

The effectiveness of ReAttach Therapy for Fibromyalgia Patients analyzed by the Symptom Amplification Model of Neurolog: A study protocol

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Abstract

Fibromyalgia, a chronic widespread musculoskeletal pain condition affecting approximately 2 to 3 percent of adults [1,2], often co-occurs with symptoms like fatigue, cognitive issues, and psychological problems such as anxiety and depression. The ongoing need to assess psychosocial interventions remains critical, given the multifactorial nature of fibromyalgia despite emerging research on non-invasive neuromodulation, virtual reality, and psychedelic therapies. ReAttach, a tailored, multimodal transdiagnostic intervention, might meet the need for a personalized approach in fibromyalgia [3]. This study protocol is part of a series of studies investigating the efficacy of ReAttach in biopsychosocial conditions [4,5,6,7]. The research will utilize the Emotions Symptom Regulation Model and Symptom Amplification Model, created by Painter (2025), which provide innovative tools to detect and analyze changes in symptom networks [4]. This approach aims to deepen understanding of fibromyalgia's complex mechanisms and the potential impact of ReAttach.

Keywords: Fibromyalgia, ReAttach, OT, Symptom Amplification Model, Psychobiosocial Conditions

Introduction

Fibromyalgia is a psychobiosocial condition whose underlying mechanisms are still poorly understood. Neurolog's Emotion Regulation Symptom Model not only may provide us with more insight into the active symptom networks of fibromyalgia patients, but can also teach us more about how these are influenced when measured with the Symptom Amplification Model (SAM) [4]. According to Cavicchioli et al. (2025), the self-concept and its neurobiological underpinnings might shed light on understanding fibromyalgia and related core features within an integrated mind-body conceptual framework [8]. One of ReAttach's social cognitive training aims is to process internal and external information about self-concept and relational concepts coherently by optimizing learning conditions through

co-regulation [3]. We therefore find it very interesting to measure what influence ReAttach sessions can have on the complaints of patients with fibromyalgia.

ReAttach is a transdiagnostic intervention designed to address sensory overresponsivity, social, emotional, and cognitive dysregulation, and autonomic nervous system imbalance across diverse psychobiosocial conditions [3]. ReAttach focuses on restoring multiple sensory processing and co-regulation capacities and on reducing both arousal-mediated and depletion-mediated symptom amplification. The application of ReAttach in patients with fibromyalgia is part of a larger research program that investigates its effectiveness across psychobiosocial conditions [5,6,7]. The NeuroLog platform assesses the efficacy of ReAttach with SAM by integrating patient-driven symptom monitoring, emotional state tracking,

and trigger documentation [4].

Study Design

Study Objectives and Scientific Positioning

This study protocol details a prospective observational cohort designed to evaluate ReAttach therapy's effectiveness in fibromyalgia patients, utilizing the Symptom Amplification Model (SAM) of NeuroLog's infrastructure for systematic assessment across psychobiosocial conditions [4,5,6,7].

This protocol details a prospective observational cohort study designed to evaluate ReAttach therapy's effectiveness in fibromyalgia patients, emphasizing continuous longitudinal measurement to capture individual treatment trajectories.

Eligible participants are adults aged 18 or older with a confirmed fibromyalgia diagnosis who are receiving ReAttach therapy as part of their standard care and can utilize digital monitoring via the NeuroLog platform.

Study Duration

We propose the following practical framework for the fibromyalgia study:

Participants will undergo 6 to 8 ReAttach sessions, with six core sessions and up to 2 additional sessions for complex cases, ensuring clarity in scheduling. During weeks 1-2, patients will receive two sessions per week to establish a therapeutic foundation and activate the co-regulation process. From weeks 3-6, the schedule shifts to weekly sessions, allowing for integration of the ReAttach effects while respecting the energy limitations many fibromyalgia patients experience. If additional sessions are necessary, they will occur biweekly during weeks 7 and 8. This schedule is designed to provide a gradual, manageable treatment plan that respects the patient's energy levels and allows for the integration of therapy's effects.

Session Duration: The initial session will combine the intake assessment with the first ReAttach intervention, lasting 45 minutes. Sessions 2-5 will be streamlined to focus solely on the ReAttach protocol and will last 30 minutes each. The final session will allocate 45 minutes to accommodate both the intervention and evaluation components.

Ethical Framework

All participants will continue to receive standard fibromyalgia care, as the ReAttach intervention provides psychosocial support in addition to, not as a substitute for, medical treatment. Due to the ethical obligation to ensure ongoing care for vulnerable patients, the study will not include a non-treatment control period. Instead, a within-subject design will be used, comparing each participant's baseline data to their post-intervention results. This approach upholds ethical standards by integrating

supportive interventions and emphasizing patient welfare.

Participant selection: inclusion criteria

We strive to include adults aged 18 to 70 with a confirmed fibromyalgia diagnosis who are currently experiencing a combination of at least three ongoing symptoms, such as:

- Debilitating headaches
- Persistent dizziness
- Overwhelming fatigue
- Pervasive pain
- Emotional turmoil
- Profound grief

Participants must also be motivated for ReAttach and provide written informed consent.

Recruitment will be carried out through general practitioners, occupational therapists, and direct engagement with potential participants. A detailed recruitment log will be maintained to ensure systematic enrollment and transparency.

Exclusion criteria

Individuals experiencing acute psychiatric crises or profound cognitive impairments that make reliable self-reporting impossible may find it challenging to utilize smartphone-based applications effectively.

Intervention

ReAttach face-to-face sessions will be combined with standard Occupational Therapy (OT) care, including goal-directed activity coaching, energy management, and graded participation tasks.

Data Collection Procedures

NeuroLog is a digital platform that uses the Symptom Amplification Model (SAM) to analyze emotional, biological, and societal factors affecting symptom severity in biopsychosocial conditions [4]. It enables patients to track their physical and emotional symptoms (on a 1-10 scale) and relevant triggers, providing real-time, anonymized data and insights in compliance with GDPR [4,5,7].

Data Analysis

The data analysis will use continuous, real-world NeuroLog data to examine intricate changes in symptom dynamics, regulatory capacity, and amplification patterns throughout the intervention. The Symptom Amplification Model (SAM) serves as the primary analytical framework for assessing the interplay between arousal and depletion. The main objective is to measure changes in SAM-derived amplification indices from baseline to post-intervention. These key analytical components include:

- Arousal-mediated amplification: Highlights sympathetic

overactivation and emotional hyperreactivity.

- Depletion-mediated amplification: Sheds light on diminished energy availability and hindered recovery processes.
- Composite amplification load: A critical indicator of overall regulatory imbalance.

These indices will be meticulously calculated from longitudinal symptom ratings, emotional state tracking, and contextual triggers to provide a detailed understanding of symptom dynamics and their regulation during the intervention.

Discussion

This study protocol is part of a larger research program that assesses the effectiveness of ReAttach therapy for various psychobiosocial conditions. These conditions are characterized by complex interactions among biological, psychological, and social factors, resulting in symptom burdens that go beyond simple physical or psychological explanations. Key features of these conditions include:

- - Fluctuations in symptoms in response to emotional stress and environmental factors.
- - Dysregulation of the autonomic nervous system.
- - Amplified symptoms influenced by pathways related to arousal or exhaustion.
- - Limited response to conventional biomedical treatments.
- - Significant functional impairments that seem disproportionate to objective clinical findings.

Conclusions

This study protocol establishes a rigorous framework for evaluating the effectiveness of ReAttach therapy in fibromyalgia patients through continuous, patient-driven digital monitoring via the NeuroLog platform, within a broader program examining ReAttach's transdiagnostic therapeutic mechanisms across conditions like persistent post-concussion syndrome, oncology, and Parkinson's Disease.

Future Directions

Future research should prioritize randomized controlled trials to validate the effectiveness of ReAttach therapy, particularly for patients with fibromyalgia. Long-term follow-up studies are essential to evaluate the sustainability of treatment effects. Additionally, it is vital to deepen our understanding of the

mechanisms behind these changes by utilizing the Symptom Amplification Model. We should also assess how innovative, continuous real-time monitoring tools, such as NeuroLog, can support a more personalized approach to care. Lastly, studies focusing on the feasibility and implementation of ReAttach in clinical settings, as well as those that capture patients' experiences, will be crucial for optimizing and scaling this transformative therapy.

Declaration of interest

Dr. Paula Zeestraten-Bartholomeus is the developer of ReAttach, Steven Painter is the developer of the Neurolog Platform and the Symptom Amplification Model.

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