Patterns and predictors of response to treatment for military veterans with PTSD

Assoc Prof Andrea Phelps
Deputy Director, Phoenix Australia Centre for Posttraumatic Mental Health
Acknowledgement

Funded by Department of Veterans’ Affairs
Key patterns and predictors of response to treatment for military veterans with post-traumatic stress disorder: a growth mixture modelling approach


1 Department of Psychiatry, Phoenix Australia – Centre for Posttraumatic Mental Health, University of Melbourne, Level 3, Alan Gilbert Building, 163 Barry St, Carlton, Australia
2 School of Psychological Science, University of Melbourne, Parkville, Australia
3 Phoenix Australia Centre for Posttraumatic Mental Health, Department of Psychiatry, University of Melbourne, Melbourne, Australia
4 School of Psychology, University of New South Wales, Sydney, Australia
5 Psychological Trauma Recovery Service, Austin Health, Melbourne, Australia
6 Trauma Recovery Program, Toowoong Private Hospital, Brisbane, Australia
7 Trauma Recovery Centre, Mater Health Services, Townsville, Australia

Background. To determine the patterns and predictors of treatment response trajectories for veterans with post-traumatic stress disorder (PTSD).

Methods. Conditional latent growth mixture modelling was used to identify classes and predict class membership. In total, 2006 veterans treated for PTSD between 2002 and 2003 across 14 hospitals in Australia completed the PTSD Checklist at intake, discharge, and 3 and 9 months follow-up. Predictor variables included co-morbid mental health problems, relationship functioning, employment and compensation status.

Results. Five distinct classes were found: those with the most severe PTSD at intake separated into a relatively large class (52.5%) with small change, and a small class (3%) with a large change. Those with slightly less severe PTSD separated into one class comprising 40.9% of the total sample with large change effects, and a second class comprising 7.5% with extremely large treatment effects. The final class (6.7%) with least severe PTSD at intake also showed a large treatment effect. Of the multiple predictor variables, depression and guilt were the only two found to predict differences in response trajectories.

Conclusions. These findings highlight the importance of assessing guilt and depression prior to treatment for PTSD, and for severe cases with co-morbid guilt and depression, considering an approach to trauma-focused therapy that specifically targets guilt and depression-related cognitions.

Received 30 January 2017; Revised 23 April 2017; Accepted 3 May 2017

Treatment Outcomes for Military Veterans With Posttraumatic Stress Disorder: Response Trajectories by Symptom Cluster

Andrea J. Phelps1, Zachary Steele2, Sean Cowlishaw3,4, Olivia Metcalfe3, Nathan Alkemade4, Peter Elliott1, Meaghan O’Donnell1, Suzi Redston1, Katelyn Kerr4, Alexandra Howard1, Jane Nurse1, John Cooper1, Renee Armstrong2, Lea Fitzgerald2, and David Forbes1

1 Phoenix Australia Centre for Posttraumatic Mental Health, Department of Psychiatry, University of Melbourne, Melbourne, Australia
2 School of Psychology, University of New South Wales, Sydney, Australia
3 Psychological Trauma Recovery Service, Austin Health, Melbourne, Australia
4 Trauma Recovery Program, Toowoong Private Hospital, Brisbane, Australia
5 Trauma Recovery Centre, Mater Health Services, Townsville, Australia
6 Population Health Sciences, Bristol Medical School, University of Bristol, Bristol, United Kingdom

Although effective posttraumatic stress disorder (PTSD) treatments are available, outcomes for veterans with PTSD are relatively modest. Previous researchers have identified subgroups of veterans with different response trajectories but have not investigated whether PTSD symptom clusters (based on a four-factor model) have different patterns of response to treatment. The importance of this lies in the potential to increase treatment focus on less responsive symptoms. We investigated treatment outcomes by symptom cluster for 2,085 Australian veterans with PTSD. We used Posttraumatic Stress Disorder Checklist if scores obtained at treatment intake, posttreatment, and 3- and 9-month follow-ups to define change across symptom clusters. Repeated measures effect sizes indicated that arousal and numbing symptoms exhibited the largest changes between intake and posttreatment, $d_{	ext{INT}} = -0.61$ and $d_{	ext{POST}} = -0.62$, respectively; whereas avoidance and intrusion symptoms showed more modest reductions, $d_{	ext{INT}} = -0.38$ and $d_{	ext{POST}} = -0.30$, respectively. However, unlike the other symptom clusters, the intrusion cluster continued to show significant changes between posttreatment and 3-month follow-up, $d_{	ext{INT}} = -0.21$. Intensity and arousal symptoms also showed contained changes between 3- and 9-month follow-ups although these effects were very small, $d_{	ext{INT}} = -0.09$. Growth curve model analyses produced consistent findings and indicated modest initial changes in intrusion symptoms that continued posttreatment. These findings may reflect the longer time required for emotional processing, relative to behavioral changes in avoidance, numbing, and arousal, during the program; they also reinforce the importance of prioritizing individual trauma-focused therapy directly targeting intrusions as the core component of programmatic treatment.
Co-authors

Prof Zachary Steel St John of God Richmond and UNSW

Dr Olivia Metcalf Phoenix Australia

Dr Nathan Alkemade Phoenix Australia

Dr Sean Cowlishaw Phoenix Australia

Dr Katelyn Kerr Toowong Private Hospital

Dr Suzy Redston Austin Health

Assoc Prof Peter Elliott, Statistical Consultant

Alexandra Howard Phoenix Australia

Lee Fitzgerald Mater Health Services

Prof Meaghan O’Donnell Phoenix Australia

Jane Nursey Phoenix Australia

Dr John Cooper Phoenix Australia

Renee Armstrong Phoenix Australia

Prof David Forbes, Phoenix Australia
Reason for the investigation

- DVA interest in continual improvement of Trauma Recovery Programs for veterans
- Use the longitudinal database to address key quality improvement questions
- Communicate findings and implications back to Trauma Recovery Programs and more broadly to the field
Background

• 30-50% of veterans don’t derive clinically meaningful benefit from evidence based treatment for PTSD (meta-analysis by Steenkamp, 2015)

• But this is based on average change across the sample

**Aim:** To address two key questions

• Are there sub-classes of veterans based on treatment response? If so, what variables predict these classes?

• Do some symptom clusters respond better to treatment than others?

• Consider treatment implications
Method

- Participants in trauma recovery programs between 2002 and 2015 (n= 2686)
- Treatment standards specify psychoeducation, symptom management, trauma focused therapy, interpersonal and lifestyle issues
- Cohorts of 5-10
- Treatment days 20-30
- 4 assessment points: Intake, Discharge, 3mth and 9mth follow up
Study 1: Are there sub-classes of veterans based on treatment response? If so, what variables predict these classes?

Outcome measure
- PTSD (PCL)

Predictors
- Alcohol (AUDIT)
- Anxiety and depression (HADS)
- Anger (DAR)
- Guilt and dissociation (scale derived from CAPS-IV)
- Pain (single item from WHOQOL-BREF)
- Relationship (Abbreviated DAS)
- Demographic data: age, pension status, compensation-seeking status, employment status
Study 1: Data analysis

• Growth mixture modelling using Mplus

• Identifies classes of individuals with similar response trajectories across the four time points – intake, discharge, 3 month and 9 month follow-up

• Stage 1 – defines the model that best fits the data

• Stage 2 – includes potential predictors of the classes
  
  a) each predictor entered individually, retained if significant results for 50% of comparisons
  
  b) Retained predictors entered simultaneously and non-significant predictors removed
Results

A five class model with depression and guilt as predictors provided the best fit for the data

- **Class 1** (32.5%) Very high start (PCL>67), small change (\(d=0.3\))
- **Class 2** (3.0%) Very high start (PCL>67), large change (\(d=1.0\))
- **Class 3** (49.9%) High start (PCL 60-63), large change (\(d=1.6\))
- **Class 4** (7.9%) High start (PCL 60-63), ex large change (\(d=2.6\))
- **Class 5** (6.7%) Low start (PCL=44), large change (\(d=0.9\))

Entropy was acceptable at 0.64
Mean PCL scores for conditional 5 class growth mixture model with depression and guilt as predictors.
Guilt and depression as predictors of class membership

For those with the most severe PTSD at intake (very high start)

- Guilt scores predicted membership of the small vs large change classes.
- Depression scores didn’t predict class membership (both classes associated with high depression)

- Veterans with the most severe PTSD, depression and guilt, had the poorest treatment response – and this is a substantial group (32.5%)
Guilt and depression as predictors of class membership

For those with less severe although still high PTSD at intake (high start)

- Neither guilt nor depression predicted class membership (large vs ex large change)

  ➢ Factors that predict the strongest outcomes (Class 4 with ES of 2.6; 7.9% of the sample) remain unknown

For those with the least severe PTSD at intake (low start)

- Also low scores on both depression and guilt
Conclusion

• Depression and guilt have previously been linked to poor treatment outcome

• This study highlights that the combination is critical – in severe PTSD, the combination of depression and guilt are more likely to interfere with recovery than either symptom alone

• Why? May interfere with full engagement in trauma focused treatment or successfully processing trauma memories

• A trauma focused approach that directly targets guilt-related cognitions E.g., Adaptive Disclosure if this combination of PTSD, guilt and depression is reflective of moral injury
Study 2: Do some symptom clusters respond more to treatment than others?

- Used PCL for DSM-IV, but items separated into 4 symptom clusters based on King’s (1998) four-factor model
  - Intrusions (items 1-5)
  - Avoidance (items 6-7)
  - Numbing (items 8-12)
  - Arousal (items 13-17)

- Confirmatory factor analysis indicated adequate model fit to the data
Study 2: Data analysis

- Growth curve models, a form of structural equation modelling, used to summarise the pattern of change in each symptom cluster over time

- Examination of the magnitude of change for each symptom cluster (mean across items) and the timing of change
Results

Magnitude of change

• There were significant reductions (small to moderate ES) across time for all symptom clusters with the largest change observed for **arousal** and **numbing**

Timing of change

• Similar for three of the symptom clusters - **avoidance**, **numbing** and **arousal**
  – Trajectories show a sharp fall in symptom level from intake to discharge followed by relatively minor change
• The trajectory for intrusions was different
  – A more gradual and sustained pattern of change over time
PTSD treatment outcomes by symptom cluster
(a) Intrusions, (b) Avoidance, (c) Numbing, (d) Arousal
Discussion

- Participation in the program, regardless of specific therapeutic approach may directly impact avoidance, numbing and arousal
  - Avoidance – surrounded by trauma-related people, places, memories
  - Numbing – making new connections, engaging in meaningful activity
  - Arousal – learning anxiety and anger reduction skills

- Intrusive symptoms are specific to PTSD and need to be targeted through trauma focused treatments
Discussion

• To the extent that avoidance and arousal are barriers to habituation and emotional processing, reduction in their severity allows for more sustained exposure to trauma memories and triggers in the real world – hence, subsequent reduction in intrusions.

• Intrusive symptoms may change only after improvements in the other symptoms – needs further exploration.

• Highlights importance of prioritising individual trauma focused therapy as core component of trauma recovery programs.
Limitations

• Data collected as part of routine program participation
  – No control condition

• Heterogeneity in program content and delivery
  – Information about specific treatment not available
  – Treatment integrity not assessed

• Multi-component, group based treatment with a chronic and complex cohort
  – Limited generalisability
Comments and questions?