tailoring interventions to postpartum needs, this study aims to promote personalized and accessible postpartum care.

What do patients find online? A biopsychosocial and nocebo content analysis of google and ChatGPT results on Dutch physiotherapy websites

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Introduction: People with musculoskeletal pain increasingly consult online sources—such as Google search results or AI-based tools like ChatGPT—before seeking professional care. The information they encounter may influence expectations, fear, and help-seeking behaviour. However, it is unknown whether the ranking of search results or AI-generated answers corresponds with the biopsychosocial quality of the information provided. Furthermore, little is known about how often such sources contain nocebo-provoking statements (e.g., alarming language) and whether sponsored Google links differ from non-sponsored results in terms of biopsychosocial content. This study aims to evaluate the biopsychosocial quality and nocebo content of online information encountered during a simulated patient journey and to explore whether ranking position and sponsorship relate to these elements.

Methods: This cross-sectional online audit will simulate patient searches for low back and neck pain using Google and ChatGPT. For Google, the first 20 organic results and all sponsored links will be extracted. ChatGPT outputs will be generated using standardized patient-like prompts. All retrieved content will be coded using Black's biopsychosocial scoring tool and a predefined nocebo checklist, applied independently by two trained assessors. Outcomes include: (1) biopsychosocial score per item; (2) number and type of nocebo statements; (3) relationships between ranking position, sponsorship status, biopsychosocial score, and nocebo count.

Hypotheses: We expect that higher-ranked Google results may not necessarily reflect higher biopsychosocial quality, and that sponsored links might contain more biomedical and potentially nocebo-inducing content. ChatGPT responses are expected to provide more neutral and structured information, but may vary depending on prompt phrasing.

Process evaluation: Challenges include dynamic search algorithms, variability in AI-generated responses, and the need for iterative calibration between assessors to ensure consistent scoring. Managing rapid content changes and documenting reproducible search procedures require ongoing methodological discussions within the research team.

Conclusion: Pending.

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Self-efficacy, disability, and activity avoidance in chronic shoulder pain: insights from a cross-sectional study

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Introduction: Chronic shoulder pain is a prevalent musculoskeletal condition often associated with functional limitations and activity avoidance. Understanding psychological and behavioral factors, such as self-efficacy, is important for developing targeted and patient-centered interventions. Objective: To investigate the association between self-efficacy, disability and avoidance behaviors, and to describe patterns of avoidance and self-efficacy in patients with chronic shoulder pain.

Methods: Cross-sectional study with patients recruited from a secondary-level physiotherapy service in Brazil. Sociodemographic and clinical data were collected. Self-efficacy was assessed using the Pain Self-Efficacy Questionnaire (PSEQ), disability using the Shoulder Pain and Disability Index (SPADI), avoidance behaviors using the Avoidance Daily Activities Photo Scale (ADAP), and pain intensity using the Numeric Pain Rating Scale (NPRS). Data were analyzed descriptively (means, SD). Associations between scores (PSEQ-SPADI; PSEQ-ADAP; SPADI-ADAP) were examined using Spearman's correlation due to non-normal distribution. Correlation strength: high ($r \geq 0.70$), moderate ($r = 0.40$-0.69), low ($r < 0.40$) (CAAE: 39289920.7.0000.5440).

Results: Eighty-seven patients (76% women) were included (mean age 50 years, SD 10.6; mean pain duration 33 months). Pain intensity was moderate (NPRS 4). Disability and self-efficacy scores were 65.3 (SD 24) and 39.6 (SD 16), respectively. Moderate negative correlations were observed between PSEQ and SPADI ($\rho = -0.40$) and PSEQ and ADAP ($\rho = -0.41$); SPADI and ADAP were strongly positively correlated ($\rho = 0.77$), all $p < 0.01$. Item-level means of the PSEQ and ADAP were examined descriptively. For the PSEQ, the highest-scoring item was item 3 ("I continue to see my friends and family as often as before despite the pain"; mean 4.46) and the lowest was item 7 ("I can cope with my pain without medication"; mean 3.11). For the ADAP, high-effort activities (e.g., carrying loads on shoulders, hips, or back) were most avoided, while self-care activities such as eating were least avoided.

Conclusion: Lower self-efficacy was associated with higher disability and greater avoidance behaviors, while disability strongly related to avoidance. On average, patients maintained social activities despite pain but struggled to cope without medication. High-effort tasks were most avoided, underscoring the need to enhance self-efficacy and implement targeted strategies to reduce avoidance.

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How lifestyle factors are associated with pain intensity and pain-related disability in people with non-specific musculoskeletal pain

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Introduction: Musculoskeletal pain (MSP) is a leading cause of disability worldwide (1). Although several cross-sectional studies have linked lifestyle factors to non-specific MSP (NSMSP), few prospective studies have examined these associations in primary care populations, and existing longitudinal studies are typically region-specific rather than focused on broad NSMSP presentations (2,3). This study aims to answer: Which lifestyle factors (sleep, nutrition, obesity, mental health, sedentary behaviour, and physical activity) are associated with pain intensity and pain-related disability in people with NSMSP visiting primary care physiotherapy?

Methods: This prospective cohort study includes adults (18-67 years) with NSMSP recruited from 34 Dutch primary care physiotherapy practices. Physiotherapists screened consecutive patients based on screening criteria during routine consultations. The baseline questionnaire assessed socio-demographic characteristics, reason for consulting the physiotherapist, symptom duration, additional pain complaints, comorbidities, and medication use. Pain intensity and disability were measured using the Numeric Pain Rating Scale (NPRS) and Brief Pain Inventory-Short Form (BPI-SF). Lifestyle factors were measured with the Pittsburgh Sleep Quality Index (sleep), Food Frequency Questionnaire (nutrition), Body Mass Index (obesity), Depression, Anxiety and Stress Scale-21 items (mental health), and International Physical Activity Questionnaires (sedentary behaviour and physical activity). Pain-related measures (NPRS and BPI) were assessed at baseline and at 3, 6 and 12 months; lifestyle factors were assessed at baseline only. Descriptive statistics will be used to describe baseline data , and multivariable regression will test whether exposure variables are associated with outcomes during follow-up.

Hypotheses: We hypothesize that lifestyle factors (sleep, nutrition, obesity, mental health, sedentary behaviour, and physical activity) are associated with pain intensity and pain-related disability in people with NSMSP .

Process evaluation: Participant inclusion is completed, with nearly 877 participants with NSMSP enrolled. Baseline data analysis is underway; follow-up data will become available in June 2026.

Conclusion: This study provides a revision or validation of existing frameworks about how modifiable lifestyle factors relate to pain and disability in primary care. Findings may support more personalized, lifestyle-oriented physiotherapy care.

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Post-exercise recovery strategies on pain and fatigue: Preliminary findings from a systematic review and meta-analysis with GRADE Recommendations

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Introduction: Post-exercise recovery strategies are widely implemented to optimize physical performance and mitigate symptoms such as pain and fatigue in physically active individuals. Despite their widespread use, the effectiveness of these interventions remains uncertain. This study aimed to evaluate the immediate (<23 h) and short-term (24–72 h) effects of major recovery strategies on pain intensity and fatigue perception in physically active adults.

Methods: A systematic review of randomized controlled trials was conducted, including adults (>18 years; ≥2.5 h of weekly physical activity) exposed to different recovery interventions following an acute exercise bout. Pain intensity and fatigue were assessed using validated scales administered immediately and within 72 hours after the interventions. Data were pooled using a random-effects meta-analysis, and the risk of bias was appraised with the PEDro scale.

Results: Only compression-based strategies significantly reduced pain, both immediately (Mean Difference = –0.88; 95% CI: –1.50 to –0.25; k = 9) and in the short term (Mean Difference = –1.23; 95% CI: –2.04 to –0.42; k = 8). No statistically significant effects were observed for other interventions on either pain or fatigue outcomes.

Process evaluation: Substantial methodological heterogeneity among the included trials limited quantitative synthesis and generalizability of the findings, constraining the strength of inference. Moreover, methodological quality, as rated by the PEDro scale, ranged predominantly from low to moderate, underscoring the need for more rigorous and standardized trial designs in future research.

Conclusion: According to GRADE recommendations, the certainty of the evidence supporting these preliminary findings is very low, indicating limited confidence in the estimated effects and precluding definitive conclusions regarding the efficacy of recovery strategies. This scenario highlights the need for high-quality randomized controlled trials with standardized protocols, strict bias control, and enhanced methodological rigor to strengthen the evidence base and support more reliable recommendations for sports practice.

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Daily associations of sleep and rest-activity patterns with pain intensity in adults with chronic pain

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Introduction: It is widely recognized that a bidirectional relationship exists between sleep and pain. Recent systematic reviews suggest that self-reported sleep quality has a stronger predictive influence on pain intensity than the reverse, particularly among patients with chronic pain (CP). However, sleep constitutes only one-third of an individual's 24-hour rest-activity rhythm (RAR). Limited research has been conducted on the combined influence of daytime activity and overall daily RAR patterns on next-day pain. This study aims to examine whether temporal associations exist between sleep, accelerometer-measured rest-activity patterns, and pain ratings in individuals with chronic pain. Specifically, the study seeks to understand how sleep, physical activity (PA), and 24-hour RAR patterns would influence next-day pain among individuals with chronic pain in the UK.

Methods: A total of 193 individuals with chronic pain (CP) participated in the study. Participants were instructed to wear the MotionWatch 8 (MW8) actigraphy device on their non-dominant wrist continuously, both day and night, for seven consecutive days in their natural sleep-wake environment. Additionally, they completed a daily sleep diary to assess self-reported sleep efficiency (SR-SE; percentage of time a person spends asleep compared to the total amount of time they spend in bed) and sleep quality (SR-SQ; subjective perception of the sleep), alongside three daily surveys to record pain intensity, which served as the outcome variable. Data collected from MW8 included actigraphic sleep variables such as sleep efficiency (A-SE) and fragmentation index (A-FI; degree of fragmentation of the sleep). PA variables included total activity counts (TAC) and total sedentary behaviour (TSB). The MW8 also measured parameters of rest-activity rhythm (RAR), including intradaily variability (IV; degree of fragmentation of RAR) and relative amplitude (RA; robustness of RAR). Multilevel modeling (MLM) was employed to examine the prospective joint effects of participants' sleep, PA, and RAR patterns on next-day pain intensity.

Results: In the multilevel modeling (MLM) analysis, higher self-reported sleep quality (SR-SQ; $\beta = -0.057$, $p < .001$, 95% CI [-0.085, -0.013]) and self-reported sleep efficiency (SR-SE; $\beta = -0.051$, $p < .01$, 95% CI [-0.089, -0.028]) significantly predicted lower next-day pain intensity. Conversely, actigraphic measures of sleep efficiency (A-SE) and fragmentation index (A-FI) were not significant predictors of next-day pain intensity. Regarding physical activity (PA) patterns, neither total activity counts (TAC) nor total sedentary behavior (TSB) from the previous day were significant predictors of next-day pain intensity. Similarly, rest-activity rhythm (RAR) parameters reflecting rhythm robustness or fragmentation, including intradaily variability (IV) and relative amplitude (RA), did not predict next-day pain intensity. The MLM results further indicated that pain intensity scores did not significantly vary across the daily surveys or days of measurement. Among demographic covariates, older age ($\beta = 0.152$, $p < .01$, 95% CI [0.053, 0.251]) and higher body mass index (BMI; $\beta = 0.110$, $p < .05$, 95% CI [0.019, 0.200]) were associated with greater reported pain intensity.

Conclusion: Findings from the MLM analysis indicate that SR-SQ and SR-SE consistently serve as robust predictors of next-day pain intensity, even after statistically controlling for daily physical activity and rest-activity rhythm parameters. This suggests that achieving better sleep mitigates next-day pain intensity, regardless of increased physical activity levels or fragmented rest-activity rhythms. These findings highlight the importance of prioritizing high-quality sleep as a means of reaping the health benefits of physical activity while minimizing the potential for heightened exercise-induced pain the following day.

Symptom perception in individuals with chronic non-specific low back pain

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Introduction: Symptom perception processes are known to contribute to the maintenance of persistent physical symptoms (PPS), and can be experimentally investigated through script-driven emotional imagery. Although chronic non-specific low back pain (CNSLBP) constitutes a major proportion of PPS, the effects of script-driven emotional imagery on symptom perception have not yet been elucidated in this population.

Methods: Individuals with (n= 40) and without (n= 40) CNSLBP imagined three emotional-imagery scripts (relaxation, acceptance, hostile) in a standing position with their eyes closed. After each script, participants were asked about their bodily complaints experienced during the script. Differences in the effects of emotional-imagery scripts on bodily complaints between individuals with and without CNSLBP were analysed through mixed models.

Results: There was a significant main effect of group ($F= 16.25$, $p< 0.0001$), script content ($F= 18.70$, $p< 0.0001$), and an interaction between both ($F= 4.09$, $p= 0.019$). Individuals with CNSLBP reported more bodily complaints during the hostile-resistance script compared to the acceptance ($t= -3.44$, $p= 0.01$) and relaxation ($t= -6.56$, $p< 0.0001$) scripts, and they reported more complaints during the hostile-resistance ($t= -5.18$, $p< 0.0001$) and acceptance scripts ($t= -3.93$, $p= 0.002$) in comparison to healthy individuals.

Process evaluation: The recruitment of the patient group is completed. Further analyses are being conducted to elucidate which factors contribute to symptom perception processes within this population.

Conclusion: Our findings highlight the importance of symptom perception processes in individuals with CNSLBP, as merely imagining an emotional script evoked an increase in bodily complaints.

The impact of lifestyle and psychological factors on symptom modulation, autonomic function and pain sensitivity in patients with chronic pain

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Introduction: Myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS) and fibromyalgia (FM) are two prevalent diseases, defined by chronic pain, extreme fatigue, cognitive symptoms, and autonomic dysfunction. Prior research suggests that lifestyle factors, such as education, physical activity, psychological factors and medication use, play a role in chronic pain. As such, we aim to explore the role of these lifestyle factors on some of the key characteristics of ME/CFS and FM, namely chronic pain, fatigue, cognitive symptoms and autonomic dysfunction.

Methods: A total of 46 patients with FM, 77 patients with ME/CFS and 77 healthy controls participated. They completed questionnaires on demographics, lifestyle (International Physical Activity Questionnaire), psychological factors (Pain Catastrophizing Scale and Back Anxiety Inventory) and symptoms (SF-36, Central Sensitization Inventory, Brief Pain Inventory, CFS symptom list, DePaul Symptom Questionnaire and Symptom Severity Scale for FM). Autonomic functioning was investigated using heart rate variability indices derived from Polar H10 data. Additionally, pressure and thermal pain thresholds were assessed using a digital algometer and a TSA-II Neurosensory Analyzer, respectively. Pearson correlations will elucidate the relationships between the aspects of lifestyle and clinical outcomes. Furthermore, multiple linear regression models will investigate how the interplay of lifestyle factors affects the clinical outcomes.

Hypotheses: We hypothesize that higher education level, higher physical activity, improved psychological state and lower levels of medication use are related to lower symptom severity, increased heart rate variability and higher pain thresholds.

Process evaluation: Data collection finished in April 2025. Data analyses will be performed in the next months and results will be available by the time of the congress.

Conclusion: By mapping out how lifestyle factors, such as education, physical activity, psychological state, and medication use, correlate with and predict symptom severity, autonomic function, and pain thresholds in patients with ME/CFS and fibromyalgia, new potential therapeutic targets can be identified.

Quality of life, pain, and psychological factors in adolescents and young adults living beyond cancer: a systematic review and meta-analysis

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Introduction: Each year, over 1.2 million adolescents and young adults (AYA, 15–39 years) are diagnosed with cancer worldwide. Despite the five-year survival rate being above 80%, many experience reduced quality of life (QoL) as cancer disrupts crucial developmental milestones such as education, relationships, and independence. Psychological distress affects AYA cancer survivors more often than healthy peers. Persistent pain is also common. This systematic review and meta-analysis examines how psychological factors, pain severity, and QoL interact to identify targets for improving AYA survivorship care.

Methods: This review was registered in PROSPERO (CRD42024613478) and conducted according to PRISMA 2020. PubMed, Web of Science, Embase, and APA PsycInfo were systematically searched. Two independent reviewers screened studies, extracted data, and assessed risk of bias using the NIH tool. When at least two studies reported comparable associations, effect sizes were converted to Fisher's Z and pooled via random-effects models. Heterogeneity was assessed using Cochran's Q and I^2, and subgroup and meta-regression analyses explored potential moderators. Certainty of evidence was rated with GRADE.

Results: From 5,673 unique records, studies were excluded due to population mismatch, wrong outcomes and study design, or unavailable association data. Seventeen studies met the inclusion criteria. Most were cross-sectional and included diverse cancer types across various countries. Twelve studies were included in the meta-analysis, revealing a low negative correlation between psychological factors and QoL ($r = –0.31$; very low certainty). Subgroup analyses indicated moderate negative associations for poorer mental health, anger, and negative cancer impact with QoL. Evidence on pain severity was limited and insufficient for meta-analysis.

Process evaluation: The definition of AYA varied across studies and lacked clarity, complicating study selection. Most included studies were low quality and cross-sectional, limiting strong interpretations and preventing causal conclusions.

Conclusion: This review shows that adverse psychological factors are associated with poorer overall QoL among individuals living beyond AYA cancer. The findings support the need for tailored psychosocial interventions and highlight the importance of further research into the interplay between psychological factors, pain, and QoL in AYA living beyond cancer.

Psychological and sensory phenotypes in frozen shoulder: associations with pain intensity over time

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Introduction: Frozen shoulder (FS) affects up to 5% of the general population and is characterized by intense pain and restricted shoulder motion. Emerging evidence suggests that pain-related psychological factors and altered central pain processing may influence pain severity and its evolution over time. Objectives: To identify distinct psychological and sensory phenotypes in people with FS and to explore whether these baseline phenotypes are associated with different trajectories of pain intensity over a 9-month period.

Methods: A total of 149 participants with FS were assessed at baseline for pain intensity and psychological and sensory variables, including pain catastrophizing, hypervigilance, self-reported symptoms related to central sensitization, and signs of allodynia, hyperalgesia, and conditioned pain modulation. Latent profile analysis (LPA) was used to identify subgroups based on baseline variables. Linear mixed models (LMMs) were then applied to examine the evolution of pain intensity across phenotypes at 3, 6, and 9 months.

Results: Two distinct phenotypes were identified. Phenotype 2 (n = 70) presented higher baseline pain intensity, greater psychological distress, and more central sensitization-related symptoms compared to phenotype 1 (n = 79). Over 9 months, both groups showed significant pain reduction. Although phenotype 2 experienced a greater absolute decrease in pain intensity, it continued to report higher pain intensity levels than phenotype 1 at every follow-up time point.

Conclusions: Two clinically meaningful phenotypes of FS were identified based on psychological and sensory characteristics. These phenotypes differed in their baseline pain profiles and in their pain trajectories over 9 months, underscoring the importance of multidimensional assessment in understanding pain heterogeneity in FS.

Does task- and context-specific fear of movement play a role in the development and persistence of pregnancy-related lumbopelvic pain? Study protocol

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Introduction: Pregnancy-related lumbopelvic pain (PLPP) affects up to 90% of pregnant women and may persist for years postpartum but its multifactorial causes are poorly understood [1]. Incorporating a biopsychosocial framework may help unravel why PLPP develops and persists. The Fear-Avoidance Model of Pain proposes that pain-related beliefs, rather than pain itself, influence recovery. In the general low back pain population, fear of movement (FoM) has been identified as a key mechanism in pain persistence. Associations between FoM and PLPP prevalence have also been observed with studies relying on generic questionnaires to assess FoM [2]. However recent studies suggest that FoM can be highly task- and context-specific: individuals may only fear certain activities in certain contexts, which generic questionnaires may miss [3]. This study aims to (1) characterise the activities during which pregnant women with PLPP have a reluctance to move and compare these to activities reported by those without PLPP, (2) explore associations between task- and context-specific FoM, fear-avoidance beliefs, pain catastrophising, depression, and anxiety in women with PLPP, and (3) determine if task- and context-specific FoM predicts the onset and persistence of PLPP.

Methods: This protocol is part of the PROFit study (G0A1N24FWO/S69463). We will recruit 211 pregnant women without PLPP in the 1st trimester and follow them up in the 3rd trimester, 6 weeks and 9 months postpartum. PLPP will be assessed via self-report and clinical tests; task- and context-specific FoM by scoring the level of reluctance to perform self-selected activities; and (pain-related) psychological factors using validated questionnaires. Descriptive statistics and group comparisons, correlations, and logistic regression will address the three objectives.

Results: By 12 Nov. 2025, 27 participants (mean age=31.0, SD=3.6) were included. We hypothesize that pregnant woman with PLPP are more reluctant to perform activities involving their lower back and/or pelvic girdle, and that higher FoM will be associated with greater fear-avoidance beliefs, pain catastrophising, depression and anxiety. Lastly, we expect elevated FoM to predict the onset and persistence of PLPP.

Process evaluation: Participant recruitment is the biggest challenge of this study.

Conclusion: This study aims to understand the role of task- and context-specific FoM in the onset and persistence PLPP, supporting better prevention and treatment strategies.

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The positive and negative “affect” of sleep on chronic pain: a systematic review of how positive and negative affect impact the day-to-day sleep-pain relationship

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Introduction: Chronic pain is a leading cause of years lived with disability and commonly associated with sleep disturbances, with poor sleep consistently linked to greater daily pain. The sleep-pain inter-relationship is influenced by a wide range of internal and external factors, making it a multifactorial interplay. Among these factors, affect has emerged as a potential contributor to this association. However, the day-to-day dynamics between sleep, pain, and affect remain to be explored, as these variables fluctuate within individuals across days. The Experience Sampling Method (ESM) captures such within-person fluctuations by repeatedly assessing individuals’ daily experiences. This systematic review aimed to determine to which extent positive affect (PA) and negative affect (NA) contribute to the within-person relationship between sleep and chronic pain by synthesizing findings from studies employing ESM.

Methods: Following PRISMA guidelines, an extensive search in three databases (Pubmed, Embase, PsycINFO), two prior systematic reviews, and backward and forward tracking identified four qualifying studies. Findings were narratively synthesized and methodological quality was assessed with the Risk Of Bias In Non-randomized Studies - of Exposure (ROBINS-E) tool.

Results: Only one study identified a mediating role of PA in the sleep-pain link, whereas none of the studies included interaction terms, limiting an adequate evaluation of moderation. Overall, there was a small predominance of studies reporting a significant effect of sleep on pain as well as a significant effect of sleep on affect and/or affect on pain, with stronger indications that PA weakens the effect of poor sleep on next-day pain. However, findings were mixed due to great methodological heterogeneity.

Process evaluation: The included studies revealed substantial inconsistency in the application of ESM, which made direct comparisons across studies challenging. Furthermore, a meta-analysis was deemed inappropriate, particularly given the small number of studies. Consequently, the conclusions should be interpreted with caution and considered primarily as hypotheses for future research.

Conclusion: This systematic review underscores both the need for further research examining the mediating and moderating roles of PA and NA within the sleep-pain link among people with chronic pain, as well as the importance for standardized ESM procedures and their consistent application.

Defining key concepts within the field of pain psychology

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Introduction: Psychological factors are central to the development and persistence of chronic musculoskeletal pain. Yet, the psychological concepts used are often vaguely defined, inconsistently interpreted and unevenly applied. This undermines the validity of measures. Pain-related fear is used as a focal construct to explore how conceptual ambiguity affects both theoretical models and the development of self-report instruments.

Methods: The first phase involves mapping the conceptual landscape of pain-related fear through literature reviews and stakeholder consultation. We will identify its core concepts and examine how the construct has evolved across theoretical traditions. Definitions are constructed using state-of-the-art guidelines, defining attributes and boundaries with related domains. We will also systematically identify and review self-report questionnaires that claim to measure pain-related fear or its subcomponents. For each instrument, we analyse its development history, theoretical grounding and intended scope. We will also examine how item content reflects the underlying construct and whether different instruments emphasise distinct facets of pain-related fear. As a final step, we will assess the content validity of these instruments. This involves examining how well questionnaire items reflect the theoretical definition of pain-related fear.

Hypotheses: We hypothesise that pain-related fear is inconsistently defined and operationalised across instruments and theoretical models. We expect that clarifying its conceptual structure and evaluating item-level content will reveal gaps, overlaps and mismatches in construct representation.

Process evaluation: Ongoing analysis reveals variation in how pain-related fear is defined and measured. Terminology often overlaps and subcomponents are inconsistently emphasized across instruments. This leads to conceptual overload and weakens theoretical clarity. The project's iterative structure allows for stepwise refinement through systematic analysis.

Conclusion: This project offers a structured approach to clarifying the concept of pain-related fear and evaluating its measurement. By integrating conceptual analysis, instrument review and content validation, it lays the foundation for more transparent, theory-informed and stakeholder-relevant psychological assessment in chronic pain research. No results are presented yet; the focus is on conceptual clarity and methodological rigour.

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A biopsychosocial content analysis of Dutch rehabilitation and anaesthesiology websites for patients with non-specific neck, back, and chronic pain

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Introduction: Patients with non-specific neck, back, and/or chronic pain increasingly seek information about their condition on websites of healthcare practitioners. This information can influence their treatment expectation and should align with contemporary biopsychosocial understanding of pain. It is unclear whether Dutch websites in the fields of rehabilitation and anaesthesiology align with the biopsychosocial model. This study aims to assess the biopsychosocial content about non-specific neck, back and chronic pain in Dutch rehabilitation and anaesthesiology websites.

Methods: All Dutch rehabilitation and anaesthesiology webpages were potentially eligible for inclusion. All webpages focusing on the topics of neck, back, and chronic pain were included. Biopsychosocial content analyses were performed according to a standardised rating method with criteria for biomedical, limited- and reasonably biopsychosocial. Analyses were performed separately for specialisms, and for the three topics. Additionally, frequency of nocebo words usage on the websites is explored.

Results: A total of 71 webpages were included, of which 42 (59.2%) were rehabilitation-, 28 (39.4%) were anaesthesiology webpages and 1 webpage described both. Across all webpages, 7 (9.7%) were rated as biomedical, 54 (75.0%) limited biopsychosocial, and 11 (15.3%) reasonably biopsychosocial. Differences between specialisms were not significantly different ($p = .055$). Differences between BPS ratings and the topics were significant ($p = .005$). Nocebos were present on 22.2% ($n = 16$) of the webpages.

Conclusions: The majority of the anaesthesiology and rehabilitation webpages (84.7%) did not achieve a 'reasonable biopsychosocial' rate. Improvements are particularly needed in describing pain as a universal and/or normal phenomenon experienced by most individuals, as well as in explaining how an individual's environment influences their thoughts, emotions, and behaviours regarding pain perception.

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Social safety learning in the context of pain

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Introduction: Pain is an unpleasant emotional experience that typically occurs in the presence of others. Growing evidence supports that social interactions causally influence pain. Positive interactions, such as social support, can reduce experimentally induced pain and related neural responses. Yet, the psychological mechanisms by which such positive interactions may relieve pain are not fully understood. Affective touch is a form of embodied social support, consisting of dynamic, slow, stroking touch (typically 1-10cm/s), which is key in building and maintaining social bonds and facilitating emotion regulation, and is usually perceived as affectively pleasant. Accumulating evidence suggests that affective touch can provide pain relief, but how it does so is poorly understood. One candidate mechanism is that affective touch may facilitate learning to distinguish between threat and safety in the context of pain, but this has not been experimentally tested. Accordingly, in this experimental study, we aim to test the hypothesis that affective touch facilitates differential threat-safety learning and speeds extinction in the context of pain. Further, we vary the relational context by pairing affective touch with either a picture of participants' loved ones (e.g., romantic partner) or a gender-matched stranger. To control for the sensory input of the affective touch, a pleasant auditory stimulus will serve as the control.

Methods and Process: We adopt a pain-related fear conditioning paradigm and test healthy (pain-free) participants. First, during an acquisition phase, neutral images (CS+) are paired with a painful stimulus (pain-US; Digitimer) and other images (CS-) are not, while presented concurrently with the different conditions (affective touch + loved one, affective touch + stranger, auditory stimulus + loved one, loved one picture only, stranger picture only; fully within-subjects design, order counterbalanced). Affective touch will be delivered by the experimenter. In an extinction phase, CS+ and CS- are presented again but the pain-US is omitted. Outcome measures are self-reported fear and expectancy ratings on every trial, and retrospective pain intensity and unpleasantness ratings after each block. We will also measure skin conductance responses.

Conclusion: This research aims to deepen our understanding of how social interactions, specifically receiving affective touch, influences threat-safety learning in the context of pain.

Persistent pain and work ability from a life-span perspective: a qualitative exploration of vulnerability and resilience

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Introduction: Living with persistent pain in older age has been previously investigated qualitatively. However, qualitative study of pain as a life-span problem is very limited. Since persistent pain often onsets early in life and substantially contributes to work disability during life course, it is important to address the entire life trajectories of people with persistent pain.
The aim of the study is to gain qualitative understanding of the lifelong interrelations of persistent pain and work ability. The study is a part of a larger mix-methods project 'Mental health and sick leave from the lifespan perspective', Örebro, Sweden, 2024-2027.

Methods: Purposeful recruitment of participants will start in January 2026, aiming for 10-15 interviews, with the inclusion criteria of 1) having exited the workforce 2) having had at least one episode of sick leave or disability pension due to persistent pain, 3) being absent of severe cognitive impairment, and 4) not having acute mental health problems at the time of data collection.
The study will employ the Life Story Interview (McAdams, 2005; 2008) for studying life trajectories of people with experience of persistent pain and work disability.

Results: Preliminary results analyzed by means of reflexive thematic analysis (Braun et al., 2022) will be presented at the conference.

Process evaluation: The presentation will have a methodological focus and will discuss the modifications to the life story interview method made to address specific research questions. Although life story interviews is a participatory research method in nature, both opportunities and hinders for empowering interview participants in shaping their life stories can occur. The talk will especially focus on the potential for unfolding life stories as more than histories of illness and pain, but also histories of coping, resilience, and growth.

Conclusion: Overall, the presentation will summarize the potential of life story interviews in capturing both vulnerability and resilience in the lifelong experiences of older adults with a history of pain and work disability.

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Bridging muscle biology and function in chronic non-specific low back pain: feasibility of a multimodal biopsy-based approach

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Introduction: Chronic nonspecific low back pain (CNSLBP) remains the leading cause of disability worldwide. Despite recognition of its biopsychosocial nature, biological mechanisms—particularly at the muscular level—remain insufficiently understood. Imaging studies show consistent atrophy and fatty infiltration of the lumbar multifidus (LM) and erector spinae (ES), but the histological and mechanical underpinnings of these alterations are unknown. Understanding how peripheral muscle pathology contributes to functional deficits could bridge the gap between biological changes and clinical outcomes.

Methods: CNSLBP patients (n = 45) and matched healthy controls will undergo ultrasound-guided fine-needle biopsies of LM and ES. Samples will be analyzed for (1) histological and metabolic parameters (fiber type and size, fibrosis/ collagen, fat infiltration, oxidative enzyme activity), (2) molecular markers (COL1A1, TGFB1, PPARγ, TNF-α, IL-6, Pax7, MyoD), and (3) single-fiber mechanical properties (maximal force, specific tension, stiffness, relaxation kinetics). Functional and proprioceptive performance will be evaluated using disability, endurance, and postural control tests. As a proof of principle, a 12-week high-load proprioceptive training program will assess longitudinal biological adaptations.

Results / hypotheses: We hypothesize that a large subgroup of CNSLBP is characterized by a fibrotic, fatty and glycolytic muscle phenotype associated with reduced single-fiber contractility and altered proprioceptive control. Targeted proprioceptive loading is expected to reverse these changes through mechanotransduction-driven remodeling.

Process evaluation: Preliminary pilot work confirms the feasibility and safety of ultrasound-guided fine-needle biopsies in paraspinal muscles. The multimodal design presents logistical challenges (sample integrity, coordination across laboratories), but these are mitigated by standardized protocols, prior experience in muscle histology, and cross-disciplinary support. Early testing highlights the acceptability of the procedure among patients and clinicians.

Conclusion: This methodology provides a feasible and innovative framework to explore biological mechanisms underlying CNSLBP. By integrating muscle histology, molecular signaling, and intrinsic fiber mechanics with functional performance, the project paves the way for individualized, mechanism-based rehabilitation strategies.

Experimental sleep disruption and its effects on pain, mood, and the brain: a systematic review

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Introduction: Sleep is essential for maintaining physical and psychological health, and even short-term disturbances can have profound effects on pain perception, mood regulation, and the brain. The effects of various experimental sleep disruption modalities, including sleep deprivation (SD), partial SD, sleep fragmentation, selective sleep stage deprivation have been extensively assessed in both human and animal research in relation to pain, mood, and the brain. Previous systematic reviews have summarized the effects of experimental sleep disruption on these outcomes but only provided partial insights due to substantial variability in study designs and how outcomes were assessed. This systematic review aims to (1) update current knowledge on the effects of experimental sleep disruption on pain, mood, and the brain, (2) further distinguish the effects of different experimental sleep disruption modalities and study designs on these outcomes, and (3) investigate how specific confounders (e.g., sex, age) can affect the outcomes.

Methods: Three databases (PubMed, PsychINFO, and Web of Science) will be searched using the following criteria: (1) studies using an experimental sleep disruption modality (total or partial SD, sleep fragmentation, or selective stage deprivation), (2) inclusion of an adequate baseline/control condition (i.e., undisturbed sleep), (3) no additional interventions were included, (4) assessment of at least one relevant outcome (pain, mood, brain), (5) published in a peer-reviewed journal, and (6) exclusion of reviews, observational studies, case report, and conference abstract. Quality assessment will be done using the Risk of Bias in Non-randomized Studies of Interventions for non-randomized studies, and the Cochrane Risk of Bias 2 tool for randomized controlled trials.

Process evaluation: In December 2025, the search strategy will be finalized and executed, followed by backward and forward citation tracking. Two investigators will independently screen titles and abstracts, after which eligible studies will undergo full-text review. Data from the eligible studies will then be extracted and analyzed to assess links between experimentally disrupted sleep and outcomes in pain, mood, and the brain.

Conclusion: Given the high global prevalence of sleep disorders and their associated sleep disturbances, investigating the effects of experimental sleep disruption on changes in pain, mood, and the brain remains essential.

Pain and the brain: examining the link between conditioned pain modulation and structural gray matter properties

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Introduction: Impaired endogenous pain modulation and structural brain alterations are common in chronic pain conditions such as fibromyalgia (FM) and chronic low back pain (CLBP). Recent meta-analytic work suggests a link between brain structure and pain-modulatory efficacy, but direct evidence in (different) pain populations is limited. This study examined how structural brain properties relate to conditioned pain modulation (CPM) across the pain continuum, including patients with FM, CLBP, recurrent low back pain (RLBP), and pain-free controls (HC).

Methods: In this cross-sectional study, structural MRI was acquired in 83 women (21 FM, 21 CLBP, 22 RLBP, 19 HC) to quantify gray matter volume (GMV), cortical thickness and surface area of predefined pain-related regions (DKT40 atlas; FreeSurfer). CPM was assessed using mechanical pressure as the test stimulus and a hot water immersion as the conditioning stimulus, and quantified as the change in pressure pain threshold. Group differences were tested with linear mixed models, and brain structure-CPM associations were examined using correlation analyses.

Results: FM exhibited less efficient pain modulation compared to all other groups. GMV was lower in the superior frontal gyrus in FM and CLBP compared to RLBP and HC, and FM showed the lowest cerebellar GMV overall. Concerning cortical thickness, CLBP showed a larger caudal anterior cingulate cortex than RLBP; HC showed greater caudal middle frontal and postcentral gyrus thickness than RLBP, and for postcentral than CLBP; and FM showed greater thickness in the precentral gyrus and the superior parietal lobule compared to CLBP, and in the precuneus compared to CLBP and RLBP. For surface area, RLBP showed greater inferior parietal lobule and superior frontal gyrus area compared to CLBP and HC; CLBP and RLBP showed greater precuneus area compared to HC but CLBP showed reduced superior frontal gyrus area compared to HC and RLBP; and FM and CLBP showed greater superior parietal lobule area compared to HC, while RLBP exceeded FM and HC in that region. No associations were found between brain properties and CPM.

Process evaluation: Further exploratory work assessing relationships with psychosocial measures is required to deepen and extend these observations.

Conclusion: Although differences in structural brain properties were evident across groups, no links with CPM were found. Larger, well-powered studies are needed to further investigate this relationship.

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Spatial summation of pain: a paradoxical trigger of inhibitory mechanisms

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Introduction: Spatial summation of pain (SSp) occurs when perceived pain increases with the size of the stimulated area. The growth in pain intensity during SSp is often nonlinear and disproportionate relative to the extent of stimulation [1,2]. However, the underlying mechanisms remain poorly understood [3]. This study aimed to investigate SSp in a temporally dynamic context, capturing its progression in real time.

Methods: Electrical noxious stimulation was delivered via five electrodes attached to the foot, arranged in a continuous linear pattern either along or across the dorsum of the foot. Ten healthy participants (N = 10) underwent four 25-second trials, each trial with a different electrode activation pattern: ascending (from one to five electrodes activated sequentially), descending (from five to one), random (random number of electrodes activated), and control (single, randomly selected electrode). Pain intensity was rated continuously using a computerised visual analogue scale (VAS).

Results: Substantial SSp was observed, as indicated by a significant effect of the number of electrodes activated ($p < 0.001$). However, the pattern of SSp varied depending on the type of trial ($p < 0.001$). Ascending trials were more painful compared to descending trials ($p < 0.001$) and control trials ($p < 0.01$). Conversely, descending trials were less painful than random trials ($p < 0.05$). Interestingly, random trials were equally painful as control trials, in which only a single electrode was activated.

Process evaluation: The analysis posed several challenges due to the high temporal resolution and volume of pain rating data collected continuously across conditions. Handling and visualizing data across different configurations demanded customized scripts to ensure comparability between trials. Despite these limitations, the data structure was ultimately manageable, and consistent effects across key comparisons suggest that the paradigm captured meaningful spatial dynamics in pain perception.

Conclusions: This study demonstrates that a dynamic paradigm can effectively evoke spatial summation of pain and capture its temporal modulation. Moreover, the sequence of spatial input appears to influence pain perception independently of stimulus area, suggesting that the order of spatial recruitment may be a key factor in SSp mechanisms.

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Unilateral and bilateral spatial summation of pain across graded innocuous and noxious temperatures

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Introduction: Spatial summation of pain (SSp) refers to the increase in pain intensity as the spatial extent of the nociceptive stimulus grows or when a spatial separation sufficient to elicit SSp is applied. Although contralateral stimulation is traditionally associated with inhibitory effects such as conditioned pain modulation (CPM), recent reports suggest that contralateral stimulation may also facilitate pain under certain conditions. This study examines whether SSp occurs during thermal stimulation applied unilaterally or bilaterally, and how noxious and innocuous stimuli shape SSp.

Methods: Healthy (N=9) participants underwent two sessions involving feet immersions in water of carefully controlled low (6–14°C) or high (43–47°C) temperatures. Each block included the following trials: one foot (left or right) and both feet simultaneously. Pain was continuously rated using CoVAS during 50 seconds of stimulation period. Data were preprocessed in Python3 (AUC was extracted from each trial) and summarized descriptively.

Results: Data revealed clear intensity-dependent SSp patterns. At 6°C, bilateral immersions produced substantially higher AUC values (M=1567.1, SD=576.9) compared with the left limb (M=1347.0,SD=565.1) and the right limb (M=1188.7, SD=501.1). A similar but weaker SSp pattern emerged at 10°C, where bilateral stimulation (M=693.8, SD=391.6) exceeded unilateral trials (L: M=567.9, SD=378.5; R: M=559.1, SD=397.0). At 14°C, AUC values were minimal across conditions (all means<91). For heat stimulation, 47°C again produced strong bilateral SSp, with AUC markedly higher for both-limb immersion (M=1791.6, SD=881.8) relative to unilateral left (M=1544.1, SD=846.8) and unilateral right (M=1545.6, SD=755.1) trials. Moderate heat (43–45°C) evoked weak or absent SSp, with all AUC means<230.

Process evaluation: Processing more than 300 raw files required resolving inconsistencies in temperature coding and file formatting. Custom preprocessing ensured retrieval of time-synchronized CoVAS ratings and accurate labeling of limbs, temperatures and different trials.

Conclusion: Presented here preliminary results indicate that intense stimuli applied over a large surface area may evoke SSp, highlighting a state-dependent interaction between facilitatory and inhibitory pain mechanisms. These findings challenge the assumption that contralateral stimulation is inherently inhibitory and suggest that SSp emerges when nociceptive input exceeds a critical threshold.

When touch is painful: a novel tactile fear conditioning paradigm imaging the neural correlates of pain related fear in patients with chronic pain

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Introduction: Chronic pain affects > 20% of people worldwide leading to enormous personal suffering. A key factor contributing to chronic pain disability that thus far has been neglected is fear of painful touch - a core symptom in people with complex regional pain syndrome (CRPS). Patients with CRPS experience pain by innocuous touch (i.e., allodynia) affecting their painful limb. Although allodynia and ensuing fear of painful touch are core symptoms in this chronic pain condition, research on this topic is scarce. This leaves the underlying mechanisms of how fear of touch is acquired, how it can spread and how it can be mitigated poorly understood. Therefore, this study aims to examine the behavioral and neural correlates of acquisition, generalization and extinction of fear of painful touch in CRPS patients (n = 20) compared to healthy controls (n = 20).

Methods: We developed a novel tactile fear conditioning paradigm which pairs vibrotactile stimulation at the fingers as the conditioned stimulus (CS+) with painful electrocutaneous stimulation at the wrist as the unconditioned stimulus (US), while other vibrotactile stimuli serve as safety (CS-) or generalization (GS) cues. Participants undergo our novel paradigm during functional Magnetic Resonance Imaging. Stimulus presentation is controlled using Presentation software. Self-reported fear and pain-US expectancy ratings are collected throughout all phases of the paradigm.

Hypotheses: Impaired threat-safety learning (e.g., enhanced fear acquisition, excessive generalization, slower extinction) will be present in patients compared to controls which will be reflected in changes in neural underpinnings of fear of painful touch.

Process evaluation: The paradigm is fully developed and optimized. The main challenge remains participant recruitment because CRPS is a rare condition. However, collaborations with specialized clinicians who support the project and refer patients are expected to facilitate this process. We expect to have finished data collection in May 26. We bridged the gap between pain researchers from physiotherapy, neuroscience, and psychology fields studying the same complex chronic pain disorder.

Conclusion: The tactile fear conditioning paradigm performed in patients with chronic pain will provide a new and unique contribution to the study of pain-related fear. CRPS patients endorsed the relevance of this project, which provides opportunities to alleviate the CRPS stigma and improve treatments.

Exploring personal variables to better understand the variability in pain sensitivity measurements

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Introduction: Pain sensitivity shows large inter-individual variability, even under standardized experimental conditions. Identifying personal variables that explain this variability may improve the interpretability of quantitative sensory testing outcomes and their use in clinical and research settings. This study aimed to explore demographic, psychosocial, and lifestyle variables associated with pressure and heat pain thresholds in pain-free individuals.

Methods: In this cross-sectional study, 181 healthy adults, mean (SD) age 34.6 (13.4) years; 55% female) underwent quantitative sensory testing, including pressure pain thresholds (PPTs) at the trapezius and tibialis anterior muscle, and heat pain thresholds (HPTs) at the forearm. Fifteen candidate variables were selected within a biopsychosocial framework. To mitigate reliance on a single variable-selection strategy, twelve regression-based selection methods representing five analytic types (full-model, stepwise, best subset, penalized, and Bayesian) were employed to identify variables associated with pain sensitivity.

Results: All candidate variables were retained in at least one model, but only a few were consistently selected across methods. Sex, body mass index, pain catastrophizing, and previous smoking history were most frequently retained (≥ 9/12 analyses). Age was mainly associated with thermal sensitivity, while sleep and psychological distress were associated with mechanical sensitivity. The explained variance of the final models ranged from 4.8% to 24.1%.

Process evaluation: Each approach yielded distinct subsets of predictors, highlighting the influence of analytic choices on the resulting models. Integrating these findings proved challenging, particularly given the modest sample size and potential instability of variable selection. This emphasizes the need methodological transparency and replication when interpreting multivariable analyses in pain sensitivity research. Further, this uncertainty is challenging and requires extensive deliberation within the research group.

Conclusion: This exploratory multivariable study indicates that a limited number of personal variables contribute consistently to mechanical and thermal pain sensitivity in healthy adults. Even though confirmatory studies are needed, we recommend including the selected variables in studies on pain sensitivity, if possible, to improve the precision of the estimates.

Excellent reproducibility of heat pain thresholds for methods of limits, methods of levels and adaptive staircase, irrespective of stimulus slope or duration – a cross sectional study in pain-free participants

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Introduction: Heat pain thresholds (HPTs) are widely used to assess thermal pain sensitivity, yet their reproducibility depends on methodological choices. The method of limits, method of levels, and adaptive staircase method are commonly used, but comparative data on their short-term reliability, agreement, and procedural burden are scarce. In addition, the influence of stimulus slope, stimulus duration, and assessor experience remains unclear. This study aimed to determine the short-term intra-rater reproducibility of three HPT methods and to explore how methodological parameters and assessor experience affect outcomes.

Methods: Three sequential cross-sectional experiments (N = 57–60 each) were conducted with healthy adults. Experiment 1 compared the reproducibility of the three HPT methods and evaluated assessor experience (novice vs. experienced). Experiment 2 examined the effect of temperature-increase slopes (0.5, 1.0, 2.0 °C/s) within the method of limits. Experiment 3 evaluated stimulus durations (2s, 4s, 6s) within the adaptive staircase method. All tests were performed under standardized environmental conditions, with three trials per method (two trials in Experiment 3). Reliability (ICC2,k) and agreement (SEM) were calculated, and repeated-measures ANOVAs assessed method-related differences in HPT.

Results: All methods demonstrated good to excellent reliability (ICC 0.90–0.97) and good agreement. The adaptive staircase method showed the highest reproducibility, especially with 6s stimuli. Assessor experience did not influence reliability or agreement. HPT values differed significantly between methods and were strongly affected by slope and stimulus duration: higher slopes produced higher HPTs, whereas longer durations produced lower HPTs. Short durations in the staircase method led to ceiling effects.

Process evaluation: Aligning protocols across experiments was feasible, but the high number of ceiling effects in the 500 ms staircase setup required protocol adjustments. Balancing reproducibility with practicality (procedure time, training demands) seems important and worth the discussion.

Conclusion: All three HPT methods provide highly reproducible measurements. Slope and stimulus duration meaningfully influence HPT levels, while assessor experience does not. For optimal reproducibility, longer stimulus durations in the adaptive staircase method and slower slopes in the method of limits are recommended.

The role of maternal weight, body composition, systemic inflammation, and mental health in pregnancy related lumbopelvic pain: a study protocol

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Introduction: Pregnancy-related lumbopelvic pain (PLPP) affects 50 to 90% of pregnant women, yet its underlying mechanisms remain poorly understood, limiting effective prevention and treatment strategies [1]. Maternal weight and gestational weight gain are recognized as risk factors, but prior studies did not differentiate between fat and fat-free mass [2]. In non-pregnant populations, higher fat mass is associated with low back pain, potentially through adiposity-related systemic inflammation. This systemic inflammation is linked to depression, a known predictor of PLPP, and anxiety [3]. However, the combined and longitudinal contribution of maternal weight, body composition, inflammation, and psychological factors to PLPP remains unexplored. This study aims (1) to determine whether (changes in) maternal weight and body composition predict the onset and persistence of PLPP, and (2) to examine the mediating and moderating roles of depression, anxiety, and systemic inflammation.

Methods: This longitudinal cohort is part of the PROFit study (G0A1N24FWO/S69463). A total of 211 pregnant women without PLPP in early pregnancy will be recruited and followed through the third trimester, as well as at six weeks and nine months postpartum. PLPP will be evaluated using patient-reported outcome measures of pain intensity and functioning, as well as clinical tests. Body composition will be measured using bioelectrical impedance analysis, and maternal weight and height will be recorded using a digital scale and stadiometer. Inflammatory markers will be measured using multiplex flow cytometry, and psychological factors will be assessed using validated questionnaires. Data will be analyzed using group comparisons, regression models, latent class growth analysis, and cross-lagged panel modelling.

Hypothesis: We hypothesize that greater gestational weight gain, higher fat mass, and stronger inflammatory responses predict the onset and persistence of PLPP. Psychological factors, such as depressive and anxiety symptoms, are expected to mediate these relationships.

Process evaluation: As of November 12, 2025, 27 participants (mean age=31.0, SD=3.6) have been included. Recruitment of participants remains the biggest hurdle of the study.

Conclusion: This study will provide new insights into how maternal weight, body composition, inflammation, and mental health interact in the onset and persistence of PLPP, guiding the improvement of prevention and intervention strategies.

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Information about low back and neck pain on Dutch physiotherapist's websites - a 5 year follow up study

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Introduction: Low back pain (LBP) is the leading cause of disability worldwide and is one of the main reasons for seeking primary healthcare. Physiotherapists are frequently consulted, and many practices offer online patient information. Whether the quality and accuracy of this information has changed over time is unclear. To determine how the situation has evolved, we conducted a five-year follow-up study evaluating the present state of LBP-related information provided on Dutch physiotherapy practice websites.

Methods: A nationwide five-year follow-up analysis of all Dutch physiotherapy websites was performed. Content was systematically evaluated and compared using an updated coding framework based on guideline recommendations and key elements of the biopsychosocial model (BPS model) and compared to the same websites assessed five years earlier. Websites were categorized as predominantly biomedical (0 psychosocial elements), limited biopsychosocial (1–2 psychosocial elements), or reasonably biopsychosocial (≥3 psychosocial elements). Descriptive statistics summarized fear-inducing language, and the McNemar-Bowker test assessed changes in biopsychosocial scores over time.

Results: The data shown in this abstract are based on preliminary results and analysis. From the original database of 449 websites, 67 contained updated content and were reassessed. Of these, 32 websites improved in biopsychosocial scores, while 10 declined. A significant shift toward biopsychosocial integration was observed ($p < 0.001$), although this improvement was not consistent across all websites. In 2025, 58% remained predominantly biomedical. Fear-inducing language persisted in 90% of content, with 36% featuring alarming visuals. Psychosocial information remained superficial. Newly established websites from the past five years are currently under review.

Process evaluation: Heterogeneity in website content complicated scoring, minimal-content websites were excluded. Two trained researchers performed assessments, initially scoring the same websites and calibrating through discussion and training to improve consistency, crucial for subjective psychosocial and fear-inducing elements. This approach reduced variability and increased reliability.

Conclusion: Despite slightly increased awareness of the BPS model, Dutch physiotherapy websites continue to emphasize biomedical and fear-based narratives. To align with the guideline and promote healthier illness beliefs, practices should update online content to reflect a more balanced, accessible biopsychosocial approach.

Effects of pain science education on self-efficacy and fear avoidance in people with non-specific chronic low back pain

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Introduction: Nonspecific chronic low back pain (nsCLBP) is the leading cause of disability worldwide and is often associated with emotional distress and functional impairment, imposing a substantial psychological burden. Current clinical guidelines recommend Pain Science Education (PSE) and exercise therapy as primary interventions for nsCLBP. However, existing evidence on the effects of PSE remains of low certainty. Therefore, this study aims to examine the effects of PSE on key psychosocial outcomes, i.e. self-efficacy and fear avoidance, the interrelations to other psychosocial outcomes, and somatosensory functioning in individuals with nsCLBP.

Methods: This within-subject pre–post cohort study (T−1 and T0) is embedded within the TechnoHIT trial (RCT; NCT06491121) and includes 65 patients with nsCLBP. Fear avoidance and self-efficacy are assessed using the Fear Avoidance Components Scale (FACS) and the Self-Efficacy for Exercise (SEE) questionnaire, respectively. Changes from pre- to post-intervention will be analysed using paired-samples t-tests. If significant effects are observed, correlations with additional measures—disability (Modified Oswestry Disability Index), pain (Visual Analogue Scale), resilience (Brief Resilience Scale), kinesiophobia (Tampa Scale for Kinesiophobia), work ability (Work Ability Index), and illness perceptions (Expectations to Recover, Brief Illness Perception Questionnaire, and Injustice Experience Questionnaire)—will be explored. Somatosensory functioning will be assessed using Quantitative Sensory Testing (QST). Age and gender will be included as potential confounders.

Hypotheses: It is hypothesised that PSE will increase self-efficacy and reduce fear-avoidance beliefs. Furthermore, resilience, kinesiophobia, illness perceptions, age, and gender may be associated with changes in these psychosocial outcomes.

Process evaluation: Data collection is currently in progress. Recruitment difficulties have posed challenges that may influence the final sample size and study timeline. Thus far, 54 participants have been enrolled, and strategies are being implemented to enhance recruitment.

Conclusions: Identifying which psychosocial outcomes are influenced by PSE, and how they interrelate, may help clinicians target mechanisms critical to effective pain education. Future research should investigate the long-term maintenance of treatment effects and explore potential moderating or mediating factors influencing PSE effectiveness.

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Activation for health self-management in chronic shoulder pain patients

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Introduction: Shoulder pain is a common musculoskeletal disorder, and up to 50% of patients do not fully recover after treatment, impacting quality of life and healthcare costs. Health education, lifestyle changes, and self-efficacy enhancement are essential. Health self-management activation, encompassing knowledge, confidence, and skills to manage one's health, is central to improving outcomes but remains poorly explored in chronic shoulder pain. Objective: To assess activation for health self-management in patients with chronic shoulder pain and to describe response distribution on the Patient Activation Measure (PAM-13).

Methods: Cross-sectional study conducted at a secondary-level physiotherapy service in Brazil. Sociodemographic and clinical data were collected. Health self-management activation was assessed using the PAM-13, self-efficacy using the Pain Self-Efficacy Questionnaire (PSEQ), disability using the Shoulder Pain and Disability Index (SPADI), and pain intensity using the Numeric Pain Rating Scale (NPRS). Data analysis was performed using descriptive statistics, with means, standard deviations (SD), and absolute and relative frequencies (CAAE: 83282924.0.0000.5440).

Results: Sixty-five patients (78% women) were included, mean age 55 years (SD 10), with 39 months of pain on average. Pain averaged 3 points on the NPRS. Forty-two percent had completed high school, and 37% worked in general services or domestic work. Activation averaged 70.8 (SD 13.8); 4.6%, 9.2%, 36.9%, and 49.2% at PAM-13 levels 1–4. Disability was moderate (SPADI: mean 51.8; SD 31), and self-efficacy was high (PSEQ: mean 44.3; SD 14). Items most frequently answered with "Disagree/Strongly Disagree" pertained to maintaining lifestyle changes (item 10: 32.3%; item 13: 30.8%) and knowledge of available treatments (item 9: 29.2%), whereas items most frequently answered with "Agree/Strongly Agree" referred to personal responsibility (item 1: 96.4%) and confidence in preventing problems or sharing concerns with healthcare professionals (items 3 and 6: 95.4% each).

Conclusion: Patients with chronic shoulder pain exhibited high activation for self-management, showing strong agreement on personal responsibility and confidence in communicating with healthcare professionals. Lower confidence was reported for maintaining lifestyle changes and knowledge of treatments, highlighting potential targets for health education and support strategies.

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Screening and referral practices for anxiety and depression among patients with chronic musculoskeletal pain within private physiotherapy practices: a qualitative study

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Introduction: Chronic musculoskeletal pain often co-occurs with psychological comorbidities such as anxiety and depression, yet little is known about the screening and management practices of physiotherapists in private physiotherapy services. This study explores the facilitators and barriers influencing physiotherapists' adoption of screening and referral practices for symptoms of anxiety and depression.

Methods: A small-q qualitative methodology was adopted to enable an in-depth exploration of the nuanced, contextual factors shaping physiotherapists' decision-making, attitudes, and behaviors. The study was approved by the Ethische Commissie Onderzoek UZ/KU Leuven and adheres to the Consolidated Criteria for Reporting Qualitative Research (COREQ). Purposive maximum-variation sampling was used to recruit physiotherapists with varied clinical experience and exposure to additional mental health – related training, ensuring diversity in perspectives and professional backgrounds. Eligible participants included physiotherapists treating patients with chronic musculoskeletal pain. There were no exclusion criteria.

Semi-structured interviews were conducted with 18 physiotherapists working in private settings (achieving data saturation). Qualitative framework analysis identified themes capturing physiotherapists' approaches to recognizing, screening, managing, and referring patients with anxiety and/or depressive symptoms in clinical practice.

Results: Ten interrelated themes were identified. Physiotherapists relied predominantly on informal, intuitive screening rather than structured validated tools. Barriers encompassed limited formal training, unclear professional boundaries, and systemic challenges such as time constraints and inconsistent referral pathways. Key facilitators included intrinsic motivation to provide biopsychosocial care, strong therapeutic alliances, and clinical intuition. Many physiotherapists reported emotional burden when managing anxiety and/or depressive symptoms without adequate support.

Process evaluation: The research process was feasible and well received by the participants. Recruitment and interviews were conducted smoothly, using open-ended prompts and clarifying questions to encourage detailed, reflective responses and capture a comprehensive understanding of participants' experiences and needs. None of the researchers had a therapeutic relationship with participants. Reflexive discussions were held throughout the analytical process to enhance methodological rigor, transparency, and to minimize potential bias. Limitations included the context-specific sample and the possibility that self-reported accounts were influenced by recall bias or social desirability. Moreover, the interpretive nature of qualitative analysis means that findings may reflect the perspectives of both participants and researchers. Nevertheless, the process fostered valuable insights into physiotherapists' experiences, highlighting the need for structured mental health training, clearer referral pathways, enhanced interprofessional collaboration, and creating support structures to mitigate clinician emotional burden. These results inform the refinement of future studies aiming to develop and evaluate strategies to integrate validated mental health screening tools into routine physiotherapy practice in a manner that maintains therapeutic rapport and minimizes administrative burden.

Conclusion: Physiotherapists acknowledge the importance of addressing co-occurring anxiety and/or depressive symptoms in chronic pain management but face personal, patient-related and systemic barriers. Enhancing training, embedding validated screening tools, and improving interprofessional collaboration are critical to advancing mental health practices within private physiotherapy settings.

Mediating factors on the effect of a multidisciplinary rehabilitation program for individuals with chronic whiplash-associated disorders

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Introduction: Despite availability of many treatment options, rehabilitation outcomes in whiplash-associated disorders (WAD) remain unsatisfactory. Numerous studies examined prognostic factors associated with treatment outcomes, yet evidence remains inconsistent. These inconsistencies highlight important gaps in understanding mechanisms underlying recovery in WAD. Building on this knowledge, the current study aims to explore mediating factors that influence key outcomes in rehabilitation. Specifically, investigating whether physiological and psychological factors measured at start of rehabilitation mediate treatment's effect on pain and functioning.

Methods: We conducted a cohort study at a rehabilitation centre. Participants were recruited from patients referred for chronic (pain) symptoms following whiplash injury. After meeting selection criteria, participants completed questionnaires at baseline and end of the rehabilitation program. Multidisciplinary rehabilitation was based on a holistic health vision and included physical therapy, occupational therapy, haptotherapy and psychological therapy. The neck disability index (NDI) and visual analogue scale (VAS) were used as measurements of disability and pain. Proposed physiological mediating factors included local and remote pain pressure thresholds, heart rate variability and breathing frequency. Proposed psychological mediating factors included kinesiophobia, symptoms of central sensitization, psychological well-being and posttraumatic stress. During analysis, NDI and VAS serve as dependent variables. Mediation will be examined using a general linear model by fitting a series of regression analyses testing how physiological and psychological factors influence treatment outcomes.

Results: A total of 57 participants completed all questionnaires. We haven't finished analysis, so it is not possible to elaborate over this aspect of the study. Results will be available at the time of congress. Our hypothesis is that physiological and psychological factors will mediate treatment's effect on pain and functioning.

Process evaluation: It proved challenging comparing research on mediating factors in treatment of chronic WAD, because of different study designs. As a result, it took more time formulating research question and hypotheses. However, patients have now been successfully included and have finished all measurements. Analyses of results are pending and will be presented at the congress.

Conclusion: To follow.

Keeping It Simple Study – effectiveness of PNE4Adults pain science education in the municipality: A multicenter randomized controlled clinical trial

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Introduction: Chronic musculoskeletal pain (CMP) affects 20-33% of the worlds' population and poses a challenge for both the individual and the healthcare system. Current care guidelines support patient education as a vital part for the management of chronic musculoskeletal pain (1). Proposed barriers for patient education include the need to simplify messages and adapt to patients' health literacy levels (2). To accommodate this barrier, the PNE4Adults was developed. We recently evaluated the feasibility and acceptability of PNE4Adults in municipality settings and found high levels of acceptability (100%) and comprehension (100%) (3). However, effectiveness of this intervention remains unknown. The primary aim of the KISS-trial is to evaluate the effect of 'PNE4Adults' combined with 'usual care' (intervention) compared to 'usual care' alone (control) in community-based rehabilitation in patients with CMP.

Methods: We included 200 patients with CMP in this multicenter, randomized controlled, superiority trial. Patients were recruited from three municipalities. The trial protocol was pre-registered on ClinicalTrials.gov before inclusion of the first participant. Inclusion started March 11th, 2024, and follow-up was completed August 2025. The primary intention-to-treat analysis will investigate the between-group difference for the primary outcome Musculoskeletal Health Questionnaire (MSK-HQ) at 3 months using a linear mixed effects model. Secondary outcomes will include mean pain intensity (of average pain and most severe pain past 24h), pain interference, pain knowledge, pain catastrophizing, pain self-efficacy, fear of movement, patient specific functional limitations, patients' impression of change, patients' satisfaction with current symptom state, any adverse events, and the time spent on consultations. Predefined interaction analyses include the moderating effect of health literacy, pain self-efficacy, pain knowledge, and sensitization on MSK-HQ and of health literacy on pain knowledge and pain self-efficacy. Analysis will be performed by data analyst blinded to group allocation.

Results (or hypothesis): Our hypothesis is that the intervention will result in a larger improvement of musculoskeletal health (MSK-HQ) after 3 months (primary endpoint) compared to the control.

Process evaluation: Patients have been successfully included and have completed final follow-up. Analysis of results are pending.

Conclusion: Are pending.

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Toward a perceived injustice–targeted pain science education 2.0: breast cancer survivors' experienced barriers, facilitators, and needs after the intervention

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Introduction: Persistent pain after breast cancer is common and often linked to perceived injustice. The BCS-PI trial (Roose, 2024) compared perceived injustice–targeted pain science education (PSE) (experimental group) with standard biomedical pain education (control group). Participants in the experimental group received 4 sessions combining perceived injustice–targeted PSE and motivational interviewing, aiming to improve understanding of pain mechanisms, enhance pain acceptance, and support engagement in personally valued goals. To explore participants' experiences, barriers, facilitators, and unmet needs, focus group discussions were conducted with experimental group members. These insights are intended to guide the development of a Perceived Injustice–Targeted Pain Science Education 2.0 in the future.

Methods: All 78 participants from the experimental group from the BCS-PI trial were invited by email, and interested individuals voluntarily signed up. The target sample size was two groups of 6–10 participants. Semi-structured discussions were guided by a pre-developed script, exploring participants' perceived barriers, facilitators, and unmet needs regarding the experimental intervention, and were designed to last approximately 1h35. Sessions were audio-recorded with consent, transcribed verbatim, and analyzed inductively using thematic analysis (familiarization, coding, theme development, review, naming, reporting) with NVivo 9. Summaries were returned to participants for verification and feedback (cross-validation).

Results: Two focus groups (n=2×8) were conducted, and summaries of both sessions were reviewed and approved by the participants. We anticipate results will highlight barriers such as challenges in applying the intervention, facilitators including supportive therapist behaviors, and unmet needs like additional follow-up. All qualitative results are expected in December 2025.

Process evaluation: Although guided by a structured script, participants occasionally strayed off topic or spoke over each other, requiring moderator guidance. Some words were unclear in single recordings, but three audio files complemented each other well.

Conclusion: The insights of the focus group discussions will help interpret the BCS-PI trial results and guide refinement of the intervention for future studies.

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Integrating persistent pain management training into the physiotherapy degree

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Introduction: In Spain, chronic pain affects 25-40% of the population, exceeding the European average of 19% (1). The International Association for the Study of Pain has highlights the physiotherapist's role in pain management and recommends that pain units include a physiotherapist among other healthcare professionals (2). Currently, there are no specific clinical traineeships in chronic pain within any Physiotherapy Degree program in Spain. The aim of this new clinical rotation is to integrate the management of persistent pain into students' practical training, enhancing their education and developing both clinical andcommunication competencies.

Methods: A treatment protocol will be implemented during the final year of the Physiotherapy Degree with individuals aged 40-75 who seek free treatment at the EUF ONCE University Clinic, predominantly persons presenting with nociplastic pain and who consent to participate. Those with red or orange flags for physiotherapy will be excluded. The protocol consists of an initial comprehensive assessment session (1-2 hours), five group sessions of Pain Neuroscience Education over one week and five weeks of movement training emphasizing external focus and dual-task exercises. When sleep disturbances, depression, or sensorimotor dysfunction are present, motor imagery, sensory re-education, and/or transcranial electrical stimulation will be provided. Participants showing signs of mental health issues will receive psychological support from the collaborating psychologist.

Hypothesis: Students will improve their competencies in managing persistent pain with high satisfaction expected among students, instructors, and participants.

Process evaluation: Before and after the protocol, the following assessments will be conducted: in students, satisfaction (Likert Scale, LS) and learning outcomes (evaluation rubric); in participants, adherence (attendance records) and treatment effects: sensory dysfunction (QST), pain quality (McGill) and distribution (Margolis Body Chart), functionality (PSFS), central sensitization (CSI), kinesiophobia (TSK), catastrophizing (PCS), self-efficacy (PSEQ), anxiety and depression (HADS), and sleep quality (ISI). Instructor´s satisfaction will also be evaluated (LS).

Conclusion: This innovative clinical traineeship aims to bridge the gap between theoretical knowledge and clinical practice, promoting evidence-based, person-centered management of persistent pain and advancing physiotherapy education.

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ReActivate: Physiotherapeutic intervention for adolescents and young adults with persistent musculoskeletal pain. A single-case experimental design

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Introduction: Persistent musculoskeletal pain is a largely prevalent problem among adolescents and young adults, affecting functioning in daily life negatively(1). Pain-related fear and avoidance behavior are associated with poor functioning and treatment results. This indicates a need for a tailored approach focusing on these aspects. The aim of this study was to evaluate a behavioral medicine intervention for young people, with persistent musculoskeletal pain, developed for primary healthcare context in Sweden. ReActivate is a physiotherapist led, tailored, intervention, based upon the fear-avoidance model. Treatment is graded exposure for physical activities and exercise that has been avoided due to worry about pain problems.

Methods: The study has a randomised repeated sequential single-case experimental (SCED) AB design(2). By repeated, daily measures during 7, 14, or 21 days before treatment (A=baseline) and during treatment (B=intervention) (totally 12 weeks), the participants are their own controls. Different baseline length enables statistical analysis of intervention effects. The design includes analyses of processes during interventions, which is important to assess behaviors and mechanisms that might explain why some people respond to interventions whereas others are non-responders.

Hypothesis: The hypothesis is that participating in ReActivate can result in decreased fear-avoidance, increased functioning and perceived physical and mental health.

Process evaluation: ReActivate is a replication of a multimodal intervention by Simons, et al(3), developed to a physiotherapist led intervention. Due to a slow recruitment process, inclusion criteria's have been revised three times. Age span has increased from 12 to 16 years to 12 to 25 years. From the initial inclusion criteria, persistent musculoskeletal pain and psychological distress, the later has been removed. Despite prompts and reminders, collecting daily diary measures has been a challenge for younger participants. Also, performing graded exposure with younger participants has been a challenge, due to developmental and cognitive aspects. However, the manual has guided to creative solutions to approach exposure.

Conclusion: ReActivate is a feasible intervention for young people with persistent musculoskeletal pain. However, graded exposure with young people can be a challenge due to developmental and cognitive aspects. This highlights the importance of tailored treatments for the patient group.

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Latent physical activity profiles of people with chronic pain: Associations with pain severity, sleep and accelerometer-measured rest-activity rhythm

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Introduction: Approximately one-third of the global population experiences chronic pain (CP), significantly impacting daily activities and altering patients' engagement patterns. Recent research highlights that individuals with CP exhibit diverse pain-related activity patterns, underscoring the need for profiling-based approaches. Although previous studies have explored differences among activity profiles in terms of pain experiences and physical activity, limited attention has been given to differences in sleep and 24-hour rest-activity rhythms (RAR). This study aimed to apply latent profile analysis (LPA) to categorize individuals with CP by self-reported activity patterns, and subsequently examine differences across these profiles regarding pain experiences, sleep quality, and accelerometer-derived RAR.

Methods: 195 participants with chronic non-cancer pain (CNCP), aged 18–65, were recruited in the UK. Eligibility required experiencing CNCP for ≥3 months. Participants completed baseline questionnaires assessing pain-related activity patterns (Patterns of Activity Measure–Pain, POAM-P: subscales of avoidance, overdoing, pacing), insomnia severity (Insomnia Severity Index, ISI), and pain severity and interference (Brief Pain Inventory–Short Form, BPI-SF). Actigraphic sleep quality (Actigraphic Total Sleep Time, A-TST; Sleep Efficiency, A-SE) and 24-hour RAR (MESOR – overall physical activity level; Amplitude – robustness of RAR; Intradaily Variability, IV – fragmentation of RAR) were objectively measured using wrist-worn accelerometers (MotionWatch 8) over a 7-day ecological momentary assessment (EMA). LPA identified distinct subgroups based on the three POAM-P subscales. Between-profile differences in pain, sleep, and RAR were analysed using Analyses of Covariance (ANCOVAs), adjusting for demographic covariates (age, gender, BMI).

Results: LPA identified four distinct profiles based on the three POAM-P subscales: "assorted activity regulation – moderate use" (n = 101, 51.8%), characterized by moderate use of all three strategies; "overdoing" (n = 39, 20%), defined by high overdoing but low avoidance and pacing; "avoidant pacing" (n = 39, 20%), marked by high avoidance and pacing but low overdoing; and "assorted activity regulation – minimal use" (n = 16, 8.2%), showing minimal use of all strategies. ANCOVAs revealed significant differences in pain outcomes: the "minimal use" profile reported the lowest pain severity and interference, while the "avoidant pacing" profile reported the highest. No significant differences emerged in sleep quality (ISI, A-TST, A-SE). However, RAR variables differed significantly: the "avoidant pacing" group showed the lowest MESOR and amplitude but the highest IV, reflecting lower activity and more disrupted rhythms. In contrast, the "assorted activity regulation – minimal use" group exhibited the highest MESOR and amplitude and the lowest IV, indicating more robust, stable daily activity rhythms.

Conclusions: This study highlights that distinct POAM-P profiles are associated with differing pain experiences and 24-hour activity rhythms. Understanding these profiles may enable clinicians to tailor more individualized interventions. Notably, minimal use of activity regulation strategies was linked to better outcomes, suggesting that a less pain-reactive, "non-action" approach may benefit CP management, challenging the contemporary assumption that activity pacing is the core intervention among CP patients.

Pain medication use disorder (PMUD), towards a new framework in pain management: a review

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Introduction: Prolonged use of opioids and gabapentinoids is associated with adverse effects, including alterations in pain signaling and brain reward pathways, which may lead to tolerance, as well as physical and psychological dependence. To address these challenges, the authors introduce pain medication use disorder as a new conceptual entity to characterize maladaptive patterns of prescribed pain medication use. Pain medication use disorder can be an addition to the currently available conditions as to date there is no term describing the symptoms related to substance use disorder as defined by the DSM-5 criteria and which are related to the use of prescribed pain medication.

Methods: A multidisciplinary approach guided the literature search, drawing on expertise and terminology contributed by pain specialists, pain psychologists, psychiatrists, and SUD experts. MEDLINE (via PubMed) was searched using the following terms: “opioid”, “gabapentin”, “pregabalin”, “gabapentinoid”, “withdrawal”, “tolerance”, “dependence”, “craving”, “abuse”, “substance use disorder” and “tapering”. Relevant literature was then carefully selected from the obtained results.

Results: Pain medication use disorder is defined as the uncontrolled use of prescribed pain medications that directly affect pain and reward circuits. Introducing pain medication use disorder as a clinical construct may enhance awareness, refine diagnostic considerations, and guide more effective treatment strategies. Neuroadaptive changes induced by opioids and gabapentinoids increase the risk for the development of pain medication use disorder, particularly in individuals predisposed to substance use disorders. Understanding the relationship between effective pain management and vulnerability for pain medication use disorder is essential for optimizing multidisciplinary care.

Conclusions and relevance: This narrative review synthesized the most recent developments in our understanding of the interaction between chronic pain and pain medication use disorder and highlights the biopsychosocial factors that predispose patients with chronic pain to the development of pain medication use disorder. Finally, we discuss long-term pain medication therapy within the context of pain medication use disorder risk, underscoring the need for integrated and individualized management approaches.

Autonomic predictors of pain and disability in chronic shoulder pain: longitudinal follow-up at three and six months

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Introduction: Chronic shoulder pain (CSP) is influenced by psychological and autonomic factors(1). Excessive pain-related avoidance, pain-related worrying, and low self-efficacy are associated with disability, while reduced heart rate variability (HRV) reflects autonomic dysregulation in chronic pain(2). However, it remains unclear whether these factors predict long-term disability. Objective: To investigate whether pain-related avoidance behavior, pain-related worrying, self-efficacy, and HRV assessed at baseline predict shoulder disability at three and six months in people with CSP.

Methods: This preregistered prospective longitudinal study (CAAE: 67931623.6.0000.5414) included 60 people with CSP. At baseline, pain-related avoidance behavior was assessed using the Avoidance Daily Activities Photo Shoulder Scale (ADAP), pain-related worrying using the Pain Catastrophizing Scale (PCS), and self-efficacy using the Pain Self-Efficacy Questionnaire (PSEQ-10). HRV was calculated from RR intervals recorded via ECG (modified CM5 lead; 2000 Hz) and Finometer Pro (finger cuff, left hand). HRV indices analyzed included root mean square of successive R-R interval differences (RMSSD), Low-frequency (LF), High frequency (HF), and the LF/HF ratio. The RMSSD reflects the primary time-domain measure used to estimate the vagally mediated changes reflected in HRV. The LF band reflects mainly sympathetic activity during resting conditions while HF band reflects parasympathetic activity. LF/HF ratio reflects parasympathetic dominance(3). Recordings were collected in supine (10 minutes) and seated positions (10 minutes), excluding the first five minutes in each position for stabilization. Shoulder disability was assessed with the Shoulder Pain and Disability Index (SPADI) at 3- and 6-month follow-ups.

Hypotheses: Excessive pain-related avoidance behavior, increased pain-related worrying, lower self-efficacy, increased sympathetic activity, and reduced parasympathetic modulation at baseline will predict greater disability at follow-up pain-related worrying.

Process evaluation: Data collection is complete; statistical analyses will start after data verification. Findings will contribute to understanding autonomic and psychosocial predictors of prognosis in CSP and may support more personalized clinical decision-making.

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Exploring personal variables to better understand the variability in dynamic experimental pain measurements

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Introduction: Pain modulation reflects a complex interaction between peripheral, spinal, and supraspinal mechanisms. Dynamic quantitative sensory testing (QST) paradigms such as Conditioned Pain Modulation (CPM), Offset Analgesia (OA), and Temporal Summation of Pain (TSP) are commonly used. In patients with chronic pain, these mechanisms often shift toward reduced inhibition and enhanced facilitation, yet substantial variability has also been observed in healthy individuals. This variability might arise from inter-individual differences in personal factors. Sociodemographic factors (e.g., age, sex), psychosocial variables (e.g., catastrophizing, resilience), and lifestyle factors (e.g., sleep, physical activity) are supposed to contribute to these differences. However, prior studies typically assessed single factors or isolated paradigms, providing a fragmented understanding of their combined influence. A multivariable approach may clarify how these personal factors jointly shape central pain modulation. Therefore, this study aimed to explore personal variables associated with CPM, OA, and TSP in healthy adults.

Methods: In this cross-sectional study, 181 healthy adults, mean (SD) 34.6 (13.4) years; 55% female) underwent dynamic quantitative sensory testing to assess TSP, CPM, and OA. To reduce dependency on specific calculation approaches, multiple metrics were derived for each paradigm. For TSP, absolute and relative indices were calculated, including the wind-up ratio and area under the curve. CPM was assessed using mechanical stimuli (tibialis anterior and trapezius muscle) and a heat stimulus applied to the volar forearm. Both absolute and relative changes were calculated. OA was measured at the volar forearm, with short-term and delayed effects analyzed using absolute and relative calculations. Fifteen candidate personal variables were selected a priori. Twelve regression-based selection methods across five analytic families (full-model, stepwise, best subset, penalized, and Bayesian) were applied to identify variables associated with dynamic pain modulation outcomes.

Results: Preliminary; TSP identified 9 predictors.

Process evaluation: Different analytic strategies produced varying sets of predictors. Synthesizing these results is complex, especially given the limited sample size. Moreover, the uncertainty associated with such analytic variability warrants careful consideration and collective interpretation within the research team.

Conclusion: N/a

Blood-based biomarkers in chemotherapy-induced peripheral neuropathy (CIPN): a systematic review

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Introduction: Chemotherapy-induced peripheral neuropathy (CIPN) is a frequent, dose-limiting toxicity of neurotoxic agents such as taxanes, platinum compounds and vinca alkaloids. Its mechanisms are complex, involving neuroinflammation, glial activation, neuroaxonal injury and disrupted neurotrophic signaling. Although clinical predictors (e.g. age, cumulative dose) exist, they lack accuracy for early detection or prognosis. Circulating blood-based biomarkers reflecting inflammatory or neuroinjury processes may provide objective insights into CIPN pathophysiology and support risk stratification, earlier detection and more targeted interventions. This systematic review aims to synthesize evidence on differences in circulating inflammatory and neuroinjury biomarkers between patients with and without CIPN, and evaluate cross-sectional and longitudinal associations between biomarker levels and CIPN presence, severity or persistence.

Methods: A systematic search will be conducted in PubMed, Embase and Web of Science. Eligible studies include observational or interventional research in adults receiving neurotoxic chemotherapy. Included biomarkers must be measurable in blood and fall within five biological domains: systemic inflammation (e.g., CRP, TNF, interleukins, chemokines), glial activation (e.g., GFAP, S100B), neuroaxonal damage (e.g., neurofilament light chain, tau), neurotrophic signaling (e.g., BDNF, NGF, GDNF) or lipid mediators (e.g., prostaglandins, leukotrienes, endocannabinoids). Data extraction follows PRISMA 2020, with quality assessment using validated tools.

Results/Hypotheses: We expect biomarkers such as IL-6, TNF-α and neurofilament light chain to be elevated in individuals who develop or sustain CIPN. We also aim to identify additional, less frequently studied biomarkers with potential relevance. Consistent biomarker patterns may clarify underlying mechanisms and highlight candidates for early detection or prediction.

Process evaluation: Screening has yielded over 13,000 articles, of which approximately 20 have been selected as relevant for inclusion. Authors will be contacted for missing information. Two reviewers will independently perform screening, risk-of-bias assessment and data extraction.

Conclusion: This review will synthesize evidence linking blood-based biomarkers to CIPN, aiming to identify reproducible biological signals that can support biomarker-guided risk prediction and personalized preventive or therapeutic strategies.

Effect of a one-time manual therapy intervention on electrocutaneous pain perception in healthy individuals across local and remote areas

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Introduction: Pain-related mechanisms in the central nervous system (CNS) can modify the subjective sensation of pain. At a clinical level, manual therapy (MT) can help to alleviate pain. But the exact mechanisms of MT, particularly to the cervical spine, still need to be investigated. The primary aim of the study was to investigate the effect of MT on pain perception, as well as sensitivity, using threshold and suprathreshold stimuli at three body locations (forehead, neck, hand).

Methods: A total of 87 healthy, pain-free individuals participated in this study and underwent a pain assessment using electrocutaneous stimulation, before and after intervention/control. Experimental intervention group of n=28 was exposed to 3 x 2 minutes manual therapy in the upper cervical region (neck). Sham intervention group (n=28) received an equivalent technique to the hand, while the remaining 28 participants served as the control group. Design: between- and within subject design. Main (dependent) variables: Supra Threshold Pain Ratings (STPRs) and Pain Thresholds (PTs). Randomisation: Body side, intervention group assignment, stimulus intensity order, and locations for stimulus delivery. For analyses a two (test: before, after) by three (group: manual therapy neck, manual technique hand, control – no intervention) by three (intensity: 5, 7.5, 10mA) ANOVA with repeated measures will be performed on each location (V1, GON, hand). To address the specific hypotheses, planned between-group t-tests (neck therapy vs. i) control, ii) hand therapy) will be performed on the outcomes as post-hoc tests, with Bonferroni correction.

Hypotheses: Concerning the modulation of the psychophysical responses to electrocutaneous stimulation at both, local and remote sites: It is hypothesised that manual therapy, applied to the upper cervical spine as local region – in the experimental intervention group, alters the perception of electrocutaneous stimuli. Alteration occurs at both suprathreshold and pain threshold levels, within the territory of the greater occipital nerve (GON) and the trigeminal distribution (V1), while no such modulation occurs at distal regions, such as the hand (remote location).

Process evaluation: Recruiting process of healthy participants and data collection was performed from Dec 2024 to Oct 2025. Study protocol registered on OSF in 2025. Data Collection now completed. Data analysis in preparation. Limitations: 1. predominantly young age of healthy particpants.

Association of chronic pain and its widespreadness with mortality and life expectancy among long-term survivors of adolescent and young adult cancer: an observational study

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Introduction: Despite improved survival rates, long-term survivors of adolescent and young adult (AYA) cancer face a persistent mortality gap compared to their peers. The potential for chronic pain and its widespread extent to exacerbate mortality risk in this population remains unexamined. We aim to determine the association of chronic pain and its widespreadness with mortality and life expectancy among long-term survivors of AYA cancer, specifically examining whether: 1) chronic pain poses a risk compared to no chronic pain; 2) chronic widespread pain poses a greater risk than chronic non-widespread pain or no chronic pain; and 3) a dose-response relationship exists between the number of pain sites and mortality risk among survivors with chronic non-widespread pain.

Methods: We will analyze data from the UK Biobank, a prospective cohort of over 0.5 million participants (aged 37–73 at recruitment, 2006–2010). Long-term AYA cancer survivors will be defined as participants diagnosed with cancer between ages 15–39 who survived ≥5 years post-diagnosis, identified via cancer registry linkage. Participants responding the baseline pain questionnaire will be categorized as: no chronic pain, chronic non-widespread pain (pain in 1-7 sites), or CWP (pain all over the body). The primary outcomes are all-cause, cardiovascular, and cancer mortality (from death registries); the secondary outcome is life expectancy. We will use survival models to calculate hazard ratios (HRs) and life expectancy differences. Confounders will be selected based on prior directed acyclic graphs. We will conduct stratified analyses by age, sex, time since diagnosis, and mental health issues. We will conduct three sensitivity analyses: (1) excluding participants who died within the first two years of follow-up; (2) excluding those with missing confounder data; and (3) redefining the reference group as the no-pain group.

Hypotheses: We hypothesize that chronic pain and CWP are associated with excess mortality and reduced life expectancy. We further hypothesize a dose-response relationship, where mortality risk increases with the number of pain sites in chronic non-widespread pain.

Process evaluation: Key strengths include the prospective design and large sample of survivors of AYA cancer. Limitations include the pain questionnaire's lack of data on severity and duration, and the absence of cancer treatment information, which may cause residual confounding.

Conclusion: This study could inform early interventions targeting chronic pain and its widespread extent to improve long-term survival for survivors of AYA cancer.

Immersive virtual reality and pain control: An experimental study protocol with healthy participants to describe the mechanisms of brain activity

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Introduction: Immersive virtual reality (IVR) can transiently modulate pain and raise sensory thresholds (1), and changes in prefrontal or executive cortical activation during VR pain modulation have been demonstrated (2). However, no published study has simultaneously employed multiple QST paradigms together with cortical hemodynamic monitoring in a IVR context.

Methods: Healthy participants will complete a single-session, within-subject protocol comprising three conditions: baseline, IVR immersion (using Nature Treks VR software), and a non-immersive 2D viewing condition. The IVR and 2D conditions will be randomized. In each condition, a 5-minute resting-state recording will be obtained using fNIRS (NIRSport2; 8 sources, 8 detectors), targeting prefrontal cortex. Immediately afterward, four QST paradigms will be applied to the right leg in fixed order. Pressure pain threshold (PPT) will be assessed via algometry; temporal summation of pain (TSP) using a 256 mN pinprick. Offset analgesia (OA) will be measured using a thermode delivering a 5/10 heat stimulus with controlled temperature transitions. Conditioned pain modulation will be quantified as the change in PPT before and after cold-water immersion of the right foot (10°C, up to 2 minutes). During all paradigms, participants will continue viewing the IVR or 2D environment as assigned. Pain intensity, unpleasantness, and enjoyment will be recorded using numerical rating scales. Resting-state and task-evoked hemodynamic data will be processed to extract oxygenated hemoglobin changes and patterns.

Hypotheses: We hypothesize that prefrontal hemodynamic responses would correlate with the inhibitory effects elicited by IVR across all QST paradigms. We further hypothesize that IVR would generate stronger inhibitory modulation than the non-immersive 2D condition, with the largest effects expected in PPT and TSP. We also hypothesize that resting-state prefrontal activity would be lower at baseline than during both IVR and 2D exposure.

Process evaluation: The project is currently in the data collection phase, and 20 participants have already completed the experimental procedures.

Conclusion: This combined QST–fNIRS approach aims to delineate neurobehavioral mechanisms engaged by IVR. Clarifying these pathways may support the development of more targeted, mechanism-based non-pharmacological interventions for pain.

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Electroencephalography biomarkers during physiotherapy for chronic non-specific neck pain: A longitudinal study protocol

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Introduction: Patients with chronic non-specific neck pain (CNNP) show neurophysiological alterations in pain processing, including increased pronociceptive plasticity and impaired pain modulation(1). However, the neural mechanisms underlying clinical improvement after physiotherapy remain unclear(2). This study aims to identify physiotherapy-induced changes in brain activity using electroencephalography (EEG).

Methods: This multicentre longitudinal study will include 100 patients with CNNP and 50 healthy controls. Patients will receive 6 weekly physiotherapy sessions involving passive mobilisation of the cervicothoracic spine, soft tissue techniques, and a home exercise programme for cervical mobility and neuromuscular control(3). Before and after treatment, all participants will undergo EEG and psychophysical pain testing. EEG will be recorded with a 64-channel system during a 5-min resting-state and a pain-evoked condition using five 40-s heat stimuli. Psychophysical measures will include pressure pain threshold, temporal summation (pinprick), cold and heat pain threshold, conditioned pain modulation, and pain mapping. EEG outcomes will comprise dominant peak frequency, amplitudes of neuronal oscillations in theta, alpha, beta, and gamma frequency bands, and brain connectivity metrics. Clinical outcomes will be reassessed at 3-month follow-up via telephone.

Hypotheses: We hypothesize that physiotherapy-induced changes in clinical outcomes will correlate with corresponding alterations in EEG biomarkers and brain connectivity patterns. We further anticipate identifying distinct patient phenotypes based on psychophysical profiles and psychological factors, including anxiety, depression, pain catastrophizing, and kinesiophobia. This study aims to improve understanding of CNNP mechanisms and support the development of EEG-based biomarkers sensitive to physiotherapy-induced modulation.

Process evaluation: The project is currently in the data collection phase. Recruitment through the public healthcare system has required additional coordination.

Conclusion: This protocol presents a comprehensive approach to explore neurophysiological correlates of clinical improvement after physiotherapy in CNNP. The findings may identify objective EEG biomarkers and phenotypic profiles predictive of treatment response, supporting personalised pain management strategies.

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Effects of multidisciplinary rehabilitation in primary care for chronic musculoskeletal pain: a cohort study

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Introduction: Chronic musculoskeletal pain (CMP) affects 18% of Dutch adults and often impairs daily functioning and participation. Multidisciplinary rehabilitation in primary care (MRPC), incorporating a biopsychosocial framework and aligned with stepped-care principles, is regarded as a promising strategy. However its development in the Netherlands remains limited. This study evaluates changes over time in functioning and participation of patients with CMP receiving MRPC.

Methods: A longitudinal cohort study was conducted including adults with CMP ≥3 months following unsuccessful monodisciplinary care. Five healthcare providers offered MRPC consisting of multidisciplinary diagnostics, a 6–12-week treatment and 12-month aftercare. Each team included at least a psychologist or pain nurse and a physical or exercise therapist. A rehabilitation physician could be consulted in complex cases. Self-reported outcomes (PDI, SF-12, WAS, PSEQ-4, USER-P, HADS, PCS-6) were collected at baseline (T0); 3 (T1); 9 (T2) and 15 months (T3). Data were analysed using linear mixed models.

Results: In total, 103 participants (mean age 48.2; 79% female) were included. Preliminary results show substantial decrease in ADL disability (PDI: 35.6→26.4; p<.001), as did anxiety (HADS-A: 8.2→6.4; p<.001), depression (HADS-D: 7.2→4.5; p<.001) and catastrophizing (PCS: 12.2→8.1; p<.001). Self-efficacy increased (PSEQ: 12.8→16.2; p<.001), alongside participation satisfaction (USER-P: 52.2→65.4; p<.001) and work ability (WAS: 4.0→4.8; p=.005). Overall, clinically meaningful improvements between timepoints were observed across these outcomes. No significant differences were found in the physical or mental component scales of SF-12.

Process evaluation: Implementation challenges included limited health insurer contracting, limited governance and coordination, low referrer awareness and variation in organisational readiness across settings. These barriers restricted reimbursement and limited patient inclusion, hindering consistent delivery and reducing opportunities for learning and optimisation. Moreover, data collection was challenged by decentralised registration.

Conclusion: MRPC shows potential for patients with CMP with consistent improvements across functioning, participation, psychosocial outcomes, and work ability. Further research is needed to confirm these findings. For wider implementation structural factors such as reimbursement and organisational readiness must be reinforced.

Ready, set, prehab! Feasibility of a multimodal patient-centered teleprehabilitation program for breast cancer patients

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Introduction: Breast cancer (BC) is the most frequently diagnosed malignancy in women worldwide. While surgery remains essential to treatment, it is often accompanied by physical, psychological, and social challenges. The perioperative phase offers a window of opportunity to optimize patients' health before treatment. Despite strong evidence for rehabilitation after BC treatment, prehabilitation remains understudied. This multicenter study explores the feasibility and patient satisfaction of a patient-centered teleprehabilitation program for women undergoing BC surgery and provides preliminary evidence of its impact on patient-reported outcomes.

Methods: Women (n=50) with stage I–III BC scheduled for primary surgery receive a multimodal teleprehabilitation program combining education, exercise therapy, and stress management. Motivational interviewing is embedded throughout to enhance engagement and behavior change. Primary outcomes (feasibility, adherence, safety, satisfaction) are assessed using logbooks, questionnaires, and interviews. Secondary outcomes (fatigue, pain, quality of life, physical activity, perceived injustice, self-efficacy, and healthcare use) are measured at baseline, one day post-intervention, and 1 and 6 months post-surgery.

Results: To date, 38 participants have been enrolled. Preliminary findings show high patient satisfaction with the program. Based on current observations and feedback from focus group discussions, the intervention appears feasible and well accepted, provided that certain practical refinements are implemented. We expect reductions in fatigue, pain, and healthcare use, and improvements in quality of life and self-efficacy. Both quantitative (repeated-measures ANOVA) and qualitative (inductive content analysis) data will be fully analyzed and presented at the conference.

Process evaluation: Recruitment proved to be the main challenge due to time constraints between diagnosis and surgery, but minor protocol adjustments and ongoing communication with breast care teams improved inclusion. Ongoing feedback from participants and clinicians led to practical solutions such as flexible scheduling and refined communication. These experiences offer key insights for optimizing and scaling teleprehabilitation in Belgian BC care.

Conclusion: This is the first Belgian study to evaluate the feasibility of a patient-centered teleprehabilitation program for women with BC, aiming to enhance patient empowerment and treatment readiness.

Rehabilitation professionals' experiences with rehabilitation for people with persistent spinal pain syndrome type 2 following spinal cord stimulation

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Introduction: Chronic pain is a common problem. Patients with Persistent Spinal Pain Syndrome Type 2 may receive spinal cord stimulation implantation to reduce this pain. Recent evidence shows that only a limited number of these patients return to work. A biopsychosocial rehabilitation programme was established to improve the work ability of these patients, but how do therapists experience guiding such a programme?

Methods: The study was conducted using the hermeneutic phenomenological method. Data were collected using semi-structured interviews. The following steps were performed during the analysis: formulating a naïve understanding, structural analysis and formulating a comprehensive understanding.

Results: A total of 10 physiotherapists, occupational therapists and psychologists were interviewed from November 2023 until February 2024. In the structural analysis we identified five themes: i) The challenge of personalizing the rehabilitation process, ii) The pursuit of interdisciplinarity, iii) Importance of biopsychosocial rehabilitation, iv) Value of long term implementation strategies and v) Employment as end result.

Conclusions: Personalization was experienced to be paramount in biopsychosocial rehabilitation but was complicated by a standardized protocol. Patient centered care could only be established by multiple disciplines working together in an interdisciplinary team. Finally, employment was identified as the main goal in rehabilitation.

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Effectiveness of in-person physiotherapy blended with digital health consisting of pain education and behavioural activation for people with spinal pain

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Introduction: Interventions focusing on both physical and psychological aspects are recommended in people with persistent spinal pain who also have psychosocial risk factors. A blended intervention called Back2Action, combining both in-person physiotherapy and psychologically-informed digital health, was developed to support physiotherapists and optimise physiotherapy treatment. Objective: To assess the effectiveness of Back2Action compared to usual physiotherapy for people with low back pain and/or neck pain.

Methods: We conducted a pragmatic multicenter randomized clinical trial (RCT). Participants with non-specific low back and/or neck pain for at least 6 weeks, who also had psychosocial risk factors (e.g. depression, anxiety, fear of movement) for persistent pain, were included. Recruitment and cluster randomization were applied at the level of physiotherapy practices, where participants were allocated to either the experimental intervention (physiotherapy blended with six online modules of pain education and behavioural activation) or the control intervention (usual care physiotherapy). Primary outcomes were disability (Oswestry Disability Index for low back pain and Neck Disability Index for neck pain) and global perceived effect (Global Perceived Effect scale). Multiple secondary outcomes of biological and psychological factors were included. Assessments were conducted at baseline and at 2-, 6-, and 12-months follow-up.

Results: A total of 143 people were included (n=87 intervention group and n=56 control group). Baseline demographics, physical and psychosocial characteristics, were balanced between the groups. In the intervention group, 42 participants (48%) completed ≥5 of the 6 modules (per-protocol). In the Back2Action group, a greater reduction in disability and higher proportion of participants reported recovery was reported, although no statistically significant between group differences were observed in the intention-to-treat analyses and perceived effect. The magnitude of the differences was even larger in the per-protocol analyses. Additionally, multiple secondary outcomes (e.g. pain and pain catastrophizing) in the Back2Action group reached both statistical significance and clinical relevance.

Conclusions:
A blended biopsychosocial intervention targeting psychological aspects showed comparable results compared to usual care physiotherapy in people with persistent spinal pain. However, those who adhered to the intervention showed better results. These findings highlight the potential to optimize physiotherapy care to reduce the impact of spinal pain.