

Association between index trauma timing and treatment retention and symptom severity in women receiving prolonged exposure therapy for PTSD and substance use disorder

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Abstract

Purpose – Women with co-occurring post-traumatic stress disorder (PTSD) and substance use disorder (SUD) demonstrate high attrition during integrated prolonged exposure (PE) psychotherapy. Existing exposure therapies identify an index trauma, which serves as the primary focus of exposure during treatment. The timing of trauma exposure (childhood vs adulthood) is known to influence symptom severity and treatment outcomes. Yet, whether the same is true for the timing of index trauma (childhood vs adulthood) is not well understood. The purpose of this study was to examine the impact of timing of index trauma on treatment retention, SUD severity, and mental health symptoms.

Design/methodology/approach – This retrospective cross-sectional observational study examined whether the timing of index trauma (childhood vs adulthood) was associated with treatment retention, SUD severity and baseline mental health among 55 women participating in integrated PE treatment for PTSD–SUD. Treatment retention was defined as completion of four or more sessions. SUD severity was measured using the Severity of Dependence Scale. Mental health was assessed based on symptoms of stress, anxiety and depression and borderline symptomatology at baseline.

Findings – There were no statistically significant associations between timing of index trauma and treatment retention, SUD severity or severity of mental health symptoms at baseline.

Research limitations/implications – The lack of a significant relationship in this study warrants further exploration of factors influencing treatment attrition and highlights a need for further research into the mechanisms of identification and operationalisation of index trauma in exposure therapy.

Originality/value – To the best of the authors' knowledge, this is the first study to explore the relationship of the timing of index trauma (childhood vs adulthood) with treatment retention, SUD severity and baseline mental health symptoms. In addition, this study offers a unique perspective from its setting in a routine treatment clinic.

Keywords Post-traumatic stress disorder (PTSD), Substance use disorder (SUD), Index trauma, Timing of trauma, COPE, Treatment retention

Paper type Research paper

(Information about the authors can be found at the end of this article.)

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Introduction

Post-traumatic stress disorder (PTSD) and substance use disorder (SUD) are significant health issues and are highly prevalent in people seeking treatment. Rates of co-occurrence range from 52% to 62% in treatment settings (Roberts *et al.*, 2015; Mills *et al.*, 2006), and co-occurrence is associated with poorer prognosis and treatment response, additional

psychiatric and physiological illness, social impairment, increased treatment episodes, as well as higher burden on public health systems (Flanagan *et al.*, 2016).

Many hypotheses have been developed to explain the complex, bidirectional relationship between PTSD and SUD. From a neurobiological perspective, research has demonstrated the presence of shared neural networks, including dysregulation within stress-response, reward-processing and emotion-regulation circuits, highlighting structural and functional parallels between PTSD and SUD (María-Ríos and Morrow, 2020). Behavioural studies have proposed that increased risk-taking may result in greater exposure to traumatic events (Clark *et al.*, 2014). The self-medication theory proposes that individuals with PTSD may use substances to relieve painful affective states (Khantzian, 1990). This theory is strongly supported, with evidence suggesting that PTSD typically predates SUD and is strongly predictive of SUD severity (Haller and Chassin, 2014).

Individuals with co-occurring PTSD–SUD experience negative health outcomes associated with both conditions simultaneously, resulting in higher levels of functional impairment and psychological distress than observed with either condition alone (Ouimette *et al.*, 2006). Patients are more likely to experience lifetime homelessness, poor vocational outcomes and low social support. They are also more likely to experience additional mental health comorbidities such as anxiety and depression, and are at higher risk for suicide compared to those with either PTSD or SUD alone. (Blakey *et al.*, 2022; Mahoney *et al.*, 2021).

Research has highlighted challenges to providing efficacious treatment for this co-morbidity. Both conditions are characterised by extreme avoidance, which can act as a barrier to recovery (Hruska *et al.*, 2011; Lancaster *et al.*, 2016). Clinical features of PTSD, including depressed mood, anxious cognitions and social isolation, can prevent help-seeking and result in early disengagement (Barawi *et al.*, 2020). In SUD recovery, attitudinal barriers and perceived loss of control of one's treatment can prevent engagement (Zemore *et al.*, 2021). From a systems perspective, compounded stigma associated with mental illness and substance use contributes to experiences of discrimination and re-traumatisation while seeking support, leading to poor engagement with health services (Ashford *et al.*, 2018; Fry, 2023).

Women encounter gender-specific barriers to treatment, including limited access to child-care and financial disadvantage (Taylor, 2010). Women are more likely than men to experience shame and guilt related to substance use, which heightens internalised stigma and further hinders treatment engagement (Schober and Annis, 1996). Berenz *et al.* (2017) found a stronger association between PTSD and alcohol use disorder for women compared to men. This is particularly concerning as women are twice as likely to develop PTSD compared to men (Christiansen and Berke, 2020; Gradus *et al.*, 2017), and recent evidence indicates that the historical gender gap in SUD prevalence – traditionally higher in men – is narrowing (McHugh *et al.*, 2018). These trends highlight a growing global concern and underscore the need for further exploration into the impacts and treatment of this comorbidity.

Current treatment provision for PTSD–SUD

A systematic review by Roberts *et al.* (2022) concluded that an integrated model, which includes a trauma-focused component alongside treatment for SUD, is likely to provide the most significant reduction in PTSD severity. A reduction in PTSD symptoms is in turn associated with improved SUD outcomes (Back, 2010; Hien *et al.*, 2010). The authors highlighted a lack of literature in this area and noted modest effect sizes in existing studies. In response to this need for effective approaches, the concurrent treatment of PTSD and SUD using prolonged exposure (COPE) was developed as a manualised, integrated intervention designed to address both conditions simultaneously (Back *et al.*, 2001; Brady *et al.*, 2001).

COPE integrates cognitive behavioural therapy (CBT) and prolonged exposure (PE) with motivational enhancement and relapse prevention skills for SUD. Psychoeducation is

provided about the relationship between PTSD and SUD. PE techniques in particular are used to reduce distress associated with PTSD symptoms by exposing participants to “real-life” situations that may induce trauma symptoms, as well as imaginal exposure. Exposure typically begins in Session 4. Treatment guidelines recommend 12 90-min sessions, delivered weekly, although treatment duration may vary based on individual needs (Back *et al.*, 2001; Back *et al.*, 2015; Foa *et al.*, 2009).

Randomised control trials (RCTs) have provided evidence that COPE is a safe and appropriate treatment for PTSD–SUD. In an Australian RCT, COPE integrated with usual treatment for SUD was found to be more effective in reducing PTSD symptoms compared to usual treatment for SUD alone; it was also safe to use with continued substance use and did not require abstinence (Mills *et al.*, 2012). In another RCT with veterans who received either COPE or relapse prevention, COPE resulted in greater symptom reduction and diagnostic remission for PTSD, as well as significantly reduced alcohol intake per day at the six-month follow-up mark (Back *et al.*, 2019). This approach has now been recognised as a gold-standard treatment approach for co-occurring PTSD–SUD in the American Psychological Association guidelines, but is still not widely implemented internationally, in part due to challenges with treatment engagement and retention (APA, 2025).

Treatment retention. Research has demonstrated a greater attrition rate among individuals approaching sessions involving commencement of exposure in both PE and COPE. In COPE, treatment withdrawal commonly occurs around Session 4. This is hypothesised as a response to the emotionally challenging nature of exposure therapy, consistent with avoidance behaviours intrinsic to PTSD (Eftekhari *et al.*, 2020; Mills *et al.*, 2012). Completion of therapy is central to treatment efficacy, allowing thorough care planning and opportunity for therapeutic discharge (Dacosta-Sánchez *et al.*, 2022). Negative outcomes associated with treatment non-completion for those with SUD include relapse and hospitalisation (Maturana *et al.*, 2023). Examining factors that promote retention may assist in optimising delivery of COPE to improve outcomes and accessibility of treatment.

Timing of trauma onset in relation to PTSD and SUD

In the context of PTSD, earlier life exposure to trauma may contribute to more severe psychopathology in adulthood (Ogle *et al.*, 2013). Evidence from two systematic reviews links childhood trauma to PTSD, anxiety, depression, psychotic disorders, bipolar disorder and suicidality in adulthood (McKay *et al.*, 2021; Thurston *et al.*, 2025). A meta-analysis of 10 studies by Zhang *et al.* (2020) reported increased substance use among individuals who experienced childhood trauma compared to those whose trauma onset was in adulthood. Childhood traumatic events were linked to illicit drug use in adolescence (Carliner *et al.*, 2016). Recent traumatic events were found to increase the risk of substance use, especially in the 12 months following the event (Konkolý Thege *et al.*, 2017). Comparatively, there is a gap in the literature regarding the impacts of adult-onset trauma on PTSD or SUD. One reason for this may be that many individuals experience multiple traumatic events (Kilpatrick *et al.*, 2013), making it difficult to find a population that has experienced only adult-onset trauma.

Identifying index trauma. Although individuals often report experiencing multiple traumatic events, many exposure-based psychological treatments require the selection of a single traumatic event to serve as an anchor point to revisit throughout therapy, commonly referred to as the index trauma (Ehring *et al.*, 2014; Persson *et al.*, 2017).

Despite its clinical importance, a standardised approach to identifying index trauma has not yet been developed. A meta-analysis by Elhai *et al.* (2009) highlighted substantial variation in how index trauma is determined across clinical research. Priebe and colleagues (2018) further demonstrated that applying different definitions of index trauma among individuals

who had multiple traumatic experiences produced variations in reported PTSD symptom severity.

The most common approach to identifying index trauma has been to ask individuals to self-identify their “worst event” (Bohus *et al.*, 2013; Resick *et al.*, 2008), under the assumption that this will be the event most strongly linked to their PTSD symptoms. However, research indicates that highly distressing events may not correspond to an individual’s current symptom profile (Breslau and Peterson, 2010; Winkelman *et al.*, 1998). Additionally, self-selection is subject to bias, as choices may be shaped by emotional states and social context (Maercker and Hecker, 2016).

Few studies explore the role and relationship of index trauma with treatment outcomes or symptom severity, even less so in the context of exposure therapies and with women. Two studies with samples of veterans have explored the relationship of index trauma type with PTSD symptom severity (Kachadourian *et al.*, 2023) or symptom type (Macia *et al.*, 2020). A third study, also with veterans, found that index trauma type in conjunction with its developmental timeframe was associated with accelerated epigenetic ageing (a contributor to premature morbidity), but age at index trauma alone was not (Tamman *et al.*, 2025).

Only one study explored the association of index trauma timing with treatment outcomes in the context of two exposure therapies (PE and written exposure therapy), reporting that both therapies were less effective in reducing trauma-related beliefs with more time elapsed between index trauma and treatment via exposure. Compared to most studies of COPE, which involve trial participants, this was the only study that used a sample of adults from the general population of a large city that more resembles real-life patients (Cole *et al.*, 2024). Provided the consistent use and central role of index trauma in exposure therapies, further study is warranted regarding its associations with symptom severity and treatment outcomes. Findings may determine if the COPE treatment protocol requires adaptation when working with different trauma timings.

Study objectives

There is an abundance of literature that links early onset trauma to more severe psychopathology. Conversely, there is a paucity of research that considers the relationship of self-identified index trauma timing on symptom severity and prognosis. This study is the first to explore the relationship between timing of self-identified index trauma with retention in COPE. It is also the first to examine whether index trauma timing is associated with more severe substance dependence and mental health symptoms at baseline.

The present retrospective study explores the association of index trauma (childhood vs adulthood) with:

- treatment retention (defined by attending ≥ 4 sessions) in women with PTSD–SUD;
- severity of SUD at baseline in women with PTSD–SUD; and
- severity of baseline mental health symptoms (depression, anxiety, stress and borderline symptomatology) in women with PTSD–SUD.

In line with current literature linking childhood trauma with more severe psychopathology and poor treatment outcomes, we hypothesised that childhood index trauma would be associated with lower treatment retention, higher severity of substance use at baseline and higher severity of mental symptoms at baseline compared to women with adulthood index trauma.

Method

This was a cross-sectional study analysing an existing data set routinely collected as part of clinical care in an outpatient addiction treatment service in Australia. The setting for this

study was a specialist addiction outpatient treatment for women (indicated by self-identified gender). This was the first clinic outside of a clinical trial to provide COPE in Australia, delivered by three clinicians (clinical psychologists) trained in COPE. This study received quality assurance ethics approval from Eastern Health (QA20-130) on 8th July, 2024.

Study participants

The population for this study was identified using convenience sampling based on consecutive referrals to the outpatient clinic. All individuals in this study were women between the ages of 18 and 65. Women who engaged with COPE for less than one treatment session were excluded from the analysis. A total 222 women were referred to COPE between 19th November, 2020, and 17th October, 2023. Some participants were declined by the treatment clinic as they were at current high risk of harm to self or others, had current psychosis or major depression, with levels of substance dependence requiring medical detoxification or withdrawal, or did not meet PTSD criteria. Some participants declined treatment as they found the treatment too intense in terms of exposure or too intensive in its demands on time with between-session tasks. Logistical barriers such as the inability to attend in-person, lack of equipment or privacy to attend via telehealth, difficulty arranging child-care or attending during business hours prevented some women from engaging in treatment. From this total of 222 referrals, 55 women were accepted into the program and engaged in more than one treatment session.

Data collection and extraction

This study analysed routinely collected clinic data through semi-structured questionnaires completed by participants and entered into the REDCap clinical database ([Harris et al., 2009](#)), and outpatient progress notes made by clinicians which were stored in the electronic medical record. Data were collected from individuals referred between 19 November, 2020 and 17 October, 2023. This end date was selected to ensure that no individuals currently engaged in COPE at the time of extraction were included in the study. Demographic data were collected at referral, including age, current homelessness, unemployment and family violence. Psychometric scales measuring PTSD symptoms, index trauma timing, substance use severity and mental health characteristics were administered during screening.

Participants were divided into two groups based on whether their self-selected index trauma occurred during childhood (under age 18) or adulthood (18+). Index trauma timing was determined by triangulating their age at the time of the event using referral data and clinical notes from assessment and treatment sessions. Participant responses had ranged from specific ages to non-specified “childhood” or “adulthood” as timing. The authors recognise that individuals who chose an adulthood index trauma may have been exposed to traumatic experiences in childhood. Only participants with complete index trauma data were included in the analysis.

Treatment retention was categorised as a binary variable; participants were divided into two groups of women who had engaged in less than four or four or more COPE sessions. Session 4 was chosen as the measure of retention as it is commonly the start of exposure in COPE and a common time-point for dropout from treatment ([Back et al., 2015](#); [Eftekhari et al., 2020](#)).

Measures and instruments

Trauma experiences were characterised using the life events checklist (LEC-5), which assesses exposure to 16 types of traumatic events ([Gray et al., 2004](#)). The International Trauma Questionnaire (ITQ) was used to measure time since index trauma ([Camden et al., 2023](#)). Severity of substance use was measured by the Severity of Substance Use Scale

(SDS), a self-report tool to measure the degree of dependence of different types of drugs. The SDS is scored from 0 to 15, with a higher score indicating higher dependence (Miele *et al.*, 2001). Where individuals had identified multiple substances of concern, they were asked to choose the most significant or problematic one and complete the tool only once.

Mental health was assessed using two scales: The Depression Anxiety Stress Scale (DASS-21; Moska *et al.*, 2023) and the Borderline Symptom List (BSL-23; Kleindienst *et al.*, 2020). Sub-scales from the DASS-21 were used, which specify score ranges to indicate severity of depression (range 0–28+), anxiety (range 0–20+) and stress (range 0–34+). The BSL-23 is a self-rating instrument to assess the degree of borderline personality symptomatology in adults, with score ranges categorising symptoms as mild, moderate, high, very high and extremely high (range 0–4).

Statistical analysis

Data were included from $n=55$ individuals, de-identified and analysed using Jamovi statistical software Version 2.3.28 (The Jamovi Project, 2023). An *a priori* power analysis was not conducted for this retrospective observational cohort study. Individuals with missing data regarding their index trauma timing or number of sessions attended were excluded from the analysis.

Analysis included descriptive statistics, presented as mean and standard deviation for demographic characteristics, trauma, substance use and mental health indicators. Descriptive characteristics were compared between participant groups with childhood versus adulthood index trauma using chi-square for categorical variables and *t*-tests for continuous variables. The *p*-value of <0.05 was used as the level of significance for statistical analysis.

Pearson's chi-square test was used to examine the significance of bivariate associations between categorical data groups of index trauma timing (childhood versus adulthood) and treatment retention (<4 sessions, ≥ 4 sessions). Independent sample *t*-tests were used to compare categorical data of index trauma timing (childhood versus adulthood) with continuous data representing SDS total score, DASS-21 sub-scale scores and BSL-23 total score. Effect sizes are reported for hypothesis tests.

Results

Demographic and baseline characteristics

The mean age was 41 years ($SD = 11.9$). Women with childhood index trauma presented for treatment at a lower mean age ($M = 38.6$, $SD = 12.4$) than those with adulthood index trauma ($M = 42.9$, $SD = 11.4$). A minority of women reported homelessness or housing insecurity (7.5%). A higher percentage of women reported current unemployment (35.8%) and current family violence (37%). Overall, women reported exposure to an average of 8.4 ($SD = 3.4$) lifetime traumatic events. While there were small differences in all demographic characteristics, none were statistically significant. Of the total group, 43.6% of women identified a childhood index trauma, while 56.4% identified an adulthood index trauma. Demographic characteristics of the sample are outlined in Table 1.

Timing of index trauma and treatment retention

Women attended an average of 12.7 ($SD = 6.9$) COPE sessions, with women who identified a childhood index trauma attending slightly more sessions ($M = 13.1$, $SD = 7.5$) compared to women identifying an adulthood index trauma ($M = 12.3$, $SD = 6.4$). However, the association between timing of index trauma and number of treatment sessions was not statistically significant [$t(53) = -0.42$, $p = 0.67$, mean difference $= -0.80$, 95% CI $[-4.57, 2.96]$, $d = -0.12$]. About 83.6% of all women engaged in four or more COPE sessions, the

Table 1 Comparison of baseline characteristics between women who identified a childhood versus adulthood index trauma

Demographics and baseline measures	Total sample (n = 55)	Childhood Index Trauma (n = 24)	Adulthood Index Trauma (n = 31)	p-value
Age [mean (SD)]	41 (11.9)	38.6 (12.4)	42.9 (11.4)	0.19
Homelessness [N (%)]	4 (7.5)	1 (1.9)	3 (5.7)	0.45
Unemployment [N (%)]	19 (35.8)	11 (20.8)	8 (15.1)	0.12
Current family violence [N (%)]	20 (37)	7 (13)	13 (24.1)	0.40
Number of COPE sessions attended	12.7 (6.9)	13.1 (7.5)	12.3 (6.4)	0.67
LEC-5: Number of trauma types experienced [mean (SD)]	8.4 (3.4)	8.8 (3.5)	8.0 (3.4)	0.45
SDS: Severity of substance use at baseline [mean (SD)] (clinical interpretation band)	10.1 (3.2) (High)	9.7 (2.8) (High)	10.4 (3.5) (High)	0.44
DASS-21: Depression at baseline [mean (SD)] (clinical interpretation band)	12.1 (5.1) (Mild)	12.3 (5.3) (Mild)	12.0 (5.1) (Mild)	0.79
DASS-21: Anxiety at baseline [mean (SD)] (clinical interpretation band)	9.8 (4.4) (Moderate)	10.8 (4.9) (Moderate)	9 (3.9) (Mild)	0.14
DASS-21: Stress at baseline [mean (SD)] (clinical interpretation band)	12.8 (4.4) (Normal)	13.5 (4.2) (Normal)	12.2 (4.6) (Normal)	0.32
BSL total score at baseline [mean (SD)] (clinical interpretation band)	2.18 (0.83) (High)	2.40 (0.83) (High)	2.01 (0.79) (High)	0.08

Note(s): Outcomes of interest (index trauma timing) had a complete data set with no missing data. Other variables, including demographic characteristics and other mental health and substance use variables, had varying levels of missing data. Means and medians were calculated on a total sample ranging from $n = 51$ to 53. COPE = Concurrent treatment of PTSD and SUD using prolonged exposure, LEC = Lifetime events checklist, SDS = Severity of Substance Use Scale, DASS = Depression Anxiety Stress Scale, BSL = Borderline symptom list

Source(s): Authors' own work

majority of whom identified an adulthood index trauma. Participant retention overall and by childhood vs adulthood index trauma groups is summarised in [Table 2](#).

Furthermore, ITQ results demonstrated that an equal proportion of individuals had experienced trauma 1–5 years ago and 5–10 years ago (both $n = 16/55$, 29.6%). The lowest portion of individuals had experienced trauma six months – one year ago ($n = 3/55$, 5.56%). There was no statistically significant difference in treatment retention between time since trauma and treatment retention [$\chi^2 = (df) 2.30, p = 0.81$]. These findings do not support the study's first hypothesis, indicating that treatment retention – defined as attending four or more COPE sessions – did not differ between women with index trauma occurring in childhood versus adulthood.

Timing of index trauma and substance use severity at baseline

All women met criteria for substance dependence at baseline, evidenced by a mean score of 10.1 (SD = 3.2) on the SDS. Women with childhood index trauma had lower substance dependence scores ($M = 9.7$, SD = 2.8) compared to women with adulthood index trauma ($M = 10.4$, SD = 3.5), but this difference was not statistically significant [$t(49) = 0.77, p = 0.44$, mean difference = 0.70, 95% CI [-1.12, 2.51], $d = 0.22$]. These findings do not support the second hypothesis, suggesting no association between timing of index trauma and substance use severity at baseline. Sample scores of substance use severity are presented in [Table 1](#).

Timing of index trauma and mental health at baseline

The DASS-21 sub-scale were used to measure depression, anxiety and stress at baseline. Women with childhood index trauma scored higher on all three measures compared to women with adulthood index trauma, but these differences were not statistically significant. All women presented with mild depressive symptoms ($M = 12.1$, SD = 5.1) and between-group differences were not significant [$t(49) = -0.26, p = 0.40$, mean difference = -0.38, 95% CI [-3.32, 2.55], $d = 0.07$]. Women presented with moderate anxiety ($M = 9.8$, SD = 4.4), and while the adulthood index trauma group reported comparatively lower mild anxiety, this difference was not significant [$t(49) = -1.49, p = 0.40$, mean difference = -1.83, 95% CI [-4.28, 0.63], $d = -0.42$]. Finally, all women reported normative and sub-clinical levels of stress ($M = 12.8$, SD = 4.4), with no significant between-group differences [$t(49) = -1.01, p = 0.31$, mean difference = -1.26, 95% CI [-3.77, 1.24], $d = -0.29$].

BSL mean score was 2.18 (SD = 0.83) at baseline, placing all women in the high-grade severity range (Kleindienst *et al.*, 2020), with higher scores for childhood index trauma. However, the difference between groups was not statistically significant [$t(51) = -1.77, p = 0.08$, mean difference = -9.13, 95% CI [-19.5, 1.24], $d = -0.49$], suggesting no difference between groups in borderline symptomatology. Overall, these data suggest no significant differences in the severity of baseline mental health symptoms based on timing of index trauma. Scores for the total sample and both groups, along with clinical interpretation of the impairment severity and p -values are presented in [Table 1](#).

Table 2 Comparison of retention of COPE in women with childhood versus adulthood index trauma

No. of COPE sessions attended	Total sample ($n = 55$)	Childhood Index Trauma ($n = 24$)	Adulthood Index Trauma ($n = 31$)
Less than four [$N(\%)$]	9 (16.4)	3 (5.5)	6 (10.9)
Four or more [$N(\%)$]	46 (83.6)	21 (38.2)	25 (45.4)

Note(s): COPE = Concurrent treatment of PTSD and SUD using prolonged exposure

Source(s): Authors' own work

Discussion

This study aimed to extend existing literature on self-identified index trauma as used in the context of exposure therapies, particularly the association of the timing of index trauma (childhood vs adulthood) with treatment retention and symptom severity. This was the first study to explore the relationship between index trauma timing and retention in COPE in a routine clinical sample with PTSD–SUD.

The first hypothesis of the study was not supported, as there was no statistically significant association between index trauma timing and retention. Retention in COPE, defined in this study as attending four or more COPE sessions, was noted in 83.6% of all women who commenced treatment, with a median attendance of 13 (SD=6.9) sessions. [Amaro *et al.* \(2007\)](#) reported that integrated treatment for PTSD–SUD in women is likely to improve overall retention by as much as 31%. They also found that baseline characteristics, trauma symptoms and substance use severity did not predict time in treatment or retention between the intervention and control group. This suggests that while index trauma timing did not predict retention, the integrated PTSD–SUD treatment offered through COPE may have increased overall retention.

Engagement in this real-world study was higher than seen in prior clinical research on COPE, wherein 66% of individuals engaged beyond Session 4, with a median attendance of five sessions ([Mills *et al.*, 2012](#)), as compared to 83.6% seen in the current study. In the setting of a routine clinic, clinicians in the current study were able to offer greater flexibility in delivery and duration of the COPE intervention. As noted above, the average number of sessions attended was 13 (SD=6.9), with typically more sessions attended. The COVID-19 pandemic was an additional factor that required flexibility from clinicians, with additional sessions and telehealth options provided as a response to psychological distress associated with the pandemic. A longer period of engagement may have enhanced therapeutic alliance and positively influenced retention rates.

The second hypothesis of this study was also not supported, as there was no statistically significant association between index trauma timing and severity of substance use. It must be noted that this finding does not contradict existing literature, which suggests that childhood trauma is connected to both substance use and treatment dropout ([Carliner *et al.*, 2016](#); [Yildiz *et al.*, 2020](#)). Provided that most women in the current sample reported exposure to multiple traumas ($M=8.4$, $SD=3.4$), the chosen index trauma may not be reflective of the true age of trauma onset, and individuals who elected to focus on an adulthood index trauma in therapy may have also had previous traumatic exposures in childhood.

These findings highlight potential limitations regarding how index trauma is operationalised and used in exposure therapy. Currently, the chosen index trauma is assumed to be the most strongly linked with a patient's PTSD symptoms ([Bohus *et al.*, 2013](#)) and therefore the focal point of exposure. However, the lack of between-group differences found in this study suggest that the construct may not adequately capture meaningful differences in traumatic exposure. Further research is required to determine if index trauma, as currently operationalised in exposure therapy, does indeed accurately identify the event most responsible for patients' PTSD symptoms and how this concept extends to individuals who have several cumulative traumatic exposures over their lifetime. This is particularly relevant for patients who present with early childhood trauma and complex PTSD rather than single, discrete event trauma.

Finally, the third hypothesis of the study was not supported: there was no significant difference in baseline severity of mental health symptoms between the two groups. Similar to previous findings, this does not contradict the established association between childhood trauma and a range of adult mental health disorders, with evidence suggesting that risk increases substantially with exposure to multiple traumatic events ([McKay *et al.*, 2021](#)). Rather, the results underscore the possibility that the timing of the identified index

trauma may not adequately capture the earliest or most impactful traumatic experiences for individuals. Additionally, the absence of significant group differences may reflect limited statistical power associated with sample size.

Although childhood and adulthood index trauma groups did not differ significantly, the presence of co-occurring and elevated psychiatric symptoms was present across both groups, demonstrated by elevated scores on the DASS-21 and BSL-23. This is in alignment with existing literature, which notes increased risk of developing a range of psychiatric symptoms following exposure to traumatic events at any age (Baker *et al.*, 2021; Liu *et al.*, 2021), in some cases more so for women than for men (Abi-Habib *et al.*, 2025). The lack of between-group differences in psycho-social outcomes may be explained by the fact that, in the context of integrated treatment for PTSD-SUD, PE used in COPE is shown to be least effective in improving psychosocial distress when compared with other trauma-focused treatments, such as eye movement desensitisation and reprocessing and imagery rescripting (Faber *et al.*, 2026).

Overall, findings from this retrospective cross-sectional observational study support current guidelines for the delivery of integrated PE COPE psychotherapy for women with comorbid PTSD-SUD. The same protocol can be effective for patients with childhood and adulthood self-identified index trauma. It highlights the need for further research and better understanding of the operationalisation and use of index trauma in the context of exposure therapy, its impact on treatment engagement and its associations with patient mental health.

Strengths and limitations

The results of this study provide a characterisation of women living with co-occurring PTSD and SUD who are engaging in COPE therapy in a routine clinical setting in an Australian context. As such, it offers unique insight from its real-world treatment setting and population. Additionally, this study addresses a gap in existing research by exploring the role and relationship of participants' self-identified "worst event" index trauma in exposure therapy, a context where it is routinely used. Finally, it used validated instruments such as LEC-5, ITQ, SDS, DASS-21 and BSL-23.

However, several limitations should be considered when interpreting these findings. Despite a larger sample than previous COPE studies, the study may nonetheless have been underpowered to detect small group differences.

Retention was operationalised as attendance at four or more COPE sessions, based on prior evidence indicating increased drop-out around this point. However, in clinical practice, trauma-focused exposure may commence earlier or later than session four, and session-level data were not examined in this study. Future research may benefit from more granular analysis of the timing of therapeutic elements and progression. Additionally, the relatively high retention rate observed in this sample (83.6%), compared with the typical retention rates reported for COPE (approximately 66%; Mills *et al.*, 2012), may limit generalisability of these findings to broader clinical populations accessing integrated PTSD-SUD treatment.

Additionally, the presence of elevated psychiatric symptoms including anxiety, depression, stress and borderline symptomatology is noted on the DASS-21 and BSL-23. However, the instruments used in this study are screening tools, which are not diagnostic. They suggest that women struggling with PTSD and/or SUD experience heightened psychological distress, but it does not confirm the presence of clinically significant mental health symptoms.

Finally, it is likely that participants in the adulthood index trauma group had experienced prior or childhood trauma. This overlap of experiences may have attenuated between-group contrasts and may explain the lack of significant between-group differences.

Future directions/recommendations

The absence of significant relationships observed in this study highlights the need for further exploration of how index trauma is defined, operationalised and used in exposure-based interventions such as COPE. Future research should directly address several key questions. For example, does the use of alternative trauma anchors, for example, the earliest remembered trauma or the “most impactful” trauma, demonstrate stronger associations with baseline mental health symptom severity or treatment retention than the timing of index trauma? Are there other aspects of treatment not explored in this study that are impacted by index trauma timing? How does the timing of trauma onset and/or exposure to multiple traumatic events influence treatment engagement and outcomes in PTSD–SUD compared to reliance on a single index trauma? Finally, do factors (such as trauma type, timing or cumulative trauma exposure) moderate or mediate the relationship between mental health symptom severity and retention in integrated PTSD–SUD interventions?

Studies using larger and more diverse samples that are representative of broader treatment-seeking populations are needed to confirm these findings or to better identify individual- and trauma-related variables that may influence treatment processes and outcomes.

Conclusion

This study found no significant association between the timing of index trauma (childhood vs adult) and treatment retention, substance use severity or baseline mental health symptom severity among women receiving integrated therapy for co-occurring PTSD–SUD. These findings suggest that existing integrated treatment approaches, such as COPE, may be similarly appropriate for women regardless of whether their index trauma occurred in childhood and adulthood. However, given the consistently high rates of attrition reported in populations with co-morbid PTSD–SUD and in exposure-based therapies more broadly, further research is needed to better understand the factors that influence engagement retention. Future studies should continue to examine the clinical relevance of index trauma timing and explore whether alternative approaches to identifying and framing traumatic experiences within therapy may more meaningfully impact treatment engagement, retention and longer-term treatment outcomes.

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Author contributions

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References

- Abi-Habib, R., Kheir, W., Yaktine, N., Maouch, M.E. and Tohme, P. (2025), “The psychological outcomes of direct and indirect exposure to trauma: the Lebanese experience”, *Psychiatric Quarterly*, doi: [10.1007/s11126-025-10149-3](https://doi.org/10.1007/s11126-025-10149-3).
- Amaro, H., Chernoff, M., Brown, V., Arévalo, S. and Gatz, M. (2007), “Does integrated trauma-informed substance abuse treatment increase treatment retention?”, *Journal of Community Psychology*, Vol. 35 No. 7, pp. 845-862, doi: [10.1002/jcop.20185](https://doi.org/10.1002/jcop.20185).

American Psychological Association (2025), "APA clinical practice guideline for the treatment of posttraumatic stress disorder (PTSD) in adults", available at: www.apa.org/about/policy/guideline-ptsd-in-adults.pdf

Ashford, R.D., Brown, A.M. and Curtis, B. (2018), "Systemic barriers in substance use disorder treatment: a prospective qualitative study of professionals in the field", *Drug and Alcohol Dependence*, Vol. 189, pp. 62-69, doi: [10.1016/j.drugalcdep.2018.04.033](https://doi.org/10.1016/j.drugalcdep.2018.04.033).

Back, S.E. (2010), "Toward an improved model of treating co-occurring PTSD and substance use disorders", *American Journal of Psychiatry*, Vol. 167 No. 1, pp. 11-13, doi: [10.1176/appi.ajp.2009.09111602](https://doi.org/10.1176/appi.ajp.2009.09111602).

Back, S.E., Dansky, B.S., Carroll, K.M., Foa, E.B. and Brady, K.T. (2001), "Exposure therapy in the treatment of PTSD among cocaine-dependent individuals: description of procedures", *Journal of Substance Abuse Treatment*, Vol. 21 No. 1, pp. 35-45, doi: [10.1016/S0740-5472\(01\)00181-7](https://doi.org/10.1016/S0740-5472(01)00181-7).

Back, S.E., Foa, E.B., Killeen, T.K., Mills, K.L., Teesson, M., Cotton, B.D., Carroll, K.M. and Brady, K.T. (2015), *Concurrent Treatment of PTSD and Substance Use Disorders Using Prolonged Exposure (COPE)*, Oxford University Press, Vol. 1, doi: [10.1093/med:psych/9780199334537.001.0001](https://doi.org/10.1093/med:psych/9780199334537.001.0001).

Back, S.E., Killeen, T., Badour, C.L., Flanagan, J.C., Allan, N.P., Ana, E.S., Lozano, B., Korte, K.J., Foa, E.B. and Brady, K.T. (2019), "Concurrent treatment of substance use disorders and PTSD using prolonged exposure: a randomized clinical trial in military veterans", *Addictive Behaviors*, Vol. 90, pp. 369-377, doi: [10.1016/j.addbeh.2018.11.032](https://doi.org/10.1016/j.addbeh.2018.11.032).

Baker, D.E., Hill, M., Chamberlain, K., Hurd, L., Karlsson, M., Zielinski, M., Calvert, M. and Bridges, A.J. (2021), "Interpersonal vs. non-interpersonal cumulative traumas and psychiatric symptoms in treatment-seeking incarcerated women", *Journal of Trauma & Dissociation*, Vol. 22 No. 3, pp. 249-264, doi: [10.1080/15299732.2020.1760172](https://doi.org/10.1080/15299732.2020.1760172).

Barawi, K.S., Lewis, C., Simon, N. and Bisson, J.I. (2020), "A systematic review of factors associated with outcome of psychological treatments for post-traumatic stress disorder", *European Journal of Psychotraumatology*, Vol. 11 No. 1, p. 1774240, doi: [10.1080/20008198.2020.1774240](https://doi.org/10.1080/20008198.2020.1774240).

Berenz, E.C., Roberson-Nay, R., Latendresse, S.J., Mezuk, B., Gardner, C.O., Amstadter, A.B. and York, T.P. (2017), "Posttraumatic stress disorder and alcohol dependence: epidemiology and order of onset", *Psychological Trauma*, Vol. 9 No. 4, pp. 485-492, doi: [10.1037/tra0000185](https://doi.org/10.1037/tra0000185).

Blakey, S.M., Dillon, K.H., Wagner, H.R., Simpson, T.L., Beckham, J.C., Calhoun, P.S. and Elbogen, E.B. (2022), "Psychosocial well-being among veterans with posttraumatic stress disorder and substance use disorder", *Psychological Trauma*, Vol. 14 No. 3, pp. 421-430, doi: [10.1037/tra0001018](https://doi.org/10.1037/tra0001018).

Bohus, M., Dyer, A.S., Priebe, K., Krüger, A., Kleindienst, N., Schmahl, C., Niedtfeld, I. and Steil, R. (2013), "Dialectical behaviour therapy for post-traumatic stress disorder after childhood sexual abuse in patients with and without borderline personality disorder: a randomised controlled trial", *Psychotherapy and Psychosomatics*, Vol. 82 No. 4, pp. 221-233, doi: [10.1159/000348451](https://doi.org/10.1159/000348451).

Brady, K.T., Dansky, B.S., Back, S.E., Foa, E.B. and Carroll, K.M. (2001), "Exposure therapy in the treatment of PTSD among cocaine-dependent individuals: preliminary findings", *Journal of Substance Abuse Treatment*, Vol. 21 No. 1, pp. 47-54, doi: [10.1016/S0740-5472\(01\)00182-9](https://doi.org/10.1016/S0740-5472(01)00182-9).

Breslau, N. and Peterson, E.L. (2010), "Assaultive violence and the risk of posttraumatic stress disorder following a subsequent trauma", *Behaviour Research and Therapy*, Vol. 48 No. 10, pp. 1063-1066, doi: [10.1016/j.brat.2010.07.001](https://doi.org/10.1016/j.brat.2010.07.001).

Camden, A.A., Petri, J.M., Jackson, B.N., Jeffirs, S.M. and Weathers, F.W. (2023), "A psychometric evaluation of the international trauma questionnaire (ITQ) in a trauma-exposed college sample", *European Journal of Trauma & Dissociation*, Vol. 7 No. 1, p. 100305, doi: [10.1016/j.ejtd.2022.100305](https://doi.org/10.1016/j.ejtd.2022.100305).

Carliner, H., Keyes, K.M., McLaughlin, K.A., Meyers, J.L., Dunn, E.C. and Martins, S.S. (2016), "Childhood trauma and illicit drug use in adolescence: a population-based national comorbidity survey replication-adolescent supplement study", *Journal of the American Academy of Child & Adolescent Psychiatry*, Vol. 55 No. 8, pp. 701-708, doi: [10.1016/j.jaac.2016.05.010](https://doi.org/10.1016/j.jaac.2016.05.010).

Christiansen, D.M. and Berke, E.T. (2020), "Gender- and sex-based contributors to sex differences in PTSD", *Current Psychiatry Reports*, Vol. 22 No. 4, p. 19, doi: [10.1007/s11920-020-1140-y](https://doi.org/10.1007/s11920-020-1140-y).

Clark, C.B., Reiland, S., Thorne, C. and Cropsey, K.L. (2014), "Relationship of trauma exposure and substance abuse to self-reported violence among men and women in substance abuse treatment", *Journal of Interpersonal Violence*, Vol. 29 No. 8, pp. 1514-1530, doi: [10.1177/0886260513507138](https://doi.org/10.1177/0886260513507138).

- Cole, T.A., Reuman, L., Lee, D.J., Shotwell Tabke, C., Marx, B.P. and Sloan, D.M. (2024), "The effect of time since index trauma on trauma-related beliefs", *Psychological Trauma*, Vol. 16 No. 2, pp. 331-339, doi: [10.1037/tra0001249](https://doi.org/10.1037/tra0001249).
- Dacosta-Sánchez, D., González-Ponce, B.M., Fernández-Calderón, F., Sánchez-García, M. and Lozano, O.M. (2022), "Retention in treatment and therapeutic adherence: how are these associated with therapeutic success? An analysis using real-world data", *International Journal of Methods in Psychiatric Research*, Vol. 31 No. 4, p. e1929, doi: [10.1002/mpr.1929](https://doi.org/10.1002/mpr.1929).
- Eftekhari, A., Crowley, J.J., Mackintosh, M.-A. and Rosen, C.S. (2020), "Predicting treatment dropout among veterans receiving prolonged exposure therapy", *Psychological Trauma*, Vol. 12 No. 4, pp. 405-412, doi: [10.1037/tra0000484](https://doi.org/10.1037/tra0000484).
- Ehring, T., Welboren, R., Morina, N., Wicherts, J.M., Freitag, J. and Emmelkamp, P.M.G. (2014), "Meta-analysis of psychological treatments for posttraumatic stress disorder in adult survivors of childhood abuse", *Clinical Psychology Review*, Vol. 34 No. 8, pp. 645-657, doi: [10.1016/j.cpr.2014.10.004](https://doi.org/10.1016/j.cpr.2014.10.004).
- Elhai, J.D., Engdahl, R.M., Palmieri, P.A., Naifeh, J.A., Schweinle, A. and Jacobs, G.A. (2009), "Assessing posttraumatic stress disorder with or without reference to a single, worst traumatic event: examining differences in factor structure", *Psychological Assessment*, Vol. 21 No. 4, pp. 629-634, doi: [10.1037/a0016677](https://doi.org/10.1037/a0016677).
- Faber, N.N.M., Lortye, S., Arntz, A., Marquenie, L.A., Goudriaan, A.E. and de Waal, M.M. (2026), "Effects of timing and type of trauma-focused treatment on psychosocial functioning: secondary outcomes from a randomized controlled trial in patients with co-occurring substance use disorder and posttraumatic stress disorder", *Behaviour Research and Therapy*, Vol. 202, p. 105053, doi: [10.1016/j.brat.2026.105053](https://doi.org/10.1016/j.brat.2026.105053).
- Flanagan, J.C., Korte, K.J., Killeen, T.K. and Back, S.E. (2016), "Concurrent treatment of substance use and PTSD", *Current Psychiatry Reports*, Vol. 18 No. 8, p. 70, doi: [10.1007/s11920-016-0709-y](https://doi.org/10.1007/s11920-016-0709-y).
- Foa, E.B., Chrestman, K.R. and Gilboa-Schechtman, E. (2009), *Prolonged Exposure Therapy for Adolescents with PTSD: Emotional Processing of Traumatic Experiences: Therapist Guide*, Oxford University Press.
- Fry, C.E. (2023), "Breaking down barriers to substance use disorder treatment", *Psychiatric Services*, Vol. 74 No. 11, p. 1113, doi: [10.1176/appi.ps.23074018](https://doi.org/10.1176/appi.ps.23074018).
- Gradus, J.L., Leatherman, S., Curreri, A., Myers, L.G., Ferguson, R. and Miller, M. (2017), "Gender differences in substance abuse, PTSD and intentional self-harm among Veterans Health Administration patients", *Drug and Alcohol Dependence*, Vol. 171, pp. 66-69, doi: [10.1016/j.drugalcdep.2016.11.012](https://doi.org/10.1016/j.drugalcdep.2016.11.012).
- Gray, M.J., Litz, B.T., Hsu, J.L. and Lombardo, T.W. (2004), "Psychometric properties of the life events checklist", *Assessment (Odessa, Fla.)*, Vol. 11 No. 4, pp. 330-341, doi: [10.1177/1073191104269954](https://doi.org/10.1177/1073191104269954).
- Haller, M. and Chassin, L. (2014), "Risk pathways among traumatic stress, posttraumatic stress disorder symptoms, and alcohol and drug problems: a test of four hypotheses", *Psychology of Addictive Behaviors*, Vol. 28 No. 3, pp. 841-851, doi: [10.1037/a0035878](https://doi.org/10.1037/a0035878).
- Harris, P.A., Taylor, R., Thielke, R., Payne, J., Gonzalez, N. and Conde, J.G. (2009), "Research electronic data capture (REDCap)—a metadata-driven methodology and workflow process for providing translational research informatics support", *Journal of Biomedical Informatics*, Vol. 42 No. 2, pp. 377-381, doi: [10.1016/j.jbi.2008.08.010](https://doi.org/10.1016/j.jbi.2008.08.010).
- Hien, D.A., Jiang, H., Campbell, A.N.C., Hu, M.-C., Miele, G.M., Cohen, L.R., Brigham, G.S., Capstick, C., Kulaga, A., Robinson, J., Suarez-Morales, L. and Nunes, E.V. (2010), "Do treatment improvements in PTSD severity affect substance use outcomes? A secondary analysis from a randomized clinical trial in NIDA's clinical trials network", *American Journal of Psychiatry*, Vol. 167 No. 1, pp. 95-101, doi: [10.1176/appi.ajp.2009.09091261](https://doi.org/10.1176/appi.ajp.2009.09091261).
- Hruska, B., Fallon, W., Spoonster, E., Sledjeski, E.M. and Delahanty, D.L. (2011), "Alcohol use disorder history moderates the relationship between avoidance coping and posttraumatic stress symptoms", *Psychology of Addictive Behaviors*, Vol. 25 No. 3, pp. 405-414, doi: [10.1037/a0022439](https://doi.org/10.1037/a0022439).
- Kachadourian, L.K., Duek, O., Tsai, J., Harpaz-Rotem, I. and Pietrzak, R.H. (2023), "Not all traumas are created equal: phenotypic heterogeneity of PTSD symptoms in relation to index traumas in U.S. military veterans", *Journal of Affective Disorders*, Vol. 340, pp. 728-731, doi: [10.1016/j.jad.2023.08.012](https://doi.org/10.1016/j.jad.2023.08.012).
- Khantzian, E.J. (1990), "Self-regulation and self-medication factors in alcoholism and the addictions. Similarities and differences", *Recent Developments in Alcoholism: An Official Publication of the American Medical Society on Alcoholism, the Research Society on Alcoholism, and the National Council on Alcoholism*, Vol. 8, pp. 255-271.

- Kilpatrick, D.G., Resnick, H.S., Milanak, M.E., Miller, M.W., Keyes, K.M. and Friedman, M.J. (2013), "National estimates of exposure to traumatic events and PTSD prevalence using DSM-IV and DSM-5 criteria", *Journal of Traumatic Stress*, Vol. 26 No. 5, pp. 537-547, doi: [10.1002/jts.21848](https://doi.org/10.1002/jts.21848).
- Kleindienst, N., Jungkunz, M. and Bohus, M. (2020), "A proposed severity classification of borderline symptoms using the borderline symptom list (BSL-23)", *Borderline Personality Disorder and Emotion Dysregulation*, Vol. 7 No. 1, p. 11, doi: [10.1186/s40479-020-00126-6](https://doi.org/10.1186/s40479-020-00126-6).
- Konkolő Thege, B., Horwood, L., Slater, L., Tan, M.C., Hodgins, D.C. and Wild, T.C. (2017), "Relationship between interpersonal trauma exposure and addictive behaviors: a systematic review", *BMC Psychiatry*, Vol. 17 No. 1, p. 164, doi: [10.1186/s12888-017-1323-1](https://doi.org/10.1186/s12888-017-1323-1).
- Lancaster, C.L., Teeters, J.B., Gros, D.F. and Back, S.E. (2016), "Posttraumatic stress disorder: overview of evidence-based assessment and treatment", *Journal of Clinical Medicine*, Vol. 5 No. 11, p. 105, doi: [10.3390/jcm5110105](https://doi.org/10.3390/jcm5110105).
- Liu, J., Mahendran, R., Chong, S.A. and Subramaniam, M. (2021), "Elucidating the impact of childhood, adulthood, and cumulative lifetime trauma exposure on psychiatric symptoms in early schizophrenia spectrum disorders", *Journal of Traumatic Stress*, Vol. 34 No. 1, pp. 137-148, doi: [10.1002/jts.22607](https://doi.org/10.1002/jts.22607).
- McHugh, R.K., Votaw, V.R., Sugarman, D.E. and Greenfield, S.F. (2018), "Sex and gender differences in substance use disorders", *Clinical Psychology Review*, Vol. 66, pp. 12-23, doi: [10.1016/j.cpr.2017.10.012](https://doi.org/10.1016/j.cpr.2017.10.012).
- McKay, M.T., Cannon, M., Chambers, D., Conroy, R.M., Coughlan, H., Dodd, P., Healy, C., O'Donnell, L. and Clarke, M.C. (2021), "Childhood trauma and adult mental disorder: a systematic review and meta-analysis of longitudinal cohort studies", *Acta Psychiatrica Scandinavica*, Vol. 143 No. 3, pp. 189-205, doi: [10.1111/acps.13268](https://doi.org/10.1111/acps.13268).
- Macia, K.S., Raines, A.M., Maieritsch, K.P. and Franklin, C.L. (2020), "PTSD networks of veterans with combat versus non-combat types of index trauma", *Journal of Affective Disorders*, Vol. 277, pp. 559-567, doi: [10.1016/j.jad.2020.08.027](https://doi.org/10.1016/j.jad.2020.08.027).
- Maercker, A. and Hecker, T. (2016), "Broadening perspectives on trauma and recovery: a socio-interpersonal view of PTSD", *European Journal of Psychotraumatology*, Vol. 7 No. 1, p. 29303, doi: [10.3402/ejpt.v7.29303](https://doi.org/10.3402/ejpt.v7.29303).
- Mahoney, C.T., Moshier, S.J., Keane, T.M. and Marx, B.P. (2021), "Heightened healthcare utilization & risk of mental disorders among veterans with comorbid opioid use disorder & posttraumatic stress disorder", *Addictive Behaviors*, Vol. 112, p. 106572, doi: [10.1016/j.addbeh.2020.106572](https://doi.org/10.1016/j.addbeh.2020.106572).
- María-Ríos, C.E. and Morrow, J.D. (2020), "Mechanisms of shared vulnerability to post-traumatic stress disorder and substance use disorders", *Frontiers in Behavioral Neuroscience*, Vol. 14, p. 6, doi: [10.3389/fnbeh.2020.00006](https://doi.org/10.3389/fnbeh.2020.00006).
- Maturana, J.R.-T., Cruz, A.G.-S., Rocha-Jiménez, T. and Castillo-Carniglia, Á. (2023), "Does substance use disorder treatment completion reduce the risk of treatment readmission in Chile?", *Drug and Alcohol Dependence*, Vol. 248, p. 109907, doi: [10.1016/j.drugalcdep.2023.109907](https://doi.org/10.1016/j.drugalcdep.2023.109907).
- Miele, G.M., Carpenter, K.M., Cockerham, M.S., Trautman, K.D., Blaine, J. and Hasin, D.S. (2001), "Substance dependence severity scale: reliability and validity for ICD-10 substance use disorders", *Addictive Behaviors*, Vol. 26 No. 4, pp. 603-612, doi: [10.1016/S0306-4603\(00\)00137-4](https://doi.org/10.1016/S0306-4603(00)00137-4).
- Mills, K.L., Teesson, M., Ross, J. and Peters, L. (2006), "Trauma, PTSD, and substance use disorders: findings from the Australian national survey of mental health and well-being", *American Journal of Psychiatry*, Vol. 163 No. 4, pp. 652-658, doi: [10.1176/ajp.2006.163.4.652](https://doi.org/10.1176/ajp.2006.163.4.652).
- Mills, K.L., Teesson, M., Back, S.E., Brady, K.T., Baker, A.L., Hopwood, S., Sannibale, C., Barrett, E.L., Merz, S., Rosenfeld, J. and Ewer, P.L. (2012), "Integrated exposure-based therapy for co-occurring posttraumatic stress disorder and substance dependence: a randomized controlled trial", *JAMA*, Vol. 308 No. 7, pp. 690-699, doi: [10.1001/jama.2012.9071](https://doi.org/10.1001/jama.2012.9071).
- Moska, C., Goudriaan, A.E., Blanken, P. and Hendriks, V. (2023), "Accuracy of the depression, anxiety and stress scale (DASS-21) for screening on comorbid internalizing disorders among youth in substance use disorder treatment", *European Addiction Research*, Vol. 29 No. 6, pp. 385-393, doi: [10.1159/000533726](https://doi.org/10.1159/000533726).
- Ogle, C.M., Rubin, D.C. and Siegler, I.C. (2013), "The impact of the developmental timing of trauma exposure on PTSD symptoms and psychosocial functioning among older adults", *Developmental Psychology*, Vol. 49 No. 11, pp. 2191-2200, doi: [10.1037/a0031985](https://doi.org/10.1037/a0031985).

Quimette, P., Goodwin, E. and Brown, P.J. (2006), "Health and well being of substance use disorder patients with and without posttraumatic stress disorder", *Addictive Behaviors*, Vol. 31 No. 8, pp. 1415-1423, doi: [10.1016/j.addbeh.2005.11.010](https://doi.org/10.1016/j.addbeh.2005.11.010).

Persson, A., Back, S.E., Killeen, T.K., Brady, K.T., Schwandt, M.L., Heilig, M. and Magnusson, Å. (2017), "Concurrent treatment of PTSD and substance use disorders using prolonged exposure (COPE): a pilot study in alcohol-dependent women", *Journal of Addiction Medicine*, Vol. 11 No. 2, pp. 119-125, doi: [10.1097/ADM.0000000000000286](https://doi.org/10.1097/ADM.0000000000000286).

Priebe, K., Kleindienst, N., Schropp, A., Dyer, A., Krüger-Gottschalk, A., Schmahl, C., Steil, R. and Bohus, M. (2018), "Defining the index trauma in post-traumatic stress disorder patients with multiple trauma exposure: impact on severity scores and treatment effects of using worst single incident versus multiple traumatic events", *European Journal of Psychotraumatology*, Vol. 9 No. 1, p. 1486124, doi: [10.1080/2008198.2018.1486124](https://doi.org/10.1080/2008198.2018.1486124).

Resick, P.A., Galovski, T.E., Uhlmansiek, M.O., Scher, C.D., Clum, G.A. and Young-Xu, Y. (2008), "A randomized clinical trial to dismantle components of cognitive processing therapy for posttraumatic stress disorder in female victims of interpersonal violence", *Journal of Consulting and Clinical Psychology*, Vol. 76 No. 2, pp. 243-258, doi: [10.1037/0022-006X.76.2.243](https://doi.org/10.1037/0022-006X.76.2.243).

Roberts, N.P., Lotzin, A. and Schäfer, I. (2022), "A systematic review and meta-analysis of psychological interventions for comorbid post-traumatic stress disorder and substance use disorder", *European Journal of Psychotraumatology*, Vol. 13 No. 1, p. 2041831, doi: [10.1080/2008198.2022.2041831](https://doi.org/10.1080/2008198.2022.2041831).

Roberts, N.P., Roberts, P.A., Jones, N. and Bisson, J.I. (2015), "Psychological interventions for post-traumatic stress disorder and comorbid substance use disorder: a systematic review and meta-analysis", *Clinical Psychology Review*, Vol. 38, pp. 25-38, doi: [10.1016/j.cpr.2015.02.007](https://doi.org/10.1016/j.cpr.2015.02.007).

Schober, R. and Annis, H.M. (1996), "Barriers to help-seeking for change in drinking: a gender-focused review of the literature", *Addictive Behaviors*, Vol. 21 No. 1, pp. 81-92, doi: [10.1016/0306-4603\(95\)00041-0](https://doi.org/10.1016/0306-4603(95)00041-0).

Tamman, A.J.F., Nagamatsu, S.T., Cabrera-Mendoza, B., Averill, L.A., Dunn, E.C., Krystal, J.H., Gelernter, J., Montalvo-Ortiz, J.L., Polimanti, R. and Pietrzak, R.H. (2025), "Developmental timing of index trauma exposure and accelerated epigenetic aging in United States military veterans", *Psychoneuroendocrinology*, Vol. 182, p. 107568, doi: [10.1016/j.psyneuen.2025.107568](https://doi.org/10.1016/j.psyneuen.2025.107568).

Taylor, O.D. (2010), "Barriers to treatment for women with substance use disorders", *Journal of Human Behavior in the Social Environment*, Vol. 20 No. 3, pp. 393-409, doi: [10.1080/10911351003673310](https://doi.org/10.1080/10911351003673310).

The Jamovi Project (2023), "Jamovi (version 2.3) [computer software]. (version 2.3). (2024). [computer software]. jamovi", available at: www.jamovi.org

Thurston, C., Murray, A.L., Franchino-Olsen, H., Silima, M., Hemady, C.L. and Meinck, F. (2025), "Prospective longitudinal associations between adverse childhood experiences and adult mental health outcomes: systematic review and meta-analysis", *Trauma, Violence & Abuse*, Vol. 27 No. 4, p. 15248380251358223, doi: [10.1177/15248380251358223](https://doi.org/10.1177/15248380251358223).

Winkelman, P., Knäuper, B. and Schwarz, N. (1998), "Looking back at anger: reference periods change the interpretation of emotion frequency questions", *Journal of Personality and Social Psychology*, Vol. 75 No. 3, pp. 719-728, doi: [10.1037/0022-3514.75.3.719](https://doi.org/10.1037/0022-3514.75.3.719).

Yildiz, D., Ciftci, A. and Yalcin, O. (2020), "The association between trauma history, trauma-related psychopathology and treatment completion at an adolescent inpatient substance abuse treatment center in Turkey", *Journal of Child & Adolescent Substance Abuse*, Vol. 29 No. 1, pp. 58-67, doi: [10.1080/1067828X.2020.1837319](https://doi.org/10.1080/1067828X.2020.1837319).

Zemore, S.E., Ware, O.D., Gilbert, P.A. and Pinedo, M. (2021), "Barriers to retention in substance use treatment: validation of a new, theory-based scale", *Journal of Substance Abuse Treatment*, Vol. 131, p. 108422, doi: [10.1016/j.jsat.2021.108422](https://doi.org/10.1016/j.jsat.2021.108422).

Zhang, S., Lin, X., Liu, J., Pan, Y., Zeng, X., Chen, F. and Wu, J. (2020), "Prevalence of childhood trauma measured by the short form of the childhood trauma questionnaire in people with substance use disorder: a meta-analysis", *Psychiatry Research*, Vol. 294, p. 113524, doi: [10.1016/j.psychres.2020.113524](https://doi.org/10.1016/j.psychres.2020.113524).

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