

## Research Article

# Exploring the Efficacy of an Anger Management Programme for Veterans with Post-Traumatic Stress Disorder

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## Abstract

**Objective:** This study assessed the efficacy of a two-week residential treatment programme to support anger difficulties in veterans diagnosed with PTSD.

**Methods:** 172 participants with a diagnosis of PTSD and co-morbid difficulties with anger completed a standardised two-week residential treatment based upon cognitive behaviour therapy and Dialectical Behaviour Therapy principles. The intervention consisted of a mixture of group sessions and individual therapy. Participants were asked to complete a range of health outcomes pre- and post-treatment and three months later. 85 participants (49.4%) were followed up three months after treatment. Primary outcomes were measures of anger and aggression and secondary outcomes included other mental health difficulties.

**Results:** No differences in terms of baseline health outcomes and demographic characteristics were evident between those followed up and participants lost to follow-up. Significant reductions on the primary outcome measures of anger and aggressive behaviour were observed post-treatment. Examination of mean scores on the DAR-5 suggested anger difficulties was at sub-threshold levels following treatment. Significant, but more modest reductions were observed for symptoms of PTSD, depression and anxiety. Individuals who were unemployed, not in relationships or being defined as being early service leavers from the military had poorer treatment outcomes. In addition, higher rates of pre-treatment depression were associated with lower treatment efficacy.

**Conclusions:** Whilst limitations exist, findings from the study suggest cautious optimism for the treatment of anger in veterans with co-morbid PTSD.

**Keywords:** Aggression; Anger; Ex-service Personnel; Mental Health; Military; Veterans

## Introduction

Anger is characterised by feelings of annoyance, displeasure, or hostility and may also encompass aggressive behaviours. Data exploring the mental health profiles of military populations have detailed high prevalence rates of anger in service personnel from a range of countries [1-3]. Further, there seems to be evidence of high rates of co-morbidity between anger and a range of mental health problems, in particular Post-Traumatic Stress Disor-

der (PTSD) [4]. Within clinical populations of treatment seeking veterans there appears to be a high proportion of veterans reporting difficulties with anger [5-7]. Indeed, a recent study of UK veterans reported high rates of co-morbidity between PTSD and difficulties with anger [8]. This indicated considerable overlap between these difficulties. Difficulties with anger have also been associated with head injuries, increased functional impairment, difficulties engaging with therapy and treatment drop-out [9-11].

There have been a number of studies from a range of countries exploring the efficacy of treatment outcomes for veterans with PTSD [8,12-14]. Generally, these studies report reductions in

the severity of PTSD symptoms post-treatment, and maintenance of these improvements in the longer term. However, whilst reductions in PTSD severity have been noted, many participants in these studies are still experiencing a high burden of symptoms [15-17]. These findings are mirrored by studies exploring treatment outcomes for PTSD between veterans and non-veteran populations, which imply that veterans have poorer treatment outcomes [18-20]. Various studies have suggested that the severity of co-morbid mental health difficulties prior to treatment predicts reductions in treatment efficacy. As such, given the high correlation between PTSD and difficulties with anger within this population it seems prudent to explore the impact of providing tailored support to target anger for veterans with PTSD.

A number of studies exploring the efficacy of interventions to support veterans with difficulties managing anger related to PTSD have reported generally positive results [2,21-24]. The majority of these studies have recruited from US veteran populations. Given the disparity of experiences in terms of PTSD prevalence and health care systems between US veterans and UK veterans, the findings from these studies warrant further investigation within UK samples. Further, Cognitive Behaviour Therapy (CBT) has been the predominant model used to guide the interventions [2,21,23]. In the current study, we explored the efficacy of a novel Anger Management Programme (AMP) for UK veterans with anger who had also been diagnosed with PTSD. This intervention was underpinned by both CBT and Dialectical Behaviour Therapy (DBT). The rational for including elements informed by DBT was to address the emotional dysregulation that is common in both PTSD and anger presentation. DBT provided a framework to support participants to develop adaptive strategies to improve affect regulation [25]. Treatment efficacy was evaluated by collecting a range of health outcomes at the start and end of treatment and then again three months later. We explored treatment outcomes in terms of changes in experiences of anger and aggression and a range of co-morbid mental health presentations. Further, predictors of treatment efficacy were evaluated.

## Methods

### Settings

This was a naturalistic study that exploited data collected from a national clinical service in the UK. This service is called Combat Stress (CS) and is the largest dedicated provider of mental health services to veterans in the UK. CS receives approximately 2,500 new referrals annually from veterans across the UK seeking support [26]. The most prevalent disorder that veterans seek support for is PTSD [9]. CS uses a phased treatment model as recommended by NICE to support individuals with PTSD [27,28]. The initial phase of treatment is stabilisation support and aims to provide individuals with adaptive strategies to manage emotional dysregulation [27]. The AMP fitted within this phase of treatment [29].

### AMP description

The AMP was a two-week residential programme that aimed to address multiple contributors to problematic anger and aggression. Individuals were assigned to closed cohorts of eight participants and were required to complete a combination of group sessions and individual therapy on weekdays between 9:30 and 16:30. The course was manualised and supervision used to ensure treatment fidelity. 25 one-hour group sessions were facilitated by a multi-disciplinary team. The MDT comprised of nursing staff, occupational therapists, art therapists, CBT therapists and psychologists. The majority of the groups (20/25) concentrated on CBT concepts (e.g.: exploration of the links between anger and thoughts, physiological arousal and behaviour; trigger identification, and self-monitoring) and principles of DBT (e.g.: improving emotional recognition; techniques for regulating overwhelming emotions; enhancing distress tolerance; cultivating acceptance and mindfulness). In addition, two occupational therapy groups were offered that focussed on wellness and promoting engagement in meaningful activities, and three sessions of art therapy and daily guided relaxation were run. All groups were manualised to ensure a standard treatment experience.

Alongside groups, participants were offered five one-hour individual sessions delivered by a psychologist or CBT therapist. These sessions were used to set individual goals, personalise and practice skills learned in groups and focus on relapse prevention.

### Participants

Participants were recruited from a population of treatment seeking veterans that had been diagnosed with PTSD. Participants may also have been experiencing a range of other co-morbid mental health difficulties. Inclusion criteria for the AMP included being a veteran (in the UK this is defined as completing one day of paid service [30]), having a diagnosis of PTSD and evidence of significant difficulties with anger. Exclusion criteria included uncontrolled substance misuse, current psychotic symptoms, a formal diagnosis of a personality disorder, or a brain injury with evidence of significant neurological impairment that would impact on their ability to engage with a psychological intervention. This did not exclude those with mild and moderate traumatic brain injuries. Those with current substance misuse or psychotic symptoms would be referred to specialist support and may have been referred to the AMP at a later date.

Between 2014 and 2016, 176 individuals enrolled on the AMP. 172/176 individuals (97.7%) completed treatment and four individuals (2.3%) opted to end their treatment early. Of these, two individuals reported difficulty with engaging in treatment as they reported increases in their anger and arousal levels during the initial few days of treatment; similarly, one person reported an increase in anxiety at the start of therapy and one individual reported struggling with group dynamics that led to them choosing to leave early.

## Measures

Participants were asked to complete a self-reported questionnaire at the start of the AMP and at the end of treatment two weeks later. Participants were then sent questionnaires in the post to elicit responses three months later. Questionnaires included a range of self-reported measures and demographic information.

## Primary outcomes

The dimensions of anger reactions (DAR-5) scale was used to assess difficulties related to anger. The DAR-5 is a five item measure, scores of 12 or above have been recommended to indicate the presence of acute difficulties with anger [31]. The questions from the DAR-5 could be hypothesised to be related to internal cognitions and emotional states. For example, 'When I get angry, I stay angry'. We were also interested in accessing behaviours related to aggressive behaviour. To do this we used a measure developed by the Walter Reed Army Institute of Research [32] which is based upon the Interpersonal Conflict Scale [33] and the State/Trait Anger Scale [34]. This measure has been used previously in studies of anger in US and UK military populations [3,32]. This a four item measure which we termed the Walter Reed Four (WR-4) and included the following questions to assess for aggressive behaviours over the last month: 'How often did you get angry at someone and yell or shout', 'How often did you get angry with someone and kick or smash something, slam the door, punch the wall etc.', 'How often did you get into a fight with someone not in your family and hit the person' and 'How often did you threaten someone with physical violence'. Respondents were asked to rate each question with five options (never, once, twice, three or four times or five or more). These were scored between zero and four and a total score calculated by adding these together.

## Secondary outcomes

The nine item Patient Health Questionnaires (PHQ-9) was used to explore symptoms of depression (scores of 10 and above used to define meeting case criteria) [35,36], the seven item General Anxiety Disorder measures (GAD-7) to assess for symptoms of generalised anxiety (cut-off score of eight or above) [37], the revised Impact of Events Scale (IES-R) to screen for symptoms of PTSD (cut-off score of 33 or above) [38]. In addition, the Alcohol Use Disorder Identification Test (AUDIT) was used to record problems with alcohol (cut-off score of 8 or above) [39]. In contrast to the other measures, the AUDIT was only administered at pre-treatment and three-month follow-up. This was due to participants being required to refrain from consuming alcohol during the two-week AMP.

## Demographic characteristics

Age, sex, educational achievement, relationship status, role in military (combat vs non-combat), type of discharge from mili-

tary (voluntary vs non-voluntary redundancy), length of employment within the military and the date they left military were collected at the start of treatment. In addition to these measures, we constructed an additional measure titled 'Time to seek help' by taking away the data of initial contact with Combat Stress with the date an individual left the military.

**Ethical approval:** Ethical approval was granted by the Combat Stress ethics committee

**Analysis:** The first stage of analysis involved using descriptive statistics to explore the sample. Following this, differences were assessed between participants we were able to follow up at three months and those lost to follow up. This was done by fitting logistic regression models to assess whether differences were present in the demographic characteristics and admission health ratings between these two groups. Following this random slope non-linear growth models with a fixed coefficient of time squared were fitted to explore the longitudinal changes in scores for the primary and secondary health outcomes at three month follow up [40]. These were adjusted for age, relationship status and employment status. These demographics were chosen for adjustment as they have previously been identified as potential predictors of treatment outcomes [8]. Effect sizes between admission and follow-up primary outcomes were calculated and interpreted using the accepted guidelines (effect size 0.2=small; 0.5=medium and 0.8 and above=large) [41]. The final stage of analysis was to examine whether baseline secondary health outcomes or demographic variables predicted treatment efficacy for the two primary health outcomes (DAR-5 and WR-4). Multivariate linear regression models were fitted to assess potential predictors of changes on either the DAR-5 or WR-4. Two models for each primary outcome were fitted. The first model was adjusted for the pre-treatment secondary health outcomes and a number of demographic variables (education, relationship status, employment status and being an early service leaver; defined as completing less than four years of service in the military). Model two further adjusted for pre-treatment scores on the primary outcomes (DAR-5 and WR-4). All analyses were conducted using STATA 13.0.

## Results

The demographic characteristics are described in (Table 1). The majority of the participants were aged 45 years old or older, reported lower educational attainments, were in a relationship, and were not working. Only a small minority were defined as early service leavers and one participant was female. It was observed that significant periods had passed since individuals had left the military, with just under three quarters of the sample stating they had left the military at least 10 years previously. Of the 172 participants who had completed the AMP during the study period, 85/172 (49.4%) were successfully followed up after three months. We were concerned that due to this relatively low number a non-

responder bias may be present. This was explored in (Table 2). Encouragingly, no significant differences in terms of demographic characteristics and pre-treatment health outcomes were observed between those followed up or not three-month post treatment.

		Full Sample	
Variable		(N=172)	
Age group, n (%)			
<35		26 (15.1)	
35-44		49 (28.5)	
>45		97 (56.4)	
Sex, n (%)			
Male		171 (99.4)	
Female		1 (0.6)	
Education, n (%)			
Low (O Levels or none)		109 (63.4)	
High (A Levels or above)		63 (36.6)	
Relationship status, n (%)			
In a relationship		120 (68.8)	
Single		53 (30.2)	
Employment status, n (%)			
Working		44 (26.5)	
Not working		122 (73.5)	
Early Service Leaver, n (%)			
No		153 (91.1)	
Yes		15 (8.9)	
Military discharge, n (%)			
Voluntary		109 (64.1)	
Non-voluntary		61 (35.9)	
Years since left the military, n (%)			
01-Sep		44 (26.3)	
Oct-19		43 (25.8)	
20-29		48 (28.8)	
30+		32 (19.1)	

<sup>1</sup>Numbers may not add up to 172 because of missing data

**Table 1:** Demographic Characteristics.

Education			
Low	31 (35.6)	32 (37.7)	1.00
High	56 (64.4)	53 (62.3)	0.89 (0.41-1.95)
Relationship status			
In a relationship	56 (64.4)	64 (75.3)	1.00
Single	31 (35.6)	21 (24.7)	0.67 (0.30-1.50)
Employment status			
Working	21 (25.0)	23 (28.1)	1.00
Not working	63 (75.0)	59 (71.9)	0.74 (0.30-1.83)
Early Service Leaver			
No	77 (90.6)	76 (91.6)	1.00
Yes	8 (9.4)	7 (8.4)	0.74 (0.21-2.61)
Military discharge			
Voluntary	52 (60.5)	57 (67.9)	1.00
Non-voluntary	34 (39.5)	27 (32.1)	0.70 (0.33-1.51)
Anger (DAR-5)			
Non-case	1 (1.2)	4 (4.7)	1.00
Case	86 (98.8)	81 (95.3)	0.20 (0.02-2.54)
Depression (PHQ-9)			
Non-case	6 (6.9)	6 (7.1)	1.00
Case	81 (93.1)	78 (92.9)	1.27 (0.22-7.33)
Anxiety (GAD-7)			
Non-case	3 (3.5)	4 (4.7)	1.00
case	84 (96.5)	81 (95.3)	0.70 (0.06-8.40)
PTSD (IES-R)			
Non-case	9 (10.7)	7 (9.0)	1.00
Case	75 (89.3)	71 (91.0)	1.50 (0.27-8.44)
Alcohol (AUDIT)			
Non-case	50 (57.5)	52 (61.9)	1.00
Case	37 (42.5)	32 (38.1)	0.91 (0.43-1.92)

**Table 2:** Characteristics and admission health differences between participants who were successfully followed up or not at 3 months.

Changes in the primary and secondary health outcomes following treatment were reported in (Table 3). Significant reductions in the two primary health outcomes assessing anger or aggressive behaviours that were maintained three months after treatment were observed. Changes in mean DAR-5 score between pre-treatment and three months follow up suggest that these dropped from above the cut-off of 12 to sub-threshold level of anger (15.2 reducing to 10.8). A large effect size was observed for the DAR-5 (0.96) and a medium effect size on the WR-4 (0.75). Whilst significant, more modest reductions were found for the secondary health outcomes such as depression and PTSD. No significant changes for alcohol were reported, though it should be noted that the mean AUDIT

scores at both pre-treatment and follow up, were below the cut-off of eight which can be used to indicate the presence of alcohol problems.

	Admission Score Mean (SD)	3 Month Score Mean (SD)	Unadjusted $\beta$ (95% CI)	Adjusted $\beta 1$ (95% CI)
Problem with anger				
DAR-5	15.2 (3.69)	10.8 (5.07)	-4.30 (-5.66 to -2.95)	-4.26 (-5.65 to -2.86)
Aggressive behaviours				
WR-4	7.78 (3.81)	4.93 (3.74)	-2.79 (-3.90 to -1.68)	-2.85 (-3.99 to -1.70)
Depression				
PHQ-9	16.8 (5.65)	16.1 (6.04)	-1.23 (-1.85 to -0.61)	-1.24 (-1.98 to -0.61)
Anxiety				
GAD-7	14.8 (4.42)	14.0 (4.71)	-1.26 (-1.84 to -0.68)	-1.29 (-1.88 to -0.70)
PTSD				
IES-R	54.9 (18.1)	49.8 (21.2)	-4.35 (-6.04 to -2.66)	-4.54 (-6.28 to -2.80)
Alcohol problems				
AUDIT	7.26 (7.55)	6.89 (6.99)	-0.06 (-0.58 to 0.46)	-0.04 (-0.56 to 0.47)

<sup>1</sup>Model adjusted for age, relationship status and employment status. SD=Standard Deviation. Effect size for DAR-5: Cohen's d=0.96. Effect size for WR-4: Cohen's d=0.75

**Table 3:** Three-month post-treatment health outcomes.

Results in (Table 4) observed whether pre-treatment secondary health outcomes or demographics characteristics predicted treatment efficacy for the primary anger-related outcomes at three months. Higher rates of pre-treatment depression were associated with significantly higher scores on the DAR-5 following treatment. Similarly, not being in employment or being single were associated with reduced treatment efficacy post-treatment on the DAR-5. In contrast, no variables were found to predict changes on the WR-4. This may have reflected the smaller effect size in treatment outcomes observed for the WR-4.

	DAR-5		WR-4	
	Model 1	Model 2	Model 1	Model 2
	$\beta$ (95% CI)	$\beta$ (95% CI)	$\beta$ (95% CI)	$\beta$ (95% CI)
Depression (PHQ-9)	0.49 (0.15 to 0.83) *	0.52 (0.21 to 0.84) *	0.01 (-0.29 to 0.30)	0.03 (-0.23 to 0.28)
Anxiety (GAD-7)	-0.06 (-0.42 to 0.31)	-0.25 (-6.1 to 0.10)	0.10 (-0.20 to 0.41)	-0.16 (-0.45 to 0.13)
PTSD (IES-R)	0.04 (-0.05 to 0.12)	0.02 (-0.06 to 0.10)	0.01 (-0.06 to 0.09)	0.01 (-0.05 to 0.08)
Alcohol (AUDIT)	0.04 (-0.13 to 0.21)	0.01 (-1.48 to 0.16)	-0.03 (-0.14 to 0.14)	-0.08 (-0.20 to 0.05)
Education (high group)	-0.07 (-2.40 to 2.26)	-0.31 (-2.47 to 1.84)	1.84 (-0.10 to 3.77)	0.98 (-0.75 to 2.72)
Relationship (single)	1.00 (-1.43 to 3.45)	0.58 (-2.70 to 2.85)	-1.11 (-3.17 to 0.96)	-0.62 (-2.43 to 1.20)
Employment (not working)	3.30 (0.76 to 5.85) *	3.77 (1.40 to 6.13) *	0.74 (-1.40 to 2.88)	1.28 (-0.60 to 3.16)
Early Service Leaver (yes)	3.99 (0.01 to 7.98) *	3.92 (0.23 to 7.61) *	-1.74 (-5.05 to 1.57)	-1.31 (-4.20 to 1.59)

Note. \* $=p \leq 0.05$ .

Model 1  $\beta$  adjusted for the other health outcomes and demographic characteristics in table.

Model 2 additionally adjusted for pre-treatment DAR-5 and WR-4 scores.

**Table 4:** Baseline health and demographic predictors of three-month anger treatment outcomes.

## Discussion

In this study, we provided evidence for positive treatment responses in a sample of UK veterans diagnosed for PTSD and who had been treated for anger and aggression. The intervention they had received was a standardised two-week residential treatment programme that consisted of a mixture of groups and individual sessions structured around both DBT and CBT principles. Improvements in symptoms of anger and aggression were noted post-treatment and maintained three months later. On average, these reductions suggested that following treatment, participants' difficulties with anger were at sub-threshold levels. Encouragingly, post-treatment reductions in both anger and aggressive behaviours were observed.

More modest improvements were observed for secondary outcomes such as PTSD, depression and anxiety. Reductions in the severity of PTSD scores post treatment are intriguing. The AMP was not designed to target PTSD per se, however, the overlap between anger and hyper-arousal symptoms of irritability common in PTSD may explain this reduction. Indeed, researchers have suggested that within military populations anger and aggression are defining features of PTSD [4]. No changes in alcohol difficulties were observed. This is perhaps not unexpected given that the mean pre-treatment scores on the AUDIT were below clinical cut-offs suggesting that alcohol problems were not prevalent within this sample prior to them starting therapy.

A number of predictors of poorer treatment efficacy were identified. These included the severity of pre-treatment depression, not being in employment or being an early service leaver from the military. Previous research has identified that early service leavers report experiencing a greater number of adverse childhood experiences and suggested they are at greater risk of experiencing mental health difficulties and post-service social exclusion compared to their peers [42-45]. The finding from the current study is worrying, as it also suggests they are also at risk of poorer treatment responses, possibly as a result of the previously listed vulnerability factors. Pre-treatment depression has previously been identified as a predictor of poorer treatment response in veterans with [8,12,46-48]. An inclusion criterion for this study was that participants had received a PTSD diagnosis. As such, as we did within the current study, it could be expected to replicate the finding of an association between symptoms of depression and poorer treatment efficacy. This replicated finding is further evidence of the importance of treating mental health difficulties that are common co-morbidities with PTSD, such as depression, prior to trauma-related therapy.

## Strengths and limitations

The study profited from the use of a standardised intervention that had been manualised to ensure good treatment fidelity. The sample was recruited from a national charity providing mental health services to veterans meaning they were representative of treatment-seeking veterans who had been diagnosed with PTSD and co-morbid difficulties with anger and aggression. Indeed, a recent study exploring the mental health profile of treatment seeking observed that PTSD was the most prevalent disorder within this population and that it was most frequently co-morbid with anger [49]. This increases confidence in the generalisability of the reported outcomes for other treatment seeking veteran populations.

However, there are a number of potential limitations that need to be considered when interpreting the results presented. Firstly, we were only able to follow up around 50% of the sample three months after treatment. We were able to demonstrate there were no differences between those followed up or not in terms of socio-demographic factors and pre-treatment health outcomes.

However, these two groups may have differed on unmeasured variables. For example, it could have been that the most unwell were lost to follow-up, as being unwell may have restricted their capacity to return the follow up measures. Alternatively, it could be that the most unwell may have been more motivated to return measures to alert the service to their need for additional support. Secondly, the current study employed an observational design. We acknowledge the limitations that not using randomisation entails. The rationale for this was that we had taken the opportunity to evaluate an existing service offered by CS. It could be that gains observed within the current study resulted from natural recovery from PTSD. However, participants reported that on average they had left the military 18.7 years previously. We have used this time as a proxy measure for time since experiencing mental health difficulties. As such, this provides evidence against spontaneous recovery as participants had been experiencing anger related to their diagnosis of PTSD for significant periods of time. Thirdly, the criteria for the study may have inadvertently excluded groups of individuals that could be hypothesised to have the most significant issues related to anger and aggression. For example, individuals with uncontrolled substance misuse difficulties. Given the brevity of the intervention, there is a clear clinical rationale for this, though it is important to note that the target population for this described intervention may be individuals with more moderate difficulties with anger, rather than individuals with more severe difficulties. That said, the mean pre-treatment score on the DAR-5 was 15.2 out of a possible 20 which suggests that participants reported significant difficulties with anger.

## Conclusions

Overall, we have presented results that demonstrated the efficacy of a two-week residential treatment programme for veterans diagnosed with PTSD to target co-morbid difficulties with anger and aggression. This programme contained a mixture of groups based upon principles of DBT and CBT alongside individual therapy sessions. The effect sizes suggest cautious optimism about such an approach. The results presented could propose a number of relevant clinical implications. Our data suggests that anger associated with PTSD can be treated prior to engaging in trauma-focused therapy. In turn, this could mean that individuals are better prepared for when they do start trauma therapy to directly address their symptoms of PTSD as co-morbid psychological problems have been found to reduce the efficacy of PTSD treatments [8]. Further, the treatment described could be categorised as a brief intervention that only included five individual therapy sessions. As such, this may provide a cost-effective method to support veterans. More research is needed to explore the intervention described within the paper using a RCT design to overcome the limitations discussed above. In addition, it would be advantageous to explore whether support for anger and aggression can have a beneficial effect on treatment outcomes for those then offered therapy targeted directly at their symptoms of PTSD.

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