**SUPPLEMENTARY STATISTICAL ANALYSES**

For each latent construct (symptom category), the analysis includes four steps: (1) identification of an appropriate structure for the base cross-time point measurement model using confirmatory factor analysis; (2) checking measurement invariance for the measurement model across time using likelihood tests; (3) using a variety of functional forms over time, estimate and compare trajectory models using growth curve models constructed using the time-specific factors for the measurement model embedded; (4) estimation and identification of latent trajectory classes using growth mixture models. Analyses were conducted using Mplus version 8.

### **Determination of base measurement models**

Symptoms were assessed at 10 time points within 6 months after enrollment (**Supplementary Table 1**). A joint measurement model that includes all time points is used to define each latent construct and to study the relationship of the time-specific latent construct measurement models at different time points. The temporal correlations of a given indicator variable were generally not fully explained by this joint model. Temporal correlations of error term of same indicator variables at adjacent time points or all time points are introduced to account for the autocorrelations. Model fit indices, such as Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR), are used to evaluate the fit of the measurement model (**Supplementary Table 2**).

### **Measurement invariance**

In order to build trajectory models using the time-specific factors, the consistency of the measurement model needs to be checked and established. Otherwise, the latent constructs defined by the measurement model are not comparable across time. All the measurement models are evaluated for strong (or scalar) invariance across time. Strong measurement invariance means that (1) the factor loading structure underlying these indicator variables are the same; (2) the factor loading parameters are equivalent; (3) the intercept (or mean) parameters of indicator variables are the same. Measurement invariance is tested using the likelihood ratio test. It is not uncommon that some of the model parameters may not satisfy measurement invariance, especially when sample size is large. For example, the intercept parameter of indicator variables may be invariant across time except for the first time point. If only a few of the time points are not invariant, the differences are less than 5%, and they can be explained by substantive reasons, measurement model with partial invariance is used for the rest of the analyses.

### **Estimation of trajectory models using growth curve model, determining best functional form**

The full sample growth trajectory pattern of each latent construct across the 6 months after enrollment were modeled by growth curve models for the time-specific factors of the embedded measurement model. Different trajectory patterns across time, such as linear and piecewise, were explored and the best trajectory pattern for each latent construct was selected based on log likelihood ratio test.

### **Identification of latent trajectory classes using growth mixture models**

Based on the best functional form identified, latent trajectory classes were estimated with that form using growth mixture models (**Supplementary Table 3**). Number of latent class was determined by model fit, Bayesian information criterion (BIC), percentage of participants in each latent class and clinical expectations. Models with convergence issues or latent classes with less than 5% participants are excluded first. Afterwards, BIC is used to select the best model. For models with similar BIC, clinical expectations are used to guide the final model selection. Model output was then used to classify participants into different latent trajectory classes. Trajectory patterns are different across latent classes with respect to either or both the intercept and slopes. In order to successfully estimate these models, a variety of modeling strategies were employed including constraining variance parameters to be positive and correlation parameter estimates to be less than or equal to 1.0, and setting small negative variances that were non-significant to zero. Sometimes the measurement error correlation structure had to be simplified. Identified classes for each symptom are depicted in **Supplementary Figure 1**. Given the smaller cohort subset with epigenetic data, statistical power in the present study was increased by comparing the combined trajectories with low or moderate recovery symptoms vs. those with moderate or high persistent symptoms during the 6 months after trauma.

**SUPPLEMENTARY TABLES**

**Supplementary Table 1. Latent constructs indicator variable questions from smartphone-based follow-up surveys**

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| --- | --- | --- | --- |
| **Latent Constructs** | **Timepoints (first 6 months)** | **Questions** | **Response options** |
| **Sleep Disturbance** | Days: 3, 15, 25, 35, 47, 57, 71, 81, 119, 161 | 1. Over the last few nights, how much of a problem have you had falling asleep? 2. Over the last few nights, how much of a problem have you had staying asleep all night? 3. Over the last few nights, how much of a problem have you had waking up too early in the morning? | None A little Some A lot Extremely  [0] [1] [2] [3] [4] |
| **Nightmares** | Days: 3, 15, 25, 35, 47, 57, 71, 81, 119, 161 | 1. Over the last few nights, how much of a problem have you had with nightmares or bad dreams about the event? 2. Over the last few nights, how much of a problem have you had with nightmares or bad dreams about other things? 3. Over the last few nights, how much of a problem have you had with panic attacks during the night? | None A little Some A lot Extremely  [0] [1] [2] [3] [4] |
| **Avoidance** | Days: 4, 17, 27, 37, 49, 59, 73, 83, 126, 168 | 1. Over the past 24 hours, how often did you avoid memories, thoughts, or feelings related to the event? 2. Over the past 24 hours, how often did you avoid external reminders of the event? (e.g., people, places, conversations, or activities) | Never Rarely Sometimes Often Very often  [0] [1] [2] [3] [4] |
| **Intrusive Memories** | Days: 4, 17, 27, 37, 49, 59, 73, 83, 126, 168 | 1. Over the past 24 hours, how often did you have repeated, disturbing, and unwanted memories of the event? 2. Over the past 24 hours, how often did you feel very upset when something reminded you of the event? 3. Over the past 24 hours, how often did you have strong physical reactions when something reminded you of the event, like heart pounding, trouble breathing, or sweating? | Never Rarely Sometimes Often Very often  [0] [1] [2] [3] [4] |
| **Hyperarousal** | Days: 5, 19, 29, 39, 51, 61, 75, 91, 133, 175 | 1. Over the past 24 hours, how often were you “superalert” or watchful, or on guard? 2. Over the past 24 hours, how often did you feel jumpy or easily startled? | Never Rarely Sometimes Often Very often  [0] [1] [2] [3] [4] |

**Supplementary Table 2.** Measurement Model Fit, Temporal Correlations, and Measurement Invariance. For temporal correlation, None means no extra correlation of error teams, and Adjacent means correlation of error terms of same indicator variable at adjacent time points.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Latent Construct** | **Temporal**  **Correlation** | **CFI** | **TLI** | **SRMR** | **RMSEA** | **Measurement Invariance** |
| Sleep Disturbance | Adjacent | 0.925 | 0.910 | 0.044 | 0.056 | Partial |
| Nightmares | Adjacent | 0.914 | 0.897 | 0.045 | 0.069 | Partial |
| Avoidance | None | 0.983 | 0.977 | 0.013 | 0.038 | Partial |
| Intrusive Memories | None | 0.929 | 0.921 | 0.030 | 0.061 | Partial |
| Hyperarousal | Adjacent | 0.931 | 0.892 | 0.039 | 0.084 | Partial |

**Supplementary Table 3.** Selected trajectory pattern, model fit indices and estimates of intercept and slope parameters of average trajectory models for each latent construct. For Growth Trajectory, Piecewise means linear piecewise trajectory model.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Latent Construct** | **Growth Trajectory** | **CFI** | **TLI** | **SRMR** | **RMSEA** |
| Sleep Disturbance | Piecewise | 0.981 | 0.979 | 0.028 | 0.066 |
| Nightmares | Piecewise | 0.981 | 0.979 | 0.015 | 0.071 |
| Avoidance | Piecewise | 0.976 | 0.974 | 0.025 | 0.073 |
| Intrusive Memories | Piecewise | 0.977 | 0.975 | 0.014 | 0.084 |
| Hyperarousal | Piecewise | 0.978 | 0.976 | 0.020 | 0.081 |

**Supplementary Figure 1.** Graphs depicting the identified latent trajectory classes for each PTSD-related symptom during the 6 months after trauma.