

Authors & year	Design	Intervention (I) and Comparison (C)	Population		Delivered to	Dosage (total number of sessions)	Primary Outcome domain (Measure(s))	Secondary Outcome domain (Measure(s))	Total sample size	Participants	
			Mean age (SD) ¹	Gender %						I	C
THERAPY TARGETING ANGER											
CBT- based											
Individual											
Shea, Lambert & Reddy, 2013	RCT with three month follow-up	I: Cognitive behavioural intervention C: Supportive intervention	US veterans (OEF/OIF) Mean age: 36.3 (10.2) Gender: Male	Individual	Twelve weekly 75 minute sessions	- Anger (OAS-M; STAXI-2)	- PTSD (CAPS) - DSM-IV Axis I disorders (SCID-I/P W/PSY) - Anger (DAR7) - Outcomes (OQ)	N= 25	n= 12	n= 11	
Participants who received the intervention showed significantly more improvement than controls on the STAXI-2 Anger Expression Index ($p=.019$), and improvement approached significance on the OAS-M aggression scale ($p <.06$). There was significantly more improvement for the intervention group on the DAR compared to controls ($p=.027$). At follow-up, changes for the intervention group were maintained, and on some scales scores had decreased further (STAXI-2 AX and Expression Out, OAS-M). Overall, participants in both groups rated themselves as being satisfied with treatment that they received.											
Group											
Marshall et al., 2010	Single group pre-post	I: Anger management treatment	US Veterans (76% Vietnam) Mean age: 55 (8.22) Gender: Male	Group	Twelve weekly 90 minute sessions	- Anger (STAXI-2)	- Conflict tactics (CTS) - Personality (MMPI-II)	N= 86	N= 86	N/A	
Significant reductions were found in state and trait anger from pre to post-treatment (small to medium effect sizes). Participants also reported being less physically aggressive after treatment, with an average of 1.24 fewer types of physically aggressive acts during the three months of treatments. Antisocial personality traits were significantly associated with fewer reductions in trait anger and physical aggression, but were not associated with state anger at post-treatment.											
Morland et al., 2010	RCT with six month follow-up	I1: Video-conferencing anger management I2: In-person anger management	US veterans (76% Vietnam war) In person: Mean age: 54.7 (9.7) Videoconference: Mean age = 54.8 (SD=9.3) Gender: Male	Group	Twelve sessions twice weekly	- Anger (STAXI-2; NAS-T)	- PTSD (CAPS, PCL-M) - Comorbidities (SCID)	N= 125	n= 61	n= 64	

At least 9 treatment sessions were completed by n= 112 participants. Participants in both conditions showed improvement post-treatment on mean anger scores (moderate to large effect sizes). ITT analyses showed that there was significant improvement in scores on the STAXI-2 subscales and the NAS-T for both groups. Mean improvements were slightly larger in the video conferencing group compared to the in-person group, however, it is unclear as to whether this difference was significant (due to reporting issues). These results were maintained at six months follow up. No differences were found between groups on attendance, homework completion or frequency of dropouts. Participants in the in-person group reported higher overall group therapeutic alliance.

Strom et al., 2013	Single group pre-post with one month-follow-up	I: CBT for driving-related anger and aggression	US veterans (56% Vietnam war) Mean age: 48.2 (15.3) Gender: Male	Group	Eight sessions	- Anger (Driving Anger Scale; Driving Anger Expression Scale; Trait Anger Scale) - Survey of Driving	- PTSD (PCL-M) - Depression (CES-D)	N= 9	N= 9	N/A
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Results showed that 55.6% of participants demonstrated reliable change in risky driving, and 44.4% showed significant reductions in trait anger. In addition, 66.7% showed significant reductions in depressive and PTSD symptoms. Participants reported high satisfaction with the treatment: 88.9% agreed that "coming to the program made a positive difference in my life", and 77.7% reported that they would recommend the treatment to others.

ANGER AS A SECONDARY OUTCOME

CBT-based

Individual

Forbes et al., 2012	RCT with three month follow-up	I: CPT C: Treatment as usual	Australian veterans (66% Vietnam war) I: Mean age: 53.13 (13.97) Gender: Male (93%) C: Mean age: 53.62 (13.33) Gender: Male	Individual	Twelve twice weekly 60 minute sessions	- PTSD (CAPS)	- Depression (BDI) - Anxiety (STAI) - Anger (DAR7) - Alcohol Use (AUDIT)	N= 59	n= 30	n= 29
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There was a significant reduction in anger from pre to post-treatment, and a further reduction at follow-up. This reduction in anger was reported for both the CPT and TAU conditions, but on all secondary outcomes the CPT group improved more than the TAU group. No differences were found between the groups in therapeutic alliance.

Combined Group and Individual

Hermenau et al., 2013	RCT with six month follow-up	I. Narrative exposure therapy C: Controls	Congolese ex-combatants (local conflicts) Mean age: 19 (2.02) Gender: Male	Group and individual	Six sessions over two weeks	- PTSD (PSS-I) - Aggression (AAS)	Integration with civilian life and current contact with combatants (6 questions)	N= 38	n= 19	n= 19
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There was a significant reduction in aggression over time in both groups ($p < .001$) and no significant difference between groups ($p = .402$). There was a further reduction in aggression scores in both groups from post-treatment to six month follow-up. There was a trend for reduced symptoms of PTSD from pre to post-treatment in the treatment group ($p = .052$), but not in the control group ($p = .078$). The treatment group reported less PTSD symptom severity than the control group at the six month follow-up.

Khoo et al., 2011	Single group pre-post with nine month follow-up	I: CBT	Australian veterans (68% Vietnam) Mean age: 53 (not reported) Gender: Male (99.7%)	Group and individual	Six weeks intensive, followed by six weeks of fortnightly sessions	- PTSD (CAPS, PCL)	- Alcohol use (AUDIT) - Anger (DAR7) - Anxiety and depression (HADS) - Quality of life (WHOQOL-brief)	N= 496	N= 496	N/A
<p>There was a significant reduction in anger from pre to post-treatment, and these treatment effects remained significant at follow-up ($p < .001$). Further, 20.5% of participants demonstrated clinically significant change in PTSD scores from pre to post-treatment, and another 39.5% of participants demonstrated positive reliable change in PTSD scores. Forty percent of participants were classified as non-responders after treatment, meaning they demonstrated no reliable change in PTSD scores, or demonstrated deterioration of PTSD symptoms.</p>										
Owens, Chard & Cox, 2008	Single group pre-post	I: PTSD Residential Rehabilitation Program using CPT at VA medical centre	US veterans (68% Vietnam war) Mean age: 52.8 (8.14) Gender: Male (80%)	Group and individual	Seven weeks intensive	- PTSD (PCL-M)	- Depression (BDI-II) - Anger (STAXI-2)	N= 99	N= 99	N/A
<p>There was no significant change to anger from pre to post-treatment. Significant reductions were found for PTSD and depression from pre to post treatment. A significant interaction between PTSD severity and anger was also observed: Pre-treatment anger was a significant predictor of PTSD severity post-treatment, where moderate and high levels of pre-treatment anger predicted higher post-treatment PTSD severity.</p>										
Alternative therapy										
Individual										
Kip et al., 2013	RCT with three month follow-up	I: Accelerated Resolution Therapy C: Attention control	US veterans (51% OIF/OEF/OND) Mean age: 41.4 (12.6) Gender: Male (80.7%)	Individual	Two to five sessions over 2 weeks, 60-75 minutes each	- PTSD (PCL-M)	- Depression (CES-D) - Anxiety (STICSA) - Aggression (AQ) - Alcohol use (AUDIT)	N= 57	n= 29	n= 28
<p>No significant difference was found between groups in aggression post-treatment, but there was significant within-subject improvement from pre-treatment to follow-up in aggression in the intervention group. Significant reductions were also found in symptoms of PTSD, anxiety and depression in the intervention group compared to controls.</p>										
Group										
Bormann et al., 2005	Single group pre-post with three month follow-up	I: Mantram repetition	US veterans Mean age: 61.8 (13.2) Gender: Male (90.3%)	Group	Five weekly classes, 90 minutes each	- Stress (Cohen's Perceived Stress Scale) - Quality of life (Endicott's QoL Enjoyment and Satisfaction Short Form)	- Anxiety (STAI) - Anger (STAXI) - PTSD (PCL)	N= 101	N= 101	N/A
<p>There was a significant reduction in state anger ($p = .03$) and trait anger ($p = .01$) from pre to post treatment, and this time effect was mediated by mantram repetition. There were also significant improvements in quality of life ($p = .001$), reduction in PTSD symptoms ($p = .02$) and state ($p = .001$) and trait anxiety ($p = .03$). Participants rated the quality of instructors, delivery of content and classroom environment, but no means and standard deviations were reported for these items.</p>										

Perlick et al., 2013	Single group pre-post	I: Multifamily group treatment	US OEF/OIF veterans and family members Mean age: 36.1 (9.3) Gender: Male (79%)	Group	Phase 1: Two to three sessions Phase 2: Two 3-hour educational workshops Phase 3: Bimonthly meetings for six months	Veterans: - Distress (PHQ)	Veterans: - PTSD (PCL) - Functioning (SPRS)	N=14 (veterans)	N=14	N/A
Post treatment, veterans expressed less anger ($p < .01$; $d = .61$), as well as increased social support and occupational activity ($p < .05$) compared to before treatment. PTSD and depression scores were lower than before treatment, but this change was not statistically significant. Family members also reported decreased burden and increased empowerment after treatment.										
Staples, Hamilton & Uddo, 2013	Single group pre-post	I: Yoga intervention	US veterans (75% Vietnam war) Mean age = 62.2 (2.2) Gender: Male (83%)	Group	6 week, 1 hour twice weekly (12 total sessions)	- PTSD (PCL-M)	- Sleep (PSQI) - Anger (STAXI-2) - Quality of life (OQ-45.2)	N=12	N=12	N/A
There was no significant improvement in anger from pre to post-treatment. There was significant improvement in PTSD hyperarousal symptoms, sleep quality and daytime dysfunction related to sleep ($p < .05$), but no improvement in total PTSD or quality of life. Seventy-five per cent of participants rated the yoga classes as "extremely enjoyable" with the remaining rating the class as "very enjoyable". Eighty-three per cent thought the yoga classes were helpful in improving quality of life, and all said they were likely to recommend the program to other veterans.										
Combined Group and Individual										
Turner, Beidel & Frueh, 2005	Single group pre-post	I: Trauma-Management Therapy	US veterans Mean age: 47.9 (2.1) Gender: Male (100%)	Individual and group	Weekly sessions for four months	- PTSD (CAPS)	- Patient symptom ratings (sleep, nightmares, flashbacks & social activities) - Depression (BDI) - Anger (STAXI) - Global severity (CGI)	N= 15	N= 15	N/A
No significant change in anger from pre to post-treatment was found. Significant reductions in anxiety, PTSD symptoms, physiological reactivity and other symptom ratings (e.g. nightmares) were found, as well as an increase in social activities and number of hours of sleep post-treatment. Patients considered it a credible and positive therapeutic experience, and all but one indicated that they would encourage other veterans to participate in the treatment.										