Usability and adherence to remote, longitudinal assessment of EEG, cognition, mood and sleep in Borderline Personality Disorder

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SUBMISSION DETAILS

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What is the Methodological Issue Being Addressed? Clinical trials in Borderline Personality Disorder (BPD) and other psychiatric illnesses often fail to demonstrate efficacy, partly because participants improve during trials regardless of treatment arm. Additional clinical attention during trials may itself provide therapeutic benefit, masking treatment effects (Benedetti et al., 2016). In BPD, symptom variability further limits traditional trial designs relying on infrequent clinic-based assessments. Here we report on the feasibility of an alternative study design for this cohort, involving high-frequency longitudinal, remote, digital measurement - which may help overcome these issues. Such a design requires enduring commitment from patients - in terms of adherence - and tools with high usability.

Introduction The current study (completing June 2026) is a usability and feasibility test of a potential solution, using longitudinal remote data collection and digital tools to obtain high-frequency (daily-to-weekly) measures while minimising patient-doctor contact. The suite includes EEG and cognitive assessment via the NeuLogiq platform (Cumulus Neuroscience), wrist-worn actigraphy and sleep tracking (CamNTech Motion8), and phone/browser-based mood assessment (Mood Zoom via Qualtrics, prompted by email).

Methods Fifty participants (30 patients with BPD, 20 healthy controls) were recruited to a 7-week longitudinal observational study involving at-home data collection (1-week familiarisation, 6-week collection). The study comprised phases with differing levels of requested engagement with the NeuLogiq platform to assess relative acceptability: familiarisation, high-intensity phase 1, low-intensity phase, and high-intensity phase 2. Requested engagement with the watch and mood assessments remained constant throughout. The primary feasibility outcome was percentage adherence to protocol across measures. NeuLogiq usability was assessed at onboarding and debrief using the System Usability Scale (SUS). Debrief interviews provided qualitative insights into usability and feasibility.

Results 47 of 50 participants have completed data collection at time of writing. Here we present interim statistics based on N=47 (BPD=29, Mean age=26.72, Sex female=93%); controls=18 (Mean age=27.11, Sex female=89%).
Mean adherence to NeuLogiq (cognition and EEG) was 87.7% (completed sessions) in patients and 96.8% in controls in high-intensity phase 1 (10 days, 7 sessions requested); 93.1% in patients and 101.9% in controls in the low-intensity phase (3 weeks, 3 sessions requested); and 86.2% in patients and 100.8% in controls in high-intensity phase 2 (10 days, 7 sessions requested).

Adherence to the mood assessment (2 measurements per day requested throughout) is summarized using median values due to negative skew. Overall adherence was 89.8% for BPD patients and 90.8% for controls, with slightly lower adherence in both groups in the low-intensity phase (85.7% and 90.5% respectively).
Adherence for the wrist-bound actigraphy tracker (measuring movement, sleep and light exposure) has not yet been calculated.
Mean NeuLogiq SUS score at onboarding was 82.2 (83.9 patients; 78.6 controls), and 80.2 (79.1 patients; 82.1 controls) at debrief – indicating excellent usability in this cohort and no additional difficulty for patients.

Conclusion Despite higher adherence in the control group than the BPD patients, the combination digital approach demonstrates broad acceptability and usability. The BPD patient cohort demonstrated high adherence (>85% in all phases and measures) - fulfilling a baseline prerequisite for use in clinical trials with lower clinical contact and higher measurement frequency.

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Guidelines I have read and understand the Poster Guidelines

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