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When Longer Sobriety Is Associated with Greater Vulnerability: PTSD Symptoms and Substance Use Across Recovery Stages During Prolonged Armed Conflict: A Cross-Sectional Comparative Study

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Abstract

Background

Individuals in recovery from substance use disorder (SUD) may face distinctive challenges during prolonged armed conflict, yet their psychological functioning under such conditions has received limited empirical attention. This study pursued two aims: (1) to compare PTSD symptom severity and psychosocial functioning between adults in abstinence-based recovery and community comparison participants from the same conflict-exposed region; and (2) to examine whether sobriety duration, analyzed both continuously and categorically (sustained recovery, 1–<5 years; stable recovery, ≥ 5 years), was associated with PTSD symptoms and substance-related behavior within the recovery group.

Methods

A cross-sectional comparative design was used during the Israel–Hamas war. Fifty-five adults from a government-funded abstinence-based addiction service (participation rate ~ 95%) and 54 community adults completed the PCL-5 (range 0–80; α = .91) and measures of substance-related behavior and psychosocial indicators.

Results

The recovery group reported significantly lower PTSD symptom severity than the community comparison group (M = 15.32 vs. 23.64; t(107) = 3.23, p = .002, d = 0.61), persisting after covariate adjustment (F(1, 103) = 5.42, p = .022), alongside better psychosocial functioning. Within the recovery group, longer sobriety was associated with higher PTSD symptoms (r = .45, p < .001) and greater substance-related behavior (r = .39, p = .003). Stable recovery participants reported significantly higher PTSD symptoms (d = 0.74, p = .009) and greater substance-related behavior (d = 0.72, p = .010) than sustained recovery participants.

Conclusions

Under prolonged armed conflict, individuals in structured recovery reported lower PTSD symptom severity and better psychosocial functioning than community participants, consistent with structured therapeutic support, clinical contact, peer networks, and crisis access available to the recovery group but largely absent for community participants. Within the recovery group, however, longer sobriety was associated with greater PTSD symptom severity and substance-related behavior. This pattern may reflect a stage-specific reduction in therapeutic containment: as recovery progresses, individuals typically attend fewer sessions, receive less clinical monitoring, and maintain greater autonomy, which

may become liabilities when external threat is continuous and unresolvable. These findings support stage-sensitive, trauma-informed outreach across the full recovery continuum during collective crises.

Background

Armed conflict exposes civilian populations to protracted collective trauma, generating profound and lasting psychiatric burden. Epidemiological surveillance consistently documents elevated rates of PTSD, major depression, and anxiety disorders across conflict zones (1–5). Emerging data from the Iron Swords War confirm this pattern: nationwide prospective studies document substantial increases in PTSD, depression, and anxiety among Israeli civilians, with dose-response relationships between exposure severity and psychological burden (6, 7), and early evidence of increased substance-related behavior at the population level (8). Unlike discrete traumatic events, prolonged armed conflict sustains active threat across months or years, creating continuous traumatic stress —a condition in which individuals must maintain adaptive functioning while danger persists rather than recedes (9, 10). This distinction is clinically consequential: continuous threat taxes regulatory resources over time, strains social support networks, and complicates trauma processing because danger cues remain ecologically present (9, 11, 12).

The co-occurrence of PTSD and SUD is both clinically important and theoretically complex. PTSD and SUD co-occur at rates substantially exceeding chance, with estimates suggesting that 30–60% of individuals with PTSD also meet criteria for a comorbid alcohol or substance use disorder (13, 14). The association is bidirectional: many individuals use substances to modulate trauma-related distress the self-medication hypothesis (15), while pre-existing SUD independently elevates risk for traumatic exposure, impairs stress regulation, and complicates recovery trajectories (16, 17). Co-occurring PTSD and SUD carries greater functional impairment, elevated relapse risk, higher suicidal ideation, and increased treatment complexity relative to either diagnosis in isolation (18, 19).

Neurobiologically, prolonged stress dysregulates the hypothalamic-pituitary-adrenal (HPA) axis and the extended amygdala systems critically implicated in stress-motivated substance use and PTSD symptom maintenance (20–22) creating a mutually reinforcing psychobiological cycle that is difficult to interrupt under ongoing environmental threat (23, 24). Chronic stress progressively degrades prefrontal regulatory function, eroding the behavioral inhibition capacity required to resist substance use under prolonged wartime conditions (24, 25). Under continuous traumatic stress, this prefrontal degradation is not a single insult but an ongoing process: as long as ecological threat persists, the neurobiological substrate for self-regulation is continuously taxed, creating an open-ended window of vulnerability for individuals whose recovery depends on intact inhibitory control.

Despite the clinical salience of this comorbidity, empirical research on how individuals currently in recovery from SUD respond psychologically to prolonged armed conflict remains limited. This gap reflects a fundamental methodological obstacle: individuals in active addiction treatment during an ongoing military conflict are especially difficult to recruit. The present study addresses this gap directly,

capitalising on a pre-existing treatment relationship to achieve a near-complete participation rate (~ 95%) during active wartime. This participation rate is methodologically noteworthy and likely reduces self-selection bias relative to most crisis-based studies of hard-to-reach clinical populations.

Recovery as a staged and heterogeneous process. Recovery from SUD is not a single event but a dynamic, socially embedded process (26–28). Contemporary frameworks recognize that recovery capital —the personal, social, and community resources supporting sustained sobriety (29, 30) and recovery-oriented social identity (31) may be as clinically important as sobriety duration per se (32). Within abstinence-oriented services, sobriety duration remains a meaningful clinical marker (33, 34). Following the Betty Ford Institute consensus framework (35), the present study classifies individuals as in sustained recovery (1–<5 years) or stable recovery (≥ 5 years). Critically, both recovery capital and recovery-oriented social identity are dynamic rather than fixed: they fluctuate in response to environmental conditions, meaning that resources accumulated during peacetime may not remain equally available or effective under conditions of prolonged collective threat.

Cross-sectional and longitudinal research consistently demonstrates that individuals in recovery show better mental health outcomes than those in active addiction (36, 37). Recovery is typically accompanied by growing social support, restored daily structure, increased self-efficacy, and accumulating recovery capital (29, 30, 38). The Social Identity Model of Recovery (SIMOR; (31) further posits that integration into a recovery-oriented social identity provides durable psychological protection through belonging and shared purpose. These mechanisms suggest recovery may buffer distress during collective crises partially supported by findings from the COVID-19 pandemic (39).

The question of stage-specific vulnerability. Resilience is context-dependent rather than global (40). Coping resources developed within recovery do not necessarily generalize to qualitatively different stressors. For individuals in recovery, prolonged collective threat may intersect with prior trauma burden, sustained self-regulatory demands, economic adversity, stigma, and fear of relapse. Allostatic load theory (41) is relevant: the cumulative regulatory burden of long-term self-management, compounded by wartime threat, may erode coping reserves in ways that are not apparent under ordinary circumstances but emerge under collective crisis. Individuals in stable recovery who have appropriately reduced intensive clinical contact as a marker of progress may find themselves with fewer external containment resources precisely when such resources are most needed. In practice, this means fewer mandatory treatment sessions, reduced clinical monitoring, greater personal autonomy, and diminished daily contact with peers and counsellors — a gradual loosening of the structured boundaries that, during earlier recovery, provided both behavioral accountability and emotional regulation support. In effect, the very success of long-term recovery—marked by reduced clinical contact and increased normative social integration—may paradoxically constitute a risk factor under prolonged ecological threat, because it removes the structured containment that once buffered the individual from external adversity. To our knowledge, this stage-specific vulnerability hypothesis has not been examined empirically in depth.

Aims and hypotheses. This study pursued two aims: (1) to compare PTSD symptom severity and psychosocial functioning between adults in structured abstinence-based recovery and community comparison participants from the same conflict-exposed region; and (2) to examine whether sobriety duration, analyzed both continuously and categorically (sustained recovery, 1–<5 years; stable recovery, ≥ 5 years), was associated with PTSD symptoms and substance-related behavior within the recovery group. Based on recovery capital theory (29, 30) and SIMOR (31), we hypothesized that the recovery group would report lower PTSD symptoms than community participants. The within-recovery direction was treated as an empirical question given the theoretical plausibility of both protection and stage-specific vulnerability.

Methods

Design and setting

This was a cross-sectional two-group comparative study. Data were collected during April 2024 approximately six months after the outbreak of the Israel- Hamas war (known in Israel as the Iron Swords War; October 7, 2023) in the Haifa Bay and Carmel Coast region of northern Israel, which experienced repeated air-raid alerts, missile threats, and sustained wartime disruption throughout the data-collection period.

Participants

The total sample comprised 109 adults: 55 in abstinence-based recovery from SUD (recovery group) and 54 community participants (comparison group). Mean age was 42.23 years (SD = 12.92); 68.8% identified as women. The recovery cohort was recruited from a government-funded addiction treatment unit operated by municipal social services in northern Israel. Participants had completed residential rehabilitation and continued receiving structured outpatient care. Eligibility required: (a) a DSM-5 SUD diagnosis; (b) documented completion of medically supervised detoxification; (c) ongoing enrolment in the program's continuing recovery framework; (d) Hebrew proficiency; and (e) written informed consent. Exclusion criteria were active psychosis, severe cognitive impairment, or current substance use at enrolment, as confirmed by routine urine toxicology. Most participants were former residential residents who remained engaged in structured outpatient recovery care. Program records indicated that all but three eligible participants agreed to participate, yielding an estimated participation rate of ~ 95%, a figure that substantially limits self-selection bias and constitutes a key methodological strength. Community participants were recruited through local social media and community networks in the same conflict-exposed region. Eligibility required age ≥ 18 years, residence in the target region during the war period, Hebrew proficiency, and provision of informed consent. No formal screening for current or past SUD was conducted in this group, and participants were not excluded based on mental health treatment status. This group should therefore be considered a regional comparison sample rather than an epidemiologically representative cohort.

Ethical approval

This study received ethical approval from the Research Ethics Committee of Western Galilee Academic College. All participants provided written informed consent prior to participation. All procedures were conducted in accordance with the Declaration of Helsinki. Data were collected anonymously via a secure online platform; participation was voluntary and uncompensated.

Recovery classification

The recovery group was enrolled in a multi-modal abstinence-based program incorporating Twelve-Step facilitation, cognitive-behavioral therapy, mindfulness-based relapse prevention, psychodrama, group therapy, and individual counselling. Primary substances of dependence were alcohol (42%), opioids (31%), stimulants (18%), and cannabis (9%). Mean continuous sobriety duration was 6.85 years (SD = 2.40; range: 13 months–18 years). No participants were in very early recovery (<1 year). Following the Betty Ford Institute consensus framework (35), participants were classified as in sustained recovery (1–<5 years; n = 28, M = 2.90 years, SD = 0.52) or stable recovery (≥5 years; n = 27, M = 10.80 years, SD = 1.70).

Measures

PTSD symptom severity. The PCL-5 (42) is a 20-item self-report instrument corresponding to DSM-5 PTSD symptom clusters. Items are rated on a 0–4 scale (0 = not at all; 4 = extremely), yielding a total score of 0–80. The PCL-5 demonstrates strong convergent and discriminant validity and robust psychometric properties across diverse trauma-exposed populations (43). Participants completed the PCL-5, referring to their war-related experiences during the ongoing conflict, and rated the extent to which they had been bothered by each symptom over the past month. Internal consistency in the present sample was excellent (Cronbach's α = .91).

Substance-related behavior during the conflict period

A 6-item composite measure assessed alcohol use, prescription medication misuse, and illicit drug use over the preceding month. Each item was rated on a 0–4 scale (0 = never to 4 = daily/always), yielding a total score of 0–24 (Cronbach's α = .84). In the recovery group, the measure captured any self-reported substance-related behavior during the conflict period; in the community comparison group, it captured conflict-period substance-related behavior relative to participants' usual pre-conflict habits. This composite was developed for the present study to capture substance-related behavior during conflict periods across both clinical and community contexts. Each item was rated on an ordinal frequency scale; the total score reflects cumulative substance involvement across multiple substance categories during the conflict period. Because operationalization was not fully identical across groups, cross-group comparisons on this measure should be interpreted cautiously; within-group comparisons (particularly the recovery-stage analyses) are not affected by this asymmetry.

Contextual psychosocial variables

Additional indicators included the number of negative life events in the preceding year, number of close relationships, and number of professional mental health service types accessed during the conflict. Emotional stability (reverse-scored neuroticism) was assessed via the Ten-Item Personality Inventory (TIPI; (44)) and examined exploratorily in the community sample.

Statistical analysis

All analyses were conducted in SPSS 28.0 (IBM Corp.). Parametric assumptions were confirmed before testing. Between-group differences (Aim 1) on continuous variables were tested with independent-samples t tests, and categorical variables with chi-square tests. A one-way ANCOVA examined the robustness of the primary PTSD between-group difference, covarying age, employment status, relationship status, and mental health service use. These covariates were selected a priori on conceptual grounds: age and employment status are established correlates of both PTSD severity and substance use outcomes; relationship status indexes social resource availability; and mental health service use was included because the large structural difference between groups on this variable (d = 1.48) represents a potential confound in this cross-sectional design. Effect sizes (Cohen's d) and 95% CIs for mean differences are reported throughout. Within the recovery cohort, Pearson correlations examined associations among PTSD symptoms, substance-related behavior, and sobriety duration. Sustained and stable recovery subgroups were compared with independent-samples t tests. Stage-subgroup equivalence on sociodemographic variables was confirmed before main analyses (all ps > .25). Exploratory community analyses use α = .05, two-tailed. No imputation procedures were used; analyses were conducted on available cases. Given the wartime setting and the difficulty of accessing this clinical population, the sample should be regarded as a pragmatic sample rather than one determined by an a priori power calculation.

During manuscript preparation, an AI-assisted language tool was used solely for English-language copy editing. The authors take full responsibility for all content.

Results

Sample characteristics

Table 1 presents demographic and clinical characteristics of all 109 participants. The recovery and community comparison groups did not differ significantly in age or educational attainment. The recovery group showed markedly higher unemployment (51.0% vs. 16.0%, $p < .001$) and lower rates of committed partnerships (34.5% vs. 57.4%, $p = .02$). The recovery group reported significantly more close relationships ($M = 4.82$ vs. 3.74, $p = .01$) and substantially greater mental health service engagement ($M = 3.64$ vs. 1.26 service types, $p < .001$).

Table 1. *Demographic and Clinical Characteristics of Study Participants*

Variable	Recovery Group (n = 55)	Community Comparison Group (n = 54)	Test statistic
Gender, women	72.7%	64.8%	$\chi^2(1) = 0.82$, $p = .37$
Employment status (% unemployed)	51.0%	16.0%	$\chi^2(3) = 18.42$, $p < .001$***
Committed relationship	34.5%	57.4%	$\chi^2(1) = 5.87$, $p < .05$*
Parenthood	61.1%	64.2%	$\chi^2(1) = 0.11$, $p = .74$
Age, years	42.15 (13.21)	42.31 (12.68)	$t(107) = 0.06$, $p = .95$
Education, years	14.00 (0.70)	14.05 (1.40)	$t(107) = 0.25$, $p = .80$
Sobriety duration, years	6.85 (2.40)	—	—
PTSD symptoms (PCL-5)	15.32 (11.85)	23.64 (15.21)	$t(107) = 3.23$, $p < .01$**
Negative life events, past year	2.18 (1.92)	3.85 (2.41)	$t(107) = 4.12$, $p < .001$***
MH service types accessed	3.64 (1.82)	1.26 (1.35)	$t(107) = 7.89$, $p < .001$***
Close relationships, n	4.82 (2.31)	3.74 (2.01)	$t(107) = 2.62$, $p < .05$*

Note. Values are M (SD) unless otherwise stated. MH = mental health; PCL-5 = PTSD Checklist for DSM-5. Sobriety duration: recovery group only. Employment status was assessed as a four-level variable (employed full-time/employed part-time/unemployed/student or retired); the chi-square statistic for employment refers to the full employment-status distribution; the percentages shown in the table correspond to the unemployed category. χ^2 tests for categorical variables; independent-samples t tests for continuous variables. *p < .05. **p < .01. ***p < .001.

Between-group differences (Aim 1)

Recovery participants reported significantly lower PTSD symptom severity (M = 15.32, SD = 11.85) than community participants (M = 23.64, SD = 15.21), $t(107) = 3.23$, $p = .002$, $d = 0.61$, mean difference = −8.32 (95% CI: −13.51 to −3.13). Regarding psychosocial functioning, the recovery group reported fewer negative life events (M = 2.18 vs. 3.85, $t(107) = 4.12$, $p < .001$, $d = 0.77$), greater mental health service engagement (M = 3.64 vs. 1.26 service types, $t(107) = 7.89$, $p < .001$, $d = 1.48$), and more close

relationships (M = 4.82 vs. 3.74, t(107) = 2.62, p = .01, d = 0.50). The between-group PTSD difference remained significant after covariate adjustment (F(1, 103) = 5.42, p = .022, ηp^2 = .05).

Within-recovery correlations (Aim 2a) (Aim 2)

Table 2 presents intercorrelations within the recovery group. PTSD symptom severity was significantly and positively associated with substance-related behavior (r = .52, p < .01) and sobriety duration (r = .45, p < .001). Sobriety duration was also positively associated with substance-related behavior (r = .39, p = .003). Greater sobriety duration was thus not associated with lower distress or reduced substance-related behavior in this wartime sample.

Table 2. *Intercorrelations Among Key Variables in the Recovery Group (n = 55)*

Variable	1	2	3	4
1. PTSD symptoms (PCL-5)	—	.52**	.45***	.15
2. Substance-related behavior score	.52**	—	.39**	.13
3. Recovery duration	.45***	.39**	—	−.08
4. Number of children	.15	.13	−.08	—

Note. Pearson correlations. *p < .05. **p < .01. ***p < .001.

Exploratory community-sample correlations

Table 3 presents intercorrelations for the community comparison group. PTSD symptoms were positively associated with substance-related behavior (r = .31, p < .05). Emotional stability (reverse-scored neuroticism) was negatively associated with substance-related behavior (r = −.34, p < .05), consistent with the literature linking trait neuroticism to substance use vulnerability (45). Number of children was negatively associated with substance-related behavior (r = −.29, p < .05). These associations are exploratory.

Table 3. *Exploratory Intercorrelations Among Key Variables in the Community Sample (n = 54)*

Variable	1	2	3	4
1. PTSD symptoms (PCL-5)	—	.31*	.15	−.25
2. Substance-related behavior score	.31*	—	−.29*	−.34*
3. Number of children	.15	−.29*	—	.18
4. Emotional stability	−.25	−.34*	.18	—

Note. Pearson correlations. Emotional stability = reverse-scored neuroticism (TIPI; (44)). *p < .05.

Recovery-stage comparisons (Aim 2b)

Prior to the main stage comparisons, sociodemographic equivalence of the subgroups was confirmed: age, $t(53) = 0.45$, $p = .65$; relationship status, $\chi^2(1) = 0.20$, $p = .65$; negative life events, $t(53) = 1.12$, $p = .27$. Table 4 and Figure 1 present the primary within-recovery findings. Stable-recovery participants (≥5 years) reported significantly higher PTSD symptom severity (M = 19.44, SD = 12.82) than sustained-recovery participants (1–<5 years; M = 11.35, SD = 8.91), $t(53) = 2.73$, $p = .009$, $d = 0.74$ (95% CI for mean difference: 2.14–14.04). Stable-recovery participants also reported significantly greater substance-related behavior (M = 5.26, SD = 3.42 vs. M = 3.21, SD = 2.15), $t(53) = 2.67$, $p = .010$, $d = 0.72$ (95% CI: 0.51–3.59). Both effects are medium-to-large. The direction of both findings is counter to the assumption of linear, cumulative protection: under prolonged wartime threat, individuals with greater sobriety demonstrated greater psychological burden.

Table 4. *Comparison of PTSD Symptoms and Substance-Related Behaviour by Recovery Stage*

Outcome	Sustained Recovery 1–<5 years (n = 28) M (SD)	Stable Recovery ≥5 years (n = 27) M (SD)	Mean Diff. [95% CI]; d; p
PTSD symptoms (PCL-5)	11.35 (8.91)	19.44 (12.82)	8.09 [2.14–14.04]; d = 0.74; p < .01**
Substance-related behavior score	3.21 (2.15)	5.26 (3.42)	2.05 [0.51–3.59]; d = 0.72; p ≤ .01**

Note. M = mean; SD = standard deviation; Mean Diff. = stable minus sustained recovery mean; CI = confidence interval; d = Cohen's d. *p < .05. **p ≤ .01. ***p < .001.

Discussion

This study provides, to our knowledge, one of the first empirical examinations of within-recovery-stage differences in PTSD symptoms and substance-related behavior during an active armed conflict in Israel,

drawing on a clinical sample with a near-complete participation rate (~95%).

Two principal findings emerged. First, participants in structured abstinence-based recovery reported lower PTSD symptom severity than community participants from the same conflict-exposed region (d = 0.61), an effect that persisted after covariate adjustment. Second, the within-recovery pattern contradicted the assumption of linear protection: longer sobriety duration was positively associated with both PTSD symptoms and substance-related behavior, and stable-recovery participants demonstrated significantly greater burden than sustained-recovery counterparts (ds = 0.72–0.74). One plausible reading of this pattern is that the very therapeutic structures that buffer recovery participants from wartime distress may gradually loosen as recovery progresses: individuals with longer sobriety may attend fewer sessions, rely less on clinical guidance and peer accountability, and exercise greater personal autonomy in daily functioning. While these are appropriate markers of clinical progress under ordinary conditions, they may also entail a gradual relaxation of the behavioral discipline and external containment that earlier-stage participants still receive. Under prolonged collective threat, this loosening may leave longer-tenured individuals with fewer immediately available regulatory supports, potentially increasing their vulnerability to both psychological distress and substance-related behavior. This interpretation remains hypothetical and was not directly tested in the present study, but it offers a coherent framework for understanding the observed pattern. Notably, the community comparison group also reported substantial symptom burden, underscoring the psychological impact of prolonged conflict outside structured therapeutic settings.

Interpreting the between-group advantage

The lower PTSD symptom severity and better psychosocial functioning reported by recovery participants should not be interpreted as evidence that recovery per se confers resilience to armed conflict. The recovery group was embedded in an active treatment program providing regular clinical contact, peer support, group therapy, and crisis access—resources largely unavailable to community participants. The between-group difference in mental health service engagement was large (d = 1.48), indicating that this structural scaffold was substantially unequal. The recovery group also reported more close relationships and fewer negative life events both established protective resources in conflict-exposed populations (46,47). These patterns are consistent with recovery capital theory (29,30), SIMOR (31), and pandemic-era evidence that recovery community connections buffer collective stress (39). The ANCOVA evidence that the between-group PTSD difference persisted after covariation provides modest additional confidence, though it does not resolve the confound of differential clinical support. Together, these features suggest that the between-group advantage may be better understood as a function of differential psychosocial scaffolding than as a direct effect of sobriety per se. The persistence of the PTSD difference after covariate adjustment strengthens confidence in the robustness of the association but does not eliminate the possibility of residual confounding.

Interpreting the within-recovery stage pattern

The finding that more years of sobriety was associated with greater, not lesser, distress challenges assumptions embedded in classical stage-based recovery models. Two complementary interpretive accounts are advanced. The first centers on clinical scaffolding: individuals in stable recovery have appropriately reduced intensive clinical contact as a marker of progress, yet under prolonged collective threat, reduced scaffolding may leave them with fewer external containment resources precisely when such resources are most needed. Allostatic load theory (41) provides a relevant framework: the cumulative regulatory burden of long-term self-management, compounded by wartime threat, may erode coping reserves in ways that are not apparent under ordinary conditions but emerge under collective crisis. Evidence indicates that chronic stress progressively degrades prefrontal regulatory function the cortical substrate supporting behavioral inhibition (24) —a process potentially amplified in individuals with a history of SUD-related frontal compromise (25,48). In concrete terms, individuals in stable recovery typically attend fewer mandatory sessions, receive less frequent clinical monitoring, and maintain greater autonomy in daily life — all appropriate markers of clinical progress under ordinary conditions, but potential liabilities when external threat is continuous and unresolvable. By contrast, individuals in sustained recovery typically maintain more frequent contact with therapeutic structures, which may provide additional external regulatory support during periods of heightened threat. This interpretation remains hypothetical, but it offers a plausible account of why shorter recovery duration was associated with lower symptom burden in the present wartime context.

The second account concerns unmeasured cohort heterogeneity: participants with longer recovery histories may differ from shorter-tenured peers on prior cumulative trauma burden, chronic health conditions, or more complex SUD histories (49). Both accounts are consistent with prospective evidence that the relationship between sobriety duration and well-being is non-linear across time (33,50). These findings can be situated within several complementary frameworks. From a Conservation of Resources perspective (47), individuals with more established recovery may have more to protect—relationships, employment, family roles, and community status—such that ongoing conflict introduces a qualitatively distinct burden of threatened loss. From the perspective of SIMOR (31), stage-related differences in social identity and community embeddedness may further shape how collective threat is appraised and managed. These frameworks do not explain the findings definitively, but they provide conceptually coherent accounts that future longitudinal work can test directly.

Relation to continuous traumatic stress theory

The continuous traumatic stress framework (9,51) offers additional theoretical traction. Unlike discrete traumatic events, which permit gradual restoration of safety and coherent trauma narrative formation, ongoing conflict disrupts the cognitive and temporal structures through which individuals process adversity and restore equilibrium. For recovery populations, this is particularly salient: the relapse-prevention and coping architectures developed in structured treatment may be optimised for managing discrete stressors and internal craving states but may be less well suited to sustaining adaptive functioning under ambient, unresolvable threat. This mismatch hypothesis that standard recovery coping tools may be insufficiently calibrated for continuous traumatic stress is speculative but empirically

testable and may explain why stable-recovery participants were more vulnerable in this wartime context. Future pre-registered longitudinal designs should explicitly test this possibility. Many relapse-prevention tools are designed to manage discrete internal or interpersonal triggers, such as craving, negative affect, or interpersonal conflict. They may be less well suited to sustained adaptation under conditions in which the source of threat is external, ongoing, and not readily controllable. This interpretation remains hypothetical, but it offers one possible explanation for why greater recovery duration did not function as a uniformly protective factor in the present sample.

Clinical implications

These findings carry direct implications for addiction and trauma services operating during wars, pandemics, natural disasters, or other prolonged collective crises. Most fundamentally, individuals in longer-term recovery should not be deprioritized for outreach simply because they have sustained sobriety. Three evidence-informed practice recommendations emerge: First, proactive stage-sensitive monitoring should be extended across the full recovery continuum during crises, with particular attention to stable-recovery participants who may have transitioned to less intensive care but remain psychologically vulnerable. Second, trauma-informed relapse-prevention protocols (52) should be systematically activated during collective threat events, with explicit attention to the distinctive vulnerabilities of continuous wartime stress, distinguishing these from the discrete, internally triggered cravings that standard protocols typically target. Third, deliberate preservation of recovery community ties, peer support relationships, mutual aid group participation, sponsor contact should be treated as a clinical priority during collective crises, given recovery capital's documented role in sustaining psychological functioning (29–31). Services may wish to adopt flexible, crisis-responsive support models that allow temporary re-intensification of contact when an external threat is prolonged, including increased session frequency, peer check-ins, and re-engagement of sponsor relationships.

These recommendations align with integrated PTSD–SUD treatment frameworks (18,19), Conservation of Resources theory (47), and emerging evidence on trauma-informed addiction services during collective crises (39).

Strengths and Limitations

This study captures a clinical population of adults in structured abstinence-based recovery assessed under active wartime conditions, with a near-complete participation rate (~95%) that substantially limits self-selection bias. To our knowledge, no published study has previously documented within-recovery-stage differences in psychological functioning during an active civilian armed conflict. The excellent PCL-5 internal consistency ($\alpha = .91$) supports confidence in the primary outcome measurement.

Limitations

Given the rarity and clinical complexity of the study population, the modest sample size reflects an inherent constraint of conflict-based clinical research; it nonetheless limits power for more complex

interaction modelling. The cross-sectional design precludes causal inference, and observed associations may reflect unmeasured confounding. Conflict exposure was not quantified with a validated exposure instrument, and the PCL-5 should be interpreted considering the war-related anchoring used in the survey. Group ascertainment was not fully symmetrical, particularly because the community comparison group was less intensively characterized than the clinical recovery cohort. The substance-related composite was study-specific and was not operationalized identically across groups. The study examined an abstinence-based pathway with ongoing professional treatment and may not generalize to natural recovery or medication-assisted treatment. Recovery capital the principal theoretical mechanism invoked in the interpretation was not directly measured. Finally, survivorship and treatment-engagement bias cannot be excluded. Several potentially relevant variables including conflict exposure severity, trauma history, type of primary substance, and sex- or gender-disaggregated effects—were not examined and should be addressed in future research with larger samples. Future studies should also incorporate direct neuropsychological assessment of inhibitory control under stress, validated measurement of recovery capital as a mediating variable, and conflict-exposure instruments calibrated for continuous threat environments. Accordingly, the present study is best understood as identifying a clinically meaningful and theoretically provocative pattern of association rather than as establishing causality or confirming a specific explanatory mechanism.

Conclusions

In a clinical sample assessed during active armed conflict with a near-complete participation rate, participants in structured abstinence-based recovery reported lower PTSD symptom severity and better psychosocial functioning than a regional community comparison group. Within the recovery cohort, however, longer sobriety duration was associated with greater, not lesser, distress and substance-related burden—a pattern that may reflect the gradual loosening of therapeutic containment as recovery progresses, including fewer mandatory sessions, reduced clinical monitoring, less reliance on peer accountability and staff guidance, and greater personal autonomy, which under ordinary conditions mark clinical success but under prolonged collective threat may diminish the behavioral discipline and external support that earlier-stage participants still receive. These findings challenge the assumption that recovery is uniformly cumulative in its protective benefits and support stage-sensitive, trauma-informed care across the full recovery continuum during collective crises. They establish an empirical foundation for prospective longitudinal research with larger samples, validated conflict-exposure measurement, direct recovery capital assessment, and pre-registered designs. Clinically, these findings suggest that individuals in stable recovery may be at risk of being overlooked during collective crises if reduced treatment intensity is assumed to indicate reduced vulnerability. Prospective longitudinal studies are now needed to clarify causality, identify mechanisms, and determine which forms of clinical and social support are most protective at different recovery stages during collective crises.

Abbreviations

ANCOVA

Analysis of covariance
COR
Conservation of Resources
DSM-5
Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition
HPA
Hypothalamic-pituitary-adrenal
PCL-5
PTSD Checklist for DSM-5
PTSD
Post-traumatic stress disorder
SIMOR
Social Identity Model of Recovery
SUD
Substance use disorder
TIPI
Ten-Item Personality Inventory.

Declarations

Ethics approval and consent to participate. This study received ethical approval from the Research Ethics Committee of Western Galilee Academic College. All participants provided written informed consent prior to participation. All procedures were conducted in accordance with the Declaration of Helsinki.

Consent for publication. Not applicable.

Availability of data and materials. The datasets generated and/or analyzed during the current study are not publicly available due to the sensitive nature of the clinical population and the risk of indirect identification but are available from the corresponding author on reasonable request, subject to ethics committee approval and applicable data-use requirements.

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Authors' contributions. CHR conceptualized and designed the study, supervised data collection, led the statistical analysis, drafted the manuscript, and approved the final version. SD conducted the study interviews and participant sessions and contributed to research design. CG contributed to study design, participated in manuscript writing, and critically revised the manuscript. NR participated in manuscript writing and critically revised the manuscript. SB and YB facilitated participant recruitment, contributed to

the methodological design and interpretation of findings. All authors read and approved the final manuscript. RN contributed to data interpretation and critically revised the manuscript.

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Figures

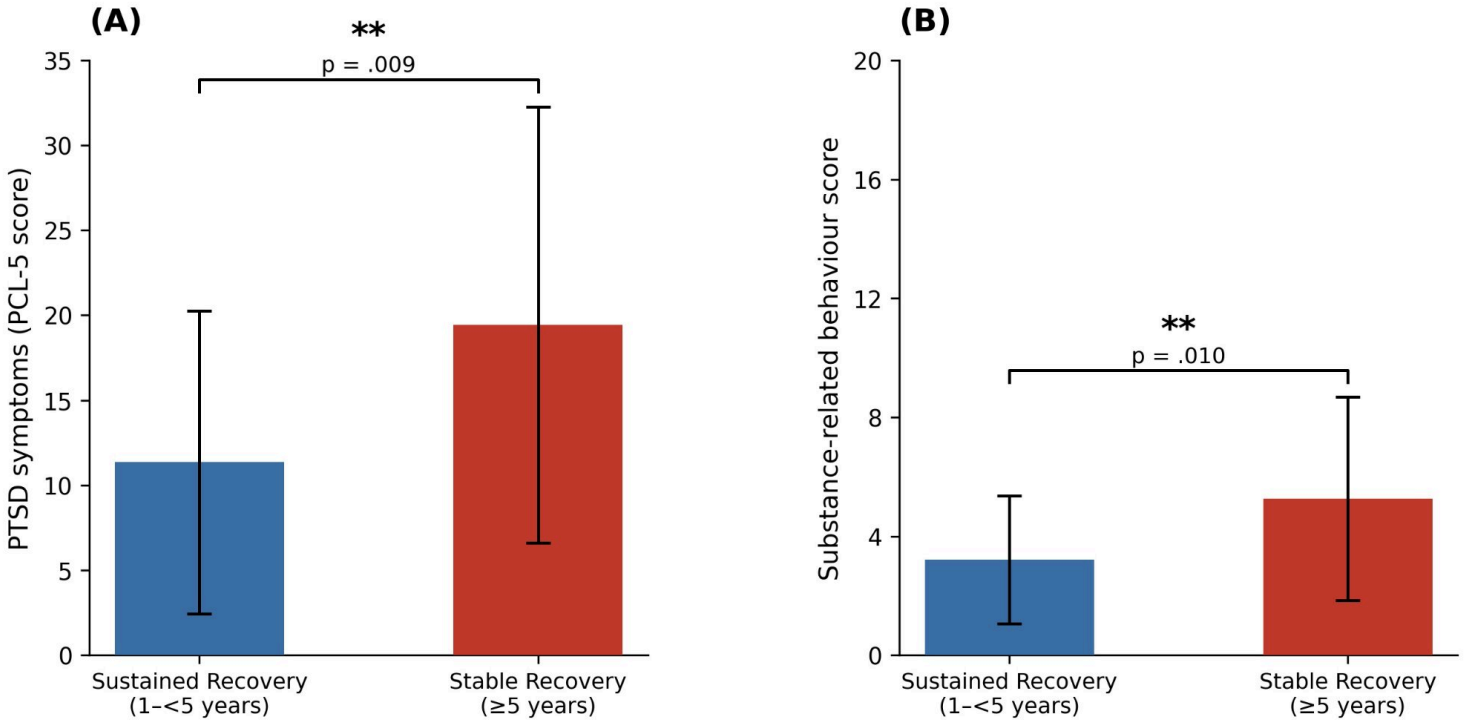


Figure 1

PTSD Symptoms (Panel A) and Substance-Related Behaviour Score (Panel B) by Recovery Stage.

Note. Bars represent group means; error bars represent standard deviations. Sustained recovery = 1–<5 years (n = 28; blue). Stable recovery = ≥5 years (n = 27; red). Panel A: PCL-5 total score (instrument range: 0–80; Y-axis: 0–35 to display data distribution). Panel B: Substance-related behavior score from a 6-item composite measure (0–24 scale; Y-axis: 0–20). **p ≤ .01.