

Single-case series evaluation of Interdisciplinary Rehabilitation for Concussion Recovery (i-RECOVeR), a novel 12-week treatment for persistent post-concussion symptoms after mild traumatic brain injury

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1 BACKGROUND AND AIMS

Multiple factors contribute to persisting post-concussion symptoms (PPCSs), often requiring multimodal treatment.

Aim: To evaluate the preliminary efficacy of i-RECOVeR, a novel interdisciplinary intervention targeting PPCSs.

2 METHODS

Design: Single-case series with multiple baselines.

Participants: 15 individuals (53% female) with mTBI ($M_{age}=38.27$ years, $SD=15.68$).



TRIAL
REGISTRATION

Treatment: The 12-week treatment consisted of initial consultations, an interdisciplinary case conference meeting, followed by coordinated treatments including:

- Psychoeducation, activity scheduling, anxiety management training, cognitive reframing, and sleep intervention.
- Movement, exercise, and manual therapy targeted towards oculomotor, vestibular, cervical, and autonomic systems.
- Medical review and management.



Outcomes and procedure

Primary outcome: Rivermead Post-Concussion Symptoms Questionnaire (RPQ).

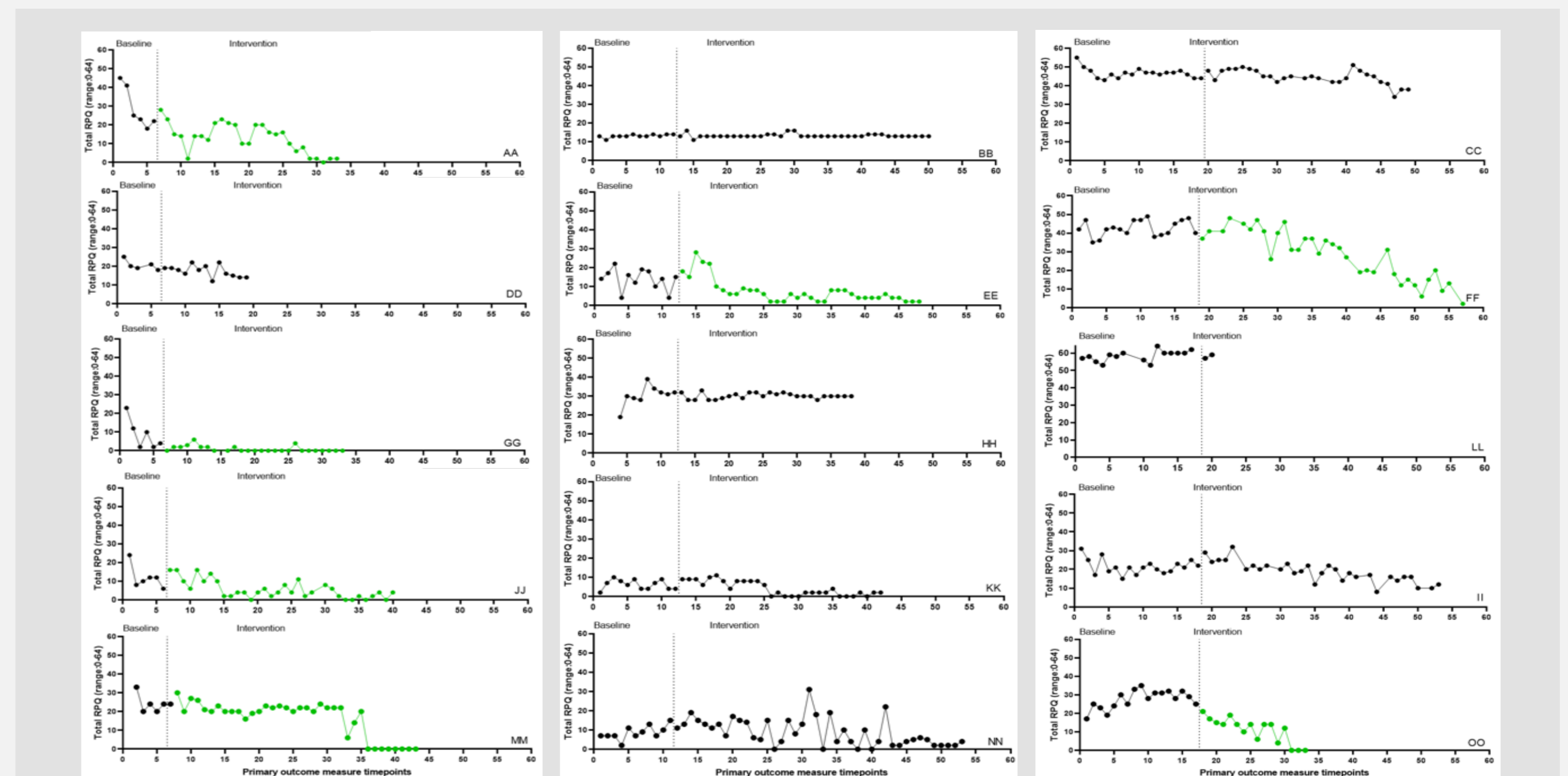
Secondary outcomes: Goal attainment scaling (GAS), Brief Fatigue Inventory, Fatigue Severity Scale, Insomnia Severity Index, Short-form 36, Depression Anxiety and Stress Scales, Brief Illness Perception Questionnaire, Vestibular/Oculomotor Screening, Smooth Pursuit Neck Torsional Test, Cervical Flexion-Rotation Test, Balance Error Scoring System, Buffalo Concussion Treadmill Test.

T1	Baseline Demographics, primary and secondary outcome measures, and neuropsychological assessment
BL	Baseline phase (2, 4, or 6 weeks) Primary outcome measure collected three days a week
T2	Pre-treatment Primary & secondary outcome measures
Tx	Treatment phase (up to 12 weeks) Primary outcome measure collected three days a week. GAS goals assessed at the start and end of treatment
T3	Post-treatment Primary & secondary outcome measures
T4	1-month follow-up Primary & secondary outcome measures & qualitative interview.
T5	3-month follow-up Primary outcome measure

3.1 RESULTS

Severity of post-concussion symptoms (RPQ)

Moderate-large effect sizes in reducing PPCSs in 12/15 cases, 7/12 reached statistical (Tau-U) and clinical (visual analysis) significance. Improvements were maintained at 1- and 3-month follow-up.



Results of Rivermead Post-Concussion Symptoms Questionnaire (RPQ total score) completed 3 times per week. Note: green line indicates significant reduction.

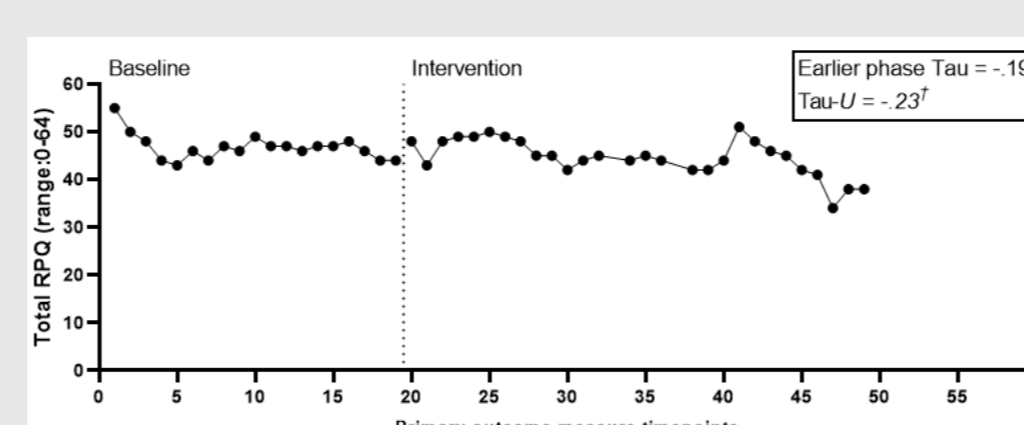
Secondary outcomes

81% of individual therapy goals were achieved using GAS. All participants achieved clinically significant improvements in at least one secondary outcome.

3.2 CASE VIGNETTE

373 days post-motor vehicle collision, Aimee, 24(F), presented with ++PPCSs.

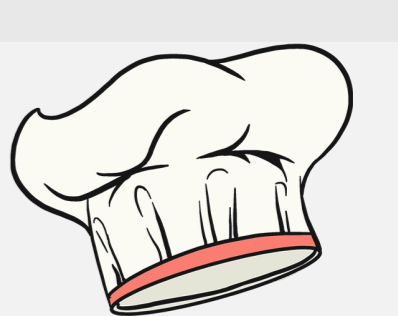
Severity of PPCSs did not significantly change for Aimee, however...



+ reading tolerance



++ walking tolerance



++ cooking tolerance

Her goal attainment was better (+) and much better (++) than expected, and...

She also had ↓ in fatigue, anxiety, and vestibular and oculomotor dysfunction.

Aimee's experience

"I'm not experiencing any of those symptoms as extremely... now I think I've noticed I probably experience it once a fortnight or a month, and that is probably gonna be triggered by stress or having a lot on my shoulder sometimes, but I know how to deal with it now, and I'm a bit more hopeful than I used to be. So, it really, really changed me from the way I used to think".

4 CONCLUSIONS

- i-RECOVeR may reduce PPCSs severity and/or mood, fatigue and sleep difficulties, and improve physical functioning, return to activity, health-related quality of life, and illness perceptions.
- Whilst many participants endorsed some residual PPCSs at post-treatment and at follow-up, GAS demonstrated that goals were attained, and qualitative interview responses suggested that functional improvement can occur in the context of residual symptoms.
- Findings underscore the potential benefit of interdisciplinary treatments in reducing PPCSs burden and contributing to functional goal attainment.
- This pilot will inform the trial design of a randomised controlled trial.