Posting of this PDF is not permitted. | For reprints or permissions, contact permissions@psychiatrist.com. | © 2025 Physicians Postgraduate Press, Inc.

A Year in the Shadow of Terror:

Longitudinal Effects of the October 7, 2023, Terrorist Attack on PTSD, Depression, Anxiety, and Suicidal Ideation Across Distinct Exposure Groups

Yossi Levi-Belz, PhD; Doron Amsalem, MD; Yoav Groweiss, PhD; Carmel Blank, PhD; Iris Shachar-Lavie, PhD; and Yuval Neria, PhD

Abstract

Background: On October 7, 2023, Israel experienced a large-scale terrorist attack followed by a prolonged war, exposing civilians and military personnel to acute and sustained trauma. While prior studies have documented short-term psychological effects of mass trauma, few have included baseline assessments or addressed long-term trajectories across distinct exposure groups. In this study, we aimed to examine changes over time in both probable diagnoses and symptom severity of posttraumatic stress disorder (PTSD), depression, anxiety, and suicidal ideation (SI), while accounting for preattack symptom levels among different exposed groups.

Methods: A prospective, representative study assessed 614 Israeli participants (309 females; 50.3%) through an online survey conducted across 3 time points: prior to the attack (T1), 1 month after (T2), and 1 year later (T3). Participants were categorized into 4 mutually exclusive exposure groups based on a predefined hierarchy prioritizing the most impactful exposure: direct exposure, bereavement (loss of a close other), reserve-duty combatants, and indirect exposure. Probable diagnoses of PTSD (using the International Trauma Questionnaire), depression (Patient Health Questionnaire-2), and anxiety (Generalized Anxiety Disorder-2) were assessed along with symptom severity and SI (SI by the Columbia-Suicide Severity Rating Scale). Generalized estimating equations were used to examine main and interaction effects of exposure type and time (T2 to T3), controlling for baseline symptom levels (T1).

Results: Overall, prevalence and severity of psychiatric symptoms declined between T2 and T3. However, exposure group moderated these changes. Reserve-duty combatants exhibited the highest rates of probable diagnoses and symptoms at both time points, with minimal improvement over time. In contrast, indirectly exposed participants demonstrated significant symptom reduction. Uniquely, SI increased over time among reserve-duty participants, highlighting their vulnerability.

Conclusions: Recovery following mass trauma such as the October 7th attack is not uniform. Exposure type and initial distress levels shape distinct psychological trajectories. Findings underscore the importance of differentiated, long-term, and trauma-informed interventions—especially for bereaved and reserve-duty individuals. Integration of baseline mental health data enhances risk identification and has critical implications for both clinical care and policy planning in the context of ongoing national crises.

J Clin Psychiatry 2025;86(4):25m15970

Author affiliations are listed at the end of this article.

On October 7, 2023, Israel experienced one of the most devastating terrorist attacks in its history.[1] In a coordinated assault by Hamas, over 1,200 civilians and soldiers were murdered, thousands were injured, and entire communities in the southern region were subjected to extreme violence and direct threat to life. Many individuals suffered the sudden loss of close relatives, while the psychological impact echoed across the nation.[2,3] In the aftermath, Israel launched a prolonged military operation, resulting in an ongoing war that has lasted over a year. Tens of thousands of civilians were recruited for active reserve duty combatants, many serving in combat under continuous threat and strain. This convergence of direct exposure, bereavement, and prolonged military involvement created a unique national trauma context with both acute and long-term mental health implications.[4,5]

Consistent with previous mass trauma research—such as the 9/11 attacks[6–8] and prior Israeli conflicts[9]—early data following October 7th showed high psychological distress. A national survey reported that ~30% of respondents met criteria for probable posttraumatic stress disorder (PTSD), over 40% for major depressive disorder (MDD), and similarly for generalized anxiety

Scan Now

Cite and Share this article at Psychiatrist.com

Clinical Points

- While extensive literature has explored trauma's impact after discrete events, little is known about mental health trajectories during prolonged, ongoing national crises. This study addresses that gap using a rare 3-wave design that includes preevent baseline data.
- When assessing psychological risk after collective trauma, clinicians should attend not only to direct exposure but also to bereavement and reserve-duty status, as each group presents unique long-term risk patterns for PTSD, depression, anxiety, and suicidality.
- Mental health practitioners should monitor symptom changes over time—not just immediate responses—especially in high-risk subgroups such as bereaved individuals and reserve combatants, who may exhibit delayed or persistent distress over a year posttrauma.

disorder (GAD).[3,10] These findings highlight the event's severe mental health toll and align with extensive evidence supporting a dose-response relationship between trauma severity and short-term psychopathology. For example, studies following the 9/11 attacks,[7] the Second Lebanon War,[10] and the 2014 Israel–Gaza conflict[11] have consistently shown that individuals with higher levels of exposure—such as proximity to violence, bereavement, or direct threat—reported significantly higher levels of PTSD, depression, and anxiety symptoms compared to those with lower exposure levels.

Importantly, the long-term course of mental health symptoms after a national trauma, especially under prolonged warfare and societal strain, remains poorly understood. While trauma responses vary widely,[12,13] with some showing resilience and others developing chronic or delayed symptoms,[7,14,15] most studies lack preevent baseline data, limiting the ability to distinguish new-onset symptoms from preexisting distress.

Although prior studies have identified directly exposed individuals, bereaved, and reserve-duty combatants as high-risk for prolonged distress,[7,16,17] little is known about their distinct symptom trajectories over time when controlling for initial distress. Reserve-duty combatants may be especially vulnerable due to ongoing life-threatening exposure,[18] cumulative operational stress,[19,20] and potential moral injury from ethically challenging combat roles.[21,22] Importantly, unlike full-time military personnel, these reserve-duty combatants experienced an abrupt transition from civilian to combat roles, often involving significant disruptions to family, work, and psychological stability.[21] This sudden shift may contribute to their heightened vulnerability in comparison to both civilians and regular military forces. These compounded exposures, layered over posttrauma civilian responsibilities, may impede recovery and lead to persistent symptoms. Thus, prospective longitudinal data—anchored in pretrauma baseline and capturing diagnostic prevalence, incidence, and symptom severity across exposure types—are essential.

The Current Study

To address these gaps, the present study longitudinally examined probable PTSD, MDD, and GAD diagnoses, symptom severity, and suicidal ideation (SI) before and after the October 7th attack and ensuing war. Building on prior work highlighting elevated mental health burden after mass trauma,[7] the study examined 4 exposure groups: (1) individuals who were directly exposed to the attack, (2) individuals who experienced the bereavement of a close other due to the attack, (3) individuals who served in reserve military duty as active combatants during or immediately after the crisis, and (4) individuals with indirect exposure only, ie, those who were not directly exposed, bereaved, or called for reserve duty, yet were affected by the broader societal impact of the attack.

In cases where participants met criteria for more than 1 exposure group, we applied a hierarchical classification scheme (direct exposure > loss > reserve duty), assigning each participant to the most severe type of exposure. This decision was guided by prior literature indicating differential psychological risk across exposure types. Specifically, direct life-threatening exposure has been consistently linked to elevated risk for PTSD and depression (eg, Neria et al[23]), while violent bereavement carries heightened vulnerability for prolonged grief and comorbid psychopathology (eg, Kristensen et al[24]). Reserve duty, although often distressing, may involve variable levels of exposure and higher perceived control, which may buffer psychological impact.[25] While this hierarchy is necessarily reductive and may not capture the complexity of cumulative exposures, it provides a structured method for group comparisons.

Participants were assessed at 3 time points: T1, approximately 1 month prior to the October 7th terrorist attack (serving as a preevent baseline), T2, approximately 1 month postattack, and T3, approximately 1 year later. This design allowed us to control for preexisting symptom levels (T1) and evaluate both short- and longer-term psychological trajectories following the trauma. To our knowledge, this is among the first large-scale longitudinal studies in Israel post October 7th, capturing acute, prolonged, and new onset psychological responses to collective trauma in civilian and military populations.

Our hypotheses were as follows:

1. Exposure-related differences: Individuals in the direct exposure, bereavement, and reserve-duty combatants groups were expected to exhibit

Posting of this PDF is not permitted. | For reprints or permissions, contact permissions@psychiatrist.com. | © 2025 Physicians Postgraduate Press, Inc.

higher levels of probable PTSD, depression, and anxiety, as well as elevated symptom severity across these domains, at both T2 (1 month postattack) and T3 (1 year postattack), compared to indirectly exposed individuals and beyond and above baseline symptom severity, as measured approximately 1 month prior to the attack (T1).
2. Time differences: A general decrease between T2 and T3 will be found in the prevalence of probable diagnoses and in the severity of PTSD, depression, anxiety, and SI symptoms, after controlling for the relevant symptom domain at T1.
3. Exposure × time interaction: A significant interaction was expected between exposure type and time, such that the rate of decline in probable diagnoses and symptom severity would differ across groups. Specifically, we expected a slower reduction among reserve-duty combatants, reflecting prolonged psychological burden, and a steeper decline among those with only indirect exposure, reflecting relative psychological resilience.

METHOD

Study Design and Participants

In this cohort study, we utilized data on a nationally representative sample of Israeli citizens collected from August 20 to 30, 2023 (6–7 weeks before the attack and the ensuing war [T1]), as part of our study on the psychological consequences of the Israeli government's proposed controversial judicial reform. We readministered the measures taken at T1 with the same cohort 2 more times: November 9–19, 2023 (5–6 weeks after the attack [T2]), and November 15–30, 2024 (57–59 weeks after the attack [T3]).

A sample of 614 individuals (309 women, 50.3%) aged 18–85 years (mean age = 41.02 years, SD = 13.79) participated in this longitudinal national survey study. Inclusion criteria called for Israeli citizens over 18 years of age. Additionally, participants were asked to report their location during the attack, and all confirmed that they were in Israel at that time. The initial survey (T1) involved 908 adults. Of the 908 participants at T1, 710 participated at T2 (response rate = 78.1%), and 614 participated at T3 (response rate = 68%). Thus, this study's final sample comprised 614 participants who completed the 2 study measurement points. The final sample's demographic data are presented in Table 1. To assess attrition bias, we compared participants who completed follow-ups with those who dropped out. No significant differences were found in sociodemographic characteristics, baseline symptom severity, or the prevalence of probable diagnoses at T1 between participants who completed follow-ups (T2 and T3) and those who were lost to follow-up.

Procedures

Study participants were recruited online via a professional survey company (Panel4All), which specializes in online studies and offers a probability-based pool panel of about 100,000 Israeli panelists, thus enabling a representative sampling of Israeli society according to various criteria. The company always provides monetary compensation to panelists for their participation. For participant recruitment, we set quotas on key demographic variables before data collection to ensure a demographically balanced sample. We used a quota sampling approach with quotas matching the Israeli national census data regarding age, sex, ethnicity, religiosity, education, and socioeconomic status (SES), as reported by Israel's Central Bureau of Statistics. The survey was closed after the quotas and required sample size were reached. This approach ensured that the sample was comparable to national distributions of these variables.

Participants were provided a link to the online questionnaire, which was constructed using Qualtrics software. All participants received a recruitment letter delineating the study's purpose and the researchers' contact information. Participation was voluntary, and the survey company provides monetary compensation to all panelists. The participants were assured of anonymity, confidentiality, and their right to withdraw from the study freely at any time during the 3 waves. Those agreeing to participate were required to sign an informed consent form. All T1 participants were approached again via email and asked to complete a second questionnaire. All T2 participants were approached for the third time via email and asked to complete the third questionnaire (T3). The Ruppin Academic Center's ethics committee approved the study (protocol Number 175/2023). To ensure participant safety given the sensitive nature of the study (eg, suicide and trauma assessment), all participants received contact information for national mental health helplines and support services at the end of the survey.

Measures

PTSD: International Trauma Questionnaire. The International Trauma Questionnaire (ITQ)[26] is an 18-item self-report measure for PTSD and complex PTSD. This study used the 9 PTSD-specific items: 6 symptom items covering reexperiencing, avoidance, and sense of threat (2 per cluster), rated on a 5-point Likert scale (0–4), and 3 items assessing functional impairment in relationships, work, and other life areas. A probable PTSD diagnosis required endorsement of 1 item from each symptom cluster and 1 impairment item. The ITQ has shown good validity and reliability,[26,27] and in our sample, internal consistency was high at T1 ($\alpha = .86$), T2 ($\alpha = .87$), and T3 ($\alpha = .86$).

Depression: Patient Health Questionnaire-2. The Patient Health Questionnaire-2 (PHQ-2)[28] is a brief, validated

Posting of this PDF is not permitted. | For reprints or permissions, contact permissions@psychiatrist.com. | © 2025 Physicians Postgraduate Press, Inc.

Table 1.

Descriptive Characteristics of the Total Sample and Exposure Subgroups (N = 614)

Sociodemographic variable	Whole sample (n = 614)	Exposure group			
		Indirect exposure (n = 402)	Direct exposure (n = 74)	Loss (n = 73)	Active reserve duty (n = 63)
Age, mean (SD), y	41.02 (13.79)	37.82 (12.43)	40.16 (13.23)	40.16 (13.87)	32.64 (12.25)
Education (years of schooling), mean (SD)	14.10 (1.91)	14.12 (2.05)	14.31 (2.16)	14.45 (2.21)	14.22 (2.11)
Socioeconomic status,[a] mean (SD)	2.53 (1.19)	2.52 (1.15)	2.56 (1.07)	2.83 (1.11)	2.86 (1.03)
Gender, n (%)					
Female	309 (50.3%)	202 (50.3%)	36 (48.7%)	30 (41.7%)	17 (73.3%)
Male	305 (49.7%)	200 (49.7%)	38 (51.3%)	43 (58.3%)	46 (26.7%)
Marital status, n (%)					
Married	406 (66.2%)	265 (65.9%)	48 (65.5%)	56 (76.8%)	34 (53.7%)
Single/divorced/widowed	208 (33.8%)	137 (34.1%)	26 (34.5%)	17 (23.2%)	29 (46.3%)
Immigration, n (%)					
No	541 (88.1%)	351 (87.2%)	64(86.2%)	60 (82.2%)	58 (92.7%)
Yes	73 (11.9%)	51 (12.8%)	10 (13.8%)	13 (17.8%)	8 (7.3%)
Ethnicity, n (%)					
Arab	102 (19.7%)	79 (19.7%)	15 (20.7%)	8 (10.3%)	0 (0%)
Jewish	510 (80.3%)	323 (80.3%)	59 (79.3%)	65 (89.0%)	63 (100%)

[a]By self-reported income on a scale of 1–5, 3 is the average salary (approximately US$3,300 per month in Israel).

depression screener derived from the PHQ-9. It includes 2 items reflecting *DSM-5* core criteria: "little interest or pleasure in doing things" and "feeling down, depressed, or hopeless." Responses are rated on a 4-point Likert scale (0–3). In this study, a cutoff score of ≥3 was used to define probable depression.[28,29] The PHQ-2 demonstrated good internal consistency at T1 (α = .82), T2 (α = .84), and T3 (α = .86).

Anxiety: Generalized Anxiety Disorder-2. The Generalized Anxiety Disorder-2 (GAD-2)[30] is a validated 2-item anxiety screener derived from the GAD-7.[27] Items assess symptom frequency over the past 2 weeks on a 4-point Likert scale (0–3), yielding a total score of 0–6. A cutoff of ≥3 has shown acceptable sensitivity (0.76; 95% CI, 0.55–0.89) and specificity (0.81; 95% CI, 0.60–0.92) for anxiety detection.[31] Internal consistency in the present sample was good across all waves: T1 (α = .86), T2 (α = .87), and T3 (α = .84).

Suicide ideation: Columbia-Suicide Severity Rating Scale. Participants' levels of SI were assessed using the first 3 items of the Columbia-Suicide Severity Rating Scale,[32] a widely recognized gold-standard tool for evaluating suicide risk.[33] These items referred to the previous 2 weeks and included passive SI ("Have you wished you were dead or wished you could go to sleep and not wake up?"), active SI ("Have you actually had any thoughts of killing yourself?"), and active SI with method ("Have you been thinking about how you might kill yourself?"). Responses were rated on a 4-point Likert scale ranging from 0 (not at all) to 3 (nearly every day), and scores were summed to yield a total range of 0–9. The measure demonstrated strong internal consistency in the current sample at both T2 (α = .81) and T3 (α = .79).

Sociodemographic and trauma-related characteristics. Participants provided information on key sociodemographic variables, including age, gender, ethnicity, and SES. In addition, trauma-related characteristics were assessed based on 3 exposure domains. First, direct exposure to the October 7 terrorist attack was defined as being physically present in communities and cities within the Gaza envelope during the assault. Second, bereavement was defined as the loss of a close relative or loved one who was murdered during the attack. Finally, participants reported whether they had been called up for active reserve military duty in the aftermath of the attack and whether they served as combat soldiers for a period exceeding 30 days.

Statistical Analyses

To assess the longitudinal effects of exposure type on probable mental health diagnoses and symptom severity following the October 7th terrorist attack, we conducted a series of generalized estimating equations (GEE) analyses. Two outcome types were modeled: (*a*) probable diagnoses (dichotomous) based on validated cutoffs for PTSD, depression, and anxiety and (*b*) continuous severity scores for PTSD, depression, anxiety, and SI. Variables were assessed at 3 time points: T1 (preattack), T2 (1 month postattack), and T3 (1 year later). All variables were assessed at 3 time points: T1, approximately 1 month before the attack; T2, approximately 1 month after the attack; and T3, approximately 1 year later. The key independent variable was exposure group, categorized into 4 mutually exclusive levels: no exposure, direct exposure, bereavement, and reserve-duty combatants. As discussed, participants who met criteria for more than 1 exposure group were categorized according to a mutually exclusive hierarchy prioritizing the most severe or emotionally impactful exposure: direct exposure, then loss, and

Posting of this PDF is not permitted. | For reprints or permissions, contact permissions@psychiatrist.com. | © 2025 Physicians Postgraduate Press, Inc.

followed by reserve duty. Those not related to each one of these groups were categorized as indirect exposure. This approach reduced misclassification and ensured distinct group comparisons.

Each GEE model included time (T2 vs T3) as a repeated within-subjects factor. For probable diagnoses, binary GEE models with identity link were used to estimate adjusted risk differences, while symptom severity outcomes were analyzed with linear GEE models assuming normal distribution. All models included main effects for exposure group and time, and their interaction (exposure × time) to examine differential changes. Baseline symptom severity at T1 was included as a covariate to control for preattack distress. For SI, where no T1 data were available, baseline depression scores served as a proxy for initial affective risk.

We used an independent working correlation structure and robust (Huber-White) sandwich estimators to account for repeated measures and ensure valid inference. Patterns of missing data were examined using Little's MCAR test, indicating that data were missing completely at random. Given the low proportion of missingness and lack of systematic attrition, multiple imputation was not applied. Analyses were restricted to complete cases with valid data on exposure, time, outcome, and covariate variables. Type III Wald χ^2 tests were used to evaluate model effects. To facilitate interpretation, estimated marginal means (EMMs) and their 95% CIs were extracted for each exposure group at each time point. SPSS (v26.0 for Windows) was used for all analyses.

RESULTS

Prevalence of Probable Psychiatric Diagnoses by Exposure Group and Time

Table 2 displays the estimated prevalence of probable PTSD, depression, and anxiety diagnoses at 2 time points: T2 (approximately 1 month after the October 7th terrorist attack) and T3 (approximately 1 year later). Prevalence rates are stratified by exposure group: indirect exposure, direct exposure, bereavement following the loss of a close other, and active reserve military service as combatants during the war. All models included the corresponding symptom severity at T1 as a covariate (eg, baseline depression scores for the depression model), allowing estimation of changes in probable diagnosis over time while controlling for initial symptom levels.

Probable PTSD. At T2, the highest prevalence of probable PTSD was observed among participants in the bereavement group (43.5%) and the reserve service group (42.3%). Lower rates were found among those with direct exposure (30.9%) and indirect exposure (27.1%). At Time 3, prevalence declined in most groups: bereavement (25.3%), direct exposure (21.3%), and no exposure (20.4%), with only a modest reduction among those in reserve service (35.7%). The GEE analysis revealed a significant main effect of exposure group (Wald $\chi^2 = 10.92$, $P = .012$), as well as a significant main effect of time (Wald $\chi^2 = 12.08$, $P < .001$), reflecting an overall decrease in probable PTSD across the sample. The interaction between group and time was not significant, suggesting that the decline over time was consistent across exposure groups.

Probable depression. A similar pattern was observed for probable depression. At T2, prevalence was highest among those with direct exposure (55.1%), followed by bereavement (50.7%), reserve service (45.1%), and indirect exposure (43.3%). At T3, all groups except the reserve service group showed marked declines: direct exposure (36.7%), loss (28.6%), and no exposure (24.9%). Among those in reserve duty, however, prevalence remained relatively stable (41.8%). The GEE model showed a significant effect of exposure group (Wald $\chi^2 = 8.19$, $P = .042$) and time (Wald $\chi^2 = 26.54$, $P < .001$), with no significant interaction.

Probable anxiety. At T2, the prevalence of probable anxiety was again highest among participants with direct exposure (51.3%), followed by bereavement (43.5%), reserve service (43.1%), and no exposure (41.4%). By T3, prevalence decreased in all groups except reserve service: no exposure (20.3%), direct exposure (31.1%), loss (27.3%), and reserve service (41.8%). The GEE model showed a significant effect of exposure group (Wald $\chi^2 = 8.80$, $P = .032$) and time (Wald $\chi^2 = 21.13$, $P < .001$), while the group × time interaction did not reach statistical significance ($P = .168$).

Symptom Severity by Exposure Group and Time

We also examined levels of symptom severity for PTSD, depression, anxiety, and SI across 4 exposure groups and 2 time points using GEE, controlling for baseline symptom severity at T1 (ie, 1 month prior to the attack). Table 3 presents the results and EMMs by exposure group and time.

Posttraumatic stress symptoms. The GEE analysis revealed a significant main effect of exposure group, Wald $\chi^2 = 23.74$, $P < .001$, and a significant main effect of time, Wald $\chi^2 = 45.87$, $P < .001$. PTSD symptoms were highest among individuals in the reserve duty group, followed by bereaved and directly exposed individuals. The interaction between exposure and time was not statistically significant, Wald $\chi^2 = 4.52$, $P = .211$, although descriptive trends indicated a larger decrease in symptoms among bereavement and indirect exposure groups. Estimated PTSD symptom means decreased across all groups from T2 to T3, except for a relatively small decrease among reserve-duty participants.

Depressive symptoms. For depression, the GEE analysis revealed a marginally significant main effect of exposure group, Wald $\chi^2 = 6.53$, $P = .088$, a significant main effect of

Posting of this PDF is not permitted. | For reprints or permissions, contact permissions@psychiatrist.com. | © 2025 Physicians Postgraduate Press, Inc.

Table 2.

Weighted Percent Positive for Probable Diagnoses as a Function of Time and Type of Exposure (n = 614)

	1 month after October 7th (T2)				1 year after October 7th (T3)						
Probable diagnosis	Indirect exposure[a] (n = 402) % [CI]	Direct exposure[b] (n = 74) % [CI]	Loss[c] (n = 73) % [CI]	Active reserve duty[d] (n = 63) % [CI]	Indirect exposure[a] (n = 402) % [CI]	Direct exposure[b] (n = 74) % [CI]	Loss[c] (n = 73) % [CI]	Active reserve duty[d] (n = 63) % [CI]	Main effect: exposure (Wald χ^2)	Main effect: time (Wald χ^2)	Interaction (Wald χ^2)
PTSD	27% [24.2–30.2]	31% [27.8–34.1]	44% [40.2–46.9]	42% [39.0–45.7]	20% [17.9–23.2]	21% [18.7–24.1]	25% [22.5–28.3]	36% [32.5–39.0]	10.08**	21.13***	5.05
Depression	43% [40.0–46.7]	55% [51.7–58.5]	51% [47.3–54.1]	45% [41.7–48.6]	25% [22.1–27.9]	37% [33.5–40.0]	29% [25.6–31.8]	42% [38.5–45.2]	8.19*	26.54***	4.01
Anxiety	41% [38.1–44.8]	51% [47.9–54.7]	44% [40.2–46.9]	43% [39.7–46.6]	20% [17.8–23.1]	31% [28.1–34.2]	27% [24.3–30.5]	42% [38.5–45.2]	8.80*	21.13***	5.01

[a]Indirect exposure = not directly exposed, bereaved, or mobilized, but affected by the broader societal impact.
[b]Direct exposure = physically present in locations targeted during the October 7th attacks.
[c]Loss = experienced the death of a close relative due to the attack.
[d]Active reserve duty = called to active combat military reserve service during the attack and the subsequent war.
*P < .05; **P < .01; ***P < .001.
Abbreviation: PTSD = posttraumatic stress disorder.

Table 3.

Estimated Mean Symptom Severity Scores and SEs for PTSD, Depression, Anxiety, and Suicidal Ideation by Exposure Group and Time Point (n = 614)

	1 month after October 7th (T1)				1 year after October 7th (T1)						
	Indirect exposure[a] (n = 402) Mean (SE)	Direct exposure[b] (n = 74) Mean (SE)	Loss[c] (n = 73) Mean (SE)	Active reserve duty[d] (n = 63) Mean (SE)	Indirect exposure[a] (n = 402) Mean (SE)	Direct exposure[b] (n = 74) Mean (SE)	Loss[c] (n = 73) Mean (SE)	Active reserve duty[d] (n = 63) Mean (SE)	Main effect: exposure (Wald χ^2)	Main effect: time (Wald χ^2)	Interaction (Wald χ^2)
PTSD symptoms	8.86 (0.26)	10.23 (0.63)	11.04 (0.70)	11.04 (0.86)	6.60 (0.31)	8.70 (0.53)	7.84 (0.63)	9.51 (0.70)	23.74***	45.87***	4.52
Depressive symptoms	2.61 (0.08)	2.91 (0.19)	2.70 (0.22)	2.55 (0.24)	1.65 (0.09)	2.10 (0.18)	1.78 (0.18)	2.36 (0.25)	6.53*	54.96***	7.92*
Anxiety symptoms	2.51 (0.09)	2.85 (0.21)	2.74 (0.23)	2.71 (0.23)	1.50 (0.09)	2.13 (0.18)	1.83 (0.18)	2.33 (0.25)	12.07**	54.53***	6.28
Suicidal ideation levels	4.07 (0.08)	3.83 (0.18)	4.20 (0.23)	4.55 (0.26)	3.68 (0.08)	3.81 (0.17)	3.77 (0.16)	4.93 (0.34)	10.31**	1.43	9.92*

[a]Indirect exposure = not directly exposed, bereaved, or mobilized, but affected by the broader societal impact.
[b]Direct exposure = physically present in locations targeted during the October 7th attacks.
[c]Loss = experienced the death of a close relative due to the attack.
[d]Active reserve duty = called to active combat military reserve service during the attack and the subsequent war.
*P < .05; **P < .01; ***P < .001.
Abbreviation: PTSD = posttraumatic stress disorder.

time, Wald $\chi^2 = 54.96$, $P < .001$, and a significant interaction between exposure and time, Wald $\chi^2 = 7.92$, $P = .048$. Across all groups, depressive symptom severity was higher at T2 and declined at T3. Notably and as can be seen in Figure 1, individuals with indirect exposure demonstrated the largest decrease, while those in the reserve-duty group showed minimal change.

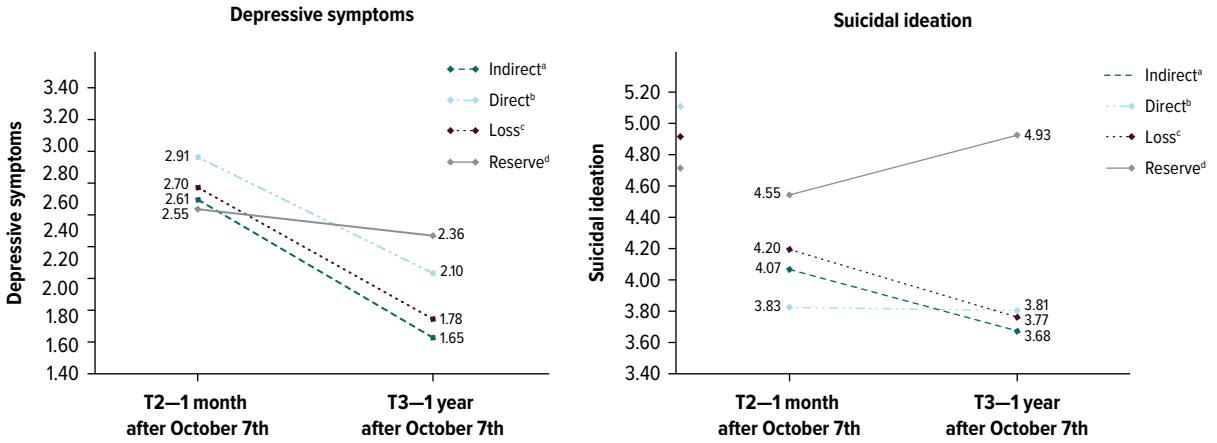
Anxiety symptoms. The GEE analysis revealed a significant main effect of exposure group, Wald $\chi^2 = 12.07$, $P = .007$, and a significant main effect of time, Wald $\chi^2 = 54.53$, $P < .001$. The exposure × time interaction did not reach significance. Mean anxiety scores were highest among the reserve-duty and bereaved groups. Across groups, anxiety symptoms generally declined from T2 to T3. The reduction was the modest among the reserve-duty group and the highest among the indirect exposure group.

Suicidal ideation levels. The GEE analysis indicated a significant main effect of exposure group, Wald $\chi^2 = 10.31$, $P = .016$, and a significant exposure × time interaction, Wald $\chi^2(3) = 9.92$, $P = .019$. The main effect of time was not

Posting of this PDF is not permitted. | For reprints or permissions, contact permissions@psychiatrist.com. | © 2025 Physicians Postgraduate Press, Inc.

Figure 1.

Changes in Depressive Symptoms and Suicidal Ideation Between 1 Month and 1 Year After October 7, by Exposure Group (n = 614)



[a]Indirect exposure = not directly exposed, bereaved, or mobilized, but affected by the broader societal impact.
[b]Direct exposure = physically present in locations targeted during the October 7th attacks.
[c]Loss = experienced the death of a close relative due to the attack.
[d]Active reserve duty = called to active combat military reserve service during the attack and the subsequent war.

significant. Notably and as can be seen in Figure 1, while SI scores decreased slightly across most groups over time, reserve-duty participants showed an increase, which may sustain or worsening distress in this group.

DISCUSSION

This longitudinal study explored the psychological impact of the October 7th, 2023, terrorist attack across 4 exposure groups: indirect exposure, direct exposure, bereavement, and reserve-duty combatants. Assessments were conducted 1 month (T2) and 1 year (T3) postattack. Critically, preattack baseline data (T1) enabled control for initial symptom severity, enhancing the accuracy of identifying trauma-related mental health changes and addressing a key gap in previous mass trauma studies.

Overall, findings indicated a general decline in probable psychiatric diagnoses of PTSD, depression, and anxiety as well as in symptom severity and SI across the sample, aligning with naturalistic recovery processes described in trauma literature.[12,13] However, significant group differences emerged, with recovery trajectories varying based on exposure type even after adjusting for baseline distress levels.

Combat reserve-duty participants consistently exhibited the highest symptom severity and prevalence of probable diagnoses at both T2 and T3, with minimal reductions over time in compared to other groups. This pattern may reflect the unique psychological burden faced by reserve-duty combatants, who—unlike civilians—were exposed to prolonged life-threatening danger, cumulative operational stress, and ethically complex situations potentially inducing moral injury.[22,34,35] These continued exposures beyond the initial traumatic event may disrupted natural recovery and sustained psychological distress.[20]

Bereaved individuals exhibited consistently high PTSD and depression symptoms, with only partial reduction over time, maintaining elevated risk relative to the indirectly exposed group. This is consistent with research on the enduring impact of violent, sudden loss in traumatic grief contexts.[7,36] Conversely, those directly exposed showed high initial distress but improved significantly by 1 year postattack, reflecting recovery patterns typical of acute trauma.[7,37,38] The indirect exposure group demonstrated the strongest recovery, aligning with the dose-response model[39] and prior findings on psychological resilience.[12,40]

Suicidal ideation findings were especially concerning, as reserve-duty combatants were the only group to show increased SI from T2 to T3. Other groups showed stable or declining levels. This pattern may reflect the cumulative impact of prolonged deployment, detachment from civilian life, ongoing threat, and insufficient psychological support. Additionally, the civilian setting of the conflict likely exposed reserve-duty combatants to morally injurious experiences—recognized contributors to suicidality in military populations[41–43] and in times of war.[44] These conceptual concerns are aligned with prior evidence of increased suicide risk following mass trauma.[45]

In the present context, morally injurious experiences may have stemmed not only from the initial trauma of the October 7th attack but also from the prolonged military

Posting of this PDF is not permitted. | For reprints or permissions, contact permissions@psychiatrist.com. | © 2025 Physicians Postgraduate Press, Inc.

engagement in Gaza, where reserve-duty soldiers may have encountered ethically distressing situations involving sustained friction with civilian populations. This dual exposure has been linked to heightened risk for moral injury and psychological distress,[46] particularly in a war characterized by asymmetry and intense public scrutiny. While not directly measured in this study, such conceptual considerations underscore the importance of targeted suicide prevention efforts, including systematic SI screening, trauma-informed care, and long-term follow-up for reserve-duty combatants. These supports should be integrated into national military mental health frameworks, with specific attention to moral injury and prolonged adjustment difficulties.

The present findings should be interpreted in light of several methodological limitations. First, all variables were assessed using self-report measures, which may be subject to reporting biases. Moreover, as SI assessments were based on self-reported recall of the prior 2 weeks, responses may have been affected by current psychological distress or exposure severity, potentially leading to recall bias in the SI estimates. Related to that, while the PHQ-2 and GAD-2 are validated screening tools, they do not constitute diagnostic assessments. Thus, in this study, we identified them as *probable* depression and anxiety cases, which may over- or underestimate prevalence. Second, although the 1-year follow-up provides important insight into posttraumatic adjustment, longer-term assessments are necessary to identify extended trajectories and potential delayed-onset psychopathology. Third, the hierarchical exposure classification (direct > loss > reserve duty) may oversimplify complex, overlapping experiences. Although theory-driven, this approach might obscure cumulative effects. Future studies should explore multidimensional models of exposure. Future research should also examine alternative, nonhierarchical models to better capture the complexity of war-related stressors. Moreover, the absence of significant exposure × time interactions for some outcomes may be due to limited statistical power rather than true null effects, especially given the moderate sample sizes in certain exposure groups (eg, n = 63 in the reserve-duty group).

Fourth, certain high-risk or marginalized subgroups such as Arab citizens, evacuees, and displaced individuals may be underrepresented in the current sample. As such, further research is warranted to examine their unique psychological responses in the wake of the October 7th attack and the ongoing war. More specifically, Arab participants are unevenly distributed across exposure groups due to exemption from reserve duty and residential segregation. As such, they are not represented in the "reserve-duty" group and are underrepresented in some of the hardest-hit areas, limiting ethnic comparisons across exposure types. Lastly, our models did not include age, gender, ethnicity, or SES as covariates, although these factors may influence both exposure classification (eg, younger men more likely to be in reserve duty) and mental health outcomes. Future studies should incorporate these variables to better disentangle their potential confounding effects.

CONCLUSIONS AND IMPLICATIONS

In summary, this study highlights the varying psychological impact of the October 7th attack and war, showing that recovery differs by exposure type—especially when stressors are prolonged or involve severe moral injuries. Using preattack baseline data, we provide strong evidence of diverse recovery trajectories following mass trauma.[12] The findings challenge "one-size-fits-all" interventions, stressing the need for long-term, trauma-informed support for reserve-duty combatants and bereaved individuals.

The findings of this study hold critical implications for mental health policy and clinical practice in contexts of national trauma and protracted conflict. First, the results underscore the importance of proactive screening and stepped-care models within both civilian and military frameworks, particularly during ongoing hostilities. Mental health services must anticipate not only immediate reactions but also delayed or chronic trajectories and respond with continuity, flexibility, and cultural sensitivity.[1] Second, the identification of bereaved individuals and reserve-duty combatants as groups at heightened and persistent psychological risk—even after controlling for pretrauma distress—underscores the need for differentiated, long-term mental health support, particularly regarding suicide risk.[41,47] Postcrisis care should include systematic screening for suicidal ideation, trauma- and moral-injury-informed interventions (eg, Litz et al[48]), and programs aimed at enhancing belongingness and reducing social disconnection—protective factors shown to mitigate suicidality.[49] Standard short-term crisis interventions may be insufficient for these populations, given their exposure to cumulative stressors, unresolved grief, and morally injurious experiences.[5]

Article Information

Published Online: September 3, 2025. https://doi.org/10.4088/JCP.25m15970
© 2025 Physicians Postgraduate Press, Inc.
Submitted: May 29, 2025; accepted July 8, 2025.

To Cite: Levi-Belz Y, Amsalem D, Groweiss Y, et al. A year in the shadow of terror: longitudinal effects of the October 7, 2023, terrorist attack on PTSD, depression, anxiety, and suicidal ideation across distinct exposure groups. *J Clin Psychiatry.* 2025; 86(4):25m15970.

Author Affiliations: The Lior Tsfaty Center for Suicide and Mental Pain Studies, Ruppin Academic Center, Emek Hefer, Israel (Levi-Belz, Groweiss, Blank); Department of Behavioral Sciences, Ruppin Academic Center, Emek Hefer, Israel (Levi-Belz, Blank); Department of Psychiatry and New York State Psychiatric Institute, Columbia University

Posting of this PDF is not permitted. | For reprints or permissions, contact permissions@psychiatrist.com. | © 2025 Physicians Postgraduate Press, Inc.

Irving Medical Center, New York, New York (Amsalem, Neria); Clinical Psychology Department, Ruppin Academic Center, Emek Hefer, Israel (Shachar-Lavie).

Corresponding Author: Yossi Levi-Belz, PhD, The Lior Tsfaty Center for Suicide and Mental Pain Studies, Ruppin Academic Center, Emek Hefer, 40250 Israel (Yossil@ruppin.ac.il).

Relevant Financial Relationships: The authors report no financial or other relationship relevant to the subject of this article.

Funding/Support: This research was supported by grant 123/2024 from the Gottesman Fund.

Role of the Funder: None.

Data Sharing: The data supporting the findings of this study are available from the corresponding author (Y.L.B.) upon reasonable request.

References

1. Katsoty D, Greidinger M, Neria Y, et al. A prediction model of PTSD in the Israeli population in the aftermath of october 7th, 2023, terrorist attack and the Israel–Hamas war. *Isr J Health Pol Res*. 2024;13(1):63.
2. Amsalem D, Haim-Nachum S, Lazarov A, et al. The effects of war-related experiences on mental health symptoms of individuals living in conflict zones: a longitudinal study. *Sci Rep*. 2025;15(1):889.
3. Levi-Belz Y, Groweiss Y, Blank C, et al. PTSD, depression, and anxiety after the October 7, 2023 attack in Israel: a nationwide prospective study. *eClinicalMedicine*. 2024;68:102418.
4. Groweiss Y, Blank C, Hamdan S, et al. The mental health impact of the October 7th terror attack on Jews and Arabs in Israel: a nationwide prospective study. *Psychiatry Res*. 2024;337:115973.
5. Neria Y, Markowitz JC, Amsalem D, et al. Israeli mental health in the aftermath of the October 7 terrorist attack: risks, challenges, and recommendations. *Isr J Health Pol Res*. 2025;14(1):25.
6. Neria Y, DiGrande L, Adams BG. Posttraumatic stress disorder following the September 11, 2001, terrorist attacks: a review of the literature among highly exposed populations. *Am Psychol*. 2011;66(6):429–446.
7. Neria Y, Wickramaratne P, Olfson M, et al. Mental and physical health consequences of the September 11, 2001 (9/11) attacks in primary care: a longitudinal study. *J Trauma Stress*. 2013;26(1):45–55.
8. Ganzel B, Casey BJ, Glover G, et al. The aftermath of 9/11: effect of intensity and recency of trauma on outcome. *Emotion*. 2007;7(2):227–238.
9. Shalev AY, Tuval R, Frenkiel-Fishman S, et al. Psychological responses to continuous terror: a study of two communities in Israel. *Am J Psychiatry*. 2006; 163(4):667–673.
10. Levi-Belz Y, Amsalem D, Groweiss Y, et al. The role of PTSD-depression comorbidity in long-term mental health sequalae of the October 7th terror attack in Israel: a nationwide prospective study. *J Affect Disord*. 2025;381:410–417.
11. Feingold D, Neria Y, Bitan DT. PTSD, distress and substance use in the aftermath of October 7th, 2023, terror attacks in Southern Israel. *J Psychiatr Res*. 2024;174: 153–158.
12. Bonanno GA, Chen S, Bagrodia R, et al. Resilience and disaster: flexible adaptation in the face of uncertain threat. *Annu Rev Psychol*. 2024;75(1):573–599.
13. Galatzer-Levy IR, Huang SH, Bonanno GA. Trajectories of resilience and dysfunction following potential trauma: a review and statistical evaluation. *Clin Psychol Rev*. 2018;63:41–55.
14. Gelkopf M, Solomon Z, Bleich A. A longitudinal study of changes in psychological responses to continuous terrorism. *Isr J Psychiatry Relat Sci*. 2013;50(2):100–109.
15. Solomon Z, Mikulincer M. Trajectories of PTSD: a 20-year longitudinal study. *Am J Psychiatry*. 2006;163(4):659–666.
16. Levi-Belz Y, Amsalem D, Groweiss Y, et al. The attack is not over yet: the impact of direct exposure to the October 7, 2023, attack on trajectories of PTSD and depression among the Israeli population. *Psychol Trauma*. 2025.
17. Bonanno GA, Mancini AD, Horton JL, et al. Trajectories of trauma symptoms and resilience in deployed US military service members: prospective cohort study. *Br J Psychiatry*. 2012;200(4):317–323.
18. Shahmiri Barzoki H, Ebrahimi M, Khoshdel A, et al. Studying the prevalence of PTSD in veterans, combatants and freed soldiers of Iran-Iraq war: a systematic and meta-analysis review. *Psychol Health Med*. 2023;28(3):812–818.
19. Dekel R, Solomon Z, Ginzburg K, et al. Combat exposure, wartime performance, and long-term adjustment among combatants. *Mil Psychol*. 2003;15(2):117–131.
20. Zasiekina L, Duchyminska T, Bifulco A, et al. War trauma impacts in Ukrainian combat and civilian populations: moral injury and associated mental health symptoms. *Mil Psychol*. 2024;36(5):555–566.
21. Levinstein Y, Zerach G, Levi-Belz Y, et al. Trajectories of moral injury and their associations with posttraumatic stress symptoms among recently discharged Israeli veterans. *J Psychiatr Res*. 2024;177:321–329.
22. Zerach G, Levinstein Y, Levi-Belz Y. Longitudinal associations between transgressions of moral beliefs and suicidal ideation among recently discharged veterans. *Psychiatry Res*. 2023;327:115392.
23. Neria Y, Nandi A, Galea S. Post-traumatic stress disorder following disasters: a systematic review. *Psychol Med*. 2008;38(4):467–480.
24. Kristensen P, Weisæth L, Heir T. Bereavement and mental health after sudden and violent losses: a review. *Psychiatry*. 2012;75(1):76–97.
25. Hoge CW, Castro CA, Messer SC, et al. Combat duty in Iraq and Afghanistan, mental health problems, and barriers to care. *N Engl J Med*. 2004;351(1):13–22.
26. Cloitre M, Shevlin M, Brewin CR, et al. The International Trauma Questionnaire: development of a self-report measure of ICD-11 PTSD and complex PTSD. *Acta Psychiatr Scand*. 2018;138(6):536–546.
27. Shevlin M, Hyland P, Vallières F, et al. A comparison of DSM-5 and ICD-11 PTSD prevalence, comorbidity and disability: an analysis of the Ukrainian Internally Displaced Person's Mental Health Survey. *Acta Psychiatr Scand*. 2018;137(2): 138–147.
28. Kroenke K, Spitzer RL, Williams JB. The Patient Health Questionnaire-2: validity of a two-item depression screener. *Med Care*. 2003;41(11):1284–1292.
29. Manea L, Gilbody S, Hewitt C, et al. Identifying depression with the PHQ-2: a diagnostic meta-analysis. *J Affect Disord*. 2016;203:382–395.
30. Kroenke K, Spitzer RL, Williams JB, et al. Anxiety disorders in primary care: prevalence, impairment, comorbidity, and detection. *Ann Intern Med*. 2007;146(5): 317–325.
31. Spitzer RL, Kroenke K, Williams JB, et al. A brief measure for assessing generalized anxiety disorder: the GAD-7. *Arch Intern Med*. 2006;166(10): 1092–1097.
32. Posner K, Brent D, Lucas C, et al. *Columbia-Suicide Severity Rating Scale (C-SSRS)*. 10. Columbia University Medical Center; 2008:2008.
33. McCall WV, Porter B, Pate AR, et al. Examining suicide assessment measures for research use: using item response theory to optimize psychometric assessment for research on suicidal ideation in major depressive disorder. *Suicide Life Threat Behav*. 2021;51(6):1086–1094.
34. Litz BT, Stein N, Delaney E, et al. Moral injury and moral repair in war veterans: a preliminary model and intervention strategy. *Clin Psychol Rev*. 2009;29(8):695–706.
35. Frankfurt S, Frazier P. A review of research on moral injury in combat veterans. *Mil Psychol*. 2016;28(5):318–330.
36. Kristensen P, Weisæth L, Heir T. Bereavement and mental health after sudden and violent losses: a review. *Psychiatry*. 2012;75(1):76–97.
37. Hansen BT, Østergaard SD, Sønderskov KM, et al. Increased incidence rate of trauma-and stressor-related disorders in Denmark after the September 11, 2001, terrorist attacks in the United States. *Am J Epidemiol*. 2016;184(7): 494–500.
38. Santiago PN, Ursano RJ, Gray CL, et al. A systematic review of PTSD prevalence and trajectories in DSM-5 defined trauma exposed populations: intentional and non-intentional traumatic events. *PloS One*. 2013;8(4):e59236.
39. Norris FH, ed. *Methods for disaster mental health research*. Guilford Press; 2006.
40. Hansen MB, Birkeland MS, Nissen A, et al. Prevalence and course of symptom-defined PTSD in individuals directly or indirectly exposed to terror: a longitudinal study. *Psychiatry*. 2017;80(2):171–183.
41. Levi-Belz Y, Ben-Yehuda A, Zerach G. Suicide risk among combatants: the longitudinal contributions of pre-enlistment characteristics, pre-deployment personality factors and moral injury. *J Affect Disord*. 2023; 324:624–631.
42. Khan AJ, Griffin BJ, Maguen S. A review of research on moral injury and suicide risk. *Curr Treat Options Psychiatry*. 2023;10(3):259–287.
43. Jamieson N, Carey LB, Jamieson A, et al. Examining the association between moral injury and suicidal behavior in military populations: a systematic review. *J Relig Health*. 2023;62(6):3904–3925.
44. Levi-Belz Y, Blank C, Groweiss Y, et al. The impact of potentially morally injurious experience of betrayal on PTSD and depression following the October 7th terror attack. *Scientific reports*. 2024;14(1):18021.
45. Safarpour H, Sohrabizadeh S, Malekyan L, et al. Suicide death rate after disasters: a meta-analysis study. *Arch Suicide Res*. 2022;26(1):14–27.
46. Zerach G, Levi-Belz Y, Griffin BJ, et al. Patterns of exposure to potentially morally injurious events among Israeli combat veterans: a latent class analysis approach. *J Anxiety Disord*. 2021;79:102378.
47. Levi-Belz Y, Levinstein Y, Zerach G. The impact of moral injury on suicide risk among recently discharged Israeli veterans: a longitudinal moderated mediation model of trauma-related guilt and self-forgiveness. *Psychol Trauma*. 2025;17(5): 1023–1032.
48. Litz BT, Lebowitz L, Gray MJ, et al. *Adaptive Disclosure: A New Treatment for Military Trauma, Loss, and Moral Injury*. Guilford Press; 2017.
49. Levi-Belz Y, Shoval-Zuckerman Y, Blank C, et al. The moderating role of belongingness in the contribution of depression to suicide ideation following the October 7, 2023, terrorist attack in Israel: a nationwide prospective study. *J Affect Disord*. 2024;356:292–299.

Posting of this PDF is not permitted. | For reprints or permissions, contact permissions@psychiatrist.com. | © 2025 Physicians Postgraduate Press, Inc.