Temporal sequencing of symptom change in youth receiving treatment for posttraumatic stress disorder and substance use: Secondary findings from a randomised controlled trial

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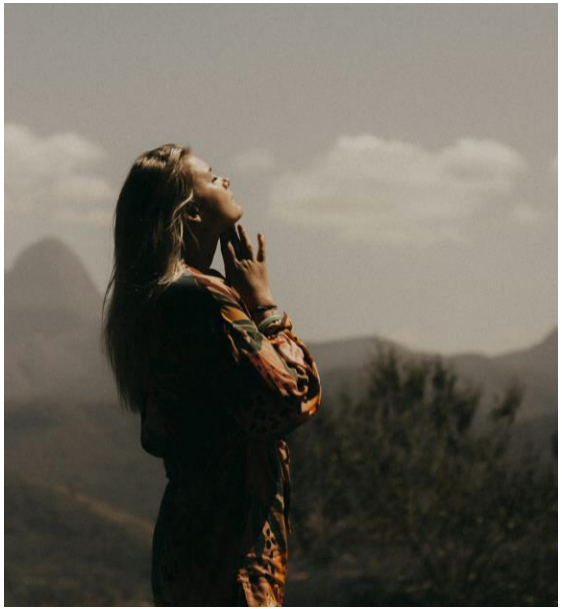
Background

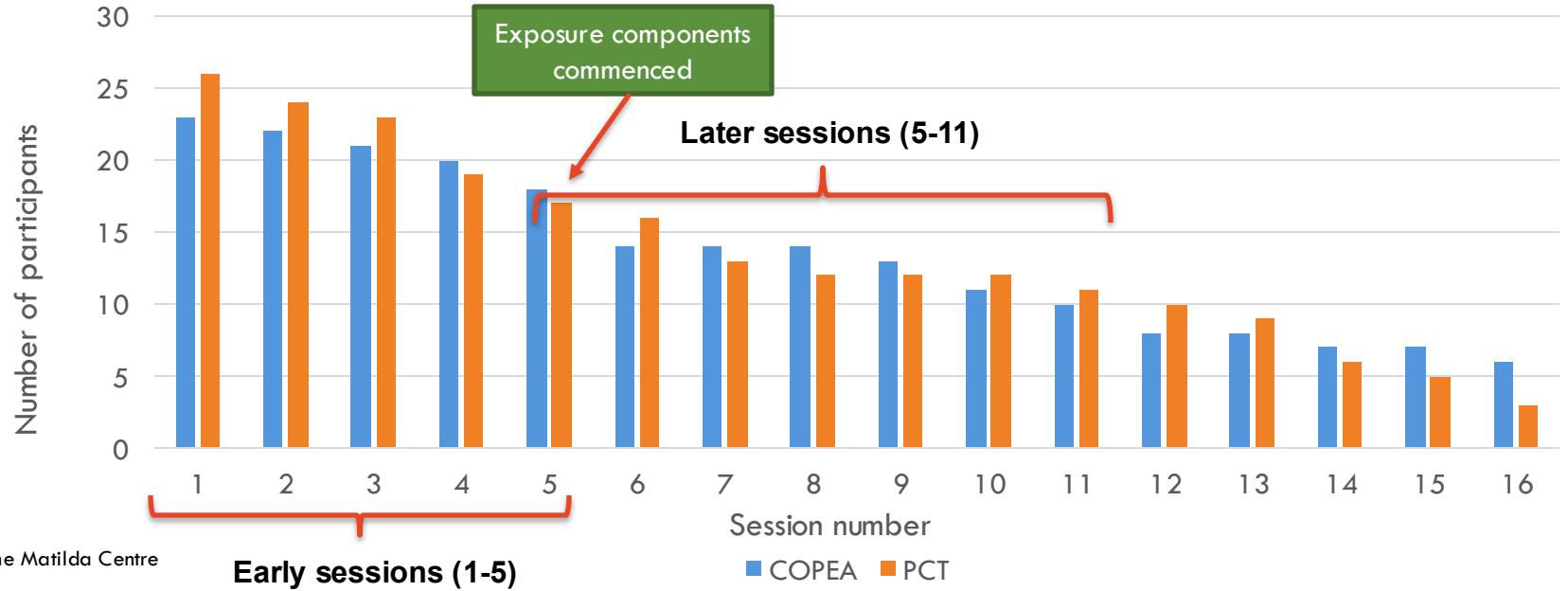
- PTSD and substance use disorders (PTSD-SUD) often co-occur in youth[1] - a period of high vulnerability to both trauma and substance exposure [2,3]
- Integrated treatments for PTSD-SUD are effective, yet the timing and direction of symptom change remain unclear.
- **Self-medication hypothesis:** substance use may serve to manage trauma-related distress[5].
- We examined the temporal relationships of change in PTSD and SU outcomes



Data collected for each session

Total sample *n* = 49 (COPE-A = 24, PCT = 25)

Conditions:
COPE-A: integrated PTSD-SUD treatment grounded in prolonged exposure and cognitive-behavioural therapy (CBT).
Person-Centred Therapy (PCT): non-directive supportive counselling.



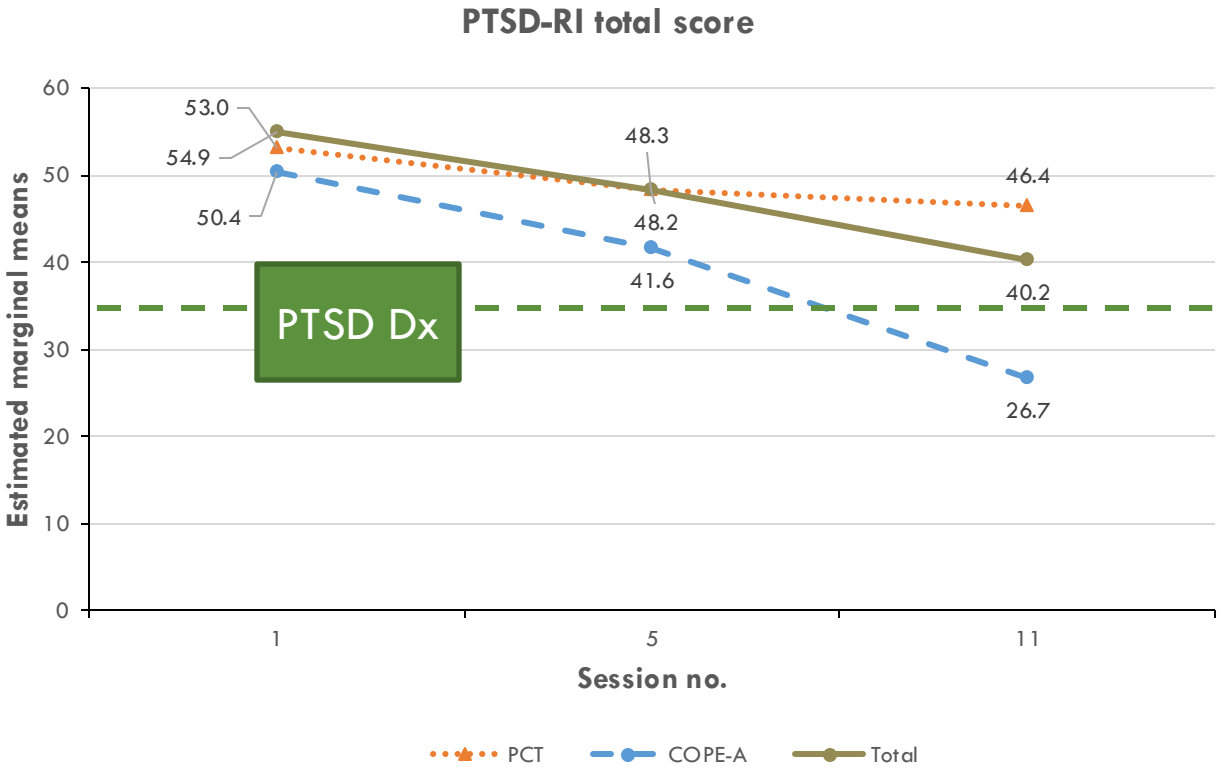
Within-treatment outcomes

- PTSD (PTSD-RI)[6]
  - Severity of PTSD symptoms and DSM-5 symptom clusters (Cluster B - Re-experiencing; Cluster C – Avoidance; Cluster D - Negative alterations in cognition and mood; Cluster E - Alterations in arousal and reactivity)
- Substance Use (Timeline Followback)[7]
  - Quantity substance use
  - Frequency substance use

Aim 1: Examine changes in PTSD severity and substance use (quantity and frequency) across key treatment phases, compared with a control group

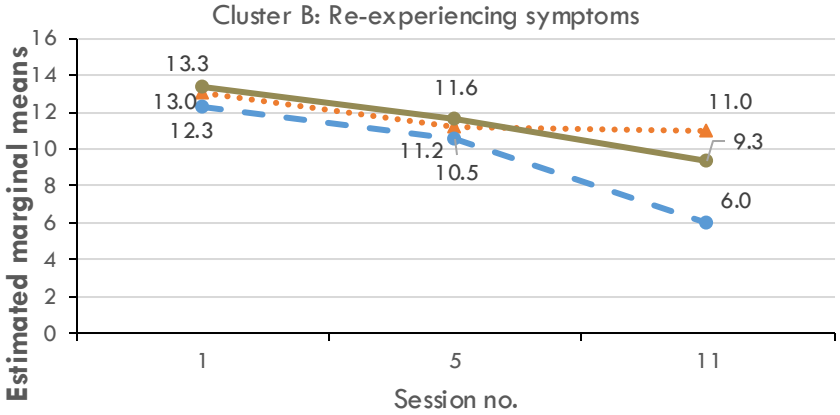
- Compared symptom scores for COPE-A and PCT at sessions 1, 5, and 11
- Generalised estimating equations (GEE) to model both within- and between-group changes over time.

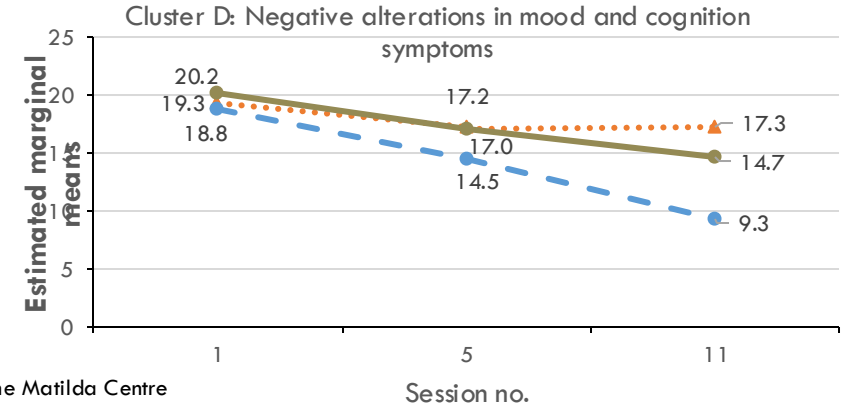
PTSD symptom severity



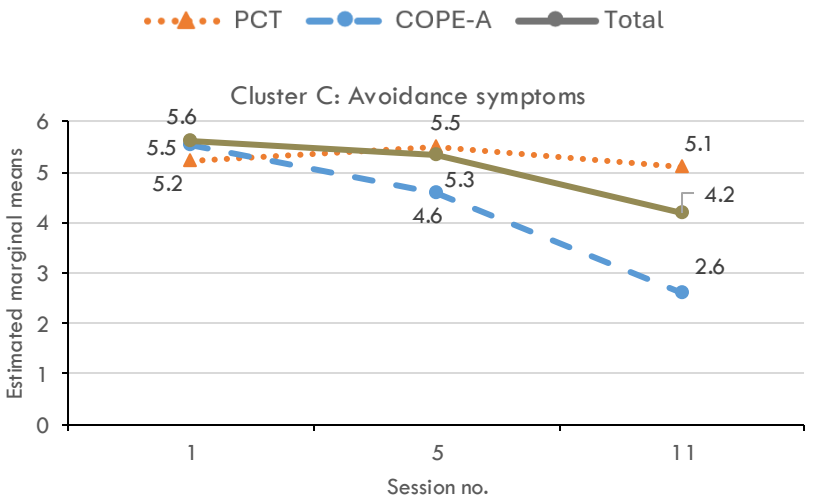
- Significant group x time interaction ($\chi^2_1 = 9.01$, $p = .011$)
- **Largest reduction** post–session 5 (after exposure began).
- **COPE-A**: PTSD severity fell below diagnostic threshold by session 11.
- Indicates **clinically meaningful improvement** beyond supportive care.

PTSD cluster symptom severity

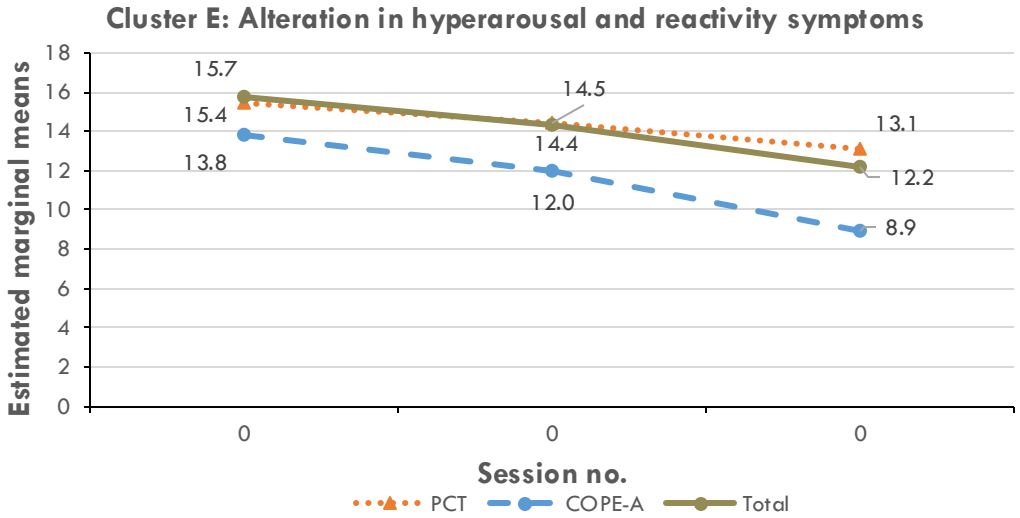




- Significant group x time interactions across **clusters B** ($\chi^2 = 6.79$, $p = .034$), **C** ($\chi^2_1 = 11.26$, $p = .004$), and **D** ($\chi^2_1 = 3.88$, $p = .049$).



PTSD cluster symptom severity

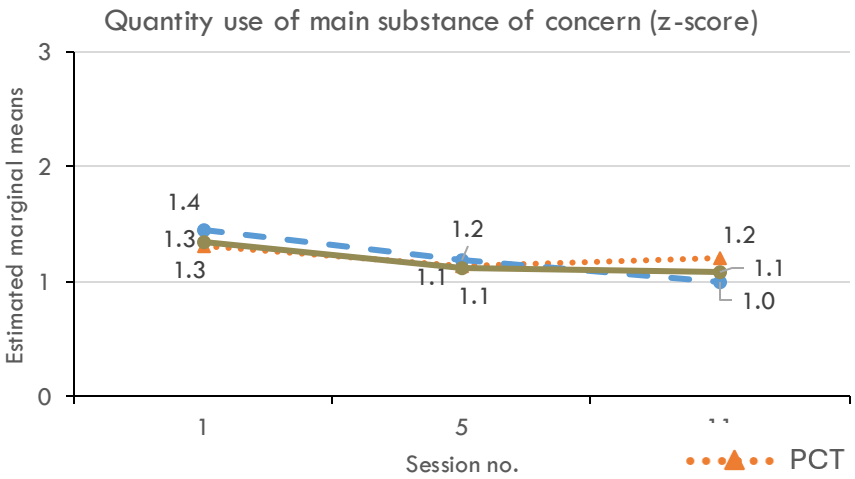


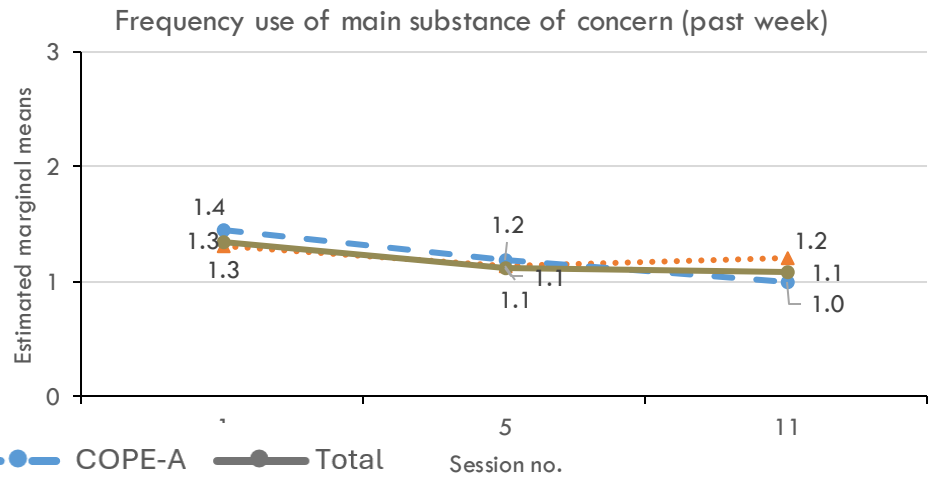
- Less change observed in **Cluster E** - may be more resistant to change[8,9]

- **Takeaway:** Most distinct changes evident in later period of treatment S5-S11 following exposure commencement, supporting the early introduction of exposure-based components as critical to PTSD symptom change.

Substance use

- No significant *group* × *time* effects for substance use quantity or frequency.
- COPE-A: modest early reduction in use frequency.
- Exposure-based therapy effective for PTSD even when substance use continues.
- Suggests need for adjunctive supports to target substance use.





Aim 2: Explore the temporal sequencing of symptom change across PTSD and substance use domains

- Examined whether **early change in one domain** related to **concurrent or delayed improvements in another.**
- Calculated **Spearman's correlations** on change scores across:
  - **Early phase:** Sessions 1–5
  - **Later phase:** Sessions 5–11

Temporal relationship of PTSD change

- **Concurrent change:** Strong positive correlations among cluster (B, C, D, E) scores in early and late treatment phases ($r = .54–.78$) → PTSD cluster symptom change occurred **together.**
- **Across phases:** Limited relationships between early and later changes → early change did not predict later change

Temporal relationship of substance use change

- **Within-phase:** Quantity and frequency strongly correlated (r = .45–.62) → changes tended to occur together.
- **Across phases:** Limited significant relationship between early and later changes.
- **Takeaway:** Suggests a holistic pattern of change for both PTSD and substance use symptoms - changes tended to occur concurrently, rather than sequentially.

Temporal relationship of PTSD-SUD change

- No significant **concurrent** or **temporal** associations between PTSD and substance-use change.
- Findings **do not provide direct support for the self-medication hypothesis within treatment phases.**
- Suggest **independent recovery trajectories** for PTSD and substance use during treatment.
    - Does not align with some with adult studies showing that PTSD symptoms tend to improve before substance use, although research is heterogenous across studies[10-16]

Conclusions

- Our findings provide new insight into **how and when change occurs in PTSD-SUD treatment,** informing strategies to optimise intervention for young people.
  - Integrated trauma-focused treatment reduced PTSD without increasing substance use (despite longstanding clinician concerns)
  - Supports introduction of exposure elements early in treatment
  - May highlight need for adjunctive supports targeting substance use.

Thank you!

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